UNIVERSITY OF EDUCATION, WINNEBA

ACCESS TO INFORMATION FOR STUDENTS WITH VISUAL IMPAIRMENT AT THE UNIVERSITY OF EDUCATION, WINNEBA

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DECLARATION

Student's Declaration

I, Sylvester Poku, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

Signature: .....

Date: .....

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Thesis as laid down by the University of Education, Winneba.

Name: DR. AWINI ADAM (**Supervisor**)

Signature: .....

Date: .....

DEDICATION

To the Poku family for their inspiration, financial and moral support.

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ABSTRACT

The purpose of the study was to explore how students with visual impairment access academic and social information on campus and to identify support systems that could be put in place to enhance access to information, to facilitate their adjustment in the University. Data was gathered from 120 students with visual impairments and 2 resources persons. One-on-one interview and a close ended questionnaire were used for the data collection. Data from the questionnaire were analyzed on Statistical Package for Social Sciences version 21.0 (IBM SPSS 21.0), and descriptive statistical method was used to calculate the frequency and percentages for each item-by-item analysis. The findings revealed that academic information was found to be the most needed information by students with visual impairment followed by social, financial, employment and health. The students with visual impairment got information to meet their academic needs through discussions with colleagues, visiting the Resources Centre for Students with Special Needs, browsing the Internet and relying on lecturers. Most of the students preferred braille format depending on their level of sightedness. Also, library facilities, equipment and staff were found to be inadequate. The challenges facing students in accessing information include: inadequate print materials, mobility difficulties, poor library facilities and slow Internet connectivity. Recommendations made include a written service policy, provision of assistive technology devices and computers with Job Access with Speech (JAWS) software to improve information services for students with visual impairment.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

Information plays a vital role in many students' lives and the 21st century has been described as the era of information revolution; with the presence of information-bearing materials in diverse formats (Ortlieb, 2014). According to Katz (2013), accessing information is a vital resource needed by students to perform well in their academic pursuits. Given the current techno-savvy generation, libraries should not only be equipped with materials in print format but also in electronic format, thus, offering users with different selection to choose from since the library is known as the academic heart of the University (Chan & Wong, 2013; Hyman, Moser, & Segala 2014). In this context, the rule of supply and demand is necessitated by information needs.

"Information usually implies that data is organized and meaningful to the person receiving it. Data is, therefore, the raw material that is transformed into information by data processing. Information can be defined in terms of its surprise value. It tells the recipient something he did not know" (Davis, 2013: 30) cited by Introna (2016). In the context of this study, information has been conceptualized as any meaningful data required by students with visual impairment that enhances their academic and social performance so as they can adjust to the University community.

Although, there are different types of information every student needs to adjust to the University community, students with visual impairment need certain kind of information for them to be able to adjust to the University community. According to Case (2008), information need is a state or process when one perceives that there is a breach between the information and knowledge available to solve a problem and the actual solution to the problem. Further, it is a gap in a person's knowledge of not

knowing where and how to obtain relevant and accurate information to satisfy their informational needs. Kuhlthau (2014), as well as Baby and Kumaravel (2011) stated that the need for information is often understood as evolving from a vague awareness of something missing and as culminating in locating the information that contributes to understanding and meaning. Specialized information programmes that offer equal opportunities, lifelong education, and cultural enjoyment to students suffering from print disabilities. This would enable students who are visually impaired to play an active role in society. Understanding the information needs of students who are visually impaired would also help to provide precise, relevant and comprehensive information to students who are visually impaired, such information needs include: academic, social, employment and health information.

Academic and social information needs form an essential part of every student's life and cannot be seen in separation from their other needs. Davies (2007) proposes that students draw from an institution's resources for a variety of purposes, including daily living and leisure, and points out that most universities claim to be equally hospitable to their whole community and should have no artificial boundaries in terms of meeting everybody's needs. However, resource constraints may impinge greatly on what a particular institution can provide. Members of the student community have no excuse to inform their needs or in the way they can access the University's services. For students with visual impairments, the mere fact that information is accessible is not enough. They must be able to access the information with relative ease. Students with visual impairments find themselves in a condition that triggers the need to seek and use information (Smith & Rosenblum, 2013). For example, students constantly find themselves in need of information to write assignments, essays, tests, and any other academic and social-related information. They further stated that during lecture time,

students with visual impairment needed specialized tools like specialized Braille computers to generate the required information. Libraries and librarians provide academic information that people need to participate in the emerging information society. Therefore, librarians have a moral obligation to make information available to all categories of users regardless of their gender, age, race, political affiliation or disability. Such inclusive, non-discriminatory service however remains the ideal rather than the norm as some people remain underserved in terms of access to information. Among these disadvantaged groups are the visually impaired. However, in the University of Education, Winneba (UEW), students who are visually impaired, who cannot read Braille, usually have access to print material by traditionally using a mediator like, a family member, a friend, a designated helper, or an organization to access academic and social information.

Again, students who are visually impaired face several challenges in accessing academic and social information that make them prone to powerlessness and inability to access information and to participate in decision making and development programmes that affect them in their fundamental rights. These include lack of proper technology, lack of facilities, inadequate finances, inadequate human resources, difficulty in navigating the environment, social isolation, access to documents, professionalism, copyright act and national information policies. Reviewing the recent past, it can be seen that sharing method of resources of academic researchers were printed references. Ongoz, and Baki (2010) asserted that lots of resources like; books, journals, encyclopedias, theses, scientific articles, and reports are open for access in electronic databases in digital media. Halloway (2011) said that to search for relevant information of any format is more often challenging especially for the students who are visually impaired at times, most of the information searchers give up in the course of

accessing information due to various challenges they encounter. Hill (2013) postulated that students who are visually impaired require specialized materials to help in accessing and seeking relevant and useful information. Case and Davidson (2011) argued that extra time is needed for information processing and transcription from information sources by students who are visually impaired. This will become problematic or impossible for students who are visually impaired to find materials in the library without specialized assistance. Understanding the information needs of different library users is essential in the set-up of information systems. Meanwhile, if librarians are to serve the library patrons realistically, they need to bear in mind the changing needs and variations in information gathering of these patrons to be able to provide services that would be most useful to their needs (Luo, 2011).

Visual impairment can be found in all countries in the world and Ghana is not excluded. Significant changes in the education of people with impairments have directed to an increase in their educational ambitions and thus, an increasing number of students with visual impairment are in tertiary institutions. Meanwhile, the publication of The Standard Rules on the Equalization of Opportunities for Persons with Disabilities (1994) by the United Nations General Assembly (1994) and Public Library Manifesto by UNESCO (1994), the mindfulness that information is a crucial and fundamental right even of the persons with disability has been established comprehensively. The International Federation of Library Associations (IFLA) Guidelines for Development of The Public Library Service (2001) said that, the growth of gatherings should be based on the principle of access for all and comprise access to formats suitable to exact clients, for example, braille and talking books for people with visual impairment. In order to offer information to the general public, libraries and librarians must make information available to all information users in order to make

contributions. Therefore, regardless of their disability, they must make knowledge available to all kinds of patrons. Yet, some people are port-out and among these unfortunate ones are the visually impaired (Friend, 2009).

The University Education, Winneba began admitting students with visual impairment in 1993/1994 academic year with five (5) students who were visually impaired (Dogbe's communication outcome, June 8, 2016, as cited in Acheampong, 2017). This number has increased with time, and currently UEW has a total number of 120 as of 2018/2019 academic year. Few studies have been conducted to find out how this group of students access information for their academic and personal development while on their various programmes of study at the University. A search at the Osagyefo Library at the UEW by the researcher on April 21, 2019, in the presence of a library staff, indicated that there was no empirical study on the support systems made by the University to enhance access to information by students who are visually impaired at the University of Education, Winneba. This study was therefore conducted to explore how students with visual impairment access academic and social information on campus and to identify support systems that could be put in place to enhance access to information, to facilitate their adjustment in the University.

1.1 Statement of the Problem

The University of Education, Winneba admits qualified students from different backgrounds and with different medical conditions to pursue different programmes. Some of these are students with special needs with varying forms of disabilities including visual impairment. The way of accessing information varies from person to person depending on the condition (Budricks, 2007). However, the ability to access and use the information on any subject allows a person to choose from many alternatives instead of being limited to a few, perhaps unwanted or unfeasible choices (Fullmer &

Majumder, 2015). Nevertheless, little is known about the broad range of information needs for the everyday life of a student with visual impairment at the University of Education, Winneba.

Again, access to information is very crucial to students including those who are visually impaired. However, an observation made by the researcher at UEW revealed some interesting ways by which students with visual impairment access information such as, asking their sighted peers to read notes for them. Barraga (1986) also stated that vision provides more than 80% of humam knowledge in the world. But there could be other ways in which students with visual impairment can use access information in the University which the researcher wishes to unravel.

Also, a study conducted by Riley (2002), Byerley and Chambers (2012) revealed that students with visual impairment experience unique challenges when accessing information which puts them at a disadvantage socially and also retards academic achievements. Due to the limited number of resources that aid in accessing information and documents in accessible formats the students with visual impairment in the University of Education Winneba face some challenges in accessing academic and social information for their adjustment in the University community. These unique challenges are what the researcher seeks to find out from the students themselves.

Furthermore, little empirical study has made about the support systems that have been put in place to enhance access to information, to facilitate their adjustment in the University. In conclusion, all the above-stated challenges or problems appear to be affecting or slowing the learning of the visually impaired in the University.

1.2 Purpose of the Study

The purpose of the study was to explore how students with visual impairment access academic and social information in the University of Education, Winneba and to identify support systems that could be put in place to enhance the students' access to information so as to facilitate their adjustment in the University.

1.3 Objectives of the Study

The study specifically sought to:

1. Identify the information needs of students with visual impairment necessary for their adjustment at the University of Education, Winneba.
2. Explore how students with visual impairment access academic and social information at the University of Education, Winneba.
3. Find out what challenges students with visual impairment face in accessing academic and social information at the University of Education, Winneba.
4. Identify identify support systems that could be put in place to enhance the students' access to information so as to facilitate their adjustment at the University of Education, Winneba.

1.4 Research Questions

The following research questions were raised from the objectives:

1. What are the information needs of students with visual impairment necessary for their adjustment at the University of Education, Winneba?
2. How do students with visual impairment access academic and social information at the University of Education, Winneba?

3. What are the challenges that students who are visually impaired face while seeking academic and social information at the University of Education, Winneba?
4. What support systems that could be put in place to enhance the students' access to information so as to facilitate their adjustment at the University of Education Winneba?

1.5 Significance of the Study

The results of this study would help in finding out the information needs of students with visual impairment at the University of Education, Winneba. This would enable the students who are visually impaired to know the appropriate information they need and how to access that information to be able to adjust to the University community. The results of the study would further help in finding out how students with visual impairment access academic and social information at the University of Education, Winneba. This would enable the University authorities to put in place appropriate means for students with visual impairment to have in accessing academic/social information at the University of Education, Winneba.

Also, the results of this study would help in revealing the challenges faced by students who are visually impaired while seeking academic and social information at the University of Education, Winneba. This would enable the University authorities to put appropriate measures to enable students who are visually impaired to access information with ease. The results of this study would further help in revealing the support system that is available in the University to enhance access to information by students with visual impairment. This would enable the University to provide more support systems or improve such provision for students with visual impairment

accessing information. Finally, the results of the study would add to the existing literature.

1.6 Delimitation

Even though there are students with visual impairment in other Universities in Ghana, this study only focused on students with visual impairment in the University of Education, Winneba. The study also focused on the information needs of students with visual impairment in the University of Education, Winneba and how students with visual impairment access academic and social information at the University of Education, Winneba; The challenges faced by students who are visually impaired while seeking information and finally the support systems that could be put in place to enhance access to information, to facilitate their adjustment in the University.

1.7 Limitations of the Study

There were difficulties in scheduling appointments to meet all the 120 participants to distribute the questionnaire to them because of the lockdown of all Universities in Ghana due to the corona virus (Covid-19) outbreak in the country. Also, there were difficulties in interviewing the participants face to face due to closing down of all Universities in Ghana. The researcher overcame this challenge by contacting the participants through phone calls. This delayed the data collection period. Despite these limitations, the outcome of the study was not significantly affected.

1.8 Operational Definition of Terms

Access: Obtain, or retrieve. It is simply being able to get to what you need.

Information: Information is knowledge about a particular subject, issue, event or process. Information can be obtained from various sources: you can be told information,

for example through a lecture or a television programme, or you can find information through your research.

Visual impairments: Limitations imposed by visual loss or reduction on a person's ability to interact with the environment. It include total blindness and low vision.

Information seeking: information seeking is the purposive search for information to satisfy certain goals on a particular issue or topic, thus incorporating a series of encounters with information within a space of time rather than a single reference incident.

1.9 Organization of the Study

The study is presented in six chapters. Chapter One of the study sets out the background and the purpose of the study. It deals with the background to the study, statement of the problem, the purpose of the study, and research questions. Other aspects of the chapter include the significance, delimitations, operational definition of terms and organization of the study. Chapter Two deals with the review of related literature. It presents an overview of the theoretical perspectives and conceptual framework of the study. It also outlines what other authors or writers have written about the topic of the study. Chapter Three focuses on the general methodology adopted for the study. It describes the research approach and design, the population, sample and sampling techniques, data gathering instruments, trustworthiness, dependability, pre-testing and data collection procedures of the study. Also covered in the chapter are procedures adopted for data analysis.

Further, chapter four also presented the results of the study, and in Chapter Five, the discussion of the findings was presented. Finally, the summary of findings,

conclusions, recommendations, and suggestions for further research form the concluding chapter of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the literature reviewed for the study. The literature was reviewed from research articles, refereed journals, and books. The literature reviewed first covered the theoretical framework and the review on the key themes raised in the research questions. The areas covered were:

1. Theoretical framework
2. Conceptual framework
3. Information needs of students with visual impairment
4. Access to academic and social information for students with visual impairment
5. Challenges faced by students who are visually impaired in accessing academic and social information
6. Available support system to enhance access to information of students with visual impairment
7. Summary of literature review

2.1 Theoretical Framework

A theoretical framework is a hypothetical outlook that guides the study and raises the questions that are expected to be dealt with. Creswell (2003) defines theoretical framework as a collection of interrelated concepts which can be simply a theory, but it can also be more general and a basic approach to understand a concept. A theoretical framework describes the types of variables that the researcher need to observe. They provide a standpoint to guide as to what subjects are significant to survey, and the group of persons that are require to be studied. It is an instruction method of building from the data to broad themes, to a generalized model or theory.

With the advent of information need and seeking behaviour, different models were proposed for identifying different steps involved in this process (Kuhlthau, 1994).

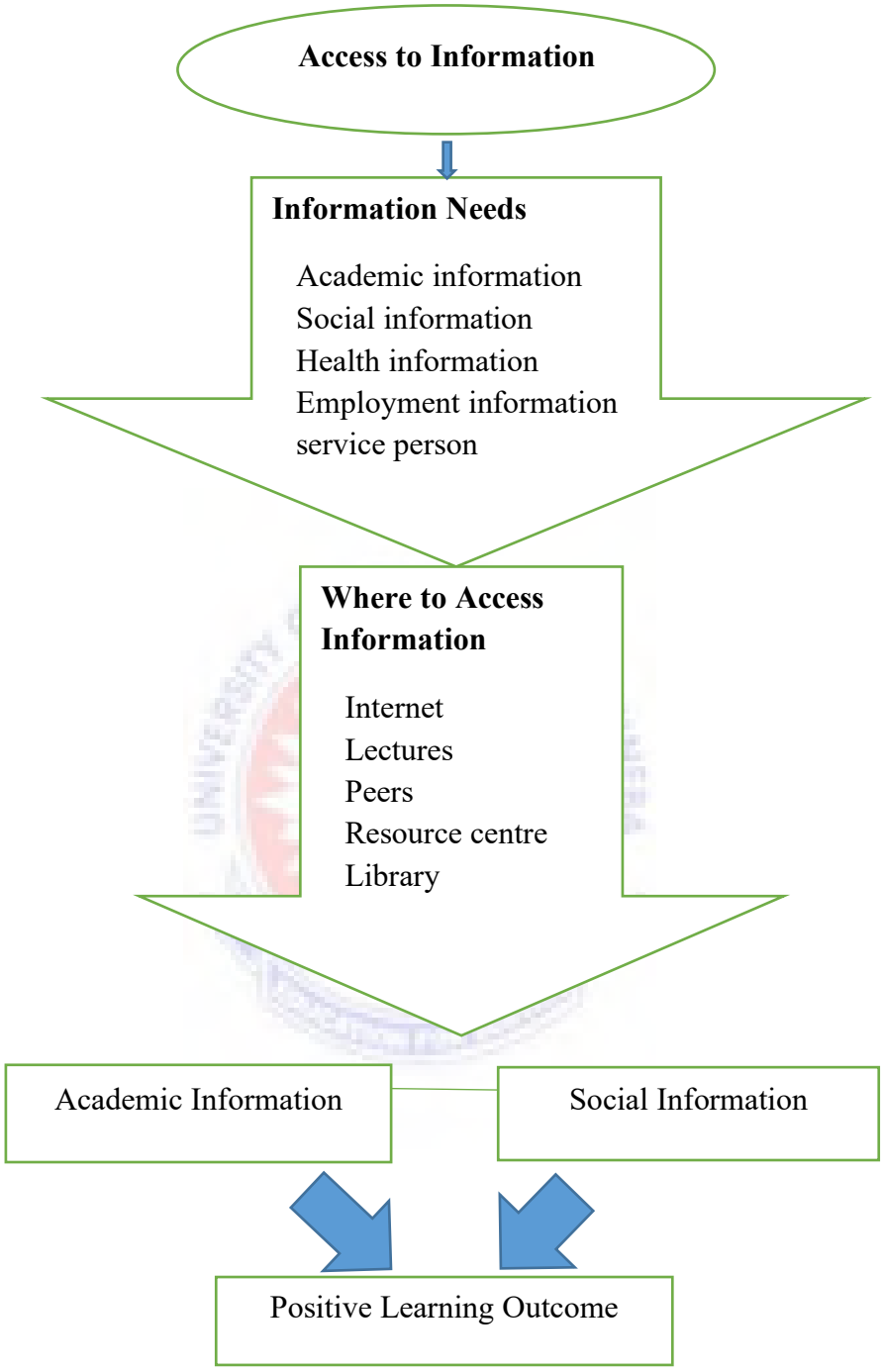
2.1.1 Wilson's 1999 Model of Information Behaviour

Wilson's (1999) model of Information Behavior is the model for this study which is the revised edition of the 1996 model. Wilson's (1999) model pinpoints the need to search information seeking in context. The model permits people to be conceptualized as one entity, which suits the setting of the concept in the disability group. Wilson (1999) has come out with different models of information behaviour for so many years. For example, from 1981 to 1999, his information behaviour models show that different factors bring about specific information needs. Wilson's (1999) information behaviour model cautiously studies patrons from the perspective of their information need, information seeking and information behaviour. Wilson's (1999) model was used as a framework for the study as it allows for a description and clarification of user information behavior. The researcher finds the model to be more appropriate to the population under study than other models.

