UNIVERSITY OF CAPE COAST

RELATIONSHIP BETWEEN COMPETENCE IN EXPANDED CORE CURRICULUM AND ACADEMIC ACHIEVEMENT OF STUDENTS WITH VISUAL IMPAIRMENT IN PUBLIC UNIVERSITIES IN GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: ..... Date 11-02-19

Name: EDWARD KOFI NTIM

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The main thrust of this study was to explore the competence in the expanded core curriculum and academic achievement of students with visual impairment in public universities in Ghana. The study was guided by the Cambourne's theory and the normalisation theory. The study was a descriptive survey and was steered by seven hypotheses and one research question. The sample comprised 93 students with visual impairment. The instrument for data collection was a questionnaire with a reliability coefficient of .764. Descriptive statistics (means, standard deviations, frequencies, and percentages) and inferential statistics (linear multiple regression, Pearson Product Moment correlation coefficient and one-way between-groups multivariate analysis of variance, MANOVA) were used to analyse the data. The findings showed that all the nine elements of the expanded core curriculum had a positive high correlation with academic achievement of students with visual impairment. Students who were introduced to the elements of the expanded core curriculum at the basic level showed more competence than those who were introduced to it during the SHS level. Students with basic level experience in ECC performed better in academic achievement. Several recommendations were made which included; The Special Education Division of Ghana Education Service should formalize the teaching of the expanded core curriculum in the special and the inclusive schools for the blind. The teaching and learning of the expanded core curriculum should commence at the basic level. Also, Ghana Education Service should train more specialist teachers to handle the various elements of the expanded core curriculum in both the basic and the second cycle schools.

KEYWORDS

Academic Achievement

Assistive Technology

Career Education

Compensatory Access

Expanded Core Curriculum

Independent Living Skills

Orientation and Mobility

Recreation and Leisure

Self-Determination

Sensory Efficiency

Social Interaction Sills

Visual Impairment

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DEDICATION

To my late mother, Afua Birago, the pillar of my education

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ACRONYMS/ABBREVIATIONS

EAHCA	Education of All Handicapped Children Act
ECC-	Expanded Core Curriculum
GES-	Ghana Education Service
IEPs-	Individualised Education Programmes
KNUST-	Kwame Nkrumah University of Science and Technology
R-CAMAT-	Resource Centre for Alternative Media and Assistive Technology
RCVI -	Resource Centre for the Visually Impaired
SPSS-	Statistical Package for Social Science
UCC-	University of Cape Coast
UEW-	University of Education, Winneba
UG-	University of Ghana

CHAPTER ONE

INTRODUCTION

Background to the Study

Vision is an essential part of human existence as it plays vital roles in the life of an individual. It enables the individual to be aware of the environment (Eguavoen, 2016). Thus, any hindrance to vision resulting in total or partial loss of sight places such a person at a great disadvantage. Citing Adediran (2000) Eguavoen (2016) indicated that about 80% of what we learn in life is acquired through sight. Smith (2007) submitted that the loss of vision affects the individual in significant ways; limiting mobility, education, independent living, employment and even socialisation. Any hindrance to vision resulting in total or partial loss of sight creates difficulties in understanding the environment of that individual. Without any form of support, it is extremely complicated for individuals with visual impairment to learn about the immediate environment and the world as a whole (Wolffe & Sacks, 1997). Impaired vision affects individuals' ability to model behaviours and observe the operations of others.

Most of the information available to the sighted is not available to individuals with atypical vision. Allman and Lewis (2014) lamented that individuals with visual impairment have extreme difficulty to access formal lessons taught in school and myriad of information that people acquire visually as they make meaning from their visual observations and experiences.

Allman and Lewis (2014) asserted that when an individual is not able to acquire information visually, the task of acquiring it should be approached and supported deliberately and thoughtfully. They therefore concluded that

educating the visually impaired requires unique consideration in which they would be provided with the tools, skills, and strategies they need to develop alternative ways of obtaining critical information (Sacks & Wolffe, 1998).

The alternative means through which students with impaired vision need to have access to the general curriculum is by the Expanded Core Curriculum (ECC). The ECC is a body of knowledge and skills that the visually impaired need to have access to and the mastery of which is essential for successful functioning in life. Allman and Lewis (2014) categorically stated that without the ECC, the visually impaired may not only be unaware of and uninformed about essential concepts and facts needed for an independent functioning, but they can also become isolated and overly dependent. They may lack self-knowledge, self-assessment, and motivation.

To support this assertion, Shonkoff and Phillips (2000) were of the view that preparation for adulthood and adult roles occurs throughout the developmental periods of infancy through to adolescence. As children mature intellectually, physically, socially, emotionally and morally, they are developing the knowledge, skills, and attitudes that influence their future behaviour and life choices (Council for Exceptional Children, 1993). The conscious teaching of ECC should therefore start from infancy through to adulthood since the early acquisition of the skills prepares the individual for lifelong success and lead to success in education in general (Guba, 1992; Langley, McLean, Wolery, & Bailey, 2011).

A woman with visual impairment was once asked: "What at all do the visually impaired want from the community?" The woman replied; "The right to be equal and the opportunity to be different" (Hatlen, 1996, p.16). The

woman's answer probably reflects the thinking of all individuals with visual impairment. They need opportunities for equalisation in all spheres of life including education. This can be possible only when the visually impaired are given the best attention through the expanded core curriculum.

According to Lewis and Allman (2014), professionals working with the visually impaired have always tried to identify and define unique needs of the students who are visually impaired and the skills that would enable them to attend school, work and pursue independent lives wherever they find themselves. Lewis and Allman (2014) citing Mackie and Dunn and Spungin observed that starting in the early 1940s; educators in the field of visual impairment began to study their students to clearly understand their specific needs. The authors attempted to define the skills that were necessary for these students as a result of their visual impairments (which were then described as disability-specific competencies) and began to define a curriculum for the teachers who worked with them. The ECC was recognised form of a disability-specific curriculum. Initially, the purpose of expanded core curriculum was to promote social skills self-sufficiency. However, its definition, its role and how it was to be taught became very important when inclusive education became real in the 1940s (Sapp & Hatlin, 2010).

Consequently, the Expanded Core Curriculum was first formulated by Hatlen in 1996 and has now generally been accepted for instruction of individuals with visual impairment in the school, the community, and the field of work ((Allman & Lewis, 2014). The expanded core curriculum subsequently became formalised; well packaged, organised and taught in schools for the blind. The Individuals with Disabilities Education Act (2004)

categorically supports the provision of instruction in all the nine areas of the expanded core curriculum, since these are functional and educational needs that result from the disability (visual impairment).

International support for specialised instruction is found in the Convention on the Rights of the Child (United Nations, 1990, p. 29.1.a), which stated that every child has the right to an education "directed to the development of the child's personality, talents, mental and physical abilities to their fullest potential." The Convention on the Rights of the Child has been ratified by 193 countries including Ghana, indicating its worldwide acceptance. In the USA, the expanded core curriculum had a legal backing when the Education for All Handicapped Children Act (now the Individuals with Disabilities Education Act [IDEA]) was passed in 1975 (APH Annual Report, 2012). In recognition of the potential of ECC in helping students with visual impairment to acquire skills, many countries including Ghana gave a legal backing for use as part of the curriculum for the visually impaired.

Although teachers of the visually impaired consider the expanded core curriculum critical for good education, it appears they do not provide their students with adequate instruction based on its principles. ECC should, therefore, be included in teachers' preparation programmes (Ferrell, 2011).

Statement of the Problem

"The eyes are the windows to the soul" is an expression that is often used to describe the deep connection one feels when looking into another's eyes. However, like windows, the eyes work both ways. They are not only important in seeing into another person's soul, but they are also vital in how we view the world around us. Eguavoen (2016) citing Adediran acknowledged

that the eyes are very important because about 80% of the knowledge we acquire is by sight and they allow us to connect with our surroundings, keep us safe, and help maintain the sharpness of our minds. The questions we need to ask ourselves are: How do the blind connect with their surroundings? How do the blind keep themselves safe? How do the blind maintain the sharpness of their minds?

The effect of blindness on the individual is unimaginable. Vision helps to acquire new skills and information through casual observation (incidental learning). Individuals with visual impairment learn differently since the information they acquire through the non-visual senses may often be inconsistent, fragmented and inadequate (Allman & Lewis, 2014). They have to put these fragmented information together to achieve success in life being profession, domestic or education.

According to Cameto and Nagle (2007), individuals who are visually impaired have the same needs for intellectual stimulation, social acceptance, emotional support, and physical activity as the sighted in our society. The extent to which individuals with visual impairment are empowered to assume meaningful roles in the society relates directly to the success at which their unique needs are identified, addressed and achieved.

In Ghana, majority of individuals with visual impairment attend special schools at the basic level where they are expected to receive instruction in the expanded core curriculum. The few who gain admission to senior high school are also expected to be taught skills in expanded core curriculum. Knowledge of these skill areas prepare students for academic work especially at the University level. Therefore one expects that students with visual impairment

would be competent in all the skills of the expanded core curriculum on the completion of senior high school.

However, it is unknown the extent to which students with visual impairment are competent in all the skill areas of the expanded core curriculum. They seem to have difficulty with the elements of expanded core curriculum which are essential for their education and life in general. They seem to encounter a number of challenges which may adversely affect their academic achievement at the university. It also appears that not much empirical research has been carried out in Ghana in the area of the expanded core curriculum for the visually impaired.

The assumption is that students with visual impairment are expected to utilise all the skills of the expanded core curriculum (compensatory access, sensory efficiency, assistive technology, orientation and mobility, independent living, social interaction, recreation and leisure, career education and self-determination) in any post-secondary programme they pursue. The students who are visually impaired in the universities should be able to braille efficiently, use the non-visual senses in activities, use the adapted technologies, move independently, work on their own and interact with the other sighted students and lecturers. To the best my knowledge there is no study that had explored the level of skills acquired by students with visual impairment on the expanded core curriculum in Ghana. It is on this basis that the researcher explored the relationship between competence in the expanded core curriculum and academic achievement of students who are visually impaired.

Purpose of the Study

The purpose of the study was to explore the relationship between competence in the expanded core curriculum and academic achievement of students with visual impairment in public universities Ghana. This study specifically examined the:

1. Level of education at which students with visual impairment are taught the expanded core curriculum could influence their competence.
2. Relationship between the compensatory access skills and the academic achievement of the students with visual impairment.
3. Relationship between the sensory efficiency skills and the academic achievement of the students with visual impairment.
4. Relationship between the assistive technology skills and the academic achievement of the students with visual impairment.
5. Relationship between the orientation and mobility skills and the academic achievement of the students with visual impairment.
6. Relationship between the independent living skills and the academic achievement of the students with visual impairment.
7. Relationship between the social interaction skills the academic achievement of the students with visual impairment.
8. Expanded core curriculum skill that best predicts the academic achievement of the students with visual impairment.

Research Hypotheses/Research Question

To address the objectives of the study, seven research hypotheses were formulated and tested in order to guide the research towards achieving the stated objectives. One research question was also formulated and answered.

These research hypotheses and the research question were delineated as follows:

Research Hypotheses

$H_0$1: The level of education at which students with visual impairment are taught expanded core curriculum does not influence their competence.

H_A1: The level of education at which students with visual impairment are taught expanded core curriculum influences their competence.

$H_0$2: There is no significant relationship between compensatory access skills and academic achievement of students with visual impairment.

H_A2: There is a significant relationship between compensatory access skills and academic achievement of students with visual impairment.

$H_0$3: There is no significant relationship between sensory efficiency skills and academic achievement of students with visual impairment.

H_A3: There is a significant relationship between sensory efficiency skills and academic achievement of students with visual impairment.

$H_0$4: There is no significant relationship between assistive technology skills and academic achievement of students with visual impairment.

H_A4: There is a significant relationship between assistive technology skills and academic achievement of students with visual impairment.

$H_0$5: There is no significant relationship between orientation and mobility skills and academic achievement of students with visual impairment.

H_A5: There is a significant relationship between orientation and mobility skills and academic achievement of students with visual impairment.

$H_0$6: There is no significant relationship between independent living skills and academic achievement of students with visual impairment.

H_A6: There is a significant relationship between independent living skills and academic achievement of students with visual impairment.

$H_0 7$: There is no significant relationship between social interaction skills and academic achievement of students with visual impairment.

$H_A 7$: There is a significant relationship between social interaction skills and academic achievement of students with visual impairment.

Research Question

Which expanded core curriculum skill best predicts academic achievement of the students with visual impairment?

Significance of the Study

Marshall and Rossman (2006, p. 33) argued that, "The researcher must show that practitioners needed information that the research will provide". It is envisaged that the study, "Relationship between competence in expanded core curriculum and academic achievement of students with visual impairment in public universities in Ghana" would be of tremendous importance to education practitioners, especially those in special and inclusive education. They would realise the importance of expanded core curriculum to the visually impaired. They would then provide both human and material resources to promote its teaching and learning.

The findings of this study will provide information for teachers on the need to strengthen the development of the expanded core curriculum in their instructional programmes.

The findings of this study will motivate parents to corroborate with the school and other agencies in developing independent skills, social skills, mobility skills which serve as prerequisite for gainful employment.

The results of the study will guide Ghana Education Service (GES) and the universities which are the major stakeholder in education, to develop policies to guide the implementation of the ECC to the fullest at the basic, secondary and tertiary levels.

Ghana Education Service will realise the need to equip the visually impaired with ICT facilities to make them be abreast with the technological innovation and advancement which is taking place.

The visually impaired would not be marginalised, stigmatised or isolated by their peer. It will create an atmosphere for harmonisation and acceptance because the visually impaired is capable of living a normal, a dignified and an independent life.

All the stakeholders in education including government, Non-Governmental Organisations (NGOs), Philanthropists and Religious Organisations can put structures in place to promote and strengthen the study of expanded core curriculum at the pre-tertiary level. This will eventually improve the education of the visually impaired at all levels.

With the publication of the study, it is going to be a source of knowledge and reference for other scholars who are interested in the education of the visually impaired and may wish to do research in special education in general and education of the visually impaired in particular.

Upon reading the publications of this thesis regular teachers will be prepared to handle the visually impaired in inclusive schools since they would realise that they are capable of learning independently and access information on their own.

Delimitations

The study was delimited to only students with visual impairments. They are familiar with the expanded core curriculum skills and they use these skills in their academic work. The study was also restricted to two public universities in Ghana. In Ghana, only four public universities admit the students with visual impairment. The universities are University of Ghana, University of Cape Coast, University of Education, Winneba and Kwame Nkrumah University of Science and Technology. At the time of the research, Kwame Nkrumah University of Science and Technology had only one student with visual impairment and therefore it was not involved. The University of Cape Coast, and the University of Education, Winneba were chosen because of proximity. The University of Ghana, Legon was used for the pilot testing of the instrument.

The study could have dwelt on other curricula like the core curriculum and the co-curriculum. However, the expanded core curriculum was chosen because it is exclusively for the visually impaired and the success of other curricula depends on the competence the visually impaired have in the expanded core curriculum. The study again was delimited to six elements of the expanded core curriculum.

Limitations

The study encountered the following challenges which could eventually affect the outcome of the study:

The students with visual impairment were in doubt of the purpose of the study and therefore might have reflected in their responses.

Descriptive research also presents the possibility of subjectivity due to predetermined and prescriptive questions.

The study was conducted in two universities (University of Cape Coast and University of Education, Winneba). It therefore placed some restrictions on the generalisation of the findings to all the universities in the country which admit students with visual impairment.

Definition of Terms

Some of the words within the study are given operational definitions as they are used in the context and scope of the research as follows:

Students with visual impairment: Students in the universities whose vision have deteriorated to the extent that they learn through the non-visual senses.

Expanded core curriculum: Refers to the skills that the students with visual impairment in the universities are expected to acquire in order to achieve academic success.

Compensatory access: The use of braille by the visually impaired to learn in order to be literate.

Sensory efficiency: The use of the fingers to read and write braille

Assistive technology: Any equipment that increases, maintains and improves the functional capabilities of the visually impaired.

Orientation and mobility: Skills that help the visually impaired to confidently enter both familiar and unfamiliar environment and to function safely, efficiently, gracefully and independently.

Independent living: Behaviours and skills involved in managing the daily demands of everyday life and maintaining the living environment.

Social interaction: Behaviour that the visually impaired needs to participate in social situations appropriately and to prevent social isolation.

Education: The manner in which students with visual impairment acquire knowledge, skills, and attitude.

Competence: The effective exhibition of the expanded core curriculum skills by students with visual impairment.

Academic achievement: The level of the output of the visually impaired in the core and elective courses.

Organisation of the Study

The study was organised under five chapters. Chapter One consisted of the background of the study, statement of the problem, the purpose of the study and the research hypotheses and question. The chapter also included delimitation of the study, limitation of the study, the definition of terms as well as the organisation of the study.

Chapter Two presented the review of the related literature which comprises conceptual framework, theory of normalization, blindness and education, conceptual and empirical review on elements of expanded core curriculum (compensatory access, sensory efficiency, assistive technology, orientation and mobility, independent living, social interaction, recreation and leisure, career education, and self-determination).

Chapter Three described the methodology which was employed for the study. The chapter described the research design, population, sample and sampling procedure, research instrument, validity and reliability of the instrument, pretesting of the instrument, data collection procedure as well as data analysis.

Chapter Four of the study concentrated on the analyses and discussion of findings. The chapter included the background characteristics of respondents. The analyses were done in line with the hypotheses and the research question. Chapter Five presented the summary, conclusions, and recommendations of the study. Areas of further research were also suggested in this chapter.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This section reviews the relevant literature of the study. The researcher is aware of the fact that other authors have written on topics which are related in a way to this research. For this reason, it would be necessary to review literature related to this topic. Information was gathered from journals, abstracts, the internet, books, and works people have done on the expanded core curriculum of the visually impaired. Review of related literature for the study was done under the following sub-headings:

1. Theory of Normalization
2. Cambourne's Theory
3. Blindness and Education
4. Conceptual Framework
5. Conceptual and Empirical Review of Expanded Core Curriculum
    a. Compensatory Access
    b. Sensory Efficiency
    c. Assistive Technology
    d. Orientation and Mobility
    e. Independent Living
    f. Social Interaction
    g. Recreation and Leisure
    h. Career Education
    i. Self-Determination
6. Academic Competence

Theoretical Review

Two theories guided the study and these are the theory of normalization and the Cambourne's theory.

Theory of Normalization

The theory of normalization is appropriate for this research. It is about assisting individuals with disabilities to lead a normal life or life as close to normal as possible (Kumar, 2013). This means that the visually impaired should be equipped with the knowledge and skill to live a normal life.

The elements of the expanded core curriculum (compensatory access, sensory efficiency, assistive technology, orientation and mobility, independent living, social interaction, recreation and leisure, career education and self-determination) are essential elements that lead to a normal life (Kumar, 2013). In other words, the theory explains that individual needs to acquire the skills before meaningful and successful integration and inclusion can be achieved.

History of normalization tells us that individuals with disabilities attracted the attention of the society after World War II. After the war, many people came back home with permanent disabilities (Kumar, 2013). Patriotism and the increased number of persons with disabilities changed the perception of people living with disability. These changes had their root in the description of the normal rhythm of life. Accordingly, after World War II, many countries in the world made major strides towards the formulation of a social policy designed to improve the care and education of children with special education needs (Kumar, 2013).

The first reference to the normalization theory was in 1943. In that year, the Swedish government appointed a committee for the enhancement of

the living conditions of partially able bodies. The suggestions of the committee were that these partially able-bodied persons should have the right to avail all the services meant for the non-disabled population which already existed in society. The intention was to make it possible for the partially able-bodied to remain in the society and lead a normal life. Kumar (2013), stated that during 1950s-1960s, Niels Eric Bank Mikkelsen was the first to actualise the normalization principles in Scandinavia. In Denmark, the term "normalization" got a legal value in 1959. From the middle of the 20th century, terms such as deinstitutionalisation, normalization, and mainstreaming had signified an ideological shift in policy making for an individual with special education needs (SEN). Consequently, the terms became the policy slogan for education and services provided to an individual with SEN (Koul, 2009).

During the first half of the 20th century the deinstitutionalisation movement, a psycho-socio-political movement that had both physical and psychosocial connotations emerged (Kumar, 2013). Physically, persons with disability were relocated from large public institutions and placed in smaller community based residential facilities (Stedman, 1977). The underlying assumption behind this movement was that community care would improve the quality of life of persons with disabilities. Psychosocially, deinstitutionalisation was a process of countering institutionalisation to eliminate these forces that compromise the interests or the integrity of the developmentally disabled (Theile, Paul, & Neufield, 1977). Basically, the concept of deinstitutionalisation gave a pace for integration of persons with disabilities in the community. This aspect is further refined and formed the genesis for normalisation.

Evolution in the practice of normalisation principle brought the concepts of mainstreaming, integration, inclusion and recently self-determination in the field of disability rehabilitation. The normalization principle is a strong advocate of equality in education for persons with disabilities. The basic principles in special education as articulated in Education of all Handicapped Children Act 1975, PL-94-142, (EACH A) are zero rejection, non-discriminatory assessment, barrier-free environment, No-child Left Behind and parental participation protection.

In 1972, Nirje expanded and deepened the definition of normalization by applying it to all the persons with disabilities. He expanded the concept of "Normalization" to mean making available to all the persons with disabilities and other handicap patterns of life conditions of everyday living which are as close as possible to or indeed the same as the regular circumstances and ways of life of society (Nirje, 1972).

In his reformation on normalization, Wolfensberger (1972), defined normalization as the utilisation of means, which are as culturally normative as possible in order to maintain and or establish personal behaviour and characteristics, which are culturally normative as possible. As distinguished from Nirje's definition, which emphasises normalisation as a means, Wolfensberger's definition emphasized both means and goals. In Wolfensberger reformation, the goals of normalisation have two dimensions and these are client normalization and environmental normalisation. Client normalisation is to increase the functional independence of persons with disability so that they may be more easily assimilated or integrated into the community; and environmental normalisation is to modify environmental

structures in order that individual differences among persons with disability can be accommodated in the community (Sacks & Wolffe, 1998).

Kumar (2013) stressed that whatever Nirje or Wolfensberger defined as normalization principle is based on the ideas of Nirje's paper, 'Normal rhythms of life'. Nirje's paper explains Normalization in terms of normal rhythms of life. He described normal rhythms of Life in eight facets. According to normal rhythms of life, normalization means the opportunity to;

1. have a normal rhythm of the day
2. experience a normal routine of life
3. experience normal rhythm of the year
4. undergo normal developmental experiences of the life cycle.
5. express one's choices, wishes, and desires.
6. experience respect and heterosexual relationships.
7. live according to normal economic standards.
8. live according to normal physical settings.

Normal Rhythm of the Day

Facilities must also give consideration to the individual needs for a personal rhythm allowing the individual to break away occasionally from the routine of the group. This first aspect of the normalisation principle argues that individuals with special education needs (SEN) have also the right to experience a normal rhythm of the day. This implies that individuals with SEN should experience all those rhythms of a day as that of a normal individual.

Normal Routine of Life

Most people live in one place, work or attend school at somewhere else and have leisure time activities at a variety of places (Nirje, 1972). Hence,

under the philosophy of normalisation, it is wrong when a person with disabilities has his school, training centre, his structured therapies, and his recreation activities in the same building that also serves as his home. With wider experiences and proper social training, the persons with disabilities will be able to use the normal leisure time facilities of his society on his own, and also learn to cope with unprepared and unstructured situations without panicking (Avedon, 1967; Chigier, 1967; Nirje, 1972).

The Normal Rhythm of the Year

It is to experience the normal rhythm of the year including holidays and family days of personal significance. Most people change their life situations and refresh their body and mind at least once a year by going on vacations. Similarly, regardless of disabilities, individuals with SEN have the right to enjoy their normal rhythm of the year like a non-disabled peer (Nirje, 1972).

Normal Developmental Experiences of the Life Cycle

This face of a normal rhythm of life is the strong advocate of equal opportunities in education with reference to individuals with SEN. As Nirje (1972) noted, children should have the warmth of atmosphere, rich sensory stimulation and surroundings, and settings of proper proportions. Individuals with disabilities especially need to be with stimuli, which will nourish knowledge and abilities. In the case where an individual with disability cannot live with his/her own family, this aspect is of special importance. In a normal society, individuals live in a world specially structured for them, guided and taught by a few significance adults. In child care homes, the changing of personnel should be minimal, thus offering the children basic security and

opportunities for identifications of the stand in parents (Nirje, 1972). If we examine this sub-face, it implies that childcare homes should provide an appropriate atmosphere by offering safety, security and an environment with emotional touch to resemble as closely as possible the family environment.

It also emphasizes the importance of early intervention programmes enriched with multi-sensory environment. Youths of school age in a normal society also live in a world specially structured for them. Childhood is an important developmental stage for learning about one's own personal abilities and potentialities; for obtaining an understanding of oneself and for building self confidence that can serve as a sound basis for life after school years (Nirje, 1972). Youngsters and youths of school age who are disabled should therefore never live in confined settings together with adults with disabilities. Their socialisation and impression of life should be gained as much as possible through contacts with normal rather than a deviant society. Hence, the need for strong advocacy of equal opportunities in education with reference to children with SEN. Nirje clearly stated that children with SEN should be provided school age experience, like a normal child. He also talked about the socialisation of the children with SEN through education, the peer group interaction and valued participation. When Nirje said that youngsters and adolescents of school age never live in a confined setting together with adults with disability, it means that children with SEN should also be given opportunities to live with their peers and attend school in their appropriate school-age, like a normal child.

Expression of Choices, Wishes, and to be Respected

This face of normalisation principle advocates for providing opportunities for individuals with SEN to express their needs and wishes and their rights to get respect regardless of their deviations.

Living in a Bi-Sexual World

Normalisation also means living in a bi-sexual world and accordingly the facilities should be provided for both male and female on a non-discriminative basis (Nirje, 1972). The meaning of this in the educational context is that of providing opportunity to experience co-education. It opposes segregation of children on the basis of gender because this is un-natural. Further, mixing of the sexes according to the normal patterns of everyday society, results in a better behaviour and atmosphere, as more motivation are added. In his point of view, the mixing of sexes is not only useful for normal development of the children with SEN, but also it will be useful for them to save themselves from any type of sexual harassment or exploitation and also to plan their marriage in adult years.

Providing Normal Economic Standards

This face of normal rhythm of life implies giving those basic financial privileges to individuals with special needs which are also available to others. This includes provision of child allowances, personal pensions, old age pension, and minimum wages among others.

Physical Settings

This aspect implies that hospitals, schools, group homes, hostels and boarding homes should be as meant for normal persons, and the facilities must be available to both children with SEN and normal children in the same

setting. Therefore, all the essential services and building like schools, hostels, hospitals, offices, and all other public places should have easy accessibility to people with disability. To provide children with SEN equal opportunities, we also need to bring about some changes in the physical structure that is, we need restructuring of the environment. This restructuring will facilitate these children accessibility to the entire community and benefit maximally from the exposure to the real environment.

To conclude, the theory of normalisation in its various interpretations is a social science theory that has had a profound positive effect on the lives of the people who were removed and segregated from the society due to their disabilities. It remains relevant in the 21st century in improving the quality of life of persons with disabilities. The theory of normalisation implies greater freedom and opportunities for satisfying the personal needs which persons with disabilities now can see within the small group. The conclusion one can draw is that normal patterns and conditions of everyday life are possible when a person has access to services available in the community. The basic principles underlying the theory of normalisation will remain as a guideline for service development for persons with disability in the 21st century too. According to Nirje (1972), the soul of the theory of normalisation "normal rhythm of life" strongly advocates equality in the living conditions of persons with disability including the visually impaired. The theory of normalisation expects individuals with visual impairment to lead independent lives. Society is expected to provide them with all the opportunities at her disposal to live a normal life as much as possible. In order to accomplish the theory of

normalisation of individuals with visual impairment must acquire the skills of the expanded core curriculum.

This theory is relevant to the study. The theory gives a clear understanding and the focus on how SEN should live within the larger community. Skills acquired through the teaching of expanded core curriculum is the surest way of empowering SEN. This study seeks to unfold the extent to which skills in expanded core curriculum have been mastered and its influence on academic achievement of students with visual impairment.

Cambourne's Theory

The study was also guided by the Cambourne's model theory. As society makes frantic effort to create the social, psychological and physical environments that promote opportunities for students with visual impairment to learn, it is essential to know the factors that can facilitate learning. According to Allman and Lewis (2014), there are a number of learning theories but Cambourne's theory tries to facilitate learning among students who are visually impaired. According to Allman and Lewis (2014), Cambourne proposed that learning occurs when individuals are interested in and engaged with the material to be learned. He believed that interest in learning develops when the learners are immersed in an environment or culture in which important skills to be mastered are exercised and when others are demonstrating these skills in their daily activities. Cambourne was of the view that engagement occurs when several conditions are present among which high expectations are placed upon learners, opportunities to improve and practice and the provision of constructive feedback from trusted others.

Cambourne's model identified three major conditions for learning and they have been described as important strategies in the effective instruction of students who are visually impaired and the strategies are immersion, demonstration and engagement (Allman & Lewis, 2014). According to them, learners who are immersed have the opportunity to encounter evidence of what is to be learned. Demonstration also involves exposure to elements or action in the environment from which people learn. For learners with visual impairment, immersion and demonstration require the society to provide suitable experiences whose purpose is to substitute for visual immersion. Usually, these substitutions involve learners' participation in experiential learning, and ensured of personal and meaningful involvement in activities which are incorporated. Experiential learning can offer the learner with visual impairment the conditions that immersion and demonstration can provide the means for engagement with learning. Also, Ferrell (2011) supported the immersion, demonstration and engagement and stressed the need for the visually impaired to learn by doing.

The theory stipulated that learners are more prepared to learn if five conditions of learning are present. These are expectations, responsibility, approximation, employment and response. Learners are prepared to engage in whatever behaviour or skills they are learning if there is communication of high expectation. Learners have a huge responsibility in the learning process and therefore should be given the opportunity to practice making choices. It will eventually promote the development of self-directed learning and critical thinking skills. Approximation as a concept looks at the freedom of the learner to make mistakes as he/she heads towards competence in performance of the

skills. Additionally, according to Allman and Lewis (2014), learners should be given the regular opportunity to apply or employ the new skills and knowledge they have learnt for real solutions. For example, the visually impaired should be given the opportunity to use the white cane to explore his/her immediate environment.

Professionals in the field of visual impairment have recognised the need for frequent opportunities for practice of emerging skills and knowledge within natural context. For instance, Lowenfeld (1973), described three outstanding techniques for teaching the visually impaired to overcome their inherent challenges of blindness. These are concrete experiences, offering opportunities to learn by doing, and ensuring exposure to unifying experiences. These strategies are still relevant today in our quest to equip the visually impaired with the skills of the expanded core curriculum (Allman & Lewis, 2014).

The visually impaired have the challenge to understand without any visual input. One important way to overcome the challenges is the provision of real, direct experiences and to encourage the use of all their non-visual senses. The provision of frequent experiences to students with visual impairment concepts and objects can help overcome barriers to comprehension. Students with visual impairment need to experience real objects to understand fully the need to participate in order to perform or master unifying experiences. Allman and Lewis (2014), explained that mastery requires that students with visual impairment first be exposed to, second systematically practice, and finally acquire every step and skills involved in an activity or task.

From the above analysis, it is clear that the Cambourne model is in line with the Lowenfeld's principles of learning. The conditions of Cambourne's model which includes immersion, demonstration and engagement are not different from Lowenfeld's principles of instruction for the visually impaired which includes concrete experience, learning by doing and unifying experience. Both of them emphasise on the learner and for that matter the visually impaired to participate or involve practically. In developing competence in the ECC, Cambourne's model therefore becomes appropriate and relevant to this study. Students with visual impairment need to be exposed to the skills of expanded core curriculum through immersion, demonstration and engagement. These experiences cumulatively lead to academic achievement.

Historical Perspective of Blindness and Education

The subject of blindness and education evolves approaches and public perceptions of how best to address the special needs of the blind. The education of the blind began with the asylums system that has a history extending back over a thousand years (Ferrell, 1998). However, according to Ferrel, it was not until the 18th century that authorities created schools particularly for those from more privileged homes. These institutions provided simple vocational and adaptive training, as well as grounding in academic subjects offered through alternative formats. Allen (2000) stated that other institutions set up at that time included; the School for the Indigent Blind in London, the Asylum and School for the Indigent Blind at Norwich. In France, the Institut National des Jeunes Aveugles was established in 1784 by ValentinHaüy. Haüy's impulse to help the blind began when he witnessed the

blind being mocked during a religious street festival. In May 1784, at Saint-Germain-des-Prés, he met a young beggar, François Lesueur; he was his first student. He developed a method of raised letters, to teach Lesueur to read, and to compose sentences. He made rapid progress, and Haüy announced the success, in September 1784 in the Journal de Paris, then receiving encouragement from the French Academy of Sciences (Strauss & Corbin 1990).

According to Tuttle and Tuttle (2000), the help of the Philanthropic Society Haüy founded the Institute for Blind Youth, the Institute National des Jeunes Aveugles, in February 1785. Building on the philanthropic spinning workshop for the blind, the institution of Blind Children was dedicated on 26th December 1786. Its purpose was to educate students and teach them manual work: spinning, and letterpress.

Attempts to actually educate the blind were first attempted towards the end of the century. Until that time they were considered mostly uneducable and untrainable. One of the major figures in the movement to educate the blind was Sébastien Guillié. He established the first ophthalmological clinic in France and became director of the school in Paris. Winzer (1993) stated that the first school with a focus on proper education was the Yorkshire School for the Blind in England. Established in 1835, it taught arithmetic, reading and writing. At the school of the London, Society for Teaching the Blind to read founded in 1838. A general education was seen as the ideal that would contribute the most to the prosperity of the blind. Educator Thomas Lucas introduced the Lucas Type, an early form of embossed text different from the Braille system (Winzer, 1993).

Another important institution at the time was the General Institution for the Blind at Birmingham (1847), which included training for industrial jobs alongside a more general curriculum. The first school for blind adults was founded in 1866 at Worcester and was called the College for the Blind Sons of Gentlemen. In 1889 the Edgerton Commission published a report that recommended that the blind should receive compulsory education from the age of 5–16 years (Sapp, & Hatlen, 2007). The law was finally passed in 1893, as an element of the broader Elementary Education Act according to Sapp and Hatlen (2007), ensured that blind people up to the age of 16 years were entitled to an Elementary-Level Education as well as to vocational training. The 1880s also saw the introduction of compulsory elementary education for the Blind throughout the United States. (However, most states of the United States did not pass laws specifically making elementary education compulsory for the blind until after 1900. By this time, reading codes- chiefly Braille and New York Point- had gained favour among educators as embossed letters (such as Moon type were said by some to be difficult to learn and cumbersome to use, and so (DOT CODES) were either newly created or imported from well-established schools in Europe. Though New York Point was widely accepted for a time, Braille has since emerged the victor in what some blindness historians have dubbed "the War of the Dots" (Winzer, 1993).

Virginia Department of Education (2010), and American Foundation for the Blind (2013), had noted that the more respected residential schools were staffed by competent teachers who kept abreast of the latest developments in educational theory. While some of their methods seem archaic by today's standards- particularly where their vocational training

options are concerned, their efforts did pave the way for the education and integration of blind students in the 20th century. The early 20th century, according to Allen (2000), saw a handful of blind students enrolled in their neighborhood schools, with special educational supports. Most still attended residential institutions, but that number dropped steadily as the years wore on - especially after the white cane was adopted into common use as a mobility tool and symbol of blindness in the 1930s. Most blind and visually impaired students according to Guidelines and Standard (2015), now attend their neighborhood schools, often aided in their educational pursuits by regular teachers of academics and by a team of professionals who train them in alternative skills: Orientation and Mobility (O&M) training-instruction in independent travel is usually taught by contractors educated in that area, as is Braille.

According to Ferrell (2000), children with blindness may also need special training in understanding spatial concepts, and in self-care, as they are often unable to learn visually and through imitation as other children do. Moreover, home economics and education dealing with anatomy are necessary for children with severe visual impairments. Since only ten percent of those registered as legally blind have no usable vision, many students are also taught to use their remaining sight to maximum effect, so that some read print (with or without optical aids) and travel without canes (Heubner, Merk-Adam, Stryker, & Wolffe, 2004). A combination of necessary training tailored to the unique needs of each student, and solid academics, is going a long way towards producing blind and visually impaired students capable of dealing with the world independently (Allen, 2000; Best, 1919; Winzer, 1993).

History of Education for the Blind in Ghana

In Ghana, Ocloo (2011) stated that the first school for the visually impaired was established in Akropong-Akwapim which also served the whole of West Africa. Though the school started in June, 1936, it was officially opened in 1945. The idea of starting a second residential school for the visually impaired at Wa in the Upper West region of Ghana was initiated by the Methodist church to serve the northern sector of the country. The second school became operational in May, 1958.

In 1962, the Henderson committee recommended that all special schools should be taken over by the Ministry of Education, and as a result, in 1968, a resolution was adopted by the conference of Teachers of the Disabled demanding that a separate directorate should be created for Special schools. This idea was hailed and in 1975, a directorate was opened to supervise the activities of all special schools in the country.

The schools for the blind in Ghana have very laudable objectives; they set out to educate all children with visual impairment in order to enable them live independently. The school system also thrives to inculcate in these children both cognitive and vocational skills which can be marketable for their independent livelihood and sustenance (Ocloo, 2011). Those who were able to excel academically had the opportunity to continue in some selected secondary schools and eventually to the university.