According to Niedzwiedzka (2003), Wilson suggests that "information needs are secondary needs triggered by primary needs which in agreement with definitions in psychology can be defined as physiological, cognitive or affective". Cognitive needs arise in an effort to find sense and directive in the world. The growth of a specific need is influenced by the setting, which can be the person himself/herself, or his position in the work place. Uniqueness of individuals strongly controls the information behavior of a person. The Personality of an individual affect the choice of information needs. Information needs of a lecturer may be different from that of a post graduate student and the needs of the same person may differ depending on the variations in circumstances.

The role a person plays in life is the result of the behaviour patterns displayed in society for the specific role. Therefore, a lecturer, a student or a father has some specific duties which are related with their occupied positions and job description. The Wilson's (1999) model (see Figure 1) portrays information seeking behaviour arising as a result of a need, which dates back to Belkin, Oddy, and Brooks (2011) "Anomalous State of Knowledge" (ASK) approach which presupposes the existence of a "gap" in the information base of the user which needs to be filled by information. In order to fulfil that need, in Wilson's (1999) words, the "user makes demands upon formal or informal information sources or services, resulting in success or failure to find relevant information. If fruitful, the user can make use of the information originated but if the information originates failed to fulfil the need, the user has to repeat the search process".

2.2 Conceptual Framework



Source: Author's conceptualization (2020)

Figure 1: Conceptual Framework.

Figure 1 depicts a conceptual framework on how students with visual impairments access information to meet their academic and social-related needs. The overall objectives of the conceptual framework are to facilitate positive learning

outcome, therefore, for students with visual impairment to gain access to academic information, there should be ways one can use to access the information, these ways include internet, library, lectures, peers and also through resource service personnel and again, there should be an adaptive teaching strategy so as to enhance their access to academic information. Also, there should be a less restrictive environment for students with visual impairment to access academic information and there must be the provision of teaching and learning material in teaching the students with visual impairment to enhance more understanding. For students with visual impairment to have positive learning outcomes there must be social interaction among peers, that is, they have to get access to social information, like everyday information. For students with visual impairment to get access to social information, there must be cooperative learning among peers to facilitate social inclusion on campus and even in society.

2.3 Information Needs of Students with Visual Impairment

There is no human activity where information is not a factor. Whether for business, for education, or for research, or for development, information has to be acquired, organized, preserved, and disseminated for use. The effectiveness and efficiency of optimum performance in all spheres of human endeavor depends on the availability of information at the right time, and in the right format. Information need is the desire to locate and obtain information to meet a necessity. An understanding of information needs of users is fundamental to the provision of efficient information services to them. Lucky and Achebe (2013) aver that visually impaired persons have information needs like any other information user; and these needs are worthy of satisfying in their own right. Rayini (2017) also asserted that, visually impaired people have the same information needs as sighted people. People who are visually impaired need to be provided with a range of ways of meeting information needs as are available

for people with normal sight. Adetroro (2010) believes that because persons with visual impairment have the same human composition as sighted people; their reading interest and information needs are likely to be similar. Hence, the visual impaired have the same library and information needs as everyone else except that they may require some adaptations.

Information services to students with visual impairment require adaptations in order to satisfy their needs. Moore (2000) reports that in the case of visually impaired people, research has suggested that the key factors that affected the range and nature of needs were age; the degree of impairment; the elapsed time since the onset of visual impairment; ethnic origin and the incidence of other disabilities. Lucky and Achebe (2013) points out that visually impaired persons exhibit a spectrum of special needs as a result of their sensory limitations. The range of such needs is manifested in the series of differences demonstrated by the person's abilities, attitudes, learning styles and motivation. Adetroro (2010) reports that persons with visual impairment need factual and recreational reading, educational materials, encyclopedias, directories and other kinds of publication used by sighted people, but unlike the sighted, they need appropriate formats or auxiliary aids to help them access their reading interests. Šehić and Tanacković (2014) study of visually impaired undergraduate and postgraduate students in Croatia revealed that academic libraries used by the students who are visually impaired only sporadically respond to their needs. Hence, they rely most often on interpersonal sources and the Internet for information materials for academic purposes. The preferred format for this specific user group is not the Braille, but electronic documents. Therefore, assistive technologies play a major role in their educational experiences. It is important that in meeting the needs of the visually impaired persons, services should be provided that will be appropriate for the type of

disability. Information needs studies will therefore, assist in determining resources and services that will meet users' needs aptly.

The concept information need has been seen by numerous scholars as abstract and intangible, (Case 2002; Maepa 2000; & Aina 2004). The abstract and intangible nature of information need, is attributed by these authors to the difficulty defining the concept clearly. Information need is defined by Case (2002) as a recognition that your knowledge is inadequate to satisfy a goal that you have. Kaniki (2012) aversd that, it as a lack of desired commodity (that is, information) necessary to deal with a situation as the individual sees fit. Going back to the late 1970s, Belkin (2010) observed that an information need arises when a person recognises something is wrong in his or her state of knowledge and wishes to resolve it. Students who are visually impaired find themselves in a situation that triggers the need to seek and use information, for example, the students constantly find themselves in need of information to write assignments, essays, tests and any other academic related information. According to van de Wijngaert (2014), the theory underlying the concept of information need arises from the recognized anomaly in the users' state of knowledge concerning some topic or situation. In response to the anomaly, the person will employ strategies to satisfy the need.

A need therefore, in Maepa's (2000) words, implies that something is inherently indispensable and cannot be done without and that an information need is situation specific. For example, in the case of students who are visually impaired, the student may want to know what assistive services are provided by the disability unit. When the student gets the right information, she or he will be able to utilize those services to assist with her or his academic career. Thus, for you to meet the individual and disability-specific needs of students who visually impaired, there must be available a full array of

programme options and services (Davies, 2007). Educational needs that are specific to these students must be addressed throughout their school experience. Educators of students who are visually impaired should know prior to enrolling at the University that the only manner in which the unique, individual needs of students could be met is to provide choices for delivering specialized services. Service providers should know that all students have the same educational needs (do the same courses) but not all can make full use of the learning information services provided in teaching situations or access the information provided by the University to support their learning because of barriers presented by the manner in which the University operates. However, as stated overhead, there is little known about the broad range of information needs for everyday life of people with disabilities.

The educational wants of students who are visually impaired will differ contingent on their level of education, specific degree and age of the student. Consequently, the required information services will vary according to the student's degree of sight impairment as well the extent to which they personally encounter barriers. Case (2002) advised that there will be occasions for most students when time outside the regular classroom will be extensive, such as when starting to learn Braille, expansion of orientation and mobility skills, career education, social skills, or eras when skills relating to living independently need to be attained. Such opportunities for learning may require pull-out time, or a special class placement, or a residential school placement for a period of time. Notwithstanding of their impairment every individual has needs which will not be related to others. In addition, individual's needs are often specific to a particular situation to be met at a certain time. In such cases a one-size-fits all approach to the provision of services should not be accepted not unless the services are universally designed.

An appropriate assessment of these exceptional educational wants in all areas related to a student's disability and instruction adapted to encounter these needs is essential to ensure appropriate educational programming. In other words, it can be said that these students have sophisticated needs. For example, it is important to realize that the student who is visually impaired must accomplish the same work as his sighted peers using disability-specific skills which generally require greater time to master in order to tackle tasks which take more time to complete. Both the reading and writing of braille, even by a skillful braille user, is time intense (Case, 2002).

The idea of information in information science is defined in numerous means. Information is defined as data that is organized to produce meaning and that actively informs some phenomenon of interest. This means that its value is largely dependent on the context and the user and it is the user who determines what information is. All information is conveyed by means of communication and only valuable if it is relevant, reliable and accurate (Oltmann, 2009). Information need is presumed therefore as evolving from a vague mindfulness of something missing, which necessitates the seeking of information that might pay to understanding and meaning (Kuhlthau, 2014). Belkin (2015) state that information as "a method used to solve a problem, which is regarded as an insufficient state of knowledge, better known as an Anomalous State of Knowledge (ASK)"(p. 134). The information need is a prerequisite that moves individuals to search information. Wilson (1999) states that there must be a cause when a person experiences an information need. Information need is defined by Case (2002), as "an acknowledgement that your knowledge is insufficient to fulfil a goal that you have" (p. 710).

Wilson (1981), stated that Information needs are stubborn or not easily dealt with. This is because there has always been difficulty in finding the setting in which information needs are obtained. Also, because information need is personal and it only takes place in the mind of the person in need, and cannot be seen by any person. The experience of a need is only revealed by inferring from the actions or through the utterances of the person in need. Information needs though, form part of all facets of everyday life - at home, work place, school, market and so forth. It forms an essential part of living and cannot be done away with. No matter where mankind finds himself, he needs to be adequately informed to help make intelligent and far reaching choices in life. The fast technological changes have also made it more imperative that mankind is rightly and adequately informed. This means that at the very core of information needs, people always find themselves in situations where they must give answers to questions, understand problems or solve them. To be able to do this effectively, people would seek out for more information (Wilson, 1981).

2.4 Access to Academic Information for Students with Visual Impairment

University libraries play a critical role in the academic lives of students and staff. The library is an important resource centre where students are expected to access a wide range of academic information and enrich their learning experiences (Gebrehiwot, 2015). The libraries in the universities provide relevant information resources for teaching, learning and research (Agyen-Gyasi, 2008) yet not all students are able to access library resources. Gebrehiwot has indicated that in many of the studies that investigated the experiences of students with disabilities, there was evidence that libraries were not organized in such a way that they would satisfy the needs of those students. Baro and Fyneman (2009) found in their study of information literacy among undergraduate students that most students in Nigerian universities lacked the

sophisticated skills that were needed to exploit the University libraries information resources, both print and electronic. Nonetheless, according to Agyen-Gyasi (2008), as well as Baro and Fyneman (2009), the ability to use libraries and information sources, both print and electronic, is becoming an integral part of undergraduate study in most African countries. Some authors believe that the inability of students to use library resources is due to insufficient education of students on how to access library resources. Hooks, Rahkonen, Clouser, Heider, Fowler (2007) remark that, "teaching students how to use the University library resources had been a challenge for academic librarians for most of the twentieth century and has emerged as a high priority for academic librarians in the twenty-first century as well" (p. 1).

Fidzani (2015) expressed the need for library orientation and user education indicating that it:

1. introduces students to facilities and resources in the library;
2. develops library skills;
3. makes students independent users and learners in the library;
4. develops capabilities as self-sufficient users;
5. establishes the library as the centre of academic activity;
6. provides basic understanding of the library so that users can make efficient use of library material and services;
7. educates users about information sources and resources and how to exploit such resources effectively and efficiently. (p. 1).

In Agyen-Gyasi (2008) study, user education programmes for newly-admitted students at the Kwame Nkrumah University of Science and Technology (KNUST) Library in Ghana was examined. The author identified some problems the library faces in user-education programmes as students' lack of interest to participate in the

programme, lack of personnel in the libraries, training needs of librarians, irregular internet connectivity and financial constraints.

2.4.1 Access to social information for students with visual impairment

The social, political and economic environment of the visually impaired also constitutes barriers to their information seeking. Access to Information and Communication Technology is a major determinant of how information rich or information poor a country is. The developing countries are disadvantaged in terms of access to information infrastructure and this greatly limits their capacity to meet the information needs of the visually impaired (Rowland, 2014). The visually impaired, like other handicapped people suffer social discrimination and cultural bias that negatively impact on their information seeking behaviour. People who are visually impaired are generally viewed as abnormal and are often excluded from the mainstream of public services including library and information provision. This discriminatory attitude stems from the society's perception of disability. A perception that is based on the medical or traditional model of disability sees disability as an individual's problem. It is a reactive model that describes people with any form of impairment in terms of their deficiencies and what they cannot do (Dutch & Muddiman, 2011; Swain & French, 2000). On the other hand, the social model of disability sees the disabled as people who have the capacity to contribute meaningfully to social development and blames the society for imposing cultural, material, structural and attitudinal barriers that prevent them from reaching their potentials. The model advocates equal rights and opportunity for the disabled in terms of access to education, health services, employment, information and other public services.

2.4.2.1 Everyday life information behaviour

In the library and information study field, there has been keen interest in everyday life information seeking since the 1990s. While several everyday life information seeking frameworks can inform our study's design and data analysis, such as Savolainen (2005), Wilson (1981, 2000), Williamson (1998), it looks highly fitting to draw upon Chatman's small world theories, most notably the theory of life in the round (Chatman, 2016). Drawing on sociological studies, such as Merton's concepts of insiders and outsiders (Merton, 2012), Chatman argued that the small world structure, i.e. the insiders/outsiders structure, created the most daunting social information barriers (Thompson, 2006).

Chatman conceptualizes small world information behaviour in the theory of life in the round, drawing on four concepts: small wordless, social norm, world view, and social type. A small world is defined as a community where opinions and concerns are shared. Language and customs, social norms and world views exist to produce a strong sense of membership among its members. Social norms are socially constructed codes of behaviour that provide a shared sense of normality, rightness and acceptability of things.

A worldview is a collective set of beliefs and shared representation of the world held by members of a small world, which allows interpretation of things and meanings. Social types were persons who exhibit traits or characteristics that distinguish them from other members of their world. It is through the operation of social norms, worldview and social types that the functioning of the small world can be sustained. Because life is functioning well enough most of the time, members seldom have to seek information from the outside world in relation to day-to-day existence. Individuals will cross information boundaries only to the extent that the following conditions are met:

(1) the information is perceived as critical, (2) there is a collective expectation that the information is relevant, and (3) a perception exists that the life in the round was no longer functioning (Chatman, 2016; Yu, 2011).

2.4.2.2 Information on orientation and mobility

Ocloo (2011) postulated that the ability to walk to work or training grounds is very crucial to any meaningful programme for individuals with visual impairment. It is therefore important to provide orientation and mobility training instructions in our educational institutions for students with visual impairment whose condition causes limitation in movement. According to LaGrow and Weessies (2014), the acquisition of skills in the area of orientation and mobility training encompasses the understanding of one's self-placement and relationship within the environment, and the abilities to efficiently plan and safely execute purposeful movement through the environment in order to arrive at a desired destination.

Orientation and mobility training as a component of the rehabilitation facilities teaches individuals with visual impairment to maintain independent travel by ambulating and negotiating both known and unknown environments safely and independently (Zijlstra, van Rens, Scherder, Brouwer, van der Velde, Verstraten, & Kempen, 2009). In spite of the importance of orientation and mobility instruction to students with visual impairment, Ocloo (2011) asserts that most educational institutions and rehabilitation centres in Ghana do not have qualified mobility instructors and devices. The author believes that this deficiency stems from the fact that Ghana as a country has no mobility training centres and that it is only UEW that offers courses in basic orientation and mobility training, which does not certify individuals as qualified mobility instructors. Meanwhile, students with visual impairments in universities require orientation and mobility instruction to be able to move independently to lecture

halls, canteens, sports grounds and other places of social gathering to enhance their academic and social development.

2.4.3 Methods used in accessing academic and social information

There are so many methods in accessing academic and social information by students with visual impairments in the University, they include:

2.4.3.1 Access to information through the library

In another study which sought to establish the extent to which library and information services were available for students with visual impairments at University of Ghana, Legon, Ayiah (2007) found out that students with visual impairments were dissatisfied with library and information services provided. The case study which involved students with visual impairments, braille transcribers, librarians and policy makers in the institution as participants revealed that the premises housing library and information services for students with visual impairments was not fully accessible to the participants. Ayiah further found out that brailled materials on the shelves were outdated and not relevant in meeting the information needs of students with visual impairments. The author further found the need for special training for all staff who serve students with visual impairments. Generally, students with visual impairments appear to have difficulties accessing library facilities ranging from physical infrastructure, print materials and electronic information. Therefore, the literature has further been reviewed under three sub-topics namely: (1) Standards of academic libraries (2) access to library building and furniture, and (3) access to learning materials both print and electronic.

2.4.3.1.1 Standards of academic libraries

To ensure recognition, libraries everywhere in the world are expected to operate according to established standards of facilities, service and performance, but they may go about this task in rather different ways. In other words, standards are meant to assist librarians in charting their own professional development. The international body for the promulgation of standards is the International Standards Organization (ISO) which depends on the various national standards institutions for significant input. In countries like the United States and Britain, libraries operate by standards.

According to The International Federation of Library Associations (IFLA) (2001), standards of libraries can be categorized into the following: those that are traditional type issued by a professional body and devised by a committee; those that are promulgated by professional associations; thirdly, those that are reports or recommendations issued by government bodies or commissions; those that the government may impose directly on libraries; and lastly, those that are issued by accrediting or validating bodies. No matter the type of standard an institution operates with according to Evans and Saponaro (2005) the primary objective of any academic library is to support the instructional and research programmes of the institution of which the library is a part. It was also noted that the standards relating to collections are that: A University library's collections should be adequate enough to support and facilitate the University's total instructional needs and research programmes; a University library's collections need to be developed systematically and consistently; and finally a University library's collections shall contain all of the varied forms of recorded information (Coyle, 2005). This means that for effective content management, librarians need to know that different disciplines are treated in different ways hence the

content to be included in the library's collections should be a case of concern to the librarian.

Coyle (2005:19) in a document entitled " Guidelines for allocation of library materials budget" no specific statement are made about the budgeting ratio for serials and monographs, however, this document indicated allocation by forms and subjects, the document further pointed out that the amount allocated should be based on the level of importance of the material. However, Evans and Saponaro (2005) asserted that modern collection management practices are making standards irrelevant. Their conclusion is that standards should be complied with, but the traditional reliance on standards documented by others may encourage the exercise of local autonomy in the formulation of objectives and the measurement of performance.

In Ghana, the National Accreditation Board has standards for academic libraries. The Board ensures that certain standards are met by the library before accreditation is granted. The standards deal with issues on budget, human resources, collections, services and physical facilities of the library. According to the National Accreditation Board (NAB), of Ghana, personnel in academic libraries should have appropriate educational backgrounds in library and information science and also in other disciplines so that they can advance the library's involvement in academic programmes. On collection, academic libraries are to select and acquire materials in all formats to the level required to support academic programmes in research, teaching and outreach services. The National Accreditation Board (NAB) of Ghana emphasises that the worldwide knowledge base is shifting from paper base to electronic base. Hence electronic resources, both bibliographic and full text, need to be procured. To ensure that the information needs of the users are met, NAB recommends that the development

of library collection should be a joint effort between staff of the library and the faculty (NAB, 2007).

The Canadian National Institute for the Blind (CNIB, 2005) undertook a study to investigate needs of students with visual impairment in a two - year study. The study explored a range of issues including income levels, employment, education and social integration of students with visual impairment as well as services provided and required to fulfil unmet needs. A significant outcome was a recommendation made by CNIB to integrate accessible library services into the standard library system.

Kumar and Sanaman (2015) conducted a study to analyze the challenges faced by the blind/ vision- impaired users during the web access in the leading academic and special libraries of Delhi, India. The result clearly stated that there are barriers faced by blind and visually impaired users in the libraries of Delhi, India during their web access. Kumar and Sanaman (2015) therefore recommended three types of web-based resources that can be offered by libraries to their users. These include access to the Internet, access to subscription databases and a library's own web pages/ website which need to be accessible to people with disabilities. Kumar and Sanaman (2015) further concluded that accessibility barriers to print, audio and visual media can be easily overcome through web technologies.

Sehic and Tanackovic (2013) conducted a study on six blind and three students with visual impairment and reported that academic libraries used by respondents only sporadically responded to their needs and that blind and students with visual impairment, when looking for information and materials for academic purposes relied most often on interpersonal sources, radio and the Internet. Sehic and Tanackovic (2013) further stated that, in seeking and using information respondents put more value on information quality and reliability than the level of effort and time needed to find it.

The preferred format for this specific user group was not the Braille, but electronic documents. Thus, assistive technologies played a major role in their information seeking.

2.4.3.1.2 Access to library building and furniture

Clearly, students with visual impairments encounter great difficulties in accessing the physical infrastructure in their environments. Gustafson-Pearce, Billett and Cecelja (2005) contended that, to a student with visual impairment, the physical world presents many challenges. The authors further pointed out that, for a student with impaired sight, finding the way through a complex environment is fraught with dangers, both actual and imaginary.

Most educational institutions handicap their students with disabilities due to lack of modifications in the environment to aid accessibility. Students with disabilities must gain complete access to school facilities such as the library for improved participation in learning and, consequently, enhance their academic and social learning outcomes (Mastropieri & Scruggs, 2000; O'Brien, 1998). This emphasizes the relationship between access to physical facilities and academic and social advancement. Shevlin, Kenny and McNeela (2002) conducted a qualitative study in Irish post-primary schools with 16 participants who were taken through a semi-structured interview. The findings revealed that access to physical facilities such as the library, lecture halls, and access to curricular did not appear to be addressed in formal school policy. Participants had to continually inform others of their needs and ask for help, which put pressure on their social lives, their sense of others and of self. This indicates that access to physical infrastructure in educational institutions remains a nightmare to students with visual impairments.

Samson (2011) conducted a study on the best practices for serving students with disabilities in eight academic libraries in four Rocky Mountain States in the USA. Samson interviewed the librarians directly responsible for library services to students with disabilities to establish how their practices reflected the 1990 Americans with Disabilities Act (ADA) and complied with the 2010 Department of Justice regulations. Findings revealed that the needs of students with disabilities were being met as students were able to physically access facilities with little or no difficulties. All libraries had either been retrofitted to accommodate students with disabilities and new structures were being constructed according to universal design standards. In the effort of the libraries to meet the physical accessibility needs of students with disabilities, Samson found that the libraries had multiple entryways with ramps, elevators, adjustable computer tables, universal adjustable keyboards, accessible study desks, stand-up study or computer tables, adjustable seating and aisles for easy movement. The author also noted that 87.5% of the libraries collaborated with their Office of Disability Services in providing assistive technology to promote access. The current study, however, focused on students with visual impairments in one public University in Ghana.

In another study, Ekwelem (2013) organized a focus group interview for 194 library users with disabilities (visually impaired and mobility challenged) in 9 universities in Enugu State, Nigeria. The responses to interview items regarding accessibility to the library building and furniture revealed that there was lack of facilities such as adjustable table and keyboard tray, ramps, lift with disabled friendly features and automatic-opening doors. This made the respondents perceive among others that libraries were established to serve only non-disabled users and that there was inadequate knowledge of the needs of those who did not or could not use the library.

The current study differs from Ekwelem's study because the current study did not include students with physical challenges.

2.4.3.1.3 Access to learning materials both print and electronic

According to Majinge and Stilwell (2013), information is essential to all human beings and every library's aim is to provide the right information at the right time and in the right format to its patrons regardless of race, religion, age, nationality and language. Academic libraries should be designed to be universally accessible, and should have equipment in place to enable all users including students with disabilities to get maximum benefit from the library's materials and services (Deines-Jones, 1995). It is therefore obligatory on library management in universities to provide the same level of service to students with disabilities as is provided to users without disabilities (Ekwelem, 2013). In order to meet the needs of visually impaired library users in University, some authors asserted that libraries must provide appropriate selection of books in formats that are usable by students with visual impairments such as large print, audio-books, talking books, and Braille materials (Majinge & Stilwell, 2013) found that students with visual impairments in the Universities libraries do not have books in Braille or large print format causing them to depend on human readers for information.

Higgins (2013) noted that the advent of internet and World Wide Web in the late 1980s and early 1990s created new avenues for the dissemination of information and that access to information has evolved from being restricted to physical space to being available through remove access. This has provided the opportunity for students including students with disabilities to access information anywhere at any time (Dadzie, 2005; Ekwelem, 2013). Universities' libraries have the responsibility to train students on how to access electronic information that are available to them.

In a study conducted by Dadzie (2007), an acting librarian at the University of Cape Coast stressed the importance of Information Retrieval Course (IRC) library staff offer to students. The participant said the IRC was to equip students with skills to enable them to access and retrieve information in traditional, hybrid and digital libraries. Interestingly, the librarian at the University of Ghana Balme Library disclosed in the study that information skills training which included training on the available electronic resources (e-resources) in the library and how to effectively search the databases were only offered to graduate students at the beginning of the academic year as part of library literacy. Meanwhile an earlier study which focused on the training needs of users of three public University libraries in Malaysia with regard to electronic resources concluded that there is the need to design a training programme that would enhance the ability of all students to use electronic resources (Basri, 2003). Academic libraries need to have effective internet connectivity (Baro & Asaba, 2010) in this era of electronic databases where the web is the first place information users look for information (Stuart, 2009). For students with visual impairment to benefit from electronic library resources computers connected to the internet and equipped with screen readers such as Window-Eyes are necessary.

Sunrich and Green (2006) conducted a survey on the programmes for students with visual impairments on the available assistive technologies for library patrons with visual impairment and the training programme in using available assistive technologies in 25 universities in United States. Out of the 6 institutions profiled, it was revealed that only one library provided 7 assistive technologies while the other institutions provided a maximum of two; namely, Kurzweil 1000 and JAWS, out of the 15 assistive technologies listed. The authors also found that students were not trained to use the available assistive technology and staff was also not trained to support students with

visual impairment to use the assistive technology mainly due to budgetary constraints. In a similar study Agyen-Gyasi (2008) identified training needs of librarians, irregular internet connectivity and financial constraints as some problems facing the user education programme at the KNUST Library Ghana which culminates into students' inability to use electronic resources.

The University of Education, Winneba has provided an online database (WINNOPAC) and e-resource for students to aid accessibility of information. In the study of computer competencies of students with disabilities at UEW, Teye (2014) found that students with disabilities have positive attitudes towards computers and that much of the skills possessed by the students was related to word processing activities. With 29 out of the 46 participants indicating that they could not search for information on the Internet, it is important to know how students with disabilities access the online database and other electronic resources of the University library.

2.4.3.2 Access to academic information from the lecture hall

Accessing University education by students with disabilities means promoting participation, progress and success in the University curriculum (Moswela & Mukhopadhyay, 2011). However, students with disabilities experience access difficulties associated with participation in the curriculum (Kearney, 2009). Individual students including those with disabilities need opportunities to access information for successful participation in learning activities to promote academic and social performance. It is the responsibility of lecturers in higher institutions to ensure that students with visual impairments have access to the curriculum and participate in learning activities at the lecture halls. Powell (2003) stated that if students with visual impairments are to participate fully in the teaching and learning process, among many other considerations, certain adaptations and modifications have to be made to the

regular curriculum. These adaptations may require the collaboration between the lecturer and resource staff. Faculty can also modify how they deliver lectures by making use of instructional material where applicable to promote participation of students with visual impairments for improved student outcomes (Tincani, 2004).

In a case study conducted in South Africa by Mushome and Monobe (2013) which employed the mixed approach, twenty students with visual impairments were interviewed using semi-structured interview items and twenty lecturers were given questionnaires. Among the findings of the research was that, there were no specialist lecturers who could teach students with visual impairment, and due to the lack of experience, most lecturers did not consider where the students with visual impairments sat during lectures. In effect, a few of the instructors considered the circumstances of students with visual impairments. The authors further identified lack of communication amongst important role-player such as specialist teacher and resource staff as a factor that denies students with visual impairment of accommodations. Instructors can modify how they deliver lectures to improve student outcomes. The more often students actively respond to instructional material, the more they are likely to learn. The difference between the Mushomme and Monobe's study and mine is that, mine study adopted the mixed method approach and did not include instructors as participants.

Some studies have reported the dissatisfaction students with disabilities experience in teaching and learning in some universities in Africa. For example, Moswela and Mukhopadhyay (2011) found that University students with disabilities struggled to access and participate in higher education in Botswana. In this qualitative study, seven students with disabilities were interviewed. One of the students with visual impairment, who participated in the study, expressed his dissatisfaction of interaction with one of his lecturers remarking:

> When I told one of my lecturers that I can't see, he did not understand what I was talking about. He did not pay any attention to my concern and continued to teach the same way that he was teaching for the entire semester. I find it very difficult to keep up with the pace. It took me long time to adjust with the pace of learning in this University. I came from a senior secondary school where people there knew how to deal with people like me who have visual problem. (p. 313)

In another study conducted by Haihambo (2010), students with disabilities in Namibian higher education institutions expressed their dissatisfaction in most of their encounters with their instructors. One student with visual impairment remarked this way:

> … I soon got a [tape] recorder, but it was not always efficient, and lecturers would not give you a chance to set it up. That's when I realized that unlike at school lecturers do not spend time on greetings. They get straight to business. So, I was always battling between leaving the tape and just listen, or try to record from wherever I could. Even when you are recording, many lecturers move around in the room, sometimes going too far away from the tape. When they leave, they don't even say — I am gone. You just have to rely on the movement in class to know the lecture is over. (p. 302)

These statements describe a few examples of lecture hall experiences of students with visual impairments in some universities in Africa. The lecture hall experience of students with visual impairments at UEW is yet to be documented for improved practice.

2.4.3.4 Access to information through Web

As the web allows access to a large amount of information, searching has become a daily activity for many people who now turn to the web for a diverse range of tasks (Kellar, Watters, & Shepherd, 2006). This ease of access to information has benefited most people, but has particularly been a blessing for people with disabilities, for example, visually impaired people, as they have access to much of the same information available to sighted people. Therefore, the web has empowered visually

impaired users (Berry, 1999) and has played a significant role in combating social exclusion (Craven, 2004).

Visually impaired people usually access the web using screen-reader software that processes web pages sequentially from top to bottom and reads their content out in computer synthesized speech. This sequential access imposes numerous challenges on visually impaired users (Leporini, Andronico, & Buzzi, 2004; Borodin, Bigham, Dausch & Ramakrishnan, 2010), for example, lack of context and information over load. The screen reader interface, like all auditory interfaces, suffers from a lack of persistence and in a search environment, it requires the user to increasingly depend on their memory to keep track of encountered information. Given the challenges imposed by the screen reader, searching can be considered to be a challenging problem for visually impaired users. The type of search task also impacts the search process as it represents the searcher's information needs and drives the information-seeking process (Marchionini, 1995).

Previous research such as Kellar et al. (2006) shows that people perform a diverse range of search tasks on the web ranging from simple tasks like finding the capital city of a country to more complex tasks like planning travel or finding medical advice. Search tasks represent an information problem for the searcher and hence, they drive the search process (Marchionini, 2007). Search tasks are goal-oriented as searchers usually aim to find information to satisfy an information need. When defining their information problem, searchers use their prior knowledge to identify concepts and relationships to formulate a search task. Kuhlthau (2014) argued that the affective and cognitive states of searchers also impacted their perception of tasks. Therefore, different searchers conceptualize information problems differently and the varying conceptualizations determine the perceived complexity of the search task. Simple

search tasks are easy to complete effectively; searchers have a well-defined mental model for simple tasks and they know which path to follow to solve their information problem.

However, search tasks that are perceived by users as complex are more difficult to complete effectively as they affect performance and search effectiveness (Bell & Ruthven, 2004). User's mental models for the information problem are ill-defined or incomplete (Marchionini, 2009). This may result from a lack of domain knowledge or a lack of understanding of the task itself. Therefore, complex tasks place high cognitive demands on users (Campbell, 2015). In this article, we focus on complex search tasks as we believe an understanding of searchers' behaviour for such tasks is fundamental to design appropriate search support. For decades, researchers have been trying to understand the online searching behaviour of web users which has led to numerous theories such as berry-picking (Bates, 2017), information foraging (Pirolli & Card, 2016), and orienteering (O'Day & Jeffries, 2013). These theories have increased our understanding about the ways people search and thus have informed the design of search interfaces. For example, Bates (2016) observed that searchers are unlikely to expect to find all relevant information in one place and used the berry-picking analogy to describe searchers' expectation of finding relevant bits of information throughout the search process. This was confirmed by others (Pirolli & Card, 2016; O' Day & Jeffries, 2013), and have provided much insight into how people make decisions about relevant information while searching.

2.4.3.4.1 Web accessibility

Web accessibility is about people being able to get and use web content. Studies have shown that there is a lot of variance in the accessibility of different websites. Government websites, websites of organizations in the field of web development and

information technology should have ideally had accessible websites; but their evaluations indicated that they were not accessible. There was also a difference between accessibility of websites from different countries. Web accessibility of websites decreased with time probably owing to the negligence of the issue in web design renewal and introduction of new complicated format of web site design (Hong, Katerattanaku, & Lee, 2008) and (Lazar, Beere, Dawn Greenidge, & Nagappa, 2003).

A primary focus of accessibility is access by people with disabilities (Henry, 2006). Unfortunately, the scenario is not as it should be especially in case of people with disabilities. Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web. Web accessibility encompasses all disabilities that affect access to the Web, including visual, auditory, and physical, speech, cognitive, and neurological disabilities. (World Wide Web Consortium - Web Accessibility Initiative, 2012) Research has confirmed that people with disabilities are most at risk of being excluded from access, and in particular people who are blind or visually impaired (Brophy & Craven, 2007)

2.5.3.4.2 Web Accessibility Issues

Baguma, Bommel, Wanyama, and Patrick, (2007) address the problem of web accessibility with the aim of understanding the issues faced by different groups of people and people with different disabilities, examining the accessibility of websites belonging to a particular group such as government departments, colleges and universities, and suggesting new methods to overcome barriers. Basically, people with visual impairments face problems accessing information on the web due to some inherent properties of Web applications which have emerged through continuous advancements of the technology. These properties largely determine the usability and

effectiveness of Web based applications to different categories of audiences. Baguma and others identified four main properties which affect accessibility for people with visual impairments. These are:

Non-linear access − information is structured in multiple layers (hypertext) hence access is link based and nonlinear

Lack of control over end user access behaviour and environment – since web designers cannot know the exact computer equipment that potential users have, or what fonts and software have been installed in the users' computers (relevant in case of people using assistive technology), they have no control over how the pages namely: the fonts and colours will appear on a page, and the size, proportions and exact locations of the different Web texts in the client end user agent.

Heavy dependence on visual cues for input and output (Graphical user interface (GUI) based) poses a significant problem for users with visual disabilities. Continuous advances in Web technology have made it more multimedia oriented to include video, flash, motion pictures and images. While ideally this is good for enhanced communication, certain media formats are unusable to Web users with disabilities even with assistive technologies.

Most developers are young and have perfect vision and who often assume that all users have perfect vision and motor control and know everything about the Web. (Baguma, Bommel, Wanyama, & Patrick, 2007)

Studies by Craven, (2003) on access to web information by visually impaired users revealed that they have to spend more time navigating around each page, especially if, for example, the page contains a lot of information or has many links. People with more experience with their assistive technology were more successful with the task (Craven, Access to electronic resources by visually impaired people, 2003).

Although there is a growing awareness about web accessibility, there are still some misunderstandings and myths prevalent about it which hinders the pace of eradicating Web accessibility barriers. Brewer lists some of these as:

Assistive technology can make / convert all Web sites in to accessible sites

WCAG 1.0 is a stand-alone solution – WCAG is all that is needed to ensure an effective user experience.

Both these misunderstandings lead to failure in looking at the necessary complementary roles of technology designers, browser and media player developers, authoring tool developers, and content developers in ensuring an accessible experience for the end user. The chief misconception is that text-only websites are a sufficient solution for accessibility, or that accessible Web sites are necessarily dull and boring. While text-only Web sites may work for people with certain types of visual impairment, they are not an effective solution for people with auditory, mobility, cognitive or neurological impairments, or even for people with many types of visual impairments. For instance, many people with low vision might rely on images, enlarged by screen magnifiers, to help them focus in on content on a Web site (Brewer, 2004).

The barriers to access identified by a study appeared to come about by lack of knowledge and thought by the page designers themselves. By adhering to simple guidelines, visually impaired users would be able to access information more effectively than would otherwise be possible (Oppenheim & Selby, 2014). A study evaluated web accessibility in higher education confirmed that only few websites were totally accessible and a continued effort to educate administrators, faculty and web designers about the need for web accessibility is essential (Thompson, Burgstahler, & Comden, 2003). Another study evaluating school websites found 84% of web sites had at least one Priority 1 error. The major sources of these errors were related to text

equivalents (Alt tags) for images. Issues related to font sizes, screen resolutions, contrast, style sheets, and flickers were also found (Wells, 2006). Avenues for improving accessibility awareness among computer science and information systems students and additionally developing and accessing developer competence in accessibility have been proposed (Bundrick, Goette, Humphries, & Young, 2006).