ECC Conceptual Framework

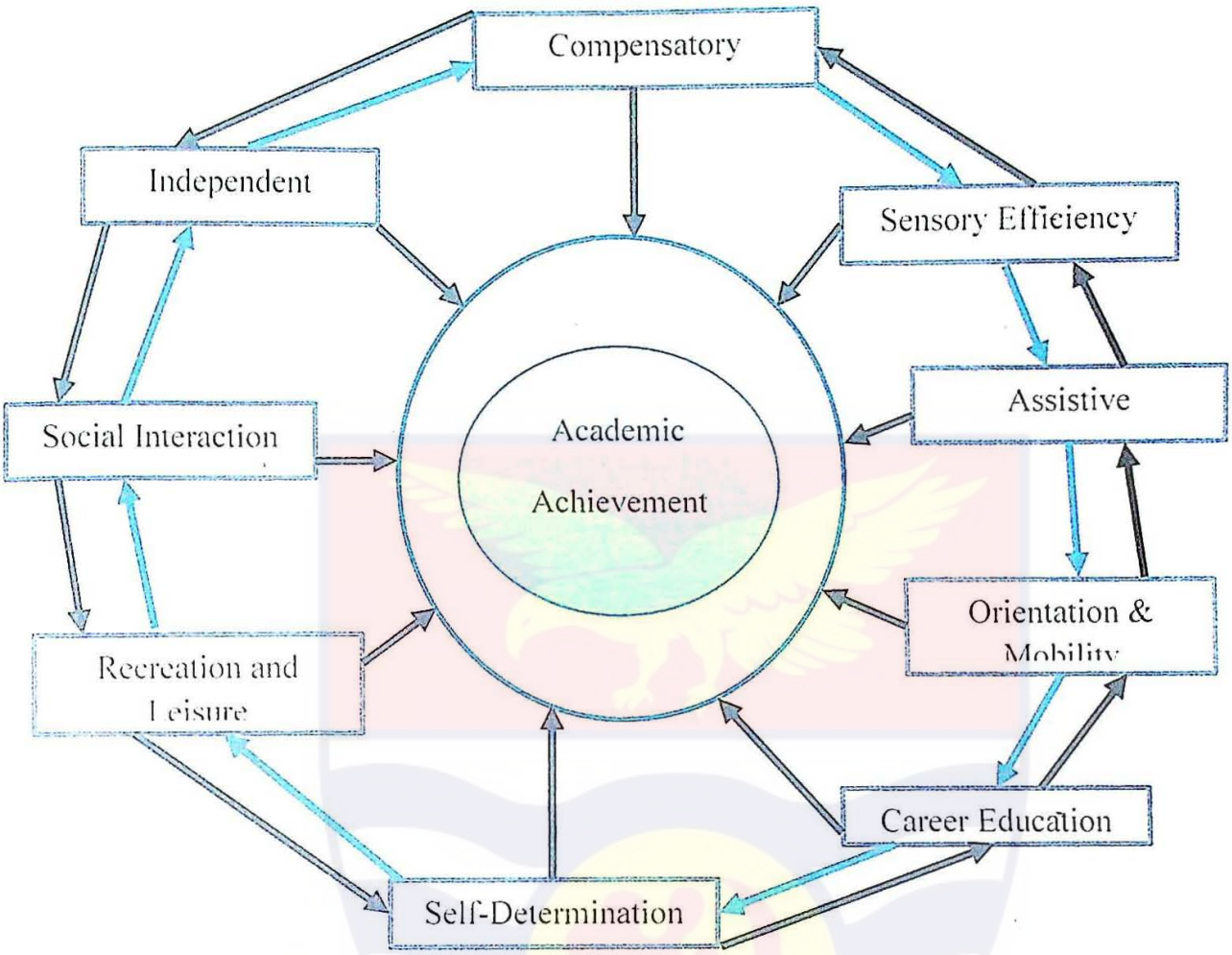

Figure 1: Conceptual Framework of Expanded Core Curriculum for the Visually Impaired

Interpretation of the Conceptual Framework

The conceptual framework (see Figure 1) explains how the nine skills of the expanded core curriculum interrelate to each other. Any one of the elements has an influence on the other. For instance, a person's career depends on the extent to which he had acquired the skills of the other elements of the expanded core curriculum. One's performance at work is influenced by the skills one has in orientation and mobility, compensatory access, assistive technology, sensory efficiency and social interaction. Also the ability of the visually impaired to socialise will depend on his compensatory access, sensory efficiency, independent living, orientation and mobility skills and even his

self-determination. All the elements of expanded core curriculum have effect on the academic achievement of students with visual impairment. The students with visual impairment are expected to use the skills embedded in the expanded core curriculum in their education to achieve academic success and even after-school to lead a normal life as much as possible. It is expected that a person with visual impairment who is competent in expanded core curriculum should be able to interact and make meaning of his environment.

Meaning of Expanded Core Curriculum

The expanded core curriculum (ECC) is used to define concepts and skills that are typically learned incidentally by sighted students and that must be sequentially presented to students who are visually impaired because of lack of vision (Spungin, & Ferrell, 2007). An ECC may include needs that result from the visual impairment to enable the students to be involved and to make progress in the general education curriculum (Ferrell, 2011). The presence of visual impairment requires that these skills be thoroughly evaluated and systematically taught by teachers with specialised expertise (Allman, & Lewis, 2014). Without specialised instruction in ECC, students with vision loss may not be aware of the activities of their peers or acquire other critical information about their surroundings (Wolffe, Sacks, & Corn, 2000). The ECC is not a parallel curriculum to the core curriculum or separate from the core curriculum. It is important to note that the core curriculum serves all students and students are expected to learn the content before graduation. This would help them to demonstrate competence within each deficit area and achieve positive adult outcomes. Even though all students with visual impairment need instruction in all the nine content areas of the

expanded core curriculum, the needs and priorities may change depending on natural transitions or circumstances (Allman, & Lewis, 2014: Spungin, & Ferrell, 2007).

Lieberman, Byrne, Mattern, Watt, and Fernandez-Vivo (2010) opined that the ECC should be used as a framework for assessing students, planning individual goals and providing instruction. Assessment of each of the ECC areas is critical to measuring achievement and assuring independence. Krawthol and Anderson (2001), intimated that instructional needs in the ECC areas can be addressed using a variety of service delivery models. They stressed that collaboration between professionals such as O&M experts, occupational therapists, physical therapists, speech-language pathologists, as well as classroom teachers will ensure comprehensive services in the ECC delivery.

According to Silberman and Sacks (2007), the expanded core curriculum proposes that instruction for students with visual impairment should include all the traditional areas of academic instruction and instruction in areas that are directly affected by the individual's visual impairment. Since the original formulation of the expanded core curriculum, the curriculum has evolved, resulting in the addition of the area of self-determination skills and the modification of visual skills to the more comprehensive sensory efficiency skills area. The expanded core curriculum should be taught by certified teachers of students with visual impairments and O&M specialists (Fazzi, 2002: Blankenship, 2007). Often parents may take a leading or collaborative role in some areas, such as independent living skills or social skills, but their involvement does not relieve teachers of the responsibility of assessing and

instructing as needed.

Every student (visually impaired or non-visually impaired) is expected to complete any educational institution with a strong grasp of knowledge, skills, and attitude to function successfully in life-after-school. In order to be successful, students who are visually impaired must learn all the nine components of the expanded core curriculum. The expanded core curriculum empowers students with visual impairment to access their education and make their own choices throughout life. Without specialised instruction in ECC, students with vision loss may not be aware of the activities of their peers or acquire other critical information about their surroundings (Ferrell, 2000). As students who are visually impaired learn the expanded core curriculum they build a strong foundation for success in life today and tomorrow. It must, therefore, be strategically and sequentially taught and integrated into all aspects of their education (Blankenship, Hatlen, & Lohmeier, 2009).

Accessing the mandatory core curriculum is problematic for students with visual impairment (Koenig, & Holbrook, 2000). In order to participate fully in the educational environment students who are visually impaired require instruction in the expanded core curriculum (Hatlen, 1996; Koenig & Holbrook, 2000). Also, it is essential that students who are visually impaired develop competence in the expanded core curriculum in order to reach their potential to live independently, have appropriate career opportunities, live rewarding, dignifying and fulfilling lives. Students with visual impairment are expected to possess the skills of the expanded core curriculum before entering any tertiary institution so as to cope with all educational activities including academic achievement. At the time of graduation from the senior high school,

according to No Child Left Behind Act (NCLB) (2001), the student with visual impairment should:

1. Be able to handle personal hygiene and grooming needs
2. Be knowledgeable of roles and responsibilities in family living and planning
3. Be able to obtain systematic and emergency medical, dental and ophthalmological care
4. Be able to acquire and prepare basic foods
5. Be able to select and order foods from restaurants
6. Be able to select and care for appropriate housing
7. Be able to acquire appropriate clothing and care for this clothing
8. Be able to budget and be familiar with banking systems
9. Be familiar with billing procedures and the use and abuse of credit cards
10. Be able to plan and organise personal time
11. Be familiar with the laws and agencies which affect or provide legal assistance for persons with visual impairments
12. Be able to engage in discourse and speak in language appropriate to that listener
13. Be able to write in a manner appropriate to the person receiving written material
14. Be cognisant of the variety of braille codes available–grade one, grade two, grade three, music, and computer braille codes
15. Be aware of the technology available to persons with visual impairments and be able to use the aids appropriate for personal needs

16. Be able to travel safely, efficiently and gracefully in familiar settings
17. Be familiar with major forms of transportation and any regulations concerning travel on this transportation
18. Be knowledgeable about when and where to access assistance when travelling and how to learn to travel in unfamiliar areas
19. Be able to respond in a mature manner to problems arising out of the visual impairment
20. Have developed age-appropriate social and recreational activities and interests
21. Have knowledge of the rights and duties of citizenship and how to exercise those rights
22. Be familiar with a number of occupations and the concept of the person as an employee or employer
23. Have participated in realistic work experiences with or without pay
24. Be familiar with the completion of standard job applications
25. Have begun the process of determining a career choice
26. Know how to access genetics counselling
27. Be familiar with own medical needs and administration of same
28. Have a written signature.

All these expectations are embedded in the various components of the expanded core curriculum. Bringing together all the nine skills learned in the expanded core curriculum produces a visually impaired person who is capable and versatile. Jacobson (2013) asserted that it is difficult to expect that a person who is congenitally visually impaired could be entirely at ease and at home within the social, recreational, and vocational structure of the general

community without mastering the elements of the expanded core curriculum. Students who are congenitally visually impaired require specific instruction in skills such as O&M, social interaction, and independent living. Without the knowledge and skills of ECC, students with visual impairment are at high risk for more isolated lives (Loumiet, & Levack, 2009: Barraga, & Erin, 2001). Accomplishments and joys such as shopping, dining, and attending and participating in recreational activities are a right, not a privilege, for persons who are visually impaired. Morelli, Folmer, Foley, and Lieberman (2011), considered responsibilities such as working, banking, taking care of health needs, and using public and private services as part of a full life for everyone, including those who are visually impaired. Adoption and implementation of a core curriculum for students who are visually impaired will ensure that students have the opportunity to function more effectively and completely in the general community.

To conclude, with the acquisition of expanded core curriculum knowledge and skills the visually impaired will be matured intellectually, physically, socially, emotionally, occupationally and morally for themselves, families and the nation at large. Shonkoff and Philips (2000) concluded that the expanded core curriculum skills help the visually impaired to develop the knowledge, skills, and attitudes that influence their future behaviour and life choices.

Compensatory Access

Compensatory access refers to the skills that must be learned in order for students with visual impairments have access to information, to be able to communicate and to be literate. Mastery of compensatory access means that

the student who is visually impaired will have access to learning in a manner equal to that of sighted peers. The compensatory access of the visually impaired is significant, but it appears they are not being addressed with sufficient specificity in the existing core curriculum (Guerette, 2014). This study, therefore, seeks to assess the influence of these skills on the academic achievement of students with visual impairment in the universities.

Barclay (2014) asserted that students with visual impairments need to access all areas of the general education curriculum at levels that are commensurate with their sighted peers. This includes concept development, spatial understanding, study and organisational skills, speaking and listening skills, and adaptations that are necessary to access all areas of the core curriculum. Compensatory access varies on the basis of the students' needs but may include braille, tactile symbols, calendar systems, or recorded materials. The compensatory needs of the students cannot be met within the existing core curriculum and therefore must be addressed by teachers (Jacobson, 2013).

Compensatory access skills are needed by the visually impaired to access the regular curriculum presented in the regular classroom, and also to enhance their ability to participate in the home and the community as well. Communication needs of students with visual impairment will vary, depending on the degree of functional vision, the effects of additional disabilities (Guerette, 2014). Citing Hatlen, Johns (2010) posited that students with visual impairment may communicate through braille, large print, print with the use of optical aids, regular print, tactile books, a calendar system, recorded materials, or combinations of these means. He further said that other compensatory access skill area might include concept development, spatial awareness,

keyboarding skills, listening skills, organisational skills, use of the abacus, or tactile discrimination skills.

Guerette (2014) claimed that the prime themes of the compensatory access are access to information, ability to communicate and literacy. In Ghana today, much emphasis has been put on quality, literacy, and numeracy for all learners including the visually impaired. Guerette stressed that the compensatory access focuses on equipping students with visual impairment the capacity to compensate for the unique needs and challenges created by the vision loss. Compensatory access addresses the ability of students with visual impairment to develop concepts and to obtain and share information with others. The overall development of compensatory access skills creates a firm foundation for future growth, learning, and development. Ultimately, the compensatory access skills enable students to access the core curriculum which includes sciences, mathematics, social studies among others. Students with visual impairment need to be equipped with the skills necessary to access information and demonstrate mastery of educational objectives.

Again, Guerette (2014) asserted that if students are not able to access information from educational materials used in the classroom, they are not engaged fully in the learning process then they will not be able to learn. Additionally, if students are not able to produce work that demonstrates what they have learned, their mastery of knowledge and skills cannot be measured. The visually impaired cannot fully participate in and master content during lessons. Compensatory access consists of prerequisite skills for accessing the core curriculum and includes six different components. The components include; concept development, spatial understanding, communication modes,

speaking and listening skills, study and organization skills and use of adapted educational materials and specialised equipment. Guerette (2014) explained that a highly individualised instruction in each of the components is essential for students with visual impairment to learn about the world, communicate, develop literacy and access the core curriculum content. The six components of compensatory access contain unique skills which are necessary to create a firm foundation for learning that occurs at school, home and in the community.

With concept formation, Jacobson (2013) indicated that students with visual impairments must be exposed formally and deliberately to the kind of information in their environment that is accessed visually and incidentally. Fazzi and Petersmeyer (2001) saw the special concept as the understanding placement, arrangement, and spacing of persons or things in relation to another. The communication modes are the methods necessary for receiving and expressing information through visual, tactile and auditory means and include the methods used to express and receive information from the environment through spoken signed, written communication and braille.

Talking about speaking and listening skills Barclay and Staples (2012) said that they are essential to life, school, and work activities. They are prerequisite for a relationship and close friendship. It is important that students with visual impairments learn ways to optimize the use of the non-visual senses to obtain information from the environment.

Another aspect of compensatory access is study and organisational skill. Organisational skills lay the groundwork for success and independence

at school, home and in the community. It also serves as study skills are necessary for academic and professional success.

Compensatory access, therefore, plays a crucial role in the education of the visually impaired. Ultimately, well developed compensatory access skills allow students with visual impairments to be independent, successful individuals and form the foundation for active participation in school, work and life (Barclay, 2014; Barclay & Staples, 2012; Salvia, Ysseldyke & Bolt, 2010).

Barclay and Staples (2012) had stated that access to literacy through Braille is required by the regulations implementing Individual with Disability Education Act, 2004. The Act stated that, in the case of a student who is visually impaired, the IEP team must provide for instruction in Braille and the use of Braille. Specialised instruction in concept development may be of significant importance when visual observation is limited. It is essential to offer specific and sequential hands-on, sensory-based lessons to build a broad base of experiences. In higher grades, there are many mathematical, geographical and scientific concepts that must be taught with adapted materials and strategies for students unable to learn from pictures and visual diagrams. A student with little or no vision may have fragmented understandings of the world without systematic tactile exploration and clear verbal explanations. Some concepts are totally visual, such as colours, rainbows, clouds, and sky. Some are too large to experience completely, such as a building, mountain ranges, and oceans. Other items are too tiny or delicate to understand through touch, including small insects, or an item under a microscope. Some items are inappropriate to explore through touches such as

wild animals or toxic substances. Fragmented concepts can impede social, academic, and vocational development (Barclay & Staples, 2012).

The visually impaired learn Braille to complete an educational programme so that they can graduate from high school and pursue college, university or other interests. They will employ curriculum themes, develop projects, and research topics of personal interest. Students can use Braille to access the many technological devices and they can explore the World Wide Web for global business transactions. Competence in the use of the Braille code enables the student to succeed academically, socially and in a pursuit of a career (Carreon, 2005; Mizera, Nahal, Barring & Wadsworth, 2004).

Sensory Efficiency

Corn and Erin (2010) described sensory efficiency as using multisensory integration to complete a task as effectively and efficiently as possible using vision, hearing, and gustatory, olfactory, tactual, the movement for concept development learning, and accessing the environment. Sensory efficiency skills include learning how to use the optical devices, hearing aids and augmentative communication devices. Learning how to integrate all remaining senses to counter the impact of any missing or impaired senses is integral to sensory efficiency.

Efficiency and effective use of the non-visual senses is essential to the development of students with visual impairment. Sensory efficiency refers to how well the visually impaired use the remaining senses to receive, transmit and interpret information about objects and events in the environment (Lohmeier, Blankenship, & Hatlen, 2009). Langley (2004) indicated that the ability to understand and make use of what is seen, heard, touched, smelled

and tasted and to react appropriately to that information is the foundation for development and learning. Piaget (2013) claimed that the use of the senses and movement for exploration are primary activities of learning at the stage of cognitive development. The development of cognitive concepts and skills lay the foundation for understanding. All learning including all the components of expanded core curriculum depends on the efficient and effective use of the sensory system (Smith, 2014).

Smith (2014) asserted the sensory efficiency area of the expanded core curriculum consists of visual function, auditory function, tactile function, gustatory function, olfactory function, proprioceptive function and vestibular function. The efficiency of the function of the visual sense is a concern when students have visual impairments. They may lack ocular motor skills, discrimination skills, and recognition skills. All these must function effectively and efficiently in order for the students to acquire knowledge and skills.

Topor (2014) explained that sensory efficiency skills include visual efficiency, auditory learning, and the development of advanced tactile skills. These must be taught consciously to children with any level of remaining vision so that all sensory inputs can be used in the process of learning. Teachers are responsible for conducting functional vision assessments, planning activities to enhance the use of vision, and determining the most appropriate use of materials and devices for individual students. Additionally, auditory learning is an essential means for many students with visual impairments to access information. Topor emphasized that when print and braille reading is supplemented with listening skills, the students' learning is

enhanced. Moreover, when the students reach senior high school, they will need to depend partially on recorded books or live readers because the variety of reading materials are inaccessible. Tactile graphics are a necessary part of the books and other learning materials that students with visual impairments use, but the profession has only recently recognised that a deliberate, sequential system is required for teaching students to correctly interpret such graphic materials. To allow a student to take a high-stakes test without the requisite skills in reading tactile graphics is to put the student at a decided disadvantage. Students who are visually impaired need to learn, in a gradual, developmental manner, that there are systems for displaying real things in abstract form (Corn & Lusk, 2010).

In the views of Corn and Lusk (2010) and Smith (2014) sensory efficiency skills are valuable life-long tools. Students who are visually impaired need to learn how to use their auditory, tactual and visual senses to maximise their accessing the environment. Again, Corn and Lusk (2010) reiterated that they are able to maximise auditory and tactual information in order to make sense of the world and access learning. Additionally, sensory efficiency skills promote efficient use of able senses to provide increased access to the environment as well as increased independence and development of identified skills.

Learners who are visually impaired need to develop sensory efficiency skills to maximise effective and efficient access to the environment. Students who are visually impaired need systematic instruction to learn efficient use of their senses. Instruction in visual efficiency must be individually designed and may include using visual gaze to make choices, tracking car movements when

crossing the street, responding to visual cues in the environment, and/or using optical devices such as magnifiers and telescopes. For most students with visual impairments, Holbrook, Koening, and Rex (2010) identified that an increased reliance on tactual skills is essential to learning. These skills should be considered as part of IEP development. It takes more detailed "hands-on" interaction and repetition to tactually understand a concept, such as relative size, that may be readily captured with a glance by sighted individuals.

Systematic instruction in auditory skills may be needed for successful mobility and learning. Students must learn to effectively use their hearing to respond appropriately to social cues, travel safely in schools and across streets, learn from recorded media, and use echolocation for orientation. In addition, according to Smith (2014) learning how to integrate all senses to counter the impact of any impaired sense is also integral to this area. For instance, learning how to use tactual, gustatory, and olfactory input rather than visual cues to identify one's personal possessions, or using hearing and the other senses to identify people one knows without visual cues.

Smith (2014) explained that efficient acquisition of sensory information is required for all learning throughout life. Without active exploration, sensory skills do not develop. Without active exploration using sensory skills, understanding of the world does not develop. Teachers of students with visual impairment provide instruction and accommodation to address the sensory efficiency needs of students with visual impairment. Teachers need to use effective strategies for students with visual impairment to overcome sensory barriers associated with factors such as unresponsiveness, limited hand use, self-stimulation, and manual avoidance. Effective

interventions ensure that students can use sensory skills efficiently for exploration; for learning cognitive, communication, and motor skills; for academic achievement, and for the mastery of other core curriculum skills. Smith (2014), concluded that these efforts are critical for the growth and development of students with visual impairment, and for their participation in school, work, and life. The importance of sensory efficiency in the education of the visually impaired cannot be underestimated. They need to learn how to develop their sensory functioning abilities to the maximum extent possible so that they can best use the non-visual senses (especially touch) to search for information which is educationally relevant.

Assistive Technology

Koweru, Omoke, and Orodho (2015) described an assistive technology device as any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customised, that is used to increase, maintain, or improve the functional capabilities of students with visual impairment. An assistive technology service means any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device. The term includes the evaluation of the needs, selecting, designing, fitting, customising, adapting, applying, retaining, repairing, and technical assistance for an individual with visual impairment, family members or, professionals (Sah, 2013).

Assistive technology as a component of expanded core curriculum focuses on the knowledge and skills that are essential to learning how to use technology to access all aspects of daily living at school, at work, at play and at rest (McNear & Farrenkopf, 2014). The term "assistive technology" refers

to a broad range of devices such as video magnifiers (closed-circuit televisions), low vision devices, computers with Braille input/output, and Braille embossers, large screen monitors, and talking calculators. Assistive technology is any piece of equipment or product system that is used to increase, maintain or improve functional capabilities of the disabled and for that matter the visually impaired (McNear, & Farrenkopf, 2014). It is mainly referred to the electronic tools that are designed to provide access to text and other learning materials and opportunities, and the support needed to learn to use the tools (Chen, 2014). Chen again had stated that technology permits students with visual impairments to access the general curriculum, to increase literacy options, and to enhance communication. Technology is now part of living and those living without it are considered to be living in darkness. Students with visual impairment have the same uses of technology as their sighted counterparts. The visually impaired therefore have to learn to use the assistive devices to make technology accessible to them.

McNear and Farrenkopf (2014) found that the role of assistive technology in the lives of the visually impaired is indispensable. It enables them to participate in the school curriculum and also promotes independence for them. With assistive technology, the visually impaired are able to accomplish tasks with greater speed, ease, and independence. They added that assistive technology empowers the visually impaired to take personal control of their learning environment. The visually impaired are able to complete their assignments independently of the teacher. For instance, a student who is visually impaired can prepare an assignment on a computer using braille display software to proof-read, emboss a copy in braille for reference and

produce a print copy for submission. The transformative and empowering aspects of assistive technology for the visually impaired cannot be overemphasized. McNear and Ferrenkopf (2014) reiterated that students with visual impairment need to learn the use of technological devices that are appropriate for the ways in which they most efficiently access the environment and make effective use of sensory input. By enhancing and adapting devices or by adding specialised features students with visual impairment can acquire the necessary skills to integrate technology into their lives. Teachers have to teach the visually impaired the use of today's technological equipment to ensure their full participation in school (McNear & Farrenkopf, 2014).

Assistive technology is based on three components; input, output and programme operation (Smith & Penrod, 2010). Input refers to methods of entering information and data into a computer or electronic tool and is a major activity for all technology users including students with visual impairment. Output refers to methods that are used to generate information and data from a computer or electronic device. McNear and Farrenkopf (2014) were of the view that a student with visual impairment should be able to use a variety of output methods using various devices and application output can be considered in terms of visual, tactile and auditory formats. Programme operation refers to the essential knowledge and skills all students need to become proficient in operating programmes that enable a computer or other devices to perform basic applications essential to using technology. Programme in this sense refers to software management, file, and data management and problem-solving skills (McNear & Farrekopf, 2014; Smith & Penrod, 2010).

Assistive technology plays a tremendous and crucial role in the academic development of the visually impaired. The success of the other skills in expanded core curriculum depends on his or her competence in the assistive technology. Zhou, Parker, Smith, and Griffin-Shirley (2011) asserted that without assistive technology the visually impaired would have been the most miserable people on earth. Technology equalises the ability to access, store, and retrieve information between sighted people and those with visual impairments. However, the use of various software and peripheral equipment that are specific to people who are visually impaired requires that appropriate technology is provided and that the many skills in the use of assistive technology be taught by a specialist in the education of these students.

Technology is seen as a tool to unlock learning and expand the horizons of all students. For the student who communicates using braille, it allows him or her to access and produce materials identical to typically sighted peers. It gives students who are blind the capability of independently storing and retrieving information. Technology has leveled the playing field for individuals with visual impairment and is an essential part of the expanded core curriculum.

In his contribution, McNear (2001), added that assistive technology enables students who are visually impaired to access information, participate in age-appropriate activities, or complete a task independently or with minimal assistance. Instruction in the use of assistive technology begins in the preschool years and evolves as the needs of the student change. It enables students who are visually impaired to access and store information from libraries around the world and the internet. The visually impaired can use

assistive technology for note taking, studying for tests, research and a variety of their academic uses.

In the view of Sah (2013), technology can increase productivity and independence by facilitating the performance, simplifying tasks, allowing greater speed and less physical energy. It can also enhance our knowledge, understanding, and participation by expanding their access to information, places, and people. Assistive technologies are used by individuals with visual impairment to perform functions that might otherwise be difficult or to some extent impossible. It really improves the quality of life for them. Therefore, it is imperative that the training of assistive technology should be integrated with the education of individuals with visual impairment for better adaptability and greater independence in the society. These training needs create an obvious call for competence in special educators for children with visual impairment towards knowledge and skills in assistive technologies (RNIB, 2013).

Students who are visually impaired should be well equipped with all of the necessary skills to manage the challenges of assistive technology. Those who graduate from senior high school without the requisite proficiencies to access mainstream technology will be unable to compete in modern society, a world that is increasingly reliant on sophisticated tools. Technology can increase productivity and independence by facilitating the performance, simplifying tasks, allowing greater speed and less physical energy to a person with visual impairment. Technology has many important applications in teacher education in general or special education in particular.

The integration of new technologies and multimedia materials in teacher education programmes at the pre-service and in-service levels can

improve the quality of training and increase competence in best practices (Sah, 2013). If the society in which the individual with visual impairment lives wants to see changes, they should use assistive technology more and more. Then we have to inculcate a technology-based approach in the individuals with visual impairment from a very early stage of education and training. Hence, it demands the proper and compulsory training in relevant and modern assistive technologies among children with visual impairment. Sah argued that advances in computer technology have a very positive impact on the education of students with visual impairments. Students with disabilities should be prepared for further education, employment and independent living (Individual with Disability Education Act IDEA, 2004 cited by Smith & Penrod, 2010). Considering that visual impairment is perhaps the disability area in which the most technological advances have been made, it is therefore imperative that the visually impaired students have an effective level and quality of access that is essential to full participation in new ways of learning especially in an inclusive setting.

Assistive technology supports persons with visual impairment to work around their area of challenge. Assistive technology does not provide a "cure" for their condition, however; it helps them to accomplish a task more independently. Technology has always had great potential to have a positive impact. For students with visual impairment, the use of specialised technologies assists them to participate in education at all levels. Assistive technology provides them with a means to overcome the major obstacles attributed to their disability. Assistive technology provides equal access to

information. The importance of assistive technology is limitless. It is the great equalizer for students with visual impairments (Smith & Penrod, 2010).

There is a variety of high-tech and low-tech assistive technology tools designed specifically for students with visual impairments that require specialised instruction. These devices include but are not limited to, electronic braille note takers, coloured transparencies, tactile symbols, calendar systems, video magnifiers, screen reader software, screen-enlarging software, braille displays, auditory access to printed materials, and magnification devices. Mastery of assistive technology contributes to the development of literacy and academic success, social interaction among peers, independence and the potential for future employment (Abner & Lahm, 2002).

Currently, computers can turn text into speech, enlarge print and translate text into Braille, opening the door to books, articles, and data that have previously been available only at great expense and difficulty (Smith & Penrod, 2010). Developing countries should, therefore, see to it that this important innovation is incorporated into their annual budget to improve and encourage people with visual impairment to be included in community activities. Through research, it has been discovered that there exists a high level of technology pessimism among persons with visual impairments. It is reasonable to infer that this cynicism is also present as people with visual impairment deal with a variety of technology-related barriers in education (Smith & Penrod, 2010). According to the American Foundation for the Blind (2013), assistive technology has removed many barriers to education and employment for visually impaired individuals. Students with visual impairments can complete homework, do research, take tests, and read books

along with their sighted classmates, because of the use of computers and other devices. These include: Assistive technology programmes that run on off-the-shelf computers can speak the text on the screen or magnify the text in a word processor, web browser, e-mail programme or other applications. Stand-alone products designed specifically for people who are visually impaired, including personal digital assistants and electronic book players, provide portable access to books, phone numbers, appointment calendars, and more optical character recognition systems scan printed material and speak the text. Braille embossers turn text files into hard-copy Braille.

In the ECC, students have the opportunity to have the skills needed in the use of technology. The implication is that the more competent students are in the use of technology the more likely students would perform academically. Consequently, this study aims at examining how competent students are in the use of assistive technology and how it translates into their academic achievement.

Orientation and Mobility

Orientation and mobility (O&M) is the area of the expanded core curriculum in which students learn the concept and skills necessary to move from one place to another safely and efficiently (Fazzi, 2014). O&M instruction focuses on conceptual understanding of the physical environment, and purposeful movement in the home, the school and the community environments. That is both safe and independent to the fullest extent of each individual's ability.

Fazzi (2014) explained that the orientation and mobility area of the expanded core curriculum focuses on two broad related components. The

following paragraphs review orientation and mobility. Orientation is one knowing one's position in relation to other objects, people, and places in one's surroundings and keeping track of how these positions and relationships change as one moves through the environment and mobility is the physical act of moving from one place to another. The development of motor skills, physical coordination, stamina and the use of appropriate mobility tools are the basis for independent mobility (Fazzi, 2014). O&M instruction provides the visually impaired with techniques that enable safe and independent travel without the use of vision (Ferrell, 2011).

The O&M area of expanded core curriculum can be broken down into body concept, environmental concepts, spatial concept, perceptual and sensory skills, mobility skills, orientation skills, interpersonal skills and decision-making skills. Each of the components of O&M is important to the visually impaired along a continuum of conceptual and skill development that leads to increasing independence as a traveller (Fazzi, & Naimy, 2010).

Fazzi (2014) concluded that O&M is a key area of the expanded core curriculum for students with visual impairments. Stakeholders in education should, therefore, ensure that students with visual impairment receive the orientation and mobility instruction they require, practice orientation and mobility skills in a variety of environment on continuous bases and apply this skills not only in schools but also in a greater community and far into the future in their college work and living environment.

Ferrell (2011) stated emphatically that O&M is the systematic way in which individuals with visual impairments orient themselves to their environments and move as safely, efficiently, and independently as possible in

those environments. Hill and Ponder (1976) were of the view that O&M concepts begin with understanding one's own body and progress to include all the concepts that are necessary to plan a trip in rural and urban environments. O&M skills begin with the simple understanding of how to move one's body with control and advance to the skills that are necessary to navigate complex environments safely, cross streets, and access transportation (Ferrell, 2011). Specially prepared O&M specialists are required to provide students with the experiences they need to develop orientation and mobility concepts and acquire orientation and mobility skills that will allow them to travel as independently as possible.

Smith (2012) and Jacobson (2013) also described orientation as the understanding or the cognitive component of where you are and what is around you. It encompasses the use of language, concept development and an awareness of self and involves the use of the senses to establish a position in space and relationships with other significant objects in the environment. Mobility, on the other hand, is the physical part of moving from one place to another. O&M primarily focus on optimising purposeful movement (Jacobson, 2013). O&M is an area of instruction focusing on students' ability to know where they are in relation to their environment and to travel safely, efficiently, purposefully and independently throughout this environment. Wall and Corn (2006) reiterated that good O&M skills are highly correlated with the degree of independence achieved by students later in life.

Developing body awareness, directionality, spatial awareness, and practical knowledge associated with the characteristics of a given environment increase the probability that the student with visual impairment will be

actively involved in age-appropriate activities with peers. Problem-solving strategies essential to travel in both familiar and unfamiliar environments, urban and rural areas and in various kinds of weather are all essential to the development of independence and self-esteem. Students who are visually impaired need to have O&M and mobility instruction that addresses their specific needs and requirements of their daily routines. (Wiener, Welsh, & Blasch, 2010).

Wall and Corn (2006), continued to mention that safe and efficient travel throughout the environment is a critical component in the education of students with visual impairments. O&M evaluation and instruction should begin in infancy with basic spatial concepts and purposeful and exploratory movement. Instruction should then progress through more independent, age-appropriate motor and travel skills in increasingly complex environments. Vision provides the primary motivation for infants to begin to move their bodies, to raise their heads to see people, to reach toward objects, to move through the environment, and to begin to play. Significant delays and differences in meeting motor milestones can impact overall development. An individual who is blind needs to know how classrooms or other environments are arranged in order to independently move with confidence. Systematic orientation to space may be needed before placement and function of furniture and objects are familiar (Wall & Corn, 2006). More advanced age-appropriate travel skills, such as orientation to all school facilities, street crossings, bus travel and community experiences are needed as the student gets older (Fazzi & Naimy, 2010).

As a part of the expanded core curriculum, O&M are a vital area of learning. Teachers who have been specifically prepared to teach O&M to the students with visual impairment are necessary for the delivery of this aspect of the expanded core curriculum. Students will need to learn about themselves and the environment in which they move; from basic body image to independent travel in rural areas and busy cities. It has been said that the two primary effects of blindness on the individual are communication and locomotion. The ECC includes an emphasis on the fundamental need and basic right of persons with visual impairment to travel as independently as possible, enjoying and learning from the environment through which they are passing to the greatest extent possible.

O&M skills therefore include, but are not limited to the following:

1. Using human guide techniques (also known as a sighted guide)
2. Using standard and adaptive canes
3. Using orientation components to determine where one is in space
4. Moving through space by walking or using a wheelchair
5. Using self-advocacy skills

Steadward (2003) had emphatically stated that good orientation is built upon a child's understanding of his/her body in relation to the environment. The following areas may be included in the student's O&M programme; exploration and understanding of his/her environment; concept development; training in the use of other senses as they relate to orientation and mobility; training in the efficient use of remaining vision; sighted guide technique when walking with another person; use of compass directions, landmarks and other environmental information to establish and maintain orientation; cane travel;

training and experience traveling in the home and school as well as residential, business, downtown or rural areas; the use of public transportation; instruction in the use of low vision aids (McNear & Farrenkopf, 2014).

The following are related areas of instruction; personal safety; using a telephone; gathering information from the public; accepting and refusing public assistance; money organisation; understanding one's eye condition as it relates to O&M; problem solving skills; social interaction skills; physical fitness and posture and gait (McNear, 2001). Levels of independence will vary with each child. O&M instruction may help one child learn to move within his/her school without assistance. A more advanced traveler may learn to use a city bus to go to a recreational centre or to walk alone on a rural road to visit a friend.

Wolffe and Kelly (2011) citing Hill and Ponder explained that the ultimate goal of O&M instruction is to enable the student enter any environment, familiar or unfamiliar, and function safely, efficiently, gracefully and independently. O&M training focus on an alternative to using sight for safe and independent travel purposes. The visually impaired are taught the use of the 'white cane' as well as other devices to promote and facilitate confidence in movement. It has been said earlier that, the two basic effects of blindness are communication and locomotion. O&M are the fundamental needs and right of the visually impaired to travel as independently as possible, enjoying and learning from the environment through which they are passing to the greatest extent possible. Despite its importance, it seems the visually impaired are not well equipped with the skills of O&M for them to enjoy their rights and independence to the fullest (Smith & Penrod, 2010).

Accepting that skills in O&M are critical to students' academic achievement it has become imperative to investigate the extent to which students with visual impairment utilise skills in O&M to improve on their academic achievement.

Independent Living

Independent living area of the ECC looks at activities that take care of one's self, family, and home. The overall mastery of these skills according to (Bardin, 2014) is to live as independently as possible, for students to manage their lives and function in the community behaviours and skills related to organisation, personal hygiene, grooming, dressing, clothing care, time management and money management among others leads to greater independence for students with visual impairment and increases the potential for a more satisfying life. Independent living is necessary for a student with visual impairment to be successful in other areas of the expanded core curriculum, especially in the areas of social interaction, career education and self-determination (Bardin, 2014).

Independent living is a key to students' achievement, independence, and life success (Chen, 2014). There are a number of behaviours and skills in the independent living area that needs to be intentionally taught to students with visual impairments. Specific behaviours and skills to be taught depend on the individual characteristics of each student, including physical and cognitive abilities, needs, age, health condition and family culture and priorities (Bardin, 2014). In order to develop success in academics and other areas of the ECC, students with visual impairments need to be proficient in independent living.

According to Chen (2014), most activities of daily living, which sighted people, perform without thinking, must be taught to students with visual impairments. Some of these independent living skills are part of the general curriculum for all students, but they are not usually presented in a sequential, organised manner sufficient for students who are visually impaired or provide adequate hands-on experiences for these students. Achieving a satisfying, rewarding adult life will be difficult for individuals with visual impairments if they are not well grounded in independent living skills.

The ECC area of independent living contains a diverse group of skills that students with visual impairment will need to master to achieve a level of independence. They are the chores people perform, according to their abilities, which enable them to manage their homes and personal lives. In order to develop success in academics and other areas of the ECC, students with visual impairment must have proficient organisational skills. These behaviours and skills transfer to efficiency at home and in the world at large. In order to be independent, people with visual impairment need to know where to find their possessions and other items in the environment and where to put them after they have finished using them. In addition to organising personal items, the visually impaired need to learn how to organise information in the form of both print and electronic materials in a systematic way (Bardin, 2014).

Personal hygiene and grooming are two of the most fundamental independent living skills the visually impaired need to develop. Good hygiene skills are necessary for a person to stay healthy, feel confident and be accepted socially. A person with poor hygiene and grooming may be avoided by others, may be unable to obtain a job and may develop health problems. Students with

visual impairment need to be taught hygiene and grooming skills in the deliberate and explicit way and they will need more opportunities to practice the skills themselves.