Axel Schmetzke conducted a study to look at the web accessibility of highly ranked University libraries and library schools (in USA) that revealed low web accessibility. It is a cause of concern that institutes training future librarians were unaware of these issues (Schmetzke, 2001). Michael Providenti who evaluated library Web accessibility at Kentucky's 4-year degree granting colleges and universities also noticed low levels of compliance with Web accessibility guidelines (Providenti, 2004). Jaeger (2002) emphasized that even beyond the need to comply with the laws to avoid claims of discrimination or lawsuits, libraries should be working to have fully accessible electronic and information technology because libraries are intended to provide information to all, not just the non-disabled. Accessible websites will produce numerous benefits to the library, from community goodwill to increased patronage to compliance (Jaeger, 2002). The responsibility of libraries in providing accessible websites was also confirmed by Golub and Lazic who tested sixteen Croatian public library websites for accessibility (Golub & Lazić, Accessibility of public library Web sites, 2002) and Brophy and Craven who add that there is substantial progress in the awareness of libraries about the issue of Web accessibility (Brophy & Craven, 2007).

Goble, Harper and Stevens (2000) focus on the probable solutions rather than pointing out the problems. A research on the ‘travails of visually impaired web travelers’ introduced the notion of travel into web design and usability metrics. Travel in the virtual, web world to that in the real, physical world has been related to evaluate

web pages. Travel objects identified were e.g. hyperlink menu is a landmark that acts as both a way point and a memory object designed into the web page, a back button is a way point provided by the browser, thus, proposing the inclusion of travel and mobility in the usability metrics of web design which would assist in the design of better user agents and web content for visually impaired and other users (Goble, Harper & Stevens, 2000). Richards and Hanson took a broader view of web accessibility by designing and introducing low cost software that improves readability, reduces distraction, and filters noisy keyboard input with software running with browsers for people with visual and motor impairments (Richards & Hanson, 2004). Thus, with varying problem identifying methods and varying issues there are also a variety of solutions offered. The feasibility of these solutions should be checked and then put to use by people who want to solve the web accessibility issue.

2.5 Challenges faced by Students who are Visually Impaired in Accessing Information

Various studies indicate that students who are visually impaired experience unique challenges when accessing library resources (Riley, 2002; Byerley & Chambers, 2012; Coonin, 2002). Students who rely on screen readers experience barriers accessing information due to their rich graphical interfaces and complex web designs of proprietary online databases (Horwath, 2002). Bowman (2002), and Byerley and Chambers (2012) tested the accessibility of specific electronic databases with screen reading software and found they were not user-friendly. Horwath (2002) surveyed users who were blind or visually impaired on the usability of four databases and found that the design had the greatest impact on the accessibility of the databases. Byerley and Chambers (2012) examined the accessibility of two databases (OCLC First search and Expanded Academic) by blind students using screen readers. Web content accessibility

guidelines were used as a measurement of accessibility. They found again that design elements in both databases compromised the accessibility of the databases (Dermody, 2011).

A more recent study by Byerley, Chambers and Thohira, (2007) examined the accessibility of online databases from the database vendors' perspectives. They found that vendors rated their products as mostly accessible. The study determined that although most vendors test their products for accessibility, only a few conducted usability tests with persons with disabilities using adaptive technology. This 2007 study from the vendor's perspective influenced the authors to conduct their own test using students with print disabilities. Technology is both an enabler and a barrier for students with print disabilities. While screen readers enable students to navigate their on-line environment, they are limited on how they can interpret a busy website. While database and website design is evolving to the benefit of users who have vision, the contradiction is that their enriched features which create greater accessibility to information also creates barriers for students who rely on screen readers (Dermody, 2011).

According to Dermody (2011) database vendors are aware of the barriers their databases pose to students who rely on screen readers. The 2007 study by Byerley et al., indicated that only five of the 12 vendors (EBSCO, Elsevier, JSTOR, LexisNexis, ProQuest) surveyed conducted usability testing with people who have visual disabilities. However, Byerley, Chambers and Thohira (2007) indicated in their study that vendors are not addressing accessibility in their marketing efforts. Assistive technologies used by individuals who are blind are costly and accessible materials, such as popular books and textbooks, are slow to be developed (Stephanie, Laurie & Maatta, 2014). In their study, they asserted that without accessibility features, including voice-over or text enlargement, these e-readers are rendered inaccessible for individuals who

have low or no vision. In a study carried out by (Dermody, 2011) the students were forced to abandon articles because of technological barriers and this limited the amount of resources they could use to write their assignments. Only the intervention of a librarian or peer would have allowed them to continue in locating the full text and reading the article. Their self-efficacy as independent learners, is challenged every time they encounter an unreadable PDF or take up to eight hours to find four articles.

Davies (2007) recognized the fact that the power bestowed by information is not easily accessible by everyone, particularly those with disabilities such as visual impairments. Ochoggia (2003) observed in his Kenyan study that the range of reading material available had always been extremely limited. Although the students in the current study were considerably better off than those in Ochoggia's study, the results of the current study indicated that the information seeking behaviours exhibited by blind and students who are visually impaired at UKZN were hindered by a number of barriers. These barriers would have been eliminated or at least minimized by providing services that were universally designed. Majinge's (2013) study in Tanzania produced similar results. Kailes and MacDonald (2006) define universal design as the design of products and environments to be usable by all, to the greatest extent possible. The barriers encountered forced the students to adopt particular alternative (adaptive) behaviours (pathways) of building in a loop back to the DU. Existing systems at UKZN, in Kenya and in Tanzania were not designed to accommodate users in the way the Social Model (Hughes & Paterson 1997; Matshedisho, 2007; Oliver, 1996) implies. These users with visual impairments had to try work around barriers. Nevertheless, students with visual impairments in the University of Education, Winneba faced similar barriers accessing information. These include challenges when accessing library resources, lack of reading material, lack of proper technology, lack of facilities,

inadequate finances, inadequate human resources, difficulty in navigating the environment, social isolation, access to documents, professionalism, copyright act and national information policies.

2.6 Support System for Students with Visual Impairments to Enhance their Access to Information

DeLee (2015) asserted that as students with visual impairments take advantage of higher education, colleges and universities should be prepared to provide necessary accommodations and support services for their overall success. The author further explained that for students with disabilities to succeed in universities, they required the support of disability support staff to complement lecturer's efforts at accommodating them in the teaching and learning process. Many students with disabilities attribute their adjustment in educational environments to the support of disability units (Matshedisho, 2010). Providing needed support services may motivate students with disabilities to take up meaningful roles in interactions and to maintain their enrollment in higher education and ultimately to graduate (Heindel, 2014). In spite of the important role of support services in the education of students with disabilities, ensuring that students with disabilities obtain the necessary disability support services needed to be successful in higher education is one of the largest challenges of universities (Cowthon & Cole, 2010).

Most higher education institutions have an office of disability support services that provides assistance to students with disabilities (Katsiyannis, Zhang, Landmark, & Reber, 2009). In Ghana and Uganda, students with disabilities educated in mainstreamed institutions receive resource support in order to access the curriculum (Goodman & Wittenstein, 2003; Spradbrow & Power, 2004). Students with disabilities received various types of support services that are geared towards making them more

successful in terms of course completions (Moisey, 2004). Support services for students with disabilities including students with visual impairments, receive in mainstreamed institutions include, note-taking, alternative test formats, extended time on tests, reading tests to students, adaptive technology, preferential classroom seating, alternate test locations, taped notes/text and providing tutorial support (Cowthon & Cole, 2010; DeLee, 2015; Kurth & Mellard, 2006).

Furthermore, students with visual impairments require specialized instruction in the use of computers with appropriate software such as Job Access With Speech (JAWS) and Non Visual Display Access (NVDA), training in the use of different types of assistive technologies (such as closed circuit television systems and Braille displays, and electronic magnifies) and training in the acquisition of orientation and mobility skills (Cooper & Nichols, 2007; Vik, & Lassen, 2010) to enhance their success in mainstreamed institutions. These support services are critical in the education of students with disabilities including students with visual impairment because, lack of these necessary support services can render them socially and academically excluded and overly dependent (Tugli, Zungu, Ramakuela, Goon, & Anyanwu, 2013).

Troiano, Liefeld, and Trachtenbert (2010) completed a study involving 262 students with disabilities from a private postsecondary institution to determine if a connection exists between learning support and student success. Five years of attendance data and graduation rates were examined and submitted to discriminate function analysis to evaluate the predictive influence of academic support centre use on college student outcomes. The various types of learning support available included assistance with note taking, test preparation, test taking, writing strategies, research skills, time management, and building self-advocacy skills. The results indicated that over 64% of the students surveyed took advantage of learning support services available

at their given institutions. Also, it was confirmed that students who consistently attended academic support centre appointments had higher rates of success than those who did not attend consistently. These students also had higher grade point averages and persisted to graduation.

The current study is different from that of Troiano et al. (2010) because the current study sought to explore how students with visual impairment access academic and social information on campus and to identify support systems that could be put in place to enhance access to information, to facilitate their adjustment in the University. Also, the current study employed questionnaire and semi-structured interview to collect data on how students with visual impairment access academic and social information in the University of Education, Winneba.

In another study, Mamiseishvili and Koch (2012) determined how different types of educational services could be related to overall success of students with disabilities in 2-year institutions in the United States. The study utilized both a survey and explanatory correlational research designs. Support services available to students with disabilities in these institutions included adaptive equipment, alternative examination format, readers, note takers, sign language and interpreters, and access to academic advisors. Although the findings from the study revealed examination provisions and tutors being the most used services, it was also discovered that over 50% of students with disabilities did not persist beyond their first year or left by the end of year three. There were students who did not utilize all services available to them and at least 44% reported never meeting with an academic advisor to help facilitate the planning and registration process.

Mamiseishvili and Koch (2012) also found out that students who experienced mobility challenges or suffered from depression, psychiatric disorders, or dyslexia did not persist after three years. Again, findings of the study suggest that having high GPAs and degree aspirations during the first-year were positively associated with persistence as 77% of students desired to pursue higher education; however, 51% left before the end of three years. The researchers concluded that even though students with disabilities had high aspirations, without proper planning and assistance students could fail to succeed. The authors suggested that administration and disability support services work together to examine and address possible problems that might exist considering the high percentage of non-returning students discovered. The current study focused on students with visual impairments in 4-year degree programmes in the University of Education, Winneba.

The University of Education, Winneba has established the Resource Centre for Students with Special Needs since 1993 to support the increasing number of students with disabilities in their social and academic life at the institution. However, the kind of support the staff at the centre provides to students with disabilities, especially those with visual impairments and the effectiveness of the support the students receive, is yet to be documented. Reinschmiedt, Sprong, Dallas, Buono and Upton (2013) expressed that increases in enrollment of students with disabilities in postsecondary institutions should propel the need for administration to evaluate support services and accommodations offered. The authors also believe that students' satisfaction of support services indicates what is effective.

To assess students' satisfaction of services offered by Disability Support Services within postsecondary institutions, the researcher conducted a survey involving 116 students with disabilities. Of the services and accommodations used, students were

most satisfied with assistive reading and listening technologies, testing accommodations, text conversion software, and readers. Academic advisement and accommodation planning, assignment extension, and taped lectures were rarely used as were tutoring and on campus classroom accommodations. The authors suggested that Disability Support Services implement strategies to disburse information in a timely manner. Some earlier studies have reported on both sides of the coin where in one case students reported low level of satisfaction with support services received and in another case majority of students reporting high levels of satisfaction with disability support services (Dutta, Schiro-Geist, & Crandall, 2003; Sharpe, Johnson, Izzo, & Murray, 2005). The current study seeks to find out the types and effectiveness of support services students with visual impairment receive from the resource centre at UEW.

2.8 Summary of Literature Review

Through a keen review of the related literature, this chapter has brought insight into the study since the key elements of concern have been revisited. The literature reviewed showed that there are many gaps in research and knowledge pertaining to Information needs of students with visual impairment, accessibility of resources by students with visual impairments to access academic and social information for students with visual impairment, an exploration of the specific challenges that these students face has been done through the past studies and support system to enhance access to information of students with visual impairment.

However, most of the studies are those that were done in other countries outside Ghana like Kenya, Nigeria and Canada. This therefore necessitated a more expansive study carried out in Ghana and more specifically at University of Education Winneba, which explored the specific information need, how to access academic and social information, challenges that the students with visual impairments face in order to

improve its services to them and finally support system to enhance access to information of students with visual impairment. This study sought to add knowledge on these information need, how to access academic and social information, challenges and finally support system with a specific focus on library, internet, lectures, Peers, website access.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methodology for the study. The areas covered were: research approach, research design, population, sample size, sampling techniques, instrumentation, validity, reliability, the procedure for data collection, method of data analysis, data trustworthiness, dependability analysis, and ethical considerations.

3.1 Philosophical Position

Generally, in research, a choice of research designs may be dependent on two aspects (Denzin & Lincoln, 2011). First is the research aim and objectives; whereas, the second is the researcher's philosophical understanding, experience, and personal beliefs or assumptions. Although, this is not as simplistic as it appears. For example, the final decision of research methods is not just a matter of random choice from the set of available methods such as interviews, questionnaires, focus groups, and observation. Also, the choice of research methodology is always susceptible to the philosophical assumptions of the researcher because a philosophical perspective not only explains the nature of society, but it also unveils the nature of science through which new knowledge can be produced (Burrell & Morgan, 1979).

More specifically, the researcher's philosophical assumptions about ontology, epistemology, and human nature play an important role in the selection of research methodology (Gill & Johnson, 2002). Thus, after deciding ontological and epistemological assumptions and taking an objective-subjective versus positive-phenomenological position of the research, an important decision related to methodology needs to be taken. In other words, an understanding of philosophical issues can be noteworthy due to numerous reasons. For example, different paradigms

lead to studying underlying phenomena in different ways. It not only describes several organizational phenomena from different perspectives but also highlights different kinds of knowledge that derive throughout observing the same phenomena from different philosophical perspectives (Hatch, 2012).

In this study, pragmatism was used to select the choice of research designs of the research methodology. Pragmatism asserts that concepts are only relevant where they support action (Kelemen & Rumens 2008). Pragmatism originated in the late-nineteenth–early- the twentieth-century USA in the work of philosophers Charles Pierce, William James, and John Dewey. It strives to reconcile both objectivism and subjectivism, facts and values, accurate and rigorous knowledge, and different contextualized experiences. It does this by considering theories, concepts, ideas, hypotheses and research findings not in an abstract form, but in terms of the roles they play as instruments of thought and action, and in terms of their practical consequences in specific contexts.

Reality matters to pragmatists as the practical effects of ideas and knowledge is valued for enabling actions to be carried out successfully. For a pragmatist, research starts with a problem and aims to contribute practical solutions that inform future practice. Researcher values drive the reflexive process of inquiry, which is initiated by doubt and a sense that something is wrong or out of place, and which re-creates belief when the problem has been resolved (Elkjaer & Simpson, 2011). As pragmatists are more interested in practical outcomes than abstract distinctions, their research may have considerable variation in terms of how 'objectivist' or 'subjectivist' it turns out to be. If you were to undertake pragmatist research, this would mean that the most important determinant for your research design and strategy would be the research problem that you would try to address, and your research question. Your research question, in turn,

would be likely to incorporate the pragmatist emphasis on practical outcomes. If a research problem does not suggest unambiguously that one particular type of knowledge or method should be adopted, this only confirms the pragmatist's view that it is perfectly possible to work with different types of knowledge and methods. This reflects a theme which recurs in this study that multiple methods are often possible, and possibly highly appropriate, within one study. Pragmatists recognize that there are many different ways of interpreting the world and undertaking research, that no single point of view can ever give the entire picture and that there may be multiple realities. This does not mean that pragmatists always use multiple methods; rather they use the method or methods that enable credible, well-founded, reliable, and relevant data to be collected that advance the research (Kelemen & Rumens, 2008).

3.2 Research Approach

The mixed-method approach was adopted for the study. Creswell and Plano (2011) noted that the mixed-method approach involves collecting data using both quantitative and qualitative methods in a single and many studies to understand the phenomenon of interest. The mixed-method approach is not required to choose between qualitative or quantitative methods but rather, to determine how both qualitative and quantitative methods would answer one's research questions (Graff, 2014). Creswell (2003) also stressed that data collection in a mixed-method approach involves gathering both numeric data and qualitative data so that the final database would represent both qualitative and quantitative information.

The mixed-method approach was used for this study because the researcher wanted to obtain data on the targeted sample for the study. This was intended to further help the researcher to compare the participants' responses to check if the respondents had similar or different answers to the research questions. Creswell (2014) identified

three different types of mixed methods studies, which include concurrent (convergent), explanatory sequential, and exploratory sequential. This study focused on the concurrent type of mixed-method approach. In a concurrent mixed method, the researcher converges both qualitative and quantitative data to provide a comprehensive analysis of the research problem (Creswell, 2018).

Plastow (2016) added that concurrent research involves a single data collection episode in which various qualitative and quantitative strategies are used to answer a research question. According to Creswell, Tashakkori, Jensen and Shapley (2003) concurrent research is used to confirm, cross-validate, or corroborate findings within a single study. Concurrent mixed-method collection strategies are employed to validate one form of data with the other form, to transform the data for comparison, or to address different types of questions (Creswell & Plano, 2011). The researcher used this type of mixed method because, it allowed her to collect both the qualitative and quantitative data at the same time during the study and compared the data during the interpretation of the result to check if the two results were the same or similar (Creswell, 2014). Furthermore, this design helped the researcher to ascertain information from the participants on access to information for students with visual impairment for their adjustment into the University community.

3.3 Research Design

This research employed explanatory sequential mixed methods as the research design to explore access to information for students with visual impairment in the University of Education, Winneba. An explanatory sequential mixed methods design (also called a two-phase model; Creswell & Plano, 2011) consists of first collecting quantitative data and then collecting qualitative data to help explain or elaborate on the quantitative results. Here, the researcher uses qualitative data to refine the results from

the quantitative data. The rationale for this approach is that the quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection, is needed to refine, extend, or explain the general picture (Creswell, 2012).

3.4 Population

The population for the study was one hundred and twenty four (124) students with visual impairment at University of Education, Winneba as at 2019/2020 academic year. They comprised of 47 level 100 students, 23 level 200 students, 36 level 300 students and 14 level 400 which offering courses in the Departments of Special Education, Social Studies Education, Political Science Education, History Education, English Education and Psychology and Education, and 4 resources persons. The breakdown of the population is presented in Table 1.

Table 1: Population Distribution of Respondents

Level	Frequency	Percentage
Level 100 students	47	38%
Level 200 students	23	19%
Level 300 students	36	29%
Level 400 students	14	11%
Resources persons	4	3%
Total	**124**	**100%**

Source: Field Data (2020)

3.5 Sample

The sample size for the study was 122 students with visual impairments, comprising 47 level 100 students, 23 level 200 students, 36 level 300 students and 14 level 400 and 2 resource persons. The students with visual impairment and the resource

persons are the people who can give me the accurate information I needed for this study. The breakdown of the sample is presented in Table 2.