Clothing can also influence self-esteem and others' perceptions of a person. The dressing also has an effect on personal safety. In their daily lives, people select clothing that is appropriate for the setting and the weather they will encounter as well as activities they will perform (Chen, 2014). The visually impaired become handicapped in this direction. The sighted learn most of the personal hygiene and personal grooming incidentally through visual observation. Opportunities should, therefore, be created for the visually impaired to practice personal hygiene and personal grooming both at home and in school (Chen, 2014).

Bardin (2014) indicated that independent living skills are highly correlated with the achievement of life-long goals for students who are visually impaired. This area encompasses all the tasks and functions people perform, according to their abilities, in order to live as independently as possible (Hatlen, 1996). Curriculum designed to address the development of independent living skills include instruction in areas such as personal hygiene, food preparation, money and time management, home management, an organisation of personal belongings and space to accommodate the lack of visual input. While similar skills may be taught within the core curriculum they do not provide sufficient opportunity for meaningful and frequent practice required for students who are visually impaired. The content of the regular curriculum is often based on the assumption of the presence of a basic level of knowledge, acquired incidentally through vision.

In support, Chen (2014) explained that individuals learn basic skills in independent living from visual observation and imitation. Most students with visual impairments, however, will need systematic instruction and adaptations to standard equipment, such as modifications to read oven markings and to cook independently and safely. Depending on the level of vision, intellectual ability, and other unique characteristics of a student, adaptations may range from minor highlighting to tactile clues for matching clothing (Chen, 2014). Students can learn to apply make-up and perform other grooming activities with magnifying lenses, specially marked containers, and highlighted dials on electric shavers. These skills are not typically evaluated or taught in a sequential and systematic basis in general education settings. Family members may require assistance and guidance to implement the proper adaptations that will permit practice and mastery of new independence skills within the home (Leuck, Erin, Corn, & Sacks, 2011).

This area of the expanded core curriculum is often referred to as daily living skills. It consists of all the tasks and functions persons perform, in accordance with their abilities, in order to lead lives as independently as possible. These curricular needs are varied, as they include skills in personal hygiene, food preparation, money management, time management, organisation, cleaning and clothing care.

Chen (2014) indicated that some independent living skills are addressed in the existing core curriculum, but they are often introduced as splinter skills, appearing in learning material, disappearing, and then reappearing. This approach will not adequately prepare students who are visually impaired for adult life. Traditional classes in home economics and

family life are not enough to meet the learning needs of most students who are visually impaired since they assume a basic level of knowledge, acquired incidentally through vision (Chen, 2014; Bardin, 2014).

To conclude, independent living incorporates the behaviours and skills involved in managing the daily demands of everyday life and maintaining the living environment (Bardin, 2014). Independent living for students with visual impairment includes behaviours and skills that individuals who are sighted usually learn through imitation and incident (Lewis & Iselin, 2002). The ultimate aim of the visually impaired is to become independent in all spheres of life as much as possible and it can be done only through education. The skills and knowledge that sighted students acquire by casually and incidentally observing and interacting with their environment are often difficult, if not impossible, for the visually impaired to learn without direct sequential instruction by knowledgeable persons. The visually impaired exhibit a lot of dependencies because probably they lack the skill of independent living. This research, therefore, focused attention on the contribution of independent living skills on the academic achievement of students with visual impairment.

Social Interaction

Social interaction is an essential area of the ECC for students with visual impairments. Social skills permeate all aspects of students' life and also an integral part of other areas of the ECC such as compensatory access, recreation, and leisure, independent living, and self-determination (Sacks, 2014). Wolffe (2006) stated that social interaction skills contain components and behaviours that are needed to participate in social situations appropriately and to prevent social isolation and stigmatisation. It sets the stage for

appropriate and necessary interaction with others. The need to develop these skills is so fundamental that it can often mean the difference between social isolation and a satisfying and fulfilling life as an adult. Institutions like universities are miniature societies and therefore students with visual impairment are expected to relate very well with their peers to promote co-existence, peer tutoring, and cooperative learning but it seems that is not what is on the ground (Sacks, Wolffe, & Tierner, 1998).

It is estimated that about 80% of what is learned socially is taken through vision. It is therefore difficult for the visually impaired to acquire information about the social environment, engaging in social activities and understanding and interpreting social activities involved in everyday interactions. The visually impaired depend on family members and friends to obtain vital information about the social worlds and the intricacies involved in maintaining a social relationship (Eguavoen, 2016). In the view of Chen (2014) and Sack (2014), among all developmental processes, it is the social development for students with visual impairment that is the most highly dependent on others. They further said that how others react to and interact with students with visual impairment can play a significant role in the students' self-perception. Again, the visually impaired can become socially isolated and experience self-esteem, which may negatively affect their success in the academic arena if they are not given the opportunities to engage with others, make choices and decisions and learn the social rules of their environment.

The area of social interaction is not limited to appropriate body language, social communication, effective conversation pattern, cooperative

skills, interaction with others, social etiquette, development of relationships and friendships knowledge of self and interpretation and monitory of social behaviour (Sacks & Wolfe, 2006b; Sacks, 2014; Chen, 2014).

Sapp and Hatlen (2010) noted that social interaction skills are the concepts and skills that people use to interact with one another. They are learned primarily by observing others who are engaged in appropriate social interactions. Individuals with visual impairments miss out on much of this incidental learning of skills that are as basic as making eye contact and as complex as skills for joining a group of peers or asking someone out on a date. Direct sequential instruction in social interaction skills according to Ogoemeka, (2014) will help individuals who are visually impaired have more opportunities for social interactions and decrease the chances of social isolation throughout their lives. In fact, isolation and stigmatisation have been a worry to the visually impaired but with the acquisition of social skills this canker will be reduced to the barest minimum (Sacks & Wolffe, 2006a).

Students with visual impairment have unique social and emotional needs that must be addressed in educational programmes to ensure successful academic performance. These students must receive special support for unique identity issues that may be associated with their visual impairment. They require systematic instruction in social skills, self-advocacy, and communication skills so that they achieve both academic and social success as they move from school to adult life. A sense of independence and interdependence in social and vocational pursuits can only happen when students with vision impairment feel that they are as competent and confident as their sighted peers (Sacks, & Wolffe, 2006a).

Han and Kemple (2006) stated that social competency includes understanding others' needs and feelings, articulating one's own ideas and needs, solving problems, cooperating and negotiating, expressing emotion, reading social situations accurately, adjusting behaviour to meet the demands of different social situations, and initiating and maintaining friendships.

A visual impairment can socially isolate a student, impede typical social interactions, or limit social skill development. A student with a visual impairment who is not able to see facial expressions and subtle body language to participate in conversations and activities may experience awkward and confusing interactions. Social skills that the sighted are able to observe and imitate may need to be taught to individuals with visual impairment.

They must be taught when and how to smile, frown, nod, wink, shrug and the other nonverbal communication skills (Sacks, 2006). Social interaction skills are essential if students are to develop friendships with their classmates and participate in activities typically associated with school-age mates, whether educational or co-curricular. In the views of Wolffe (2006), having good interpersonal communication skills is also highly correlated with employability in adults. For the visually impaired to learn good interpersonal communication skills they must be provided information timely, insightful, and sequential instruction (Sapp, & Hatlen, 2010). Information associated with the non-verbal communication (gestures, body language, facial expressions) or cultural practices (how close to stand to the person with whom you are speaking) must be made available to them.

Furthermore, peers of students who are visually impaired require specific instruction to increase their awareness of the implications of vision

loss on social interaction if they are to become both comfortable in their interactions with their classmate who is visually impaired and knowledgeable about how to interact with their peers with visual impairments.

Chen (2011) supported the need to equip students with visual impairment as they with social skills they do not learn social interaction skills as casually and incidentally as their sighted peers. Chen said social skills must be careful, consciously, and sequentially taught to students who are visually impaired. Nothing in the existing core curriculum addresses this critical need in a satisfactory manner. Thus, instruction in social interaction skills becomes a part of the ECC as a need so fundamental that it can often mean the difference between social isolation and a satisfying and fulfilling life as an adult.

It is difficult to cope with and overcome practical and emotional limitations that are caused by visual impairments without acquiring knowledge of and gaining experience in confronting obstacles, meeting challenges, and engaging in activities that develop problem-solving skills and strategies (Sacks, & Wolffe, 2006; Sacks, 2014). The curriculum is a framework that can be adapted to any group and modified as necessary. As Wolffe, Sacks, and Thomas (2000, p. 10) noted: "The goal of social-skills instruction is to provide the visually impaired with the information and skills they need in order to feel confident and comfortable in social situations."

Social interaction skills are essential in the education of the visually impaired. It is, therefore, necessary to research into the extent to which it influences the academic achievement of students with visual impairment.

Recreation and Leisure

Recreation and Leisure focus on the development of interest and skills involved in physical and leisure activities. Physical activity is a critical element for good health and a happy lifestyle especially for those with visual impairment. It needs to be deliberately planned for these students because lack of vision reduces the opportunity to observe and choose activities of interest (Aillaud, & Leiberman, 2013). The visually impaired acquire these skills through thoughtfully planned instruction and demonstration to stay healthy for education. Casual observation seems to suggest that the visually impaired are not involved in recreation and leisure activities.

Citing Edginton, Jordan, DeGraaf and Edginton; Allman, Lewis, Lieberman and Ross (2014) observed that the recreation and leisure area of the ECC concentrates on the knowledge, behaviours, and skills that allow the visually impaired to participate in a healthy level of physical activity and enjoy fun relaxing activities in their free time. Involving in recreation and leisure offers opportunities for social interactions and is crucial for the physical and mental health and well-being of individuals throughout their lives. Aillaud and Leiberman (2013) ascertained that activities provide opportunities to rest, release tension, slow down mentally, share experiences with friends, meet new people, practice autonomy and increase self-reliance. Physical activity helps to maintain normal weight and avoid chronic diseases and other health problems (Physical Activity and Health, 2011). Physical activity also promotes self-confidence and healthy and happy lives. The visually impaired need all these to enjoy life appreciably (Leibeman, Byrne, Mattern, Watt, & Fernanadez-Vivo, 2010).

Allman, Lewis, Lieberman, and Ross (2014) proposed that the visually impaired need to be exposed directly to the skills needed for incorporating recreation and leisure activities into their lives. Also, they need to be offered safe and non-threatening opportunities to try physical activities. However, Leiberman, Ponchillia, and Ponchikkia (2013), identified the fear of possible injury, lack of available activities, the inability of teachers to assist the visually impaired, lack of opportunities to be active, absence of others to participate with and negative attitude of others towards the involvement of the visually impaired as barriers to their involvement in recreation activities. Allman, et al (2014) established that, the involvement of the visually impaired in recreation and leisure activities provides opportunities for them to demonstrate career competency, independent living, and social interaction.

While sports have value in everyone's life, it is even more important in the life of a person with a disability. This is because of the influence sports have in helping children and youth to discover their potential in school, sports, and the community, and to achieve their dreams. Sport can help individuals who are visually impaired by strengthening their self-esteem and their ability to overcome difficulties, and by normalising their living environment (Aillaud, & Leiberman, 2013; Anthony, 2013).

Visual impairments impose limitations on the ease with which the visually impaired acquire information about their peers, dress, and activities. This, in turn, impacts their ability to develop physical and social skills (MacCuspie, 1996). Sport is especially conducive to developing positive self-esteem, building social skills and friendships, and providing pleasure (Ponchillia, 2002). Lack of participation in sport and recreational activities

results in fewer interactions with peers, fewer friendships and, thus, a negative impact on self-worth (Wolffe & Sacks, 1997). As these children progress through school, activities that require good physical development and agility are closely associated with friendship groups. The numbers of mutual friends and one's peer social standing have been found to contribute uniquely to children's overall social adjustment as characterised by the sharing of feelings, self-disclosure, trust, and loyalty (MacCuspie, 1996). The development of early friendships appears to be based on proximity and common interests.

Physical activity offers a range of benefits for all ages and abilities and is essential for healthy growth and development. For students with visual impairments who travel independently on the playground, their level of physical agility must be comparable to their peers if they are to be routinely included in activities (MacCuspie, 1996). Regular physical activity in childhood develops cardiovascular fitness, strength, flexibility and bone density. Being physically active helps maintain a healthy body weight, and is associated with positive self-esteem, greater self-efficacy, improved academic and cognitive performance, and greater perceived well-being. It lets people set their own standards, and reap the social, emotional, spiritual and physical benefits of choosing their own activities (Lieberman, & McHugh, 2001).

The primary goals of leisure are first, that students develop the skills and attitudes needed to fully participate in recreation activities and second, that they become knowledgeable of recreational choices as they can intelligently select how they spend their leisure time. Anthony (2013), reiterated that individuals who are visually impaired often live a highly structured life. Too often, too many decisions are made and activities are

selected for them. Students who are visually impaired are rarely given the opportunity to participate in recreational and leisure activities unless they have been taught these activities. They will not know whether they will enjoy a particular game if they do not have the opportunity to learn how to play that particular game under supervision. In contrast, sighted students may decide to try a game purely because they have observed other people play that game. Recreational and leisure skills for students with visual impairments must be planned and deliberately taught, focusing on the development of lifelong and enjoyable activities (Corn, Bina, & Sacks, 2009).

Recreation and leisure skills may include traditional as well as adapted physical education activities. The visually impaired need help in identifying the array of choices available to them in this area and must be taught how to perform leisure skill that most people learn through observation. Recreation and leisure skills and experiences provide the same benefits for students who are visually impaired as they do for their peers who are sighted. However, without modifications or specific instruction to master prerequisite skills, students who are visually impaired are frequently excluded from such activities. Many of the motor skills learned during the rough and tumble play of childhood activities do not develop naturally in students who are visually impaired (Sacks, 2014; Chen, 2014; Han & Kemple, 2006). The initial exposure to specific activities is cumbersome or their level of participation or success below that of their peers, students who are visually impaired may become easily discouraged. The provision of specific and timely instruction and opportunities to practice newly acquired skills will ensure students who

are visually impaired derive pleasure from participation in an array of recreational and leisure activities.

Students with visual impairments need to be taught recreation and leisure activities that they can enjoy throughout their lives. They are often not aware of the options or the possible adaptations that would allow them to participate in these activities. Such skills include both individual and organised group activities for students of all ages and levels. Skills in recreation and leisure according to Gasperetti, et al (2010) are seldom offered as a part of the existing core curriculum. Rather, physical education in the form of team games and athletics is the typical way in which physical fitness needs are met for students without visual impairments. Many of the activities in physical education are excellent and appropriate for students who are visually impaired. In addition, however, these students need to develop activities in recreation and leisure that they can enjoy throughout their lives.

Morelli, Folmer, Foley, and Lieberman (2011) opined that most often students without visual impairments select their recreation and leisure activity repertoire by visually observing activities and choosing those in which they wish to participate. The teaching of recreation and leisure skills to students who are visually impaired must be planned and deliberately taught and should focus on the development of life-long skills.

Skills to ensure student's enjoyment of physical and leisure-time activities including:

1. Making choices about how to spend leisure time
2. Actively participating in physical and social recreational activities
3. Trying new leisure activities

4. Following rules in games and activities at an appropriate level
5. Maintaining safety during leisure activities

Recreation and leisure play the very effective role in the education of the visually impaired. It is through recreation and leisure activities that the visually impaired get a fit body and brain to pursue academic work and improved their academic achievement.

Career Education

Career education focuses on components of activities, behaviours, and skills needed to prepare students with visual impairment for all the roles they play throughout their lives, including even the maintenance of economic independence in adult life (Nagje, 2001). Lack of preparation in the area of career education has been a major cause of unemployment and underemployment among the visually impaired (Wolffe & Kelly, 2011). Therefore, helping students develop skills in career education prepares the ground work for full and satisfying lives for students who are visually impaired.

Wolffe (2014) explained career education as the development of knowledge, the refinement of innate talents and the promotion of skills (work habits) that are needed for success in employment and other life roles. Career education is not only about obtaining and maintaining employment but also preparing students for the next movement. It is therefore a broad understanding of many activities of life and the different types of occupations that people pursue. Instruction in career education is of more importance to the visually impaired. It will help them to determine their life and career paths which include life roles to play, occupational areas of greatest interest, jobs to

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perform, and how to find, obtain and maintain employment (Haupt & Kane, 2004: Wolffe, 2006a).

Wagner, Cameto, and Knokey (2010) and Wolffe and Kelly (2011) proposed that the visually impaired are likely to work, live independently, go into marriages after graduating from high school. They attributed the likely cause to lack of instruction geared towards skill development and the way students with visual impairments learn about career education. The proponents of career education believe that people develop their life work or careers through the roles they engage in over the course of their lives. The lifelong learning model for career education includes career awareness, career exploration, career preparation and career placement (Wolffe & Kelly, 2011). Students with visual impairment may need to start career education activities at an earlier age because of the following factors:

1. Inability to learn incidentally through vision about the environment and what people do for work.
2. Low expectation people have for the visually impaired based on a misconception
3. Lack of realistic feedback and inability of the visually impaired to see what classmates can do.
4. Limited exposure to a role model of successful adults with visual impairment (Wolffe, 2014).

In career awareness, the visual impairment have to master a variety of skills and knowledge which is not limited to; organisational skills, following directions, information about work, positive work habits, basic work skills and incidental information about the world and how it operates. Golub (2003)

reiterated that in the career exploration of the visually impaired work on depending the career awareness by exploring options that match their interests, abilities, values, and personalities. Wolffe (1999), explained that, the skills and knowledge that the visually impaired need to acquire during the career exploration stage is not limited to time management, advanced content, skills, and techniques, understanding related position within a profession, refinement of work habits and ability to articulate vocational interests, abilities, skills, values, and liabilities. Career preparation on its part focuses on the knowledge and skills needed to enter into a particular career that a student with visual impairment might have identified during the career exploration stages (McDonnall, 2011; Woffle, 2014). According to them, the knowledge, skills, and abilities the visually impaired need to develop or refine during high school to be prepared to move into work or to participate in career.-related post-secondary training includes; application of learned concepts in daily roles and responsibilities, clear life and career values, personal and vocational goals, and understanding of valuable work and life resources, interpersonal skills, ability to select, use and maintain equipment and tools and finally self-esteem and self-reliance.

Wolffe (2014), Wolffe (2011a), Wolffe (2011b) and Wolffe and Kelly (2011) identified that the focus is on students' application of what they have learned in the previous phases of career education about the importance of work. What is essentially different is regarding career placement is that students with visual impairment are expected to find work outside their home and school environments, apply what they have learned and eventually achieve independence through their efforts. They indicated that at this stage,

students need to develop and show mastery in the following skills; preparing for and participate in career-related training, participation in work-related skills and habits through volunteering, pursuing advanced career-related information, refining interests and experiences based on work trials, preparing for post-graduating support and planning for life and career advancement (Wolffe, 2014; Wolffe, 2011a; Wolffe, 2011b; Wolffe, & Kelly, 2011).