Table 2: The Sample Size involved in the study

Level	Frequency	Percentage
Level 100 students	47	39%
Level 200 students	23	19%
Level 300 students	36	30%
Level 400 students	14	11%
Resources persons	2	2%
Total	**122**	**100%**

Source: Field Data (2020)

3.6 Sampling Technique

The sampling technique refers to the process of selecting a portion of the population to represent the entire population (Fraenkel & Wallen, 2000; Muijs, 2004). The purpose of sampling is to obtain a group of participants who will be representative of the larger population or will provide specific information needed to address the questions raised (Hayford, 2013). Purposive and census sampling was used for selecting the respondents for the study. The resource persons were purposively selected whilst the students were sampled using the census approach. Cohen, Manion and Morrison (2007) also noted that, in purposive sampling, the researcher handpicks the cases to be included in the sample on the basis of his or her judgment. The purposive sampling technique was used to select the resources persons because of the resources persons those the school personnel responsible for supporting the students in accessing all form information in the University. Therefore, those two resources persons were well experienced and could provide key information about the research questions.

The census approach was used to select the students with visual impairments. A census study, according to Creswell (2012), permits conclusions to be drawn about the entire population. The census approach was used as the sample size selection for the students because the number was small and it simply reports descriptive statistics about the entire population (Creswell, 2012). Also, Krejcie and Morgan (1970), cited in Cohen et al. (2007) stated that where the population of the study is small as is less than 100, it is advisable to include the whole wider population as the sample. Furthermore, the use of this technique helped the researcher to get more information from all the participants concerning the research topic.

3.7 Instrumentation

The instruments used for collecting the data for the study were semi-structured interview guide and close-ended questionnaire.

3.7.1 Semi-structured interview guide

A semi-structured interview guide was used to collect the data for the study. The interview questions were prepared based on the key themes raised in the questions. According to Avoke (2005), interviews can be described as a form of a conversation between two people. The semi-structured interview guide was used because it allowed for deeper probing of issues from respondents on the research questions. Again, since only two permanent resource persons for students with visual impairment in the University of Education, Winneba were involved, the researcher found it appropriate to interview them one-on-one, so that he could get more accurate answers to his research questions. The interview, which was done face-to-face, took place in the Office of the resource persons at the University of Education, Winneba and lasted between 30 to 40 minutes. The respondents were interviewed each at a time in order to elicit correct

responses. Responses from the participants were recorded on a tape recorder for easy transcription.

3.7.2 Questionnaire

"A questionnaire is a document or form containing a number of questions on a particular theme, problem, issue, or opinion to be investigated" (Kumekpor, 2002, p. 80). Kumar (2005) stated that "a questionnaire is a written list of questions, the answers to which are recorded by the respondents" (p. 5). The respondents usually read the questions, analyze it, and then put down the answers. A questionnaire was used for the study to collect data from students with visual impairment. This questionnaire was made of close-ended questions and it was made of four sections: Section A was about biographical data, Section B was about information need, Section C about how they access academic/social information, Section D challenges and support system that could be put in place to enhance access to information, so as to facilitate their adjustment in the University.

3.8 Validity

First of all, a written format of the interview guide for the interview was shown to the researcher's supervisor for approval. To ensure trustworthiness, responses for the interview were played to respondents to listen immediately after the interviews were conducted to make sure what was recorded were really respondents' views. The transcribed interviews were also shown to the respondents again to check if what were said were what had been transcribed. The content validity was then adopted where the interview guide and questionnaire items were carefully designed to cover the key themes raised in the research questions.

3.9 Reliability

To ensure the reliability of the questionnaire items, it was given out to colleagues for peer review and expert opinion from the research supervisors. On the other hand, a pre-test was conducted with a sample of 10 students with visual impairments from the University of Ghana. A questionnaire was used to collect data, which was used for the reliability test. Cronbach's alpha value was calculated. Table 3 shows the results of the reliability test for the various sections of the questionnaire.

Table 3: Reliability Scores of the Pre-test

Factor	Cronbach's Alpha	No. of items
Information needs of students with visual impairment.	0.584 10	10
Access to academic and social information for students with visual impairment.	0.614 13	13
Challenges face by students who are visually impaired accessing academic and social information.	0.759 14	14
Available support system to enhance access to information of students with visual impairment.	0.589 8	8
Total	**0.745 52**	**45**

Source: Field data, (2019)

From Table 3, the reliability of the questionnaire items was computed to be 0.74. According to Zaiontz (2016) the acceptable variables for an alpha, range from 0.70 to 0.95. Therefore, Cronbach's Alpha value was reliable and can be used for gathering the data. The interview which was also conducted on the result from the pre-test revealed that some of the questions were not well-structured and asked, and therefore needed corrections. This was in line with Alumode (2011), who stated that the main reason for the pre-test is to detect ambiguities, deficiencies, and weaknesses in the instrument for correction and modification so as to improve the internal consistency of the instrument.

3.10 Trustworthiness

Trustworthiness or rigor of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Polit & Beck, 2014). In each study, researchers should establish the protocols and procedures necessary for a study to be considered worthy of consideration by readers (Amankwaa, 2016). Several criteria of trustworthiness exist, but the best-known criteria are credibility, transferability, dependability, and confirmability as defined by (Lincoln & Guba, 2005). Although there are several criteria of trustworthiness, in this study, credibility, will be used. Strategies exist to be used to establish credibility, among which are prolonged engagement, persistent observation, member check and triangulation. In this study, to ensure the credibility of the study, method triangulation as a type of triangulation was used, thus the interview methods. In qualitative studies, reliability is just a match between data collected from the field and what is really happening in the natural setting (Bogdan & Biklen, 2007).

To ensure trustworthiness, responses for the interview were recorded and played to respondents to listen immediately after the interviews were conducted to make sure what were recorded were really respondents' views. Again, the interviews were conducted in the natural setting of the participants which is the office of the participants in the institution. Macmillan and Schumacher (2001) indicated that participants' in-depth interviews need to be conducted in natural settings to reflect the reality of life experiences more accurately than do laboratory settings.

The researcher was assured that the results of the study had to be generalized from the sample to the population and also the instruments accurately assess what the study intended to know. The use of questioner, interview in this study, allowed method triangulation of the data. Method triangulation is a method of cross-checking data from

multiple methods of data collection (Lincoln & Guba, 2005). The use of triangulation in this study therefore increased the validity of the result.

3.11 Pre-testing of Instrument

The pre-test was conducted with a sample of 10 students with visual impairments from the University of Ghana by the researcher after which the necessary modifications were made before the questionnaires were finally administered. The questionnaire transcribed into Braille format to make it easier for respondents to answer. The questionnaire also administered to students with visual impairment by the researcher and the answered questionnaire was retrieved from respondents on a later visit. The answered copy of the questionnaire was then transcribed by the research himself from Braille format to print format. In regarding the information needs by respondents, the results that were gathered shows that all the 10 respondents from universities of Ghana, Lagon required information on academic issues, employment, health and financial information. This goes on to show that students' needs are varied, it is clear from the data that academic, employment and health information needs form a fundamental part of visually challenged students' life on their campuses.

3.12 Procedure for Data Collection

The researcher sought permission from the Heads of Department of participants involved in the study. Permission was also sought from the Coordinator of the Resource Centre for Students with Special Needs, University of Education, Winneba who informed the resource persons in order to elicit their cooperation and assistance. Creswell (2012) maintained that it is important to respect the site where research takes place. This respect, according to Creswell, is shown by gaining permission before

entering the site. Permission to the site was facilitated by an introductory letter that the researcher received from the Head, Department of Special Education, UEW.

How to approach respondents to see the need for their participation in the study and on the explanations to certain concepts and portions in the questionnaire. Administering the questionnaire personally and with the help of the resource persons gave the researcher the opportunity to explain in depth how to answer the question. Participants were assured of the necessary confidentiality of information to be gathered and to book appointments with them. The day and time of the data collection were agreed upon with the resource persons and the students. When the time was due, the researcher went back as agreed on and collected the data. The students come in barges as and when they are free, the questionnaire was also in braille format for those who were blind to make it easier for respondents to answer and some were also put in large print for those with low vision. The data was gather on the 10th of March to the 14th March, 2020 and it lasted for one (1) hour. After the collection of the quantitative data, the researcher have it the need to interview the resource person's to confirm what the students has said is true and the interview also lasted between 30 to 40 minutes.

3.14 Data Analysis

The analysis of the data was done by analyzing the questionnaire, followed by the analyses of the interview.

3.14.1 Analysis of questionnaire data

Data obtained from the responses of the questionnaires were coded and subjected to rigorous analysis. Quantitative data obtained mainly from the questionnaire were analyzed using Statistical Package for Social Sciences version 21.0

(IBM SPSS, 21.0), descriptive statistics were calculated to obtain the frequency and percentages for each item-by-item analysis which was used to simplify the data.

3.14.2 Analysis of interview data

The interview data were transcribed based on the code for each interview. The thematic contents were formulated based on the research questions and the data gathered were grouped and analyzed under each thematic content, and then discussed with the findings of other related studies. Participants' verbatim responses were also used where necessary.

3.15 Ethical Considerations

Ethical matters are very important in research and therefore have to be a concern to the researcher. The students and resource persons who took part in this study were personally informed about the purpose and the procedure involved in gathering the data for the study by the researcher before the study was conducted. The participants were not forced to take part in the study, but rather it was done voluntarily. The participants were assured of confidentiality of any information they would give. The researcher also assured the participants that information they gave was going to be treated confidentially; and they were also told that they could withdraw from the study anytime they wanted. Again, the participants were promised that they could have access to the findings of the study and that they could contact the researcher if they had problems concerning this study.

CHAPTER FOUR

ANALYSIS AND FINDINGS

4.0 Introduction

This chapter presents the results of the findings. The chapter is divided into two sections: the first section presents the data analysis from the students through a questionnaire and the second section, the transcriptions of data generated from the interview conducted with the resource persons, and some selected students. The analysis reflected on the themes that emerged from the data.

4.1 Response Rate

A total of one hundred and twenty (120) copies of the questionnaire were sent out to students with visual impairment in the University of Education, Winneba which were hereby randomly designated as participants. Out of the 120 copies of the questionnaire that were distributed to the respondents in the University of Education, Winneba, a total of one hundred and two (102) copies were returned giving a response rate of 85%. According to Babbie (1973:165), "a response rate for a survey study of this nature is adequate enough for analysis and reporting should at least be 50%". Babbie (1973) further stated that a response rate of 60% is good while 70% is very good.

4.2 Demographics of Respondents

Data was gathered on the background of respondents with the idea to define how it influenced their information access. The background information included gender, age, level of study, programmes, and residential status. These have been presented under the following sub-headings.

4.2.1 Gender of respondents

Respondents were asked to indicate their gender. This question was posed to ascertain the number of students who were either male or female. This provides a better understanding of the population of students under study. Though this is not part of the main objectives of the study, it helps in determining the gender background of the respondents. Figure 2 depicts the gender distribution of the respondents in the University.

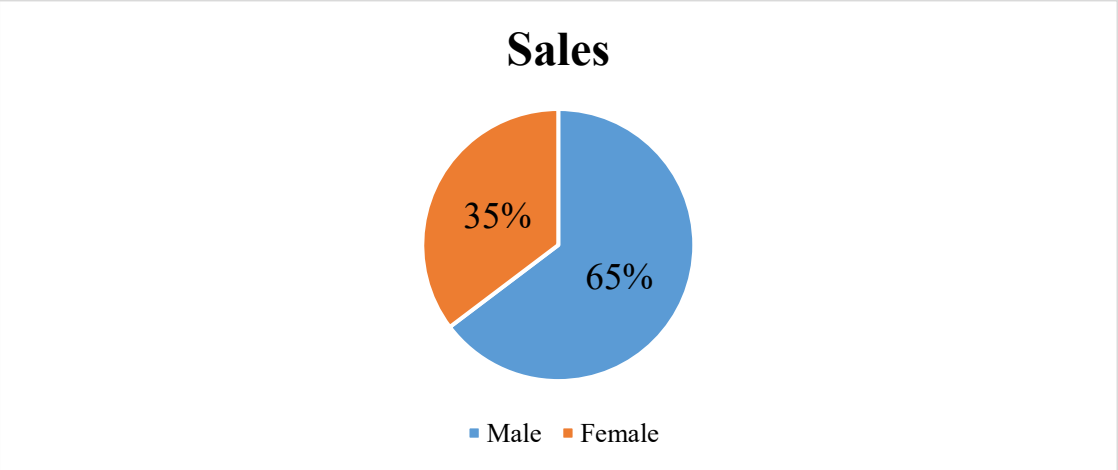


Figure 2: Gender distribution of respondents

Figure 2 reveals that 66 (65%) respondents were males and 36 (35%) were females. In this study, the male had the highest number of respondents out of 102 students for both males and females. It was observed that more males were covered than females in the University in the study. This provided a true reflection of the gender of the students admitted to the University that is more males were admitted than the females.

4.2.2 Age of respondents

Respondents were asked to indicate their ages in a range that was provided. The age distribution is presented in Table 4.

Table 4: Age distribution of respondents

Age	Male		Female		Total	
	F	**(%)**	**F**	**(%)**	**F**	**(%)**
17-21	8	(7.84)	4	(3.9)	12	(11.8)
22-26	35	(34.3)	20	(19.6)	55	(53.9)
27-31	19	(18.6)	9	(8.8)	28	(27.5)
32-36	4	(3.9)	0	(0)	4	(3.9)
37-41	0	(0)	3	(2.9)	3	(2.9)
42 and above	0	(0)	0	(0)	0	(0)
Total	**66**	**(64.7)**	**36**	**(35.3)**	**102**	**(100.0)**

Source: Field Data (2020)

Data gathered shows that 12 (11.8%) respondents from the University were between the ages of 17-21, 55 (53.9%) were in the age range of 22-26, while 28 (27.5%) were in the category of 27-31, 4 (3.9%) were also in the category of 32-36, while 3 (2.9%) were in the age range of 37-41. None of the respondents from both male and female was in the age range of 42 and above. The ages of the respondents show that 55 (53.9%) of the respondents were young adults falling within the age range of 22-26. This indicates that the University admits a lot of young adults who were between 22-26 years. On the other hand, the number of female respondents was 3(2.9%) aging between 37-41.

4.2.3 Level of study

The respondents were asked to show their levels of study to make a distinction between undergraduate and postgraduate respondents to ascertain whether the respondents' level of the study had an impact on their information-seeking behavior.

Table 5: Level of study of students with visual impairment

Level of study	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
800	0	(0)	0	(0)	0	(0)
400	11	(10.8)	3	(2.9)	14	(13.7)
300	15	(14.7)	11	(10.8)	26	(25.5)
200	10	(9.8)	10	(9.8)	20	(19.6)
100	30	(29.4)	12	(29.4)	42	(41.2)
Total	**66**	**(64.7)**	**36**	**(34.3)**	**102**	**(100.0)**

Source: Field Data (2020)

From the responses gathered, all the respondents, 102 (100%) were undergraduates, meaning there was no postgraduate. As shown table 5, 14 (13.7%) were level 400 students, 26 (25.5%) were level 300, 20 (19.6%) were level 200 and 42 (41.2%) were level 100 students. In the case of level of study, level 100 had the highest number of respondents 42 (41%) who were at level 100 than the other level. However, males in the University had their highest number of respondents 66 (64.7%), and also had no postgraduate students. The finding also indicates that most of the respondents were in level 100.

4.2.4 Programmes offered

Respondents were asked to indicate their programmes offered at the University. Programmes offered by students with visual impairment are presented in Table 6.

Table 6: Programmes students with visual impairment offered.

Programmes	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
Special Education	47	(46.1)	31	(30.4)	78	(76.5)
Social Studies	5	(4.9)	3	(2.9)	8	(7.8)
Political Science	9	(8.8)	0	(0)	9	(8.8)
Geography	0	(0)	1	(0.98)	1	(0.98)
CBR	0	(0)	1	(0.98)	1	(0.98)
English	3	(2.9)	0	(0)	3	(2.9)
History	1	(0.98)	0	(0)	1	(0.98)
Guidance and Counseling	1	(0.98)	0	(0)	1	(0.98)
Total	**66**	**(64.7)**	**36**	**(35.1)**	**102**	**(100.0)**

Source: Field Data (2020)

In respect of the programme offered, by students with visual impairment in the University, 78 (76.5%) were studying Special Education, 9 (8.8%) were studying Political Science, 8 (7.8%) were studying Social Studies, 1 (0.98%) was studying Geography, 1 (0.98%) were studying CBR, 3 (2.9%) was studying English, 1 (0.98%) was studying History, 1 (0.98%) was studying Guidance and Counseling and It can generally be concluded that most of the students with visual impairment in the University were offering Special Education.

4.2.5 Residential status

The respondents were asked to indicate their residential status in the University.

Table 7: Residential Status

Residential Status	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
University Hall	30	(29.4)	13	(12.7)	43	(42.2)
Simpa Hall	25	(24.5)	12	(11.8)	37	(36.3)
SSNIT Hall	6	(5.9)	10	(3.9)	12	(11.8)
Ghartey Hall	1	(0.98)	0	(0)	1	(0.98)
Aggrey Hall	0	(0)	1	(0.98)	1	(0.98)
None Residential	4	(3.9)	2	(1.10)	6	(5.9)
Total	**6**	**(64.7)**	**36**	**(35.1)**	**102**	**(100.0)**

Source: Field Data (2020)

The results that were gathered shows that 43 (42.2%) of the respondents were resident in the University Hall, 37 (36.3%) were residents in the Simpa Hall, 12 (11.8%) were resident in the SSNIT Hall, 1 (0.98%) was a resident in the Ghartey Hall, 1 (0.98%) was resident in the Aggrey Hall, 6 (5.9%) of the respondents were residents outside the campus. In a follow-up which indicates the floor in which they were. The respondents indicated that they were on the ground floor and in lower beds and just a few indicated that they were on the first floor and all slept in the flower beds. The respondents also indicated that there were open gutters on the roads and the distance from their halls of residence to their lecture halls was far. The findings, therefore, indicate that most of the respondents in the University confirmed that they were residents in the University Hall, SSNIT Hall, and the Simpa Hall. This is because they find most of their courses being taught at the North Campus. Just a few ones were

resident in the Aggrey and Gharty Hall and 6 (5.9%) of the respondents were residents outside the campus due to late payment for the University halls.

4.3 Analysis of Quantitative Data

4.3.1 Research Question 1: What are the information needs of students with visual impairment necessary for their adjustment at the University of Education, Winneba?

The first research question of the study was to determine the information needs of students with visual impairment. This research question had multiple or varied responses. Respondents' opinions were sought and the results are presented in Table 8.

Table 8: Information Needs of students with visual impairment

Information Needs	Male		Female		Total	
	F	%	F	%	F	%
Academic information	66	(64.7)	36	(35.3)	102	(100)
Social information	66	(64.7)	36	(35.3)	102	(100)
Employment/Job related information	50	(49)	45	(44.1)	95	(93.1)
Health information	56	(54.9)	38	(87.3)	94	(92.5)
Financial information	60	(58.8)	40	(39.2)	100	(98)
Orientation and mobility information	38	(37.3)	29	(28.4)	67	(65.7)
Internet knowledge information	25	(24.5)	10	(9.8)	35	(34.3)
Login access to use library web-based information	15	(14.5)	10	(9.8)	25	(24.50
Adaptive technology/Assistive aids information	20	(19.6)	15	(14.5)	35	(34.3)

Source: Field Data (2020)

From Table 8 regarding the information needs by respondents, the results that were gathered show that all the 102 (100%) students with visual impairment in the University of Education, Winneba required academic and social information, 95 (93.1%) required employment information, 94 (92.5%) required health information, 100 (98%) required financial information, 67(65.7) required Orientation and mobility information, whiles 33(34.3) required Internet knowledge information, 25 (24.5%) seek library web-based information and 35 (34.3%) required adaptive technology or assistive aids information. In this study, the male had the highest number of respondents 50 (49%) seeking employment information because most of the respondents were adults. The findings, therefore, indicate that academic, social, employment, and health information was the information needs, needed by respondents in the University. This goes on to show that students' needs are varied, it is clear from the data that academic, social, employment and health information needs form a fundamental part of students with visual impairments' lives in the University of Education, Winneba.

4.3.1.1 Reason for seeking information

The study was to find out the reason why the students sought for information. The respondents were given some reasons as a guide to choose from in responding to the query.

1. To pass examination
2. To keep up with new knowledge
3. To obtain material for learning
4. To seek better understanding of a topic and
5. To obtain materials that might be useful for my research work.

The respondents were then asked to select one or a combination of the reasons for seeking information as identified above. Their responses are illustrated in Table 9 below.

Table 9: Reason for seeking information

Reason	Male		Female		Total	
	F	%	F	%	F	%
To pass examination	66	(64.7)	36	(35.3)	102	(100.0)
To keep up with new knowledge	15	(14.7)	25	(24.5)	40	(39.2)
To obtain material for learning	30	(29.4)	41	(40.2)	71	(69.6)
To seek better understanding of a topic	14	(13.7)	24	(23.5)	38	(37.3)
To obtain materials that might be useful for my research work.	10	(9.8)	15	(14.7)	25	(24.5)
Others	20	(19.6)	14	(13.7)	34	(33.3)

Source: Field Data (2020)

It is evident from Table 9 that, 102 (100%) from the University sought for information to pass examinations, 71 (69.6%) sought for information to obtain materials for learning, while 40 (39.2%) sought information to keep up with new knowledge, 38 (37.3%) sought for information to seek a better understanding of a topic, 25 (24.5%) sought for information to obtain materials that might be useful for research work and 34 (33.3%) required all the above-mentioned reasons for seeking information. In this study, both male and female 102 (102%) respondents sought information purposely to pass examinations followed by enabling them to get work to do after they have completed the University.

4.3.1.2 Information sources

The second objective of the research was to determine the sources of acquiring information by respondents. Respondents' opinions were sought and the results are presented in Table 10.

Table 10: Sources of acquiring information from both gender

Sources	Male		Female		Total	
Information	**F**	**(%)**	**F**	**(%)**	**F**	**(%)**
Textbooks	19	(18.6)	30	(29.4)	49	(48)
Library	14	(13.7)	12	(11.8)	26	(25.5)
Colleagues	40	(39.2)	32	(31.4)	72	(70.6)
Group discussions	20	(19.6)	39	(38.2)	59	(57.8)
Internet	28	(27.5)	19	(18.6)	47	(46.1)
Lecturers	35	(34.1)	25	(24.5)	60	(58.8)
Handouts	23	(22.5)	31	(30.4)	54	(52.9)
Radio	30	(29.4)	14	(13.7)	44	(43.1)

Source: Field Data (2020)

From the responses in Table 10, it can be deduced that 72 (70.6%) relied on colleagues as their source of information, 60 (58.8%) relied on lecturers to acquire information, 59 (57.8%) got information through participation in group discussions as their source of information, 54 (52.9%) indicated hand out as their source of acquiring information. 49 (48%) consulted textbooks to acquire information. From the study, 47 (46.1%) browsed the Internet as their source of acquiring information, 44 (43.1%) of the respondents in the University indicated radio as their source of acquiring information, while 38 (55.8%) consulted library to acquire the information they needed The results indicate that a significant number of the respondents 72 (70.6%) in the University depended on colleagues to gain information. The results also indicate that

the main source for acquiring academic information by students with visual impairment a the University was through colleagues for most their information.

4.3.1.3 Format of information source

The respondents were further asked to indicate their preferred format of information they needed to meet their needs. Figure 4.3 presents the frequency distribution of respondents to the question that sought to find out how respondents wanted the needed information to be delivered.

Table 11: Preferred format of information source

Information format	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
Print	9	(8.8)	15	(14.7)	24	(23.5)
Braille	50	(49)	30	(29.4)	88	(86.3)
Electronic	10	(9.8)	4	(3.9)	14	(13.7)
Audio	23	(22.5)	18	(17.6)	51	(50.0)
Other sources	4	(3.9)	3	(2.9)	7	(6.9)

Source: Field Data (2020)

Table 10 shows that 88 (86.3%) of the respondents in the University needed their information source in Braille format, 51 (50%) preferred audio format, 24 (23.5%) preferred print format, 14 (13.7%) preferred an electronic format, and 7 (6.9%) preferred all the types mentioned. The responses indicate that 88 (86.3%) of the students with visual impairment at the University needed their information source to be in a Braille format followed by audio format and then print.

4.3.2 Research Question 2: How do students with visual impairment access academic and social information at the University of Education, Winneba?

4.3.2.1 Method used in seeking information

The respondents were further asked to indicate method used in seeking information in order to meet their information needs. Table 12 presents the frequency distribution of respondents to the question that sought to find out how respondents wanted the needed information to be delivered.

Table 12: Method used in seeking information

Method	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
library staff	14	(13.7)	10	(9.8)	24	(23.5)
colleagues	40	(39.2)	32	(31.4)	72	(70.0)
Internet	28	(27.5)	19	(18.6)	47	(46.1)
lecturers	40	(58.8)	24	(33.3)	64	(62.7)
textbooks	19	(18.6)	30	(29.4)	49	(48.0)
Using Resource Centre	41	(40.2)	26	(25.5)	67	(65.7)

Source: Field data (2020)

Table 12 shows that 72 (70%) preferred relying on colleagues, 67 (65.7%) visited the Resource Centre to seek for information, 64(62.7%) relied on lecturers to meet their information needs, 49 (40.2%) consulted textbooks as a way of meeting their information needs while 47 (46.1%) of the respondents in the University preferred the Internet as a way of meeting their information needs and 24 (23.5) sought the assistance of library staff.

The results of the study indicated that the majority of the respondents 72 (70%) relied on their colleagues followed by the Resource Centre 67 (65.7%) and lecturers 64 (62.7%) as their method for meeting their information needs. However, more respondents from male students preferred the Internet while female students most of the respondents preferred the Resource Centre to require information. It also shows that the respondents acquired the information through both formal and informal ways such as using online resources, consultation with lecturers, and visiting the Resource Centre.

4.3.2.2 Library use

The mandate of any library is to provide relevant and up to date materials with a view to fulfil the information needs of users. The respondents were asked about the use of the library for their academic work. Their responses are presented in figure 3.

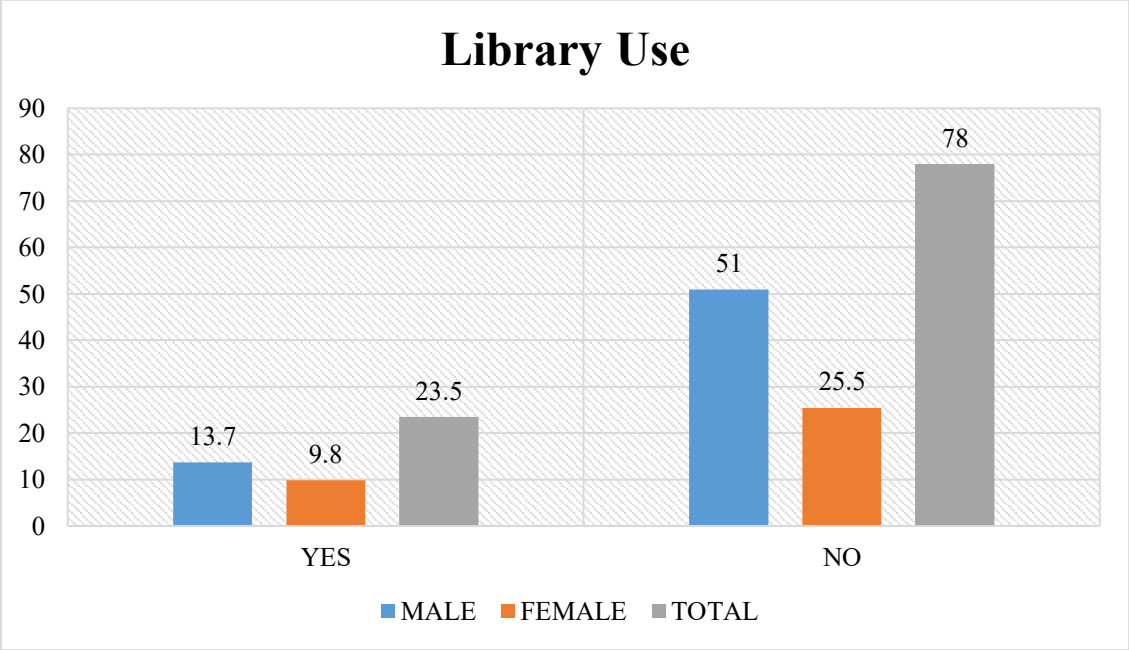


Figure 3: Library use

Concerning the question about the use of the library for their academic and social needs, within the University, 24 respondents (23.5%) indicated that they patronized the University library while 78 (76.5%) did not patronize the University

library for their academic and social needs. The results show that male students who are visually impaired in the University use the library more than female students who are visually impaired.

4.3.2.3 Reasons for using or not using the University Library

Respondents from the University were asked to state the reasons for using or not accessing academic and social information from the University library. Figure 4 depicts the responses of respondents.

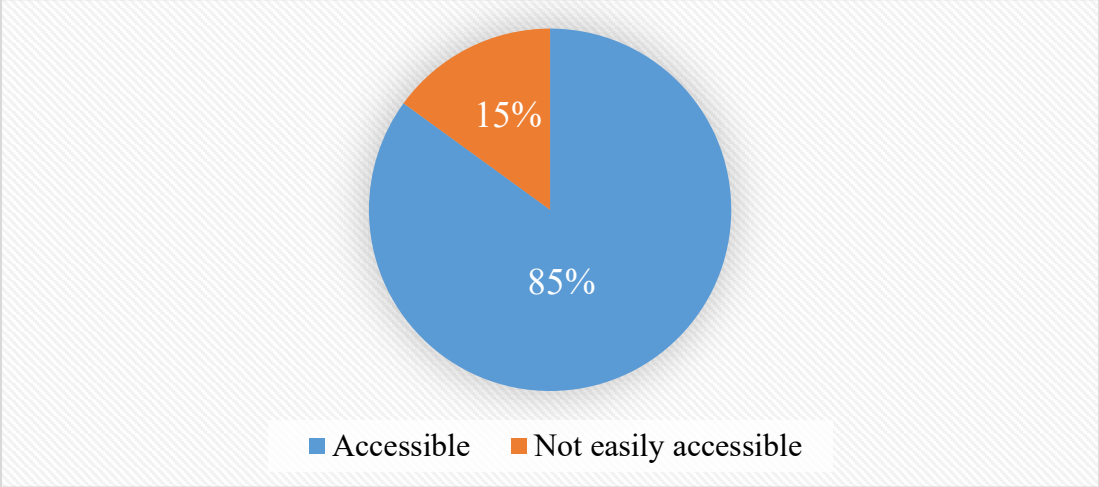


Figure 4: Reasons for not using the University Library

As shown in Figure 4, 85 (83.3%) respondents from the University did not use the University library because the materials or information resources were not accessible and 15 (14.7%) respondents indicated that the formats were accessible to their needs. The results show that few of the respondents in the University used the University library because the library collections were not accessible to some of them whilst the rest of the problem had to do with the format of the collections.

On the frequency of accessible of information resource/material in the University library all the respondents who used the library, reported that they all relied on the resource persons at the Resource Centre for Students with Special Needs when

they found the required material in the University library, the respondents sent it to the Resource Centre for Students with Special Needs for repackaging to make it accessible to the students.

4.3.2.4 Special services provided by the Library

The respondents were asked to state whether there were specialized services in the library for the students with visual impairment. The respondents were further asked if services existed, in what form they were and if none why this was so. This question was asked to ascertain whether there were any special services provided to cater for the particular needs of students with visual impairment or not. Twenty (29%) respondents in the University indicated that the library provided special services for them in the form of Braille Library and ICT Laboratory. They also indicated that the facilities there were inadequate because there were few computers, few personnel and the Braille Library too was on the last floor of the faculty block.

In a follow up question, respondents were asked why that was the case. Majority of the respondents in the University noted cost implications saying that there was lack of financial and human resources. This means that the ICT Laboratory lack funds and personnel to provide the specialized services for students with visual impairments. The finding indicated that only 20 (29%) respondents in the University used the Braille Library because the library provided special services for them. There was another follow up question, to indicate the kind of special services provided for the students with visual impairment, respondents answered by stated scan, embossed hand out and textbook, and teaching them how to use computer, are some of the special services provided for them.

4.3.2.5 Rating the services of the Braille Library or University Library in terms of the information needs of students with visual impairment?

In order for the researcher to determine how well University libraries had helped in the academic performance of respondents, they were asked to rate the services of their libraries on a scale of A-E with "A" being Poor and "E" being Excellent. Table 14 below shows the frequency distribution of responses from the students with visual impairment.

Table 14: Rating services by the University library in academic performance

Method	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
Excellent	0	(0)	0	(0)	0	(0)
Very good	0	(0)	0	(0)	0	(0)
Good	46	(45.1)	14	(13.7)	60	(58.8)
Average	14	(13.7)	19	(18.6)	33	(32.3)
Poor	6	(5.9)	3	(2.9)	9	(8.8)
Total	**66**	**(64.7)**	**36**	**(35.3)**	**102**	**(100)**

Source: Field data (2020)

Table 14 shows the frequency distribution of responses to the question on how well the services by the libraries had helped in academic performance of respondents. sixty (58.8%) respondents rated the library as good, 33 (32.3%) rated it as average, while nine (8.8%) respondents rated it as poor. None of the respondents from both genders rated it as very good or excellent. Within the University, majority of the male, 46 (45.1%) respondents rated the library as good while majority of the females, 19 (18.6%) rated the library as average. The results indicate that majority of the respondents from both genders rated the University library as average due to the services that they provided to them.

4.3.2.6 Awareness of services provided by Resource Centre

Respondents were asked if they were aware of the services provided by the Resource Centre for Students with Special Needs. Their responses are presented in Figure 5.

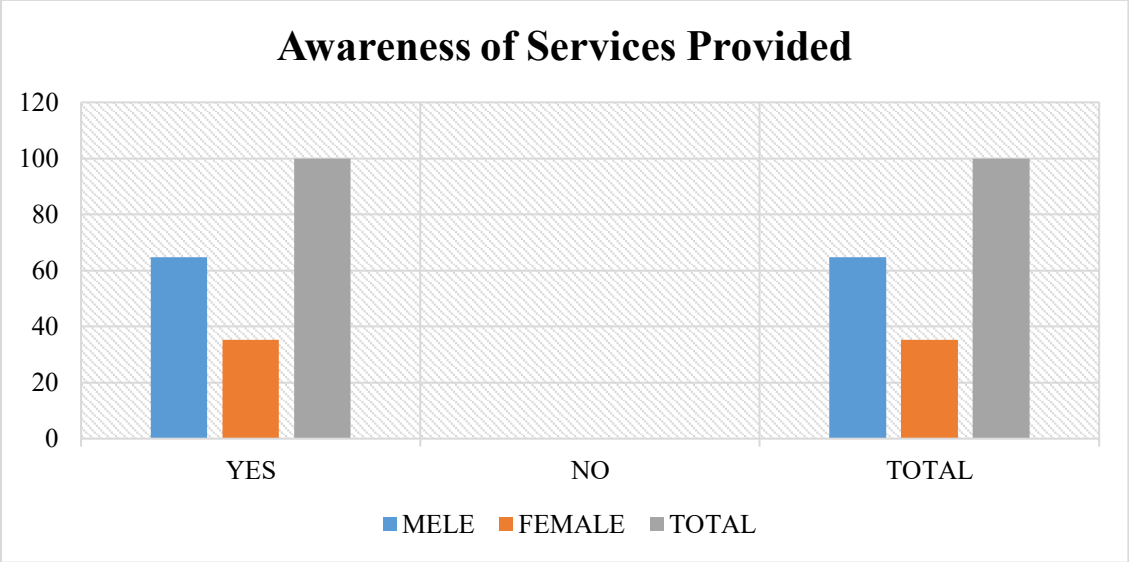


Figure 5: Awareness of services

From Figure 5, all the respondents in the University answered in the affirmative. The respondents got to know the services through orientation given to them during fresh students' orientation at the beginning of the academic year.

4.3.2.7 Services provided by Resource Centre for Students with Special Needs

There are several services which are specially tailored to fulfil the information needs of students with visual impairment. These services are designed to facilitate access to information by students with visual impairment. The respondents were asked to indicate the type of services provided by the Resource Centre for Students with Special Needs. Services provided to the respondents in the University were production of handouts in appropriate format (Braille, soft copy), enlargement of font sizes of texts

for students with low vision, transcribing braille assignments into print, supervising examinations and giving tutoring services. User satisfaction of the services provided by the Resource Centre for Students with Special Needs, is presented in the Table 15

Table 15: Level of user Satisfaction with Services

Information resource/ Material	**Male**		**Female**		**Total**	
	F	**%**	**F**	**%**	**F**	**(%)**
Satisfied	54	(52.9)	30	(29.4)	84	(82.4)
Not satisfied	12	(11.8)	6	(5.9)	18	(17.6)
Total	66	(64.7)	36	(35.3)	102	(100)

Source: Field data (2020)

From Table 15, regarding the level of user satisfaction with the services provided by Resource Centre for Students with Special Needs, for satisfaction of the services provided, males 54 (52.9%) respondents were satisfied while 12(11.8%) were not satisfied. In the case of the females, 30 (29.4%) respondents were satisfied and 6 (5.9%) were not satisfied. The results show that majority of the respondents 84 (82.4%) were satisfied with the services provided by the Resource Centre for Students with Special Needs.