The concepts and skills that all students acquire in vocational education are not sufficient for students with visual impairments. Sighted students have many opportunities to learn about careers and work habits through visual observation. Students who are visually impaired need to have firsthand experiences with various jobs and roles in life to make personal, independent decisions. For example, they will not know what a bank teller does without spending some time with a bank teller or engaging in other hands-on learning about the responsibilities of a bank teller. The goal according to Clark and Patton (2013) is to enable students who are visually impaired to explore and become knowledgeable about opportunities for employment and to feel confident about entering the labour market. Many visually impaired students reach their teen years naive about the world of work. Through no fault of theirs, numerous youngsters who are academically trained have little or no work experience and thus little practical understanding of the labour market, jobs, and how one progresses through jobs to capture one's career goals (O'Shea & Feller, 2000). This was emphasized by Wolffe (2014), as he said; "Without vision or with impaired vision, it is difficult to learn incidentally about work roles, the types of jobs available, what tasks are

inherent in different jobs, and what work behaviours are expected of employees" (p. 13).

The combination of information, practical application, and reflection in both a structured learning environment and a natural habitat can help students develop the attitudes, knowledge, and skills that are necessary for them to prepare themselves for their future careers: Career education gives students information and strategies that are work related (Wolffe & Kelly, 2011). Career education for students who are visually impaired needs to begin as early as possible and include self-awareness and career exploration activities, job seeking skills instruction, information about job keeping and encourage opportunities for gaining work experience (Wolffe & Kelly, 2011). Career education provides students with information about the world of work, career options, and an overview of skills necessary to be successfully employed. For students who are visually impaired, there are many additional programme components, which need to be addressed. The examples include; accommodations needed to complete specific jobs, access to the appropriate assistive technology, self-advocacy skills and those to deal effectively with negative attitudes toward individuals with disabilities.

Frequently, students who are visually impaired are unaware of the array of career options because they do not see the variety of workers in their environment or because adults around them are uninformed about the career opportunities available to those who are visually impaired (Everson & Zhang, 2010). Employment statistics from both Canada and the United States show that individuals who are visually impaired are both underemployed and have unacceptably high rates of unemployment (Bureau of Labour Statistics, 2012).

Bureau of Labour Statistics explained that without specific and timely intervention to address career development issues, students who are visually impaired encounter significant barriers to successful employment.

Students with visual impairments need to be taught about the types of work and career options that are available since they cannot casually observe people in different job roles. They need opportunities to explore their strengths and interests in a systematic well-planned manner. Career exploration and subsequent training may include the acquisition of specialised skills and equipment and an understanding of how to request and develop natural supports in the workplace to compete in the job market. Students must be prepared for a wide range of vocational choices and the adaptations, including technological devices, which make them attainable. It is important to have opportunities to job shadow for concrete experiences of different career choices and to learn about other persons with visual impairments who have successful vocational outcomes.

Clark and Patton (2013), also explained that there is a need for general vocational education, as offered in the traditional core curriculum, as well as the need for career education offered specifically for students who are blind and visually impaired. Many of the skills and knowledge offered to all students through vocational education can be of value to students who are blind and visually impaired. Career education in an ECC will provide the student who is visually impaired with the opportunity to learn first-hand the work done by the bank teller, the gardener, the social worker, the artist, and others. It will provide the student opportunities to explore strengths and interests in a systematic, well-planned manner. Unemployment and

underemployment have been the leading problems facing adults who are visually impaired. This portion of the ECC is vital to students and should be part of the expanded curriculum for even the youngest of these individuals. Skills that enable students who are visually impaired to move toward working as an adult include:

1. Exploring and expressing preferences about work roles
2. Assuming work responsibilities at home and school
3. Understanding concepts of reward for work
4. Participating in job experiences

O'Shea and Feller (2000) reiterated that learning about jobs and adult work roles at a developmentally appropriate level career education for students who are visually impaired needs to begin as early as possible and include self-awareness and career explanation activities, job seeking skills instruction, information about job keeping and encourage opportunities for gaining work experiences. Equipping the individuals who are visually impaired with skills of career education will make them focus on what they want to do in the future.

Self-Determination

Self-determination refers to a person's right to decide freely and without undue influence how he or she wishes to live his or her life (Woffle, & Erin, 2012). According to Woffle and Erin, to develop self-determination skills, children or adolescents who are visually impaired must be provided with the necessary knowledge and experience. They must learn which choices are available to them, have the skills necessary to take advantage of these choices and be given opportunities to make age-appropriate choices for

themselves. To do so, they often need direct instruction in learning to evaluate options and making choices (Woffle & Erin, 2012). They farther explain that self-determination includes personal decision-making, self-advocacy, and assertiveness based on an understanding of one's abilities and related needs. These skills lead to competency, as opposed to learned helplessness, and are important components of positive self-esteem. Specialised instruction in developing self-determination skills can help students participate meaningfully in their education and transition planning and make positive adult lifestyle, job, and other life choices upon graduation.

This area of the ECC highlights the importance of believing in oneself while understanding one's abilities and limitations. Students learn from successes and failures how to achieve one's goals in life. Self-determination is the ability for people to control their lives, reach goals they have set and taken part fully in the world around them. It is the ability to define and achieve goals based on a foundation of knowing and valuing oneself (Field & Hoffmam, 1994). Self-determination involves knowledge of self and the environment, decision making, problem-solving, goal setting, personal advocacy, communication skills, self-control, and knowledge of how to interact with the environment to achieve desired outcomes. Self-determination instruction is based on the premise that students must acquire specific knowledge and have many opportunities to practice them.

Self-determination skills enable students with visual impairment to advocate effectively for their own needs goals. Self-determination is about the visually impaired ability to make decisions about their future including needs and wants (Wolffe & Rosenblum, 2014). The positive outcome of teaching

self-determination skills and self-directed and self-regulated behaviour are well documented (Wehmeyer, 2003; Deci & Ryan, 2008; Wolffe & Rosenblum, 2014). The concept of self-determination came into being as a result of disability rights of the 1970s. The focus was on the rights of people with disabilities including the visually impaired to self-govern, self-determined and advocate for them to have control over their destinies, work and community activities (Wolffe & Rosenblum, 2014 citing Nirje, 1972). Without structured self-determination skills, the visually impaired may be at risk of remaining dependent on others for life. Reed and Curtis (2012) stated that much has been written about the phenomenon "learned helplessness". It is associated with poor psychological well-being, passivity, depression and low self-esteem. Self- determination is the opposite of learned helplessness. Self-determination is one's ability to make choices and exercise control over life, to achieve goals, and to acquire skills and resources necessary to participate fully and meaningfully as an adult in society (Deci, & Ryan, 2008).

Wolffe (2012) and Wolffe and Rosenblum (2014) reiterated that researchers and practitioners in special education (specifically the education of the visually impaired) have identified six components of self-determination skills. Each component supports and controls the success of others. All the six components result in the achievement of self-determination and they include, self-knowledge, self-advocacy and empowerment, assertiveness, informed decision making, problem solving and goal setting and self-directed and self-regulated behaviour. Teaching students with visual impairment the critical skills that support self-determination is a major contribution to helping them learn how to make good decisions for themselves, solve problems and set

goals, speak up for themselves and communicate effectively and above all develop higher levels of self-esteem and self-confidence. Wolffe and Rosenblum (2014) concluded that should be concerned about the welfare of students need to provide opportunities for them to develop and practice these important life skills.

The visually impaired should have the ability to advocate for their needs, desires and to make independent choices about personal preferences and goals. Self-determination promotes independence and successful functioning in society and also as a valid predictor of future success (Hatlen, 2003; Tuttle & Tuttle, 2000). According to Hatlen the inability of the visually impaired to advocate for what they need can have a negative effect on their quality education outcome. As teachers of the visually impaired a common goal we all share for our students with visual impairments is for them to lead the highest possible quality of life. We must equip them with self-determination knowledge and skills they need to be empowered to achieve their chosen goal and insist on their rights as citizens.

Empirical Studies on Expanded Core Curriculum

Lohmeier (2005) is of the view specialised schools for the blind were the only options for educational programming available to students with visual impairments. Lohmeier (2005) said that throughout the 19th century and into the mid-20th century, the instruction in specialised schools consisted primarily of the core curriculum or academic areas. Current research suggested that specialized schools should provide instruction in both academic and specialized skill areas. The study examined whether specialized schools for students who are blind or visually impaired in the United States are including

the nine areas of the expanded core curriculum in their instructional programmes and whether they are doing it before, during, or after school hours. Recent research has supported the importance of the ECC and has investigated the current state of ECC instruction in the United States. The Council for Exceptional Children (2009) included all nine areas of the ECC in its list of the knowledge and skills that beginning teachers of students with visual impairments need. It included only the skills and knowledge that have been validated by research as valuable for the education of children with disabilities, thus indicating that the larger educational community recognises that all areas of the ECC are important for students with visual impairments.

Lewis, Savaiano, Blankenship, and Greeley-Bennett (2014) conducted an extensive review of existing literature to identify intervention research in three areas of the ECC for students with visual impairments: independent living skills, self-determination skills, and social interaction skills. The students with visual impairments often struggle to develop competence in these three areas without direct instruction, yet it is thought that they are critical for successful adult functioning (Lewis et al, 2014). Lewis et al summarised the results by the review of the ECC area. They found seven (30%) studies on independent living skills, six (26%) studies on self-determination, and ten (43%) studies on social skills. Additionally, they reported that single-subject multiple baseline designs were most commonly used, though many of the researchers failed to demonstrate experimental control through sufficient replications of their interventions to support causality. Based on the paucity of intervention studies, the authors concluded

that there are few research-based strategies to facilitate the development of skills in these three areas.

Wolffe and Kelly (2011) reported that the National Longitudinal Transition Study 2 (NLTS2) is a nationally representative, longitudinal database of high school and post-high school transition-aged youths with disabilities. The tools used in the data collection process included interviews with parents or guardians and with the youths; surveys of teachers, school programmes, and school characteristics; students' assessment histories; and transcripts detailing which courses the students had taken, the grades the students received, and the students' attendance records. The descriptive data pertaining specifically to measures of the ECC fell into two categories: youths with low vision and youths who are completely blind. The analyses indicated that there are numerous significant relationships between the receipt of instruction in ECC-like content areas and meaningful outcomes, such as employment, postsecondary training, and engagement in social activities.

Ringwalt (2013) investigated how the ECC was taught to high school students who are blind or visually impaired at the Indiana School for the Blind and Visually Impaired (ISBVI). The study focused on three students pursuing different academic tracks with varying degrees of vision. The students were observed throughout their school day and during the residential time. Following the students through the day brought to light the instructional strategies that the teachers used to assist them in mastering the components of the ECC. Differences were apparent between the components of the ECC taught in the classes where students were working towards a certificate of completion and classes where students were working towards a diploma.

Students who were working on a certificate of completion focused on independent living skills, recreation and leisure skills and social skills. Students working towards a diploma received more instruction in compensatory skills, visual efficiency skills, and assistive technology skills; the one ECC component that was consistently instructed to all students was instruction in orientation and mobility. Four themes emerged from the analyses of the observations and interview data: 1. the time needed to provide the instruction, 2. to whom does the responsibility fall for instructing students in the ECC, 3. the level of preparedness of students who attend ISBVI; and, 4. differences in opportunities for students in academic vs. life skills classrooms in ECC instruction.

Sapp and Hatlen (2007) surveyed the views of teachers of students with visual impairments and O&M specialists of the ECC, all the participants responded to open-ended questions with positive comments about the importance of the ECC in the lives of their students. Most of them discussed how the skills in the ECC prepare students for real life. Some went further, stating that when students master ECC skills, it is the difference between life and a successful life, and students who received high-quality instruction in the ECC have a richer quality of life than do those who do not. Some participants were even more passionate about the importance of the ECC by stating that, the ECC was everything and almost more important than academics. They therefore concluded that there was no point in reading, writing, and doing mathematics if you had no friends and could not get a job.

Kalra, Lauwers, Dewey, Stephelton and Dias (2007) reported that less than 3% of the 145 million blind people living in developing countries are

literate. This low literacy rate is partly due to the lack of trained teachers and the challenges associated with learning to write Braille on a traditional slate and stylus. These challenges included writing from right to left, writing mirrored images of letters, and receiving significantly delayed feedback. Extensive conversations with the Mathru School for the Blind near Bangalore, India, revealed the need for a robust, low-power, low-cost Braille writing tutor. The authors presented an interactive and participatory design process resulting in the creation and refinement of a prototype Braille writing tutor system. This system used a novel input device to capture a student's activity on a slate using a stylus and uses a range of techniques to teach Braille writing skills to both beginner and advanced students. The study reported on lessons learned from the implementation of this project and from a six-week pilot study at the Mathru School and outlined future directions for improvement.

Lohmeier, Blankenship, and Hatlen (2009) completed a survey of professionals' views about the national agenda for the education of children and youths with visual impairments, including those with multiple disabilities. They found that most respondents believed that teachers of students with visual impairments and O&M specialists were knowledgeable about the ECC and that most were committed to the need for assessment and instruction in all areas of the ECC. Unfortunately, they also found that most respondents did not believe that these professionals had the time to teach all areas of the ECC.

Sapp and Hatlen's (2007) national survey of 50 professionals who attended 16 university training programmes found that more instruction for preservice teachers in the ECC is currently provided than in the past. Students who graduated in the past 10 years, compared to students who graduated

earlier, rated their training higher in all areas of the ECC, with differences in scores on career skills, self-determination, social skills, and technology skills reaching significance ($p<.05$). Despite this improvement, all but two respondents listed suggestions for skills in the ECC for which they wished they had received more training: skills in specific areas of the ECC, ways to incorporate the ECC into the typical school day, applying the ECC to students with a range of visual and intellectual abilities, and incorporating the ECC into students' Individualised Education Programmes and lesson plans. The differences in responses indicated that some personnel preparation programmes are strong in preparing teachers for providing instruction in the expanded core curriculum.

Bell and Mino (2013) found that individuals who are legally blind or visually impaired in the United States have long suffered high rates of unemployment. The purpose of their study was to determine the current employment status of these individuals and to analyse its consistency with federal reports. The study also examined demographic factors, education, civic involvement, and rehabilitation experiences of this population in order to determine whether some of the factors could be identified as contributing to the employment outcomes. Results showed that the employment rate for individuals who are legally blind/visually impaired is 37%, which is consistent with previous research. Findings show that a gender gap still exists, with a significant difference in annual earnings between men and women. Education and rehabilitation-related factors seemed to impact employment outcomes; where higher educational attainment is associated with better employment outcomes. In addition, individuals who were trained under the Structured Discovery

approach were more likely to be employed and to have higher earnings than those who did not. Finally, for individuals who read braille on a weekly basis and used a white cane, the likelihood of being employed and receiving higher earnings was higher than those who did not use these tools.

Researching into the topic "Infusing the expanded core curriculum into physical education for children with visual impairment" Haegele, Columna, Lieberman, and Runyan (2014) discovered that for students with visual impairment to become independent and successful adults, they need specific instruction in addition to the school's general curriculum. They then added that the nine components of the expanded core curriculum must be embedded throughout the school day, including physical education courses that can promote the full potential of all students with visual impairment.

McDonnall, O'Mally, and Crudden (2014) investigated employers' knowledge about how persons who are blind or visually impaired performed typical job tasks (that is, use accommodations), how this knowledge relates to employers' attitudes about these individuals as employees, and where employers seek help with job accommodations. Businesses from four states were contacted by telephone to request participation; surveys were completed by 160 randomly selected businesses and 37 businesses referred by vocational rehabilitation agencies, yielding a total sample of 197. A 5-item instrument measured employers' knowledge about how blind or visually impaired persons complete typical job tasks, and an 11-item instrument measured employers' attitudes toward blind or visually impaired persons as employees. Results showed that the majority of employers (67%) could not identify how blind or visually impaired persons performed any of the typical job tasks. Employers

referred by vocational rehabilitation agencies were more likely to identify correct strategies that employers in the randomly identified sample. Knowledge levels were associated with attitudes toward blind or visually impaired persons as employees. Only 8.8% of the randomly identified sample cited an appropriate source of information about accommodations; 49.7% cited a secondary source and 41.5% were not able to identify an appropriate source. Most employers have limited or no knowledge about how blind or visually impaired persons perform routine job tasks. Those employers with greater levels of knowledge also had more positive attitudes toward blind or visually impaired persons as employees. It was encouraging that many employers were aware of an appropriate or secondary source of information about accommodations, and would, therefore, be likely to find such information if needed.

Lahav, Schloerb, and Srinivasan (2015) developed the BlindAid, a virtual system for orientation and mobility (O&M) training of people who are blind or have low vision, allows interaction with different virtual components (structures and objects) via auditory and haptic feedback. This research examined if and how the BlindAid that was integrated within an O&M training programme could be of help when teaching those who are blind or visually impaired to develop O&M skills. Using qualitative and quantitative methods, this research focused on 16 participants during their O&M course and studied virtual environment exploration and orientation tasks in virtual environments. Results showed that the encouraging results of the current study indicated the potential strengths of the BlindAid system as an O&M training device for visually impaired people. Follow-up research evaluating

transference of knowledge from virtual environments to real spaces could contribute to O&M training for people who are visually impaired.

Other studies on ECC in parts indicated that the visually impaired need to acquire all the skills in the expanded core curriculum to lead a normal life as much as possible (McDonnall, 2010; McDonnall, 2011; McDonnall, & O'Mally, 2012; Wolffe, & Kelly, 2011; Erickson, & Von Schrader, 2012; Ferrell, & Monson, 2011; Zebehazy, & Smith, 2011. According to these researchers the ECC is not just a curriculum but a way of life and a key to having a quality life for the visually impaired. The studies affirm the need to equip the visually impaired with all the skills of the expanded core curriculum.

In Ghana, no study known to the researcher had been carried out in assessing the competence level of the visually impaired on ECC. Studies so reported in Ghanaian literature were related to attitude (Kpodoe, 2012) and support (Owusu-Amoako, 2015). The study is therefore meant to fill the gap of the absence of research on ECC in Ghana.

Empirical Studies on Academic Achievement of Students

According to Eguavoen (2016), the problem associated with the academic performance of students with visual impairment has a number of indicators which have not received adequate attention from researchers in special education. He consequently examined the relationship between information and communication technology (ICT) utilisation on the academic performance of students with visual impairment in Lagos State. The objectives of the study were to identify ICT tools, level of ICT utilisation as well as their relationship to academic performance among students with visual impairment. Eguavoen used descriptive research design of correlational type, twenty-eight

students with visual impairment. They were selected using purposive sampling technique from two special schools located within Lagos state. A structured questionnaire was used to elicit information from the respondents and data obtained were analysed using descriptive statistics and Pearson product moment correlation statistics. Two research questions were raised while one hypothesis was generated and tested at .05 level of significance. The results indicated that there was a significant relationship between information and communication technology utilisation and academic performance of students with visual impairment in Lagos state ($r = .536$, $P < .05$). Based on the findings of the study, Eguavoen (2016) recommended that schools should adopt appropriate ICT tools that will enhance the academic performance of students with visual impairment and to include ICT training skills in the curriculum of special schools.

Verdier and Ek (2014) examined reading development, academic achievement, and support in school for six students with blindness or severe visual impairments in inclusive educational settings. School grades and results from reading observations and decoding skills tests were collected, and interviews were conducted with students, parents, and teachers. Results showed that the outcome of these students' schooling varied a great deal on both levels of academic achievement and reading development, as well as in the support needed and received. Students with additional disabilities had less positive experiences in school, and the parents of these students were more critical of the support provided by the schools. Important aspects of the outcomes concerned the attitudes held by school management and teachers and the competence of teachers. In some cases, teachers lacked sufficient

knowledge about braille and teaching methods for students with visual impairments.