Regarding the policy that guides the services provided by the library and the Resource Centre for Students with Special Needs, all the 68 respondents from both genders indicated that there was no such policy for them. This shows that the University that enrolled the students with special needs did not have any laydown policy guiding the services provided for students with visual impairment.

4.3.3 Research Question 3: What are the challenges faced by students who are visually impaired while seeking academic and social information?

The researcher sought to find out the challenges that were encountered by respondents in accessing academic and social information. This particular objective of the study had multiple or varied responses.

Table 16: Challenges of Accessing Academic and Social Information

Challenges	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
Inadequate Embossed materials	59	(49.0)	36	(35.3)	95	(93.1)
Inadequate computers	39	(38.2)	29	(28.4)	58	(56.9)
Slow Internet connectivity	23	(22.6)	14	(13.7)	37	(36.3)
Inadequate skilled staff	38	(37.3)	26	(25.5)	64	(62.7)
Lack of AT skills	20	(19.6)	15	(14.5)	35	(34.3)
Limited space	15	(14.7)	4	(3.9)	19	(18.6)
Orientation and mobility information problem	56	(54.9)	38	(87.3)	94	(92.5)
Inadequate AT software	25	(24.5)	10	(9.8)	35	(34.3)
Lack of training on e-resources	15	(14.5)	10	(9.8)	25	(24.5)
Poor library facility	38	(37.3)	29	(28.4)	67	(65.7)

Source: Field data (2020)

The result collated from the students with visual impairment revealed that 95(93.1%) respondents considered embossed materials to be one of the major challenges they faced when accessing information, the respondents further stated that there are few embossed materials which are not sufficient for their use. Ninety four (92.5%) respondents rated mobility to be one of the challenges in accessing information, and 67 (65.7%) respondents indicated poor library facilities to be a

challenge they encounter when accessing information. Again 64 (62.7%) respondents indicated that Inadequately skilled staff was one of the challenges they faced when accessing information at the library, 58 (56.9%) respondents also indicated that inadequate computers were also one of the challenges, 37(36.3%) respondents specified that slow Internet connectivity was one of the challenges while 35 (34.3%) respondents indicated that Lack of AT skills was one of the challenges that disrupt their information seeking process. Again, 35 (34.3%) respondents indicated inadequate AT software to be a challenge they encounter when accessing information, 25 respondents (24.5%) indicated lack of training on e-resources to be a challenge they encounter when accessing information whereas, 19 (18.6) respondents indicated Limited space to be a challenge they encounter when accessing information. From the overall results, it can be concluded that identified limitations were quite common to both genders. This is clear in the results demonstrated in Table 16 which indicated that 59 (49%) and 36 (35.3%) respondents from males and females respectively see embossed materials to be their major hindrance in accessing information since there are not enough books that are embossed.

4.3.4 Research Question 4: What support system could be put in place to enhance access to information to facilitate their adjustment in the University?

The researcher sought for information on supports system that could be put in place to enhance access to information. Their responses were as presented in the table 17.

Table 17: Suggested Supports System to enhance access to Information

Suggested solutions	Male		Female		Total	
	F	(%)	F	(%)	F	(%)
Provision of adequate Embossed materials	59	(49.0)	36	(35.3)	95	(93.1)
Adequate computers	39	(38.2)	29	(28.4)	58	(56.9)
Strong Internet connectivity	23	(22.6)	14	(13.7)	37	(36.3)
Adequate skilled staff	38	(37.3)	26	(25.5)	64	(62.7)
Assistive Technology skills	20	(19.6)	15	(14.5)	35	(34.3)
A Bigger space	15	(14.7)	4	(3.9)	19	(18.6)
Orientation and mobility information	56	(54.9)	38	(87.3)	94	(92.5)
Training Students on AT software	25	(24.5)	10	(9.8)	35	(34.3)
Training Students on e-resources	15	(14.5)	10	(9.8)	25	(24.5)
Good library facility	38	(37.3)	29	(28.4)	67	(65.7)

Source: Field data (2020)

From the Table 17, students offered various suggestions to overcome their challenges in table 17. From these findings, it was clear that access to information can be improved mainly by ensuring that there are enough embossed materials in the braille

library to facilitate their information access. Also, it was clear that access to information can be improved mainly by ensuring adequate provision of computers fitted with assistive technology, conducting organized and frequent training on how to access e-resources, improving internet connectivity, and conducting staff induction on adaptive technology. The University management should, therefore, consider the suggestions for improvements in access to information by students with visual impairment since they are directly gathered from this specific category of users.

Also, the findings further revealed that depending on the information needs of the student with visual impairment, information supports systems including; talking books, bold print books or screen readers on the computers, provision of soft copies of learning materials for the students, embossment of learning materials and creation of audio versions of learning materials. It was also revealed that, teaching them how to use some assistive devices like CCTV, JAWS, voice recognition software, and talking books will help students with visual impairments access information with ease.

4.4 Analyses of Qualitative Interview Data

This section presents analyses of the one-on-one interview data which was done with the teachers. The interview data were coded and subjected to thematic analyses and consequently, the themes and sub-themes have been used in the analysis of the main variables of the research questions. To answer the first research questions, the responses from the interview data were used.

4.4.1 Research Question 1: What are the information needs of students with visual impairment for the adjustment to the University community in the University of Education, Winneba?

Four themes emerged from the analysis of this variable. These included the type of information needs for students with visual impairment for the adjustment into the University community and how they have access to academic and social information. The respondents who were the resource persons were interviewed one-on-one at different times. Each resource persons was asked to describe the extent to which students with visual impairments get access to the information they need for the adjustment to the University community and from their responses, it was noted that the students with visual impairments needed orientation and mobility information, financial aids information, social and academic information.

4.4.1.1 Information needs

Concerning the information needs, the resource persons were asked to provide when the students with visual impairment come to them seeking for a particular information they need.

Resource person A commented:

> *Students with visual impairment come to us when they need information about the environment; example a student came to me asking about the new pavilion that they are constructing behind the Faculty of Educational Studies block because there has been a short-cut root to Simpa hall but now they are unable to use the place any more, which as a result, has put confusion into the minds of the students with visual impairment because they are more familiar with that root as far as moving to their hall (Simpa) is concerned. At Times some of them come to us to accompany them to the lecture hall, which I normally give them some training to aid their movement, which helps them move to lectures, to board a car on their own. Also, students with visual impairments always come to me to emboss handout from the lecturers for them for their academic needs. At times they also want me to read a portion of the textbook to them* **(A verbatim expression by Resource person A).**

The same resource person added:

> *Financial aids (Bursary / Grants / Scholarship), students with visual impairments, always come to me to fill and endorse bursary and VC scholarship for them* **(A verbatim expression by Resource person A).**

Resource person B commented:

> *I think students with visual impairment need social information to relate well to their sighted colleague, they always complain that the sighted don't come to them so they also don't associate with the sighted colleague* **(verbatim expression by Resource person B).**

It is therefore clear that students with visual impairment always needs assistance in order to access the information they need. Students with visual impairment received various types of support services that are geared towards making them more successful in terms of course completions (Moisey, 2004).

4.4.1.2 Access to orientation and mobility information

From the analysis of the data, it was realized that one of the main themes under the extent to which students with visual impairments needed to get information was orientation and mobility information. One of the resource persons commented this way:

> *We give orientation and mobility information training to the first-year students who are newly admitted into the University who knew nothing about the University, we orient them about the environment that is, how to get the resource offices, lecturer halls and library.*
> **(A Verbatim expression by Resource person A).**

Resource person B commented:

> *We orient them the proper way of how to use the white cane so that they don't rely on their sighted colleague always but they can also live independent life. We encourage all first-year students to get his or her own white cane to walk independently.* **(A verbatim expression by Resource person B).**

From the above comments it was clear that, though students with visual impairments had been giving orientation and mobility training, some students have

problem about the orientation and mobility. It was again noted from the comment that some of the resources for orientation and mobility including: white canes, for students with visual impairments to use were not available which further limited them in the orientation and mobility.

4.4.1.3 Financial aids (Bursary/Grants/Scholarship) information

Another theme that emerged regarding the extent to which students with visual impairments needed information was financial aids (Bursary / Grants / Scholarship) information.

Resource person A said:

> *Every year, students with visual impairments seek financial aids from the various sources this include bursary, grants, and VC scholarship, they always come to us to fill it for them when the time is due. Because of that they always seek information about that financial aids.* **(A verbatim expression by one Resource person A).**

Resource person B said:

> *Some of the students with visual impairment receive sponsor from their district and this money is always paid to the University account and students always pay their fees before the sponsor comes and students need to retrieve their money back, therefore this students need information on how to retrieve the money back from the University, so we guild the about how to retrieve the amount of money from the University.* **(A verbatim expression by Resource person A).**

From the above comments it was clear that, students with visual impairments really need information on financial aids. Agyen-Gyasi (2008) identified training needs of librarians, irregular internet connectivity and financial constraints as some problems facing the user education programme at the University of Education, Winneba which culminates into students' inability to use electronic resources.

During the interview, the staff serving the students with visual impairment in the Resource Centre for Students with Special Needs were also asked to suggest

solutions that they thought would be of help in improving access of information to students with visual impairment. The findings were as indicated below:

> *Organizing meetings with students in order to understand better their information needs as well as get an avenue of knowing the specific challenges that they face while trying to access various informational resources with e-resources being part.*
>
> *By benchmarking in other advanced institutions on how to go about retrieval of e-resources by specific categories of users.*
>
> *Offering training to the students on how to access to information.*
>
> *Provision of enough facilities like computers and assistive technology programmes.*
>
> *Ensuring staff motivation.*
>
> *Increasing the number of resource person to help students with visual impairment to access information.*

It is therefore clear that there are possibilities of improving access to information. These findings are in agreement with that of Brophy and Craven (2007). In their study, Brophy and Craven noted that the accessibility of Web-based information can be improved in two principal ways: through the use of access technology and through adopting good practice in interface design.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0 Introduction

This chapter discusses the research findings of the research objectives, existing and relevant literature. The discussion is based on the objectives of the study and informed the collection and analysis of data. The results of the findings are discussed according to the research objectives and dwell on biographical information of respondents' information needs, Access to academic and social information, challenges faced by students who are visually impaired in accessing academic and social information, the support system to enhance access to information of students with visual impairment.

5.1 Research question 1: What are the information needs of students with visual impairment necessary for their adjustment at the University of Education, Winneba?

People are generally motivated by different circumstances to access information. However, in all these instances, the overriding motivation was to satisfy one need. This confirms Wilsons (1999) observation, that there must be a resultant aim when a person experiences an information need. The study established that students with visual impairment like any other student needed information for their daily activities. They had several different information needs which also needed several different sources to fulfill.

The students from the University have shown that they have different information needs but academic needs were found to be their highest need followed by social information and employment. This finding corroborates Owolabi, Jimoh, and Okpeh (2010) study which also found that students use information mainly for

educational purposes. This finding also supports the findings of Bharti (2009) whose study also revealed that the information needs of the students with visual impairment revolved around academic information needs. Some aspects of the findings also corroborate with Canadian National Institute for the Blind (CNIB, 2005) research which found out that visually impaired young people's information needs include finance, employment, education, and social integration.

Information has a significant role in supporting, and improving people's life. It came out of the study that, students seek information for various reasons, but the most prominent is, to obtain materials for learning and to pass examinations. Some also seek information to keep up with new knowledge and to seek a better understanding of a topic. Smith and Rosenblum (2013) affirm this purpose when they reported that students constantly find themselves in need of information to write assignments, essays, tests, and any other academic-related information. Furthermore, this study confirmed the findings of Opare-Ababio (2011) that students seek information purposively to broaden their subject knowledge, enhance their course work, and to pass examinations and tests.

The extent of use of information sources and formats used are the key areas of information-seeking behavior. Thus, after identifying the respondents' information needs, the next step was to decide on which information sources were consulted and the information formats preferred by the students who are visually impaired. In this study, the students who are visually impaired' responses revealed that they used a combination of sources which included colleagues, the Internet, radio, lecturers, group discussion, textbooks, and handouts. The responses clearly showed that the students needed or used multiple sources of information for their studies and therefore did not

depend on a single source of information. Colleagues were their main source of acquiring information.

A study conducted by Sehic (2013) confirmed that when students with visual impairment are searching for information and materials for educational purposes they relied mostly on interpersonal sources. From the study, it also emerged that the students acquired the needed information through both formal and informal sources. This is by Wilson's (1999) model which states that users make demands upon traditional or non-traditional information sources to acquire the needed information.

Furthermore, Williamson, Schauder, and Bow's (2000) findings concluded that students with visual impairment deserve to be given a variety of ways of meeting their information needs, as are available for the sighted. They further stated that, while information is inevitable in human life, there must be a way for people with a print disability to participate equally in the information society. Fidzani's (2013) study also revealed that students had a wide range of needs and they preferred information from their lecturers because they consider the source as reliable. As compared to other colleagues elsewhere, students with visual impairment were no different in their use of a variety of sources.

The choice of students' formats of information is greatly influenced by the degree of sightedness. About the format that they preferred to access information, some students from the University had a high preference for Braille format. This is because the majority of the students 88 (86.3%) from the University preferred their information in the Braille format, followed by audio 51 (50%) and the reason for this was quite obvious as assistive technologies plays a major role in their information seeking.

This also confirms earlier studies conducted by Sehic (2013), Bharti (2009), and Saumure and Given (2004) who respectively reported that students with visual impairment preferred electronic format but not print format because print slows their reading down and often makes them dependent on other people. With the advent of Information and Communication Technology, it is not surprising that this category of students also preferred audio formats. Indeed, the use of audio resources plays an essential role in the life of students with visual impairment and is something that cannot be avoided.

Furthermore, Saumure and Given's (2004) findings concluded that the growth of ICT and the increase of information in electronic format has enhanced their independence and improved the chances of the students with visual impairment to find and use information. The most important thing is that the students had a preference for more than one format. This meant that no one format was regarded as the best choice, however, a combined or multiple choice of formats was the preference of the students. In selecting information sources for the visually impaired there should be a balance in the acquisition of the various formats. The different formats of information sources, therefore, are what are needed to satisfy students with visual impairment as no one format alone is adequate to meet their needs.

5.2 Research Question 2: How do students with visual impairment access academic and social information at the University of Education, Winneba?

Students with visual impairment have various ways of finding the information required for whatever situation they find themselves in. The different strategies employed in acquiring information also apply to the students who are visually impaired.

Circumstances such as being a student, being alone, or staying with family influenced how the students sought and acquired information. The information behavior model by Wilson (1999) has been used as a framework that assists in accepting the information-seeking behaviour the students exhibited.

From the study, the most used method by the students in seeking information from the University was accessing the Resource Centre, Internet, colleagues, textbooks, and lecturers. The rests were journals and the library staff. Wilson's (1999) model indicates that once the information user has a need, she/he can make demands on information sources or systems, which the students did. The students, in this regard, followed Wilson's (1999) model. However, for most of them, their information-seeking behaviour was never a success before they went to the Resource Centre (R.C)/ Office of Students with Special Needs (OSSN) for information repackaging before they could use it. This is by a study conducted by Bharti (2009) which indicated that Disability Unit plays a major role to ensure that information that the students found was repackaged for them in a usable format. Bharti (2009) also reported that libraries, colleagues, and friends played a vital role when searching for information. Furthermore, a study conducted by Shunmugam (2002) established that librarians, colleagues, and RC for Students with Special Needs play a significant role in students who are visually impaired' information seeking process. Appiah (2019) additionally reported that in searching for information by students with visual impairment in Akropong School for the Blind, the students did not rely on their colleagues but rather they entirely depend on library staff and Resource centres because the majority of them are blind just few are partially sighted.

Knowing the information needs of various patron groups is essential in the preparation to set up information systems. Meanwhile, if academic librarians and information providers are to serve the academic community effectively, they need to know the varying needs and differences in information gathering of the different categories of patrons to be able to offer services to meet their required needs. The quality and scope of library collections are major determinants that influence users' desire to use the resources of the library. A library cannot attract users if its collection is not accessible.

Students' library use and service were examined to help find out how diligent students generally use the library in their quest for academic information. Male students used the University library because it has a special service for them. On the frequency of usage of the University library, all the Males respondents who used the library reported visiting the library not often and they all relied on library staff for assistance.

However, female students did not use the University library because it did not offer any special services for them and more so the materials were not accessible while the formats available did not apply to them. The majority of the respondents in the University noted that the library had no resource persons to provide specialized services for students with visual impairments.

However, a study by Davies (2007) recommended that educators of students who are visually impaired should know before enrolling them at the University. To satisfy their specific needs, then different specialized services must be provided to them. Davies (2007) further went on to recommend that service providers should know that all students have the same educational needs (do the same courses) and not all can benefit from the learning information services delivered in teaching situations or access the information provided by the University to support their learning because of barriers

presented by how the University operates. Craddock (2001) additionally reported that a library serving students with visual impairment must provide such users with the information they require in the appropriate formats and insufficient time for it to be useful. Research by Akinola (2002) also revealed that facilities in the libraries of institutions that admit students with visual impairment are grossly inadequate and visually impaired library users in institutions do not derive any appreciable satisfaction from the library.

Although students from the University responded that they used the University library because it provides special services, they also lamented that the facilities in the Braille Library were far below expectation, that's there is only one qualify resource person in the Braille Library the rest knew nothing about facilities used by students with visual impairment. In the case of Computer Laboratory, they mentioned that the number of computers there was not enough, there was the frequent breakdown of the computers and there is only one ICT tutor who takes all the students with visual impairment at all level. The library is responsible for acquiring and circulating information for its users but the responses from the students were enough to tell that a lot more needed to be done at the Braille Library and the Computer Laboratory respectively.

5.3 Research Question 3: What are the challenges that students who are visually impaired face while seeking academic and social information in the University?

Nothing comes without drawbacks, and in the same way, information seeking by students with visual impairment like any other human endeavor was not without challenges. The fact that information is there for students with visual impairment is not enough. The question is whether the information is accessible in a usable format to the

students with visual impairment using any information-seeking behaviour they choose. As applied to this study, respondents from the universities brought to the fore, some of the challenges they encounter when seeking information. These challenges from every indication showed that the students find it difficult to achieve whatever goal or objective they intend to in their information seeking. The most pertinent of these were as follows:

1. Embossed materials
2. Mobility problems
3. Poor library facilities (Braille scanner and Braille embosser) and
4. Slow Internet connectivity

5.3.1 Embossed materials

In the University, students with visual impairment found the issue of embossed materials as a hindrance to their information seeking. This was a bit challenged for the students with visual impairment in the University. Due to lack of sight, students with visual impairments encounter certain constraints in accessing information. For example, a high proportion of reading and information materials found in the public University libraries are in standard print format. Also, any information intended for students who are visually impaired had to be transcribed into Braille or read directly to them. This presents a major problem of accessing information by students with visual impairments because they cannot read ordinary standard print.

Accessibility barriers to print can be certainly overcome through web technologies (Kumar & Sanaman 2015). Furthermore, McCarthy's (2002) findings concluded that students with visual impairment can use materials that are in print when provided an assistive technology such as optical scanner, optical character recognition, and Closed-Circuit Television (CCTV) for students with low vision. This confirms Edward and Lewis's (1998) finding which shows that access to printed materials has

been described as one of the challenges facing students with visual impairment anywhere, they find themselves. Edward and Lewis (1998) further revealed that the introduction of printed materials has not put the needs of students with visual impairment into consideration. Today, Information and Communication Technology (ICT) look far more capable than standard print.

The solution for printed materials was to design information services that can resolve the unique needs of the students who are visually impaired. It also calls for heavy financial investment, which is not generally available in most academic institutions in Ghana. University administrators, librarians, and publishers should endeavour to plan to put things in place to ameliorate this problem.

5.3.2 Mobility problems

The mobility problem was found to be the second challenge student's encounter in their attempt to seek information. This was shown by findings which indicate that 94 (92.5%) respondents rated mobility to be one of the challenges in accessing information, students indicated that this type of challenge slows down their information seeking because they need to get somebody to accompany them when seeking information. Mobility indeed is a big problem for students with visual impairment and stakeholders should consider their needs, particularly their movement to seek information in the library and Resource Centre for Students with Special Needs. Physical impediments such as uncovered gutters and the absence of visually impaired friendly directional signs hinder access to information since these students are afraid of injuring themselves, they solicit the help of sighted friends. The implication of this is that if their colleagues/ friends are not available to lead them to the library they cannot seek information.

Brown (2000) opines that the physical environment and location are important criteria in determining access to information. This indication supports the findings by Rowland (2014) which shows that the location of the students with visual impairment also creates problems in their information seeking process. People living with disabilities are sometimes suffering from social discrimination that adversely has an impact on their information seeking. Traveling or moving into a busy place may create a big problem. This problem always requests for assistance for students who are visually impaired.

5.3.3 Poor Library Facilities

Facilities have a major influence on the academic activities of students, and insufficient facilities lead to poor performance. However, students with visual impairment in the University do not use the University library at all. It does not provide any special services for them and more so the collection in the library was not accessible and the formats too did not apply to them.

This indication given by the students agrees with the findings by Friend (2009) a library for the students with visual impairment are not fully equipped. The International Federation of Library Associations (IFLA) Guidelines for Development of the Public Library Service (2001:2) stressed that "all libraries serving the visually impaired should ensure that their collections and services complement and integrate with national agencies to provide access to as wide range of alternative formats and services as possible". This presentation by IFLA did not comply with both genders.

5.3.4 Slow Internet Connectivity

Lastly, 37(36.3%) respondents specified that slow Internet connectivity was one of the challenges for students with visual impairment in this study. Students in the University found the intermittent break in Internet connectivity as a major challenge in accessing information. A slow Internet speed made it difficult for users to enjoy smooth interactions on the Internet site as posited by Arthur and Brafi (2013). Also, the slow Internet connectivity compels students to turn to other sources for Internet services such as cyber cafes. The effect of this is that, because it is a commercial service, students have to pay for the service. As such, they are not able to browse the internet as much as they would want and in the manner in which they find appropriate. This negatively affects their studies as they mostly browse for academic purposes. A study by Gerber (2003) stated that having access to the internet is vital because it influences positively on human life.

5.4 Research Question 4: What support systems that could be put in place to enhance the students' access to information so as to facilitate their adjustment at the University of Education, Winneba?

Concerning research question 4 that was to identify support systems that could be put in place to enhance access to information, to facilitate their adjustment in the University. the analysis of the comments from the respondents revealed that, some of the support systems that can put place including, scanning of print documents and books to be used on students' personal computers that had screen readers, embossment of learning materials, creation of audio versions of learning materials and teaching them how to use some assistive devices. The analysis indicated that the supports system provided was tailored to the needs of individual students. The major supports system that appeared in the comments from the responders was the provision of soft copies of

learning materials for the students. In expressing their views, it was revealed that the supports system they receive from the resource center was not only related to academics but also social, employment, and health.

Further analysis of the data revealed the theme, effectiveness of support received. It was evident that the students received the support they requested in good time with an uncompromised quality even though there were isolated cases where some works had some minor errors. A study by Dutta, Schiro-Geist, and Crandall (2003) confirmed the findings of the current study indicate that participants in their study reported high levels of satisfaction with the supports they received from the disability support service. On the contrary, Sharpe, Johnson, Izzo, and Murray (2005) reported participants' low levels of satisfaction with supports received from the disability support units.

From the analysis of the comments, it was revealed that support system to enhance access to academic and social information including ICT instruction, note-taking and orientation, and mobility training. It was revealed that the students wanted the management of the University to recruit more staff, provide an equipped ICT laboratory with a specialist instructor and purchase more supportive equipment and devices such as embossers, Perkins Braillers, magnifiers, computers, recorders and new technological devices for the blind because of the inadequacy of this equipment. Supporting these findings, Teye (2014), identified students with disabilities difficulty with access to computers and the inadequacy of computer training as barriers to computer use among the participants. Teye recommended that the management of UEW consider recruiting qualified and competent ICT personnel to assist the students with disabilities in using the computer and take charge of the technology-related needs of students with disabilities.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter presents a summary and conclusion of the study's findings in line with the objectives. Additionally, recommendations have also been made based on the findings as well as suggestions for areas for further research. The objectives of the study were to:

1. Identify the information needs of students with visual impairment necessary for their adjustment at the University of Education, Winneba.
2. Explore how students with visual impairment access academic and social information at the University of Education, Winneba.
3. Find out the challenges students with visual impairment face in accessing academic and social information at the University of Education, Winneba.
4. Identify identify support systems that could be put in place to enhance the students' access to information so as to facilitate their adjustment at the University of Education, Winneba.

Four research questions were developed to guide the study. The flow theory by Wilson was adopted to guide the study. The concurrent mixed research approach using the explanatory sequential design was also used. A Likert scale type questionnaire was used to collect the data from 102 students with visual impairments and 2 resource persons. Data from the questionnaire was analyzed via Statistical Product and Service Solutions (SPSS) version 21.0, to generate the percentages on frequent count while Data from the interviews were analyzed using themes that emerged from the responses of the respondents.

All though, the following were not part of the main objectives of the study, it was sought from the findings.

1. The University admits more male students with visual impairment more than female students.
2. Students with visual impairment sought information to obtain materials for learning.
3. Braille materials were found to be the most preferred format of information source needed by the students with visual impairment in the University and this was followed by audio format.
4. Students with visual impairment acquired the needed information through both formal and informal channels.
5. University Library provides special services for students with visual impairment. Students with visual impairment visit the library not often.
6. All the students with visual impairment in University who used the Library sought assistance from library staff.
7. Students with a visual impairment were aware of the services provided by the Resource Centre for Students with Special Needs.
8. Personnel in the Resource Centre for Students with Special Needs were inadequate.
9. The University Resource Centre for Students with Special Needs had no laydown policy for the services rendered students with visual impairment.

6.1 Summary of Major Findings

The purpose of the study was to explore how students with visual impairment access academic and social information in the UEW and to identify support systems that could be put in place to enhance access to information to facilitate their adjustment in the University. Identifying the information needs of students with visual impairment helped to determine whether the services that are provided by the University of Education, Winneba met their information needs or not. The purpose behind the research objectives was to facilitate recommendations that would improve services that are rendered for the students with visual impairment at the University of Education, Winneba. The major findings are summarized below:

6.1.1 Information needs of students with visual impairment for their adjustment to the University community at the University of Education, Winneba?

The students with visual impairments like any other students needed information for their daily activities. Academic information was found to be the most needed type of information by students with visual impairment followed by social, financial, employment and health in both genders.

The academic, social, financial, employment and health information needs form a fundamental part of students with visual impairments' life in the University Education, Winneba.

6.1.2 How students with visual impairment access to academic and social information at the University of Education, Winneba.

The of students with visual impairment depended on their colleagues to acquire the needed information followed by the Internet, radio, and lecturers. Also the students

with visual impairments acquired the information through both formal and informal ways such as using online resources, consultation with lecturers, and visiting the Resource Centre.

6.1.3 Challenges students with visual impairment face in accessing academic and social information at the University of Education, Winneba

Challenges students with visual impairments faced in accessing academic and social information. The braille materials, mobility problems, poor library facilities, and slow Internet connectivity were found to be the challenges for students with visual impairment in the University encountered in accessing information.

Information in printed materials was the major challenge students with visual impairment encountered when accessing information due to their condition. A students with a visual impairment from the University did not use the University library because the collection was not accessible to them. Finally, facilities in the Braille Library Section and Computer Laboratory of University library were inadequate.

The study also established the following challenges:

1. That the library website was not very accessible to users with visual impairment
2. It is not easy for the students with visual impairment to use E-resources.
3. The not enough computers in the section for users with special needs.
4. That the staff serving in the section for users with special needs were not enough to assist them.

6.1.4 Support systems that could be put in place to enhance access to information to facilitate their adjustment in the University

There were enough embossed materials in the braille library to facilitate their information access. Also, access to information could be improved mainly by ensuring

adequate provision of computers fitted with assistive technology, conducting organized and frequent training on how to access e-resources, improving internet connectivity, and conducting staff induction on adaptive technology.

In addition, depending on the information needs of the student with visual impairment, information supports systems including; talking books, bold print books or screen readers on the computers, provision of soft copies of learning materials for the students, embossment of learning materials and creation of audio versions of learning materials. Teaching them how to use some assistive devices like CCTV, JAWS, voice recognition software, and talking books.

6.2 Conclusion

It can be concluded from the finding that students with visual impairment at the University of Education, Winneba needs information on academic, social, financial, employment and health information needs form a fundamental part of students with visual impairments' life in the University and these needs must be addressed.

Again, students with visual impairment at the University access academic and social information through colleagues, Resource Centre, lecturers and also consulted textbooks as a way of meeting their information needs. Students with visual impairment face challenges in accessing information in the University.

Finally, it is important in improving the way the students access information by providing adequate support services for students with visual impairment at the University of Education, Winneba. Assistive technologies have changed the information in print materials to audio and through voice activation device. Also, print characters have been changed to Braille characters. The University library expects to meet the academic needs of all of its users, including those with special needs.

6.3 Recommendations

Based on the findings from the study, the researcher wishes to make the following recommendations:

1. University authorities should make available information services to students with visual impairment in academic, social, financial, employment and health information needs. That's when planning budgets and allocating monetary resources, consideration of the needs of special needs should be included. In order to be able to procure special equipment for this group of students, there is a need to increase the budgetary allocation for the University libraries. A sufficient budget would be of utmost importance since buying assistive technology equipment requires substantial funds.
2. University authorities should put in appropriate measures to enable students who are visually impaired to access academic and social information with ease. That's the availability of a wide variety of assistive devices makes it possible for students with visual impairment to use computers and telecommunication equipment. In providing students who are visually impairment their access to academic and social information, technology that improves their education and career opportunities, assistive technology devices may play a significant role. Computers with screen readers, screen magnifiers, braille embossers, braille note-takers, scanners, applications for speech recognition and closed-circuit television are important and should be made available for students with special needs to use. There is also the need to prepare at least one library staff to be able to use these items and be able to support the students with their use.

3. The study established that the library website was not very accessible to students with visual impairment, as per the statements by the majority. Again it was established that more than half of the students with visual impairment found it challenging to use e-resources. Further, the study established that computers in the section for students with special needs were not enough as per the statement made by the majority and that staff serving in the section for users with special needs were not enough to satisfactorily attend to the needs of students with visual impairments. There should be an advocacy for facilitation of learners and for learners initiative where learners who are knowledgeable in AT can assist the others during their free time. Furthermore, the library management should organize training and induction forums for staff on AT and e-resources. And finially, the University should recruit more skilled personnel to render services on information to students with visual impairment.
4. Support systems such as adequate embossed materials, computers with Job Access with Speech (JAWS) software, internet connectivity, adequate skilled staff, and assistive technology should provide by University authorities for students with visual impairment in accessing information. This will make life more bearable for the students with visual impairment and to improve their computer literacy and information-seeking levels, also it is recommended that management of the University should make adequate arrangements of computers with JAWS applications at the Computer Laboratory for students with visual impairment. This will allow the laboratory to provide more students with access to knowledge.

6.5 Areas for Further Study

Further research may be carried out in the following areas:

1. Impact of assistive technology on access to academic and social information for students with visual impairment at the University of Education, Winneba.
2. A comparative study between students who are blind and those with low vision students on how to access information at the University of Education, Winneba.

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APPENDICES

APPENDIX A

Letter of Introduction

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF EDUCATIONAL STUDIES
DEPARTMENT OF SPECIAL EDUCATION
P. O. Box 25, Winneba, Ghana
sped@uew.edu.gh
+233 (020) 2041069

9th March, 2020

The Registrar
University of Education, Winneba
P. O. Box 25
Winneba

Dear Sir,

LETTER OF INTRODUCTION: MR. SYLVESTER POKU

I write to introduce to you, **Mr. Sylvester Poku *an*** M.Phil. student of the Department of Special Education with index number 8180150007.

He is currently working on his thesis on the topic: ***"Access to Information for Students with Visual Impairment at the University of Education, Winneba".*** He needs to administer and interview blind students from Department of Special Education.

I would be grateful if you could give him the needed assistance to enable him collect the data.

Thank you for the consideration and assistance

Yours faithfully,

DR. DANIEL S. Q. DOGBE
Ag. Head of Department

APPENDIX B

Questionnaire for Students

Section A

BIOGRAPHICAL DATA

1. Gender Male ( ) Female ( )

2. Age:

(a) 17-21 (b) 22-26 (c) 27-31 (d) 32-36 (e) 37-41 (f) 42 and above

3. Level of study:

(a) 800 [ ] (b) 400 [ ] (c) 300 [ ] (d) 200 [ ] (e) 100 [ ]

4. What course do you offer? ……..

5. Are you resident on campus? Yes [ ] No [ ]

5b. If 'No' why? ……..

…….

5c. If 'yes' which floor can you be located? (Please specify) ……

5d. Which hall are you in?

Section B

INFORMATION NEEDS

6. What information do you normally require? (Please choose as many as applicable).

Academic information

Social information

Employment/Job related information

Health information

Financial information

Orientation and mobility information

Internet knowledge information

Login access to use library web-based information

Adaptive technology/Assistive aids information

Others (please specify)

7. For what reason (s) do you need such information? (Please choose as many as applicable).

(a) To pass examinations

(b) To keep up with new knowledge in my field of studies

(c) To obtain materials for learning

(d) To obtain materials that might be useful for my research work

(e) To seek better understanding of a topic

Others (Please specify) ……..

8. Where do you find information you need? (Please choose by a scale of preference).

(a) Textbooks

(b) Library

(c) Colleagues

(d) Group discussion

(e) Internet

(f) Lecturers

(g) Handouts

(h) Radio

Others (Please specify)

……..

9. Which format do you wish information you need should take? (Please choose as many as applicable).

a) Print
b) Braille
c) Electronic
d) Audio

Others (Please specify) ……

Section C

WAYS OF ACCESSING INFORMATION BY STUDENTS WITH VISUAL IMPAIRMENT

10. What method do you use to seek information? (Please choose as many as possible).

a) By asking library staff
b) Consulting colleagues
c) Browsing Internet
d) Relying on lecturers
e) Consulting textbooks
f) Consulting journals
g) Using Resource Centre

Others (Please specify)……

11. Do you use the University libraries for information you needed?

Yes [ ] No [ ]

11b. Do you find information resource/materials in the University libraries accessible OR not accessible?

Yes [they accessible] or No [not accessible]

14a. Do you often require personal assistance in seeking information in the University library?

Yes [ ] No [ ]

14b. If 'Yes' please give reasons……..…….

……
…

……
…

14c. If 'No' why?

……..…
…

15a. Does the University Library provide any special services for students with visual impairments?

Yes [ ] No [ ]

15b. If 'Yes' indicate the kind of special services provided for the students with visual impairments

……

15c. If 'No' please give reasons……..……

16. List other resources that are not at the University Library but should be acquired to assist students with visual impairments.

……

18. How would you generally rate the services of the Braille Library or University Library in terms of the information needs of students with visual impairment?

(Please choose one).

(a) Excellent [ ] (b) Very good [ ] (c) Good [ ] (d) Average [ ] (e) Poor [ ]

19. Are you aware of the services that are provided by the Office of Students with Special Needs or Resource Centre in the University?

Yes [ ] No [ ]

19b. If 'Yes' how did you get to know about those services? (Please elaborate).

……

……

19c. What are the services provided at the Office of Students with Special Needs and Resource Centre?

……...……

……...……

19d. Are you satisfied with those services?

Yes [ ] No [ ]

19e. If 'No', please explain…….

……

SECTION D

CHALLENGES IN ACCESSING INFORMATION

21. Do you encounter any challenges in accessing information?

Yes [ ] No [ ]

21b. If 'Yes', list the challenges you faced when accessing information by choose from the list below? (Please choose as many as possible)

a) Embossed materials
b) Inadequate computers
c) Internet inconsistency
d) Inadequate skilled staff
e) Lack of AT skills
f) Limited space
g) Orientation and mobility information problem
h) Inadequate AT software
i) Lack of training on e-resources
j) Poor library facility

Others (Please specify)
……

22. Are you able to access, retrieve and use information from the internet without any assistance?

(a) Yes (b) No

23. How long do you take to retrieve a single information from the internet? (Please choose one).

(a) Very long time (b) Long time (c) Short time (d) Very short time

24. How do you read the resource retrieved? (Please choose one).

(a) I use student readers

(b) I use the staff in the section

(c) I use screen readers

(d) I use screen magnification

22. Are there any suggestions that can put in place in order to enhance your accessing information in the University?
……