Scott (2009) explored how fifteen students with blindness and visual impairments experienced their engagement in undergraduate studies at four 4-year universities and perceived their success. They also provided their understandings of the impact of institutions, faculty, staff, and others on their academic success. Previous literature suggested that students with blindness and visual impairments, as well as students with other disabilities, were academically successful in college because of institutional support and the positive attitude of faculty and peers (Baggett, 1994; Branker, 1997; Enberg, 1999; Fichten, 2005; Roy, 2000 cited by Scott, 2009)). Findings from this study demonstrated that participants' understandings and experiences with blindness varied and their subsequent adjustment and transition also differed. Participants described several factors that facilitated the creation of positive educational experiences during their undergraduate programmes: positive exposure to a new region of the country, positive peers, supportive departments and professors, financial opportunities, and welcoming and diverse campus environments. As these students transitioned to the university, they utilised accommodations and services provided by Disability Students Services (DSS) to facilitate their access to the academic environment. The undergraduate students also described challenging experiences, including feeling academic discrimination, a sense of isolation, limited campus accessibility, and peer interaction issues. There were other support systems that facilitated participant academic success, such as mentors, family, administrators, and staff. This study concluded that blind and visually

impaired undergraduate students were more likely to succeed academically when they felt a sense of connectedness with the university academic system. DSS is most responsible for facilitating that connectedness. Quality contact and collaboration with faculty were also important, as well as the attitudes of faculty, administration, and staff. The disconnectedness between study participants and the university system was fostered through inflexible bureaucratic procedures; the attitudes of faculty, staff, and administrators; and isolation from peers.

Chapter Summary

Compensatory access skills are critical to both the long and short-term success of the students. The skills allow students with visual impairment to obtain information about the world around them. At school, compensatory access skills permit access to core curriculum; at home and in the community. Through systematic planning, assessment, and sequential instruction by teachers of students with visual impairments, students can be equipped with the skills to develop concepts about the world and to obtain and share information with others. Ultimately, well-developed compensatory access skills allow students with visual impairments to be independent, successful individuals and so form the foundations for active participation in school, work, and life.

Efficient use of all sensory systems is essential to the development of students with visual impairment. It is about how the visually impaired receive, transmit and interprets information about people, objects, and events in the environment. Efficient acquisition of sensory information is required throughout life. Without active exploration, sensory skills do not develop and

also without active exploration using sensory skills, understanding of the world does not develop.

Assistive technology focuses on the knowledge and skills that are essential to learning and technology to access all aspect of daily living, whether at school, at work, at play or at rest. Technology has become a fundamental part of everyday living. Through using assistive technology the visually impaired can live, work and play with greater independent access to the surrounding world.

Orientation and mobility is about the concepts and skill necessary to get from one place to another safely and efficiently. It is critical for students with visual impairment to become familiar with the concepts and skills in order to effectively travel as independently as possible in the home, school, and community environments. Orientation and mobility is a key area of the ECC for individuals with visual impairment to develop the highest level of independence, and high expectations need to be reinforced and opportunities to apply orientation and mobility skills need to be provided at home and in the community. It is, therefore, necessary for them to receive the essential orientation and mobility instruction they require, practice the skills in a variety of environments and apply these skills not only in schools but also in the greater community and far into the future in their college, work and living environments.

The independent living area of the ECC addresses activities necessary to take care of one's self, family, and home and to live as independently as possible. The independent living skills enable the visually impaired to take care of themselves and others as they meet the demands of everyday life. In

fact instruction in independent living, skill is an integral part of education for students with visual impairments. The ultimate goal for these students is to achieve the highest level of independence as possible and to feel confident and happy with themselves. Even though arguably, independent living skills are more valuable than academic skills. Students who struggle academically still need to maintain their appearance, nourish their bodies and keep their living space safe and clean.

For students with visual impairment to be socially successful, they need to develop a social presence. That is showing interest in others, experiencing a variety of activities that involve risk taking and decision making, demonstrating a repertoire of social behaviours that promote positive interaction with others. Socially competent students with visual impairments understand that social skills facilitate friendship and promote positive relationships with peers and adults. Students with visual impairments may be subject to isolation from classmates and friends and have difficulty maintaining employment or living independently as adults. When students receive consistent messages about their social performance, use the skills and strategies they learned and experience clear and realistic expectation, they demonstrate a strong social presence and develop a sense of self-worth (Sacks, 2014). Those who have a strong social presence take responsibility for their actions. They feel confident and comfortable with themselves and have a sense of humour and can laugh at themselves when social mistakes are made.

Without the skills of the ECC, individuals with visual impairment cannot organise their environment or develop concepts that are important in understanding how things are connected in their world. Students who are

visually impaired need to access this information through direct experiences and hands-on, tactile exploration provided by a qualified professional who understands the significance of and strategies for addressing these unique needs. Accessing mandatory curriculum that is presented to all students in a public school classroom is problematic for students with visual impairment. In order to participate fully within this educational environment students who are visually impaired require instruction in disability-specific or compensatory skills such as Braille literacy skills, assistive technology skills, use of low vision devices, social interaction skills, independent living and personal management skills and orientation and mobility skills. This disability-specific curriculum for children and youth who are visually impaired is known as the ECC. Access to instruction in the skills outlined in the ECC is essential for the visually impaired and the ECC is not just a curriculum but it ensures the successful life of the visually impaired and without it the visually impaired is hopeless and helpless.

CHAPTER THREE

RESEARCH METHODS

Introduction

It is generally accepted that the quality of any research project hinges on gathering relevant information that would be used to solve a stated problem. The quality of these processes determines the validity and reliability of data collection and the results obtained (Willington, 2000). To achieve this, systematic methods and instruments of collecting information for this study were adopted. The chapter presents the methodology for the study and it focused on research design, population, sample and sampling techniques, instrument, and data collection procedure and data analysis.

Research Design

Maxwell (2012) viewed a research design as a preconceived plan or programme that guides the researcher to collect, analyse and interpret data. A research design is a framework for the collection and analysis of data, choice of research design reflects decisions about priority being given to a range of dimensions of the research process (Bryman, 2012). According to Jonson (2008), research studies are designed to obtain information concerning the current status of phenomena.

The study is to explore the competence in the use of use of the ECC and academic achievement of students with visual impairment in public universities in Ghana. Seidu (2006) described the descriptive design as the study of an existing condition, prevailing view points, attitudes, ongoing processes and developing trends in order to obtain information that can be analysed and interpreted to come up with a report of the present status of

subject or phenomenon under study. This design is suitable because it gives an in-depth description of the phenomena in their existing setting and also economical in collecting data from a large sample with high data turn over (Kothari, 2004). The descriptive research design is a scientific method which involves observing and describing the behaviour of a subject without influencing it in any way. Descriptive research is again designed to obtain information on current status of a phenomenon and draws a conclusion from the facts discovered. Kothari again noted that the facts received from descriptive research can result in the formulation of significant principles of knowledge and provide solutions to local, national and international burning issues.

According to Koul (2009), descriptive research can involve measurement, classification, analysis, comparison, and interpretation. It collects three types of information which include what is in existence, comparing what exists with the norm or desirable, and how to achieve goals. Even though descriptive research is considered primitive, it is able to provide information to solve problems and at times provide data to form the basis of another research (Koul, 2009). Descriptive research actually involves events that had happened and are related to the current happenings. Descriptive research varies greatly in complexity. At one instance, it constitutes frequency account of events to study of local problems without any significant research purpose. At another instance, they attempt to ascertain significant interrelationships among phenomena (Koul, 2009).

Research Approach

There are three common paradigms in social science research which are positivism, interpretivism and pragmatism (Babbie, 2011; Creswell, 2009; Neuman, 2014). Positivism is acknowledged as the key paradigm that guides quantitative inquiry; it is linked to the natural sciences (Neuman 2014). Neuman added that positivism focuses on discovering causal laws, careful empirical observations and value for free research.

Interpretivism attempts to deal with the issue of human complexity by exploring it directly (Polit & Beck 2003). Williamson (2013) described interpretivism as an approach that is linked to the neutralistic inquiry. Neuman (2014) described interpretivism as the systematic analysis of socially meaningful action through the direct detailed observations of people in natural settings to arrive at understandings and interpretations of how people creates and maintain their social worlds. This is the paradigm that guides qualitative inquiry.

The main goal of a researcher in interpretivism is to rely as much as possible on the participants' views of the situation being studied. Interpretivism also emphasises the inherent complexity of humans and their ability to shape and create their own experiences and the idea that truth is a composite of realities (Polit & Beck, 2003). Studies located in the interpretive paradigm allow researchers to access the experiences and viewpoints of the research participants (Kusi, 2012). Interpretivism seeks to generate theory and therefore it is also termed as constructivism (Creswell, 2009). Creswell added that researchers in qualitative studies seek to understand the context or setting of the participants through visiting this context and gathering information

personally. Creswell (2013) suggested that it is important to conduct a study in the field where participants live and work to understand what they are say. Creswell (2013) further added that procedures of the interpretivism paradigm are characterised as inductive, emerging and shaped by the researcher's experience in collecting and analysing data.

Pragmatists are in a position which argues that it is possible to work with both positivism and interpretivism positions (Saunders, Lewis, & Thornhill, 2009). Baert (2005) reiterated that cognitive aims of social investigation include the critique of society (which ties in with self-emancipation or the lifting of past restrictions), understanding (which comes down to the attribution of meanings to texts or practices). Pragmatism offers an epistemological justification (that is via pragmatic epistemic values or standards) and logic (that is, it uses the combination of methods and ideas that help one to best frame, address, and provide tentative answers to one's research questions for mixing the approaches (Johnson, Onwuegbuzie, & Turner, 2007).

The pragmatist worldview focuses on the consequences of research, the primary importance of questions asked rather than the methods and multi-methods of data collections that inform the problems under study. Thus, pragmatism is pluralistic and oriented toward what works in practice (Creswell, & Plano-Clark, 2007; Feilzer, 2010). Feilzer added that pragmatism allows the researcher to be free of mental and practical constraints imposed by the forced dichotomy between positivism and constructivism. Creswell (2009) states that pragmatism opens the door to multiple methods, different worldviews and different assumptions, as well as different forms of data

collection and analysis. In this case, the main focus is the research problem and how best to get the solution for this problem. When one paradigm cannot sufficiently attain the desired results, the strengths of the two paradigms are combined. Romm and Ngulube (2015) explained that bringing together both quantitative and qualitative research so that the strengths of both approaches are combined leads to a better understanding of the research problem than either alone.

Positivist researchers on the other hand generally aim at answering questions about relationships among well-defined concepts with the purpose of explaining, predicting and controlling phenomena (Cecez-Kecmanovic, & Kennan, 2013). Positivism believes that the world is a fixed entity whose mysteries are not beyond human comprehension, thus their findings are always quantitative, statistically significant and generalizable (O'Leary, 2004). As a result, findings are quantifiable and communicated numerically. Positivism also reflects a deterministic philosophy which causes and probably determines the effect or outcomes (Creswell, 2014). Thus, the problems studied by the post-positivists reflect the need to examine the causes that influence outcome such as issues examined in experiments (Creswell, 2014). Positivism is associated with experimental, design, social surveys and questions. These methods are normally used in studies focusing on theory verification, determination, empirical observation and measurements. According to Cecez-Keemanovic and Kennan (2013) the aim of the positivist researchers is to discover a set of laws that can be used to predict general patterns of human behaviour. The studies located in the positivist paradigm argue that research should be objective, free of value, research question driven

and measurable.

From the explanation of positivist, interpretive and pragmatist paradigms, the positivist paradigm would be selected for the study because the researcher wants to explore the relationship between competence in expanded core curriculum and academic achievement of students with visual impairment in public universities in Ghana. The researcher decided to use positivist paradigm where data are collected and tested scientifically for objectivity means. Again, the research was able to discover regularities and causal laws so that people can explain, predict and control events and processes.

Quantitative data analysis is a powerful research form, emanating in part from the positivist. Again, quantitative research involves theory or hypothesis testing, deduction, confirmation, explanation, prediction, standardised data collection, statistical analysis and it is generally large scale (O'Leary, 2009; Johnson & Onwuegbuzie, 2004). Quantitative research results in findings that could be generalised to the population from which the sample was selected (Johnson & Onwuegbuzie, 2004). This is because it uses probability or random sampling which allows tests of statistical significance from which inferences can be made (Bryman, 2012). Also, quantitative research tends to be more objective as the researchers adopt this approach in order to understand the facts their data present to them (Johnson & Onwuegbuzie, 2004). Their objectivity may be a result of the little or no contact they have with their research participants. The advantage here is that the researcher would be more objective as he/she would have no emotional involvement with the participants.

In this study, the researcher collected and analysed the data quantitatively. The purpose of the quantitative data was to provide a numeric description that may be generalised to the population. Specifically, the quantitative findings were important because they helped generalise the state of education based on the ECC students with visual impairment. The researcher used the quantitative survey results to understand the relationship between the competence in the ECC and the academic achievement of students with visual impairment in public universities in Ghana.

Study Areas

In Ghana, there are four universities which admit students with visual impairment, these are University of Ghana (UG), Kwame Nkrumah University of Science and Technology (KNUST), University of Cape Coast (UCC) and University of Education, Winneba (UEW). At the time of this study, KNUST had only one student with visual impairment. Two universities (UCC and UEW) were selected for the study because of proximity. UG was used for the pilot-testing of the instruments.

As indicated earlier, the study was conducted at the University of Cape Coast, Cape Coast and University of Education, Winneba. Both universities are located in the Central Region of Ghana, West-Africa. UCC was established in 1962 as a university college. It became a full university in 1971 and at the time of the study, the student population was 74,549. The University of Cape Coast started the admission of students with visual impairment in 1979/1980 academic year with three students. In the same year, the university established a Resource Centre for the Visually Impaired (RCVI) to cater for their special needs. Through the collaboration between Special Education

Division of the Ghana Education Service (GES) and the University, GES formerly posted resource persons, to cater for the unique needs of the students with visual impairment to the University. The Centre is found at the basement of the Sam Jonah Library of the University. The Centre had been renamed as Resource Centre for Alternative Media and Assistive Technology (R-CAMAT) in 2012. At the time of the research, the R-CAMAT had 30 students with visual impairments and staff strength of 10, of which four were resource persons for the visually impaired.

The University of Education was established as a result of the amalgamation of Teachers Diploma Institutions in Ghana in 1992 and it was affiliated to UCC. It became a full-fledged University in 2002. College of Special Education, which became part of the amalgamated institution admitted students with visual impairment and became a department under the University. The admission of students with visual impairment into the UEW, therefore, continued with the related services. A resource centre for the visually impaired was established to provide special services for the students with visual impairment. At the time of the research, the university had 63 students with visual impairment and six resource persons.

Population

Mugenda and Mugenda (2003), defined population as an entire group of individuals, events or objects with some observable characteristics. Best and Khan (1993) similarly referred to the population as "a group of individuals or people that have one or more characteristics in common that are of interest to the researcher" (p.13). There are two types of population in research and these are target population and accessible population. Target population refers

to the entire group of individuals or objects to which researchers are interested in generalising the conclusions. The accessible population is the subset of the target population and it is the population that researchers draw their sample and apply their conclusions (Krause & Corts, 2012). The target population for the study was the students with visual impairment and their resource persons of the University of Cape Coast and the University of Education, Winneba. The accessible population was the students with visual impairment (the blind and the low vision) and the resource persons for students with visual impairment at the two universities. The student population was 93, (63 from UEW and 30 from UCC) and the resource persons were 10 in number (four from UCC and six from UEW).

Sample and Sampling Procedure

The quality of any research depends not only on the appropriateness of methodology and instrumentation, but also on the suitability of the sampling strategy that is adopted (Cohen, Manion, & Morrison, 2011). The sample was chosen from the study population that is commonly referred to as the 'target population or accessible population' (Burns, & Grove, 2003, p.23). Purposive sampling was used for the study. According to Merriam (1998), "Purposive sampling is based on the assumption that one wants to discover, understand, gain insight; therefore one needs to select a sample from which one can learn most" (p. 48). Patton (2015), added that the purposive sampling involves studying information-rich case in-depth and detail to understand and illuminate important cases rather than generalising from a sample to a population.

Purposive sampling was used to select the students with visual impairment.

The total sample was 93, which consisted of 63 students from UEW and 30 were from UCC. According to Cooper and Schindler (2000, p. 164), census survey involves the use of all members in any population of interest. They stated that a "census is feasible when the population is small". Based on the size of the population, the researcher used census technique to include all the students with visual impairment. The quantitative method was used because the researcher wanted to have a fair statistical inference that could help generalise the findings to the public.

Data Collection Instrument

After examining the research hypotheses and nature at which the researcher wanted to make in-depth analysis to the issue, it called for Likert scale type questionnaire.

Questionnaire

A questionnaire is a device which consists of a series of questions dealing with psychological, social, and educational topics given to an individual or a group of individuals with the objective of obtaining data with regard to some problems under investigation. Barr, Davis, and Johnson (as cited by Koul, 2009) defined questionnaires as a systematic compilation of questions that are administered to a sample of a population from which information is desired. A questionnaire was chosen because of its ''ability to reach respondents who live at widely dispersed addresses'' and the ''low cost of data collection'' associated with it (Oppenheim, 1992, p.102). In the quest

of developing the instruments, the existing literature was taken into consideration.

The questionnaire for students with visual impairment (see Appendix A) was made up of 59 items. All of the items were close-ended and they were designed on a six-point Likert scale format. The six-point Likert scale was scored as; "Never" =0, "Rarely" =1, "Sometimes" =2, "Often" =3, "Very often" =4 and "Always" =5. The questionnaire was divided into twelve (12) sections. Sections A and B contained four and ten items, respectively, Sections C to K contained five items each, while Section L addressed one major item with sub-items. Section A elicited demographic information on the respondents and Section B collected information on respondents' knowledge about ECC. Section C elicited information on the competence of students with visual impairment in compensatory access.

Section D dwelt on the competence of students with visual impairment in sensory efficiency. Section E elicited information on the competence of students with visual impairment in assistive technology. Section F was designed to solicit information on the competence of students with visual impairment in orientation and mobility. Section G considered the competence of students with visual impairment in independent living. Section H looked for information on the competence of students with visual impairment in social interaction. Finally, Section I elicited information on elements of the ECC which impacts most on the academic achievement of students with visual impairment.

Pilot-Testing of Instrument

The instruments were pilot-tested at the University of Ghana. The university educates students with visual impairment. It was therefore justifiable in using them for the pilot-testing of the instruments. The students possessed the same characteristics as the sample of the study. They had completed both basic and secondary education and the researcher, therefore, assumed that they were supposed to possess the skills of the expanded core curriculum and were supposed to make use of them in their education at the university. The pilot-testing of the instruments helped to ensure that the final instruments were devoid of ambiguity (Cohen et al., 2004; Sommers, & Sommers, 2002; Morrison, 1993; Oppenheim, 1992).

In fact, the wording of questionnaire is of paramount importance and that pilot-testing of the instrument is crucial to their success. A pilot-testing of the instrument has several functions, principally to increase the reliability, validity, and practicability of the questionnaire (Cohen, Manion, & Morrison, 2011). Pilot-testing was carried out on the instruments to determine their appropriateness before using them for the main study. This was done to identify questions on the questionnaire that respondents might have difficulty understanding or interpreting as intended. In order to validate the reliabilities of the various instruments, as stated earlier, a pilot-test was conducted in the University of Ghana. In all, 30 respondents were selected for the pilot-test. Those who were selected possessed the same characteristics as the sample of the study.

Again, it was done to ensure that instructions and questions on the items were clear and also devoid of misleading items. Also, those that were

not related to the research questions were corrected before the final administration. The pilot-testing of the instrument helped the researcher to obtain information on the general layout of the instrument. Finally, the pilot-testing of the instruments offered the researcher the opportunity to identify redundant and commonly misunderstood questions as well as to try out the coding and classification system for the data analysis. Example of items that were modified include "I use my sense to acquire information" was changed to "I use my auditory sense to acquire information." "I am able to maintain my safety" was restructured as "I am able to maintain my safety and wellbeing." "I go to lectures always" was modified as "I am regular and punctual at lectures." The information obtained from the respondents was used to build more refined instruments for the collection of data. Cohen, Manion and Morrison (2011) quoting Oppenheim (1992) remarked that everything about the questionnaire should be piloted; nothing should be excluded not even the face or the quality of the paper.

Validity and Reliability of the Instruments

The idea of validity hinges on the extent to which research data and the methods of obtaining the data are deemed accurate, honest and on target. Practically, the validity of an instrument is assessed in relation to the extent to which evidence can be generated in support of the claim that the instrument measures the attributes targeted in the proposed research (Dambudzo, 2009). Validity is defined as ''the appropriateness of the interpretations, inferences, and actions that we make based on test scores'' (Johnson & Onwuegbuzie, 2004, p.140). They suggested that, in ensuring validity, we must ensure that the test measures what it is intended to measure, for the particular group of

people and for the particular context, and also the interpretations that are made based on the test scores are correct. As a result, Hair (2005), opined that validity refers to how well the concept is defined by the measure.

Reliability, on the other hand, refers to "the consistency or stability of the test scores'' (Gay, Mills & Airasian, 2009; Hair, 2005; Johnson & Onwuegbuzie, 2004). This means that the assessment tool would yield the same or almost the same scores any time it is administered to the same individual or group.

According to Vanderpuye (2013) there are several ways of determining the reliability of an instrument, for example, there is the split half, test re-test, alternative form methods and the internal consistency method. The Cronbach's alpha is estimated to be the most widely used method for estimating the internal consistency of an instrument (Kimberlin & Winterstein, 2008). Kimberlin and Winterstein (2008), reported that it is used for summated scales or Likert scale items. Since the questionnaires were predominantly Likert scale type and the researcher wanted to estimate the internal consistency of the instruments, the Cronbach's alpha was deemed the best method to estimate the reliability of the instrument. The Cronbach's alpha has a correlation coefficient ranging in value from 0 to 1. The closer a reliability coefficient value is to 1, the more reliable the test, while the closer the reliability coefficient value is to 0, the less reliable the test (Gay et al., 2009).

After the data had been collected, it was cleaned, coded and processed with the use of Statistical Package for Social Sciences (SPSS. Version. 23). Cronbach's Alpha (α) was computed to determine the reliability coefficient.

According to Fraenkel and Wallen (2000), a reliability coefficient of .86 or better is acceptable.

The Alpha value obtained was .780 (number of items = 30), therefore the instrument was judged to be reliable and acceptable for collecting useful data for the study. In order to determine the reliability of the sub-section on the questionnaire, Cronbach Alpha was computed for each of the variables (basically on the ECC skills). Table 1 shows the reliability of the sections measured on the questionnaire.

Table 1: Reliability Coefficient for Each of the Variables

Study Variables (Skills)	Reliability Coefficient (α)
Compensatory Access	.721
Sensory Efficiency	.734
Assistive Technology	.875
Orientation and Mobility	.771
Independent Living	.765
Social Interaction	.812

Source: Field data, (2017)

Validity ensures that inferences based on collected data are accurate and meaningful. It is necessary to have experts examine the instrument items and judge their representativeness (McMillan & Schumacher, 2001). The instruments were therefore given to PhD colleague students in the field of Special Education for their inputs and comments to improve the face validity.

To further refine the questionnaire, the supervisors and experts in the Department of Education and Psychology went through each item on the questionnaire to evaluate their relevance to the objectives of the study. Extra

sheets of paper were added to the questionnaire for supervisors and other experts to pass comments on the clarity, weaknesses, inadequacies, ambiguities, and problems on all aspects of the items in the instrument. As a result of such comments, statements felt to be ambiguous or misleading or redundant were either removed or revised for clarity. The refined instruments were pilot-tested at UG for the main study.

Ethical Considerations

In social research, consideration for moral issues and respect for participants is essential. In this research, several ethical issues were taken into consideration. The research addressed some ethical concerns which include informed consent, anonymity, and confidentiality. Informed consent affords prospective participants the opportunity to accept or decline to engage in the research. It describes the need for participants to understand the aims, objectives and potential harm that such involvement may have on them (Seidman, 2006). In this study, the purpose of the study was carefully reviewed with the participants before they were involved in the study.

The anonymity of study respondents was also highly taken into consideration in the study. Oliver (2010), pointed out that anonymity is a vital issue in research ethics because it gives the participants the opportunity to have their identity concealed. Neither names nor any identifiable information from respondents was taken as a way of ensuring the ethical principle of anonymity. This was to prevent possible victimisation of respondents where certain responses may be viewed as unpalatable to other stakeholders.

Again, the effort was made to maintain the confidentiality of the responses of the participants. Participants were told that their responses would

be kept confidential and that no one known to them would have access to the information provided and none of the respondents' names were recorded in the study. Most essentially on the ethical issues, information that was cited from previous studies and books were duly acknowledged through both citations and references in order to avoid academic dishonesty. In order to deal with ethical issues like confidentiality, anonymity, consent, privacy, freedom of withdrawal and debriefing, the researcher applied for ethical clearance from Institutional Review Board, University of Cape Coast. An introductory letter was also collected from the Department of Education and Psychology to grant the researcher access to the resource centres of the universities.

Data Collection Procedures

The questionnaire was delivered by hand to the resource persons at the centres who were trained to administer the questionnaire to the students with visual impairment. Two working weeks interval was given for the questionnaire to be completed. After the two weeks, the researcher made a follow up to collect the answered questionnaire. The researcher conducted the interview and spent an average of time of 20 minutes for each resource persons of the visually impaired. The tape recorder was used to record the responses given by the interviewees after the research had sought permission from the authorities. The tape-recorded interview was transcribed verbatim. The researcher did the observation himself and wrote down the information himself. Again, academic transcripts of students who are visually impaired were collected from the universities. The researcher spent ten working days in all to collect the data.

Data Processing and Analysis

After data had been gathered, the data was processed and managed by coding the data, editing the data where appropriate, entering the data into the appropriate software (Statistical Package for the Social Sciences, version 23) to generate results and finally cleaning the data to remove any forms of mistakes that might have gone unnoticed.

Descriptive statistics was employed to analyse the background information because it was deemed suitable for meaningful interpretation, conclusions, and recommendations of data. Also, since the research design of this study is a non-experimental, explanatory, cross-sectional design (Jonson, 2008) multiple regression analysis was used to measure the relationships of the predictive variables of the nine components of the expanded core curriculum, and the dependent variable (academic achievement of students with visual impairment). Multiple regression was used to analyze data to answer the research question. The students' scores were obtained from Students Records Sections of the two Universities. The scores served as the dependent variable where the independent variables (elements of the ECC) were computed against the scores.

The researcher chose to use a multiple regression analysis because, according to Field (2009), "regression analysis enables us to predict future (outcomes) based on values of predictive variables" (p. 198). The multiple regression was also used to determine the overall fit (variance explained) of the model and the relative contribution of each of the predictors (competence in elements of ECC) to the total variance explained in the criterion variable (academic achievement of the visually impaired).

In addition, regression analysis is an efficient means of gathering data without introducing threats to reliability that can occur with other data collection means (Suskie, 1996 cited in Draper & Smith, 2014). This is because the researcher found out which of the elements of the ECC contributed most to the academic performance of the students with visual impairment. In addition, the one-way between-groups multivariate analysis of variance (MANOVA) was used to analyse data for the research hypothesis one in order to determine the influence of ECC on academic achievement.

The rest of the data for the research hypotheses two, three, four, five, six, and seven were analysed using Pearson Product Moment correlation to test the relationship between the nine elements of ECC and the academic achievement of students with visual impairment. Pearson Product moment correlation is the most appropriate correlation coefficient to use when the variables involved in the study are continuous. Pearson correlation was used to examine the relationship between elements of ECC and the academic achievement of the students who are visually impaired. Pearson's correlation coefficient (r) was used to measure the strength of the association between the two variables.

Chapter Summary

The study was designed to explore the relationship between competence in the ECC and academic achievement of students with visual impairment in public universities in Ghana. The data were generated from the students with visual impairment using questionnaire. The items for the questionnaire were generated from the research literature. In this chapter, the methodology and design of the research were outlined. The discussion of the

approach to data collection and analysis were also looked at. In addition to that, the trustworthiness of the study was discussed.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The chapter presents the analysis and interpretation of the findings of this study. The purpose of the study was to explore the relationship between competence in the expanded core curriculum and academic achievement of students with visual impairment in public universities in Ghana. The analysis and interpretation of data were carried out based on the results of the seven research hypotheses and one research question set for the study. The analysis was based on the 100% return rate data obtained from 93 respondents selected for the study. The quantitative data were analysed using inferential statistics (The one-way between-groups multivariate analysis of variance (MANOVA), Pearson product moment correlation and linear multiple regression) and descriptive statistics (means, standard deviations, frequencies, and percentages). The first part of this chapter describes the demographic characteristics of the respondents. In the second part, the research findings are presented based on the research hypotheses and the research question formulated for the study.

Description of Respondents

This section discusses the background information of the respondents. These include the respondents' age, sex, and programmes. Table 2 shows the distribution of the respondents by age.

Table 2: Distribution of the Respondents by their Age

Variable	Subscale	Freq.	Percent %
Age	18-20	10	10.7
	21-23	34	36.6
	24-26	40	43.0
	27+ years	9	9.7
Total		93	100.0

Source: Field Data, (2017)

Table 2 shows the distribution of the respondents by their age. From the table, the majority of the respondents were between the ages of 24-26 (n=40, 43.0%). The students who were above 27 were the least (n=9, 9.7%). This demonstrates that majority of the students with visual impairment were 24 years and above.

The gender of the students is presented in Table 3.

Table 3: Distribution of the Respondents by their Sex

Variable	Subscale	Freq.	Percent %
Gender	Male	59	63.4
	Female	34	36.6
Total		93	100.0

Source: Field Data, (2017)

From Table 3, it is clear that male students formed the majority with (n=59, 63.4%) while (n=34, 36.6%) were females. This means that more males with visual impairment were being educated in the universities than females with visual impairment.

The levels of the students are presented in Table 4.

Table 4: Distribution of the Respondents by their Levels in the University

Variable	Subscale	Freq.	Percent %
Levels of Students in the University	100	30	32.3
	200	19	20.4
	300	29	31.2
	400	15	16.1
Total		93	100.0

Source: Field Data (2017)

Table 4 illustrates the results on the distribution of the respondents by their levels in the University. Majority of the respondents were in Level 100 (n=30, 32.3%) and the least were in level 400 (n=15, 16.1%). However, the majority of the respondents used for the study were at levels 100 and 300 with a total of (n=59, 63.5%) students.

Table 5 presents the information on the knowledge of the students in expanded core curriculum

Table 5: Distribution of the Respondents' Knowledge in ECC

Variable	Subscale	Freq	Percent %
Knowledge in ECC	Yes	71	76.3
	No	22	23.7
Total		93	100.0

Source: Field Data, (2017)

The results from Table 5 show that majority of the students (n=71, 76.3%) had knowledge about the term "expanded core curriculum" while few of them (n=22, 23.7%) confirmed not to have heard the term. The term

expanded core curriculum is fairly new even though the components or elements of it had been with the training of the blind from time immemorial.

The expanded core curriculum (ECC) is used to define concepts and skills that are typically learned incidentally by sighted students and that must be sequentially presented to students who are visually impaired because of lack of vision (Spungin, & Ferrell, 2007). An ECC may include needs that result from the visual impairment to enable the students to be involved and to make progress in the general education curriculum (Ferrell, 2011). The presence of visual impairment requires that these skills be thoroughly evaluated and systematically taught by teachers with specialised expertise (Allman, & Lewis, 2014). Without specialised instruction in ECC, students with vision loss may not be aware of the activities of their peers or acquire other critical information about their surroundings (Wolffe, Sacks, & Corn, 2000).

Guerette (2014) stated that the alternative means to have access to the general curriculum is the expanded core curriculum (ECC). The elements of ECC are the foundational skills without which students with visual impairment cannot participate successfully in school, at work and daily life in general. This demonstrates that the students with visual impairment were making use of the elements of ECC in their education. However, a few of them were familiar with the term "expanded core curriculum".

Table 6 presents the levels at which respondents studied expanded core curriculum (ECC).

Table 6: Distribution of the Levels at which Respondents Studied ECC

Variable	Subscale	Freq.	Percent %
Levels	Basic	47	50.6
	Secondary	27	29.0
	Both Levels	19	20.4
Total		93	100.0

Source: Field Data, (2017)

From Table 6, the majority of the respondents studied the ECC at the basic level (n=47, 50.6%). This was followed by the secondary level (n=27, 29.0%). Both Levels recorded the least count (n=19, 20.4%). The statistics show that majority of the students with visual impairment studied the elements of the expanded core curriculum at the basic level. This explains why the expanded core curriculum is seen as a catalyst to the education of the visually impaired. From the onset of their education, they have to study the expanded core curriculum.

Hatlen (1996) had expressed similar views. She had stated emphatically that in order to participate fully within the educational environment, students who are visually impaired require instruction in the expanded core curriculum. This means that the teaching of ECC should start from the basic level and it justified why the majority of the respondents were taught the ECC at the basic level. Koenig and Holbrook (2000), were also of the view that it is essential for students who are visually impaired to develop competence in the expanded core curriculum. This can help them to reach their potential to live independently, have appropriate career opportunities and to live rewarding, dignifying and fulfilling lives. Students with visual

impairment are expected to possess the skills of the expanded core curriculum before entering any tertiary institution so as to cope with all educational activities including academic achievement. The teaching of ECC should be continuous and should be taught from basic through secondary to the tertiary for students with visual impairment to be competent.

Main Results

The analysis of the main data is organised in line with the research hypotheses and the research question that guided the study.

Research Hypotheses One

$H_0 1$: *The level at which students with visual impairrment are taught the expanded core curriculum does not influence their competence.*

$H_A 1$: *The level at which students with visual impairment are taught the expanded core curriculum influences their competence.*

To achieve the purpose of the study, the researcher tested the hypothesis that the level at which expanded core curriculum is taught to students with visual impairment does not influence their competence. The one-way between-groups multivariate analysis of variance (MANOVA) was used for the analysis. However, prior to conducting the MANOVA test, certain statistical assumptions were established. This includes normality assumption (Kolmogorov-Smirnov[a] and Q-Q Plot), and test for homogeneity of variance.

Table 7 presents a test for the assumptions.

Table 7: Normality Test Results of the Variables

Levels	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Basic Level	.163	47	.003	.915	47	.652
Secondary	.258	27	.000	.866	27	.062
Both Level	.149	19	.200*	.928	19	.156

Source: Field Survey (2017) *Significant, p<.05

Table 7 presents results of the normality of the data. The Shapiro-Wilk was reported because it handles data with larger sample size (N> 50). The Shapiro-Wilk produced a statistic of (t= .915, n=47, p>0.05, Sig. =.652) for basic level, (t= .866, n=27, p>.05, Sig. =.062) for secondary level and both levels produced a statistic of (t= .928, n=19, p>0.05, Sig=.156). From the Shapiro-Wilk results, all the levels produced a sig value greater than the p-value of 0.05 implying that the data was normal. Having tested for the normality, it is appropriate to run the one-way between-groups MANOVA test.

This hypothesis was tested with the Multivariate Analysis of Variance (MANOVA), given that there are three categorical levels of the independent variable and six related dependent measures of the expanded core curriculum.

The Box's test of equality of covariance matrices of the dependent variables across groups (Table 8) shows that the variances were not equal, F (21, 4580.21) = 2.48, P < .001).

Table 8: Box's Test of Equality of Covariance Matrices[a]

Box's M	60.179
F	2.478
df1	21
df2	4580.212
Sig.	.000

Source: Field Survey (2017) *Significant, p<.05

The Pillai's Trace statistics have been reported because of the non-equality of covariance across groups. The results showed a significant multivariate effect of the level at which the ECC were taught [$F(12, 172) = 2.05$, $p < .023$, $\eta^2 = .125$].

Table 9: Multivariate test of Effect of Levels at Which ECC was taught on Acquisition of Competencies

Effect		Value	F	Hyp df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.961	346.718	6.0	85.0	.000*	.961
	Wilks' Lambda	.039	346.718	6.0	85.0	.000*	.961
	Hotelling's Trace	24.474	346.718	6.0	85.0	.000*	.961
	Roy's Largest Root	24.474	346.718	6.0	85.0	.000*	.961
levels	Pillai's Trace	.250	2.052	12.0	172.0	.023*	.125
	Wilks' Lambda	.762	2.062	12.0	170.0	.022*	.127
	Hotelling's Trace	.296	2.072	12.0	168.0	.021*	.129
	Roy's Largest Root	.222	3.187	6.0	86.0	.007*	.182

Source: Field Survey (2017) *Significant, p<.05

Having observed significant multivariate effect, the between-subject effects were analysed to find out which of the ECC skills (dependent variables) showed significant effect of level at which the skills the ECC were introduced to participants. The Levene's test of equality of variance (Table

10) indicated only compensatory access skills and sensory efficiency skills showed equality of variance across the levels.

Table 10: Levene's test of Equality of Error Variance Across Levels

ECC	F	df1	df2	Sig.
Compensatory access skills	.053	2	90	.949
Sensory efficiency skills	.221	2	90	.802
Assistive technology skills	3.551	2	90	.033*
Orientation & mobility skills	3.587	2	90	.032*
Independent living skills	4.975	2	90	.009*
Social interaction skills	10.136	2	90	.000*

Source: Field Survey (2017) *Significant, p<.05

The between-subject effect analysis (Table 10) showed that the respondents' level of competence in the expanded core curriculum differed based on the level they were introduced (Basic, Secondary or Both) on all the six dimensions in considered in this study, except independent living skills, F (2, 90) = 2.29, p = .108, η^2 = .05).

Table 11: Test of between-Subject Effects of Levels on Acquisition of ECC

Source	Dependent Variable	Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared (η^2)
levels	Comp. Access	307.47	2	153.735	4.156	.019	.085
	Sensory efficiency	256.78	2	128.390	3.462	.036	.071
	Assistive	135.25	2	67.623	3.336	.040	.069
	Orientation	151.51	2	75.755	3.719	.028	.076
	Independent	2833.89	2	1416.945	2.285	.108	.048
	Social	3998.05	2	1999.026	3.460	.036	.071
Error	Com skills	3328.85	90	36.987			
	sensory skills	3337.29	90	37.081			
	Assistive	1824.56	90	20.273			

Table 11: Continued

	Orientation	1833.16	90	20.368
	Independent	55802.07	90	620.023
	Social	51990.74	90	577.675
	Com skills	26494.00	93	
	sensory skills	26264.00	93	
	Assistive	12691.00	93	
Total	Orientation	12566.00	93	
	Independent	186101.0	93	
	Social	152634.0	93	

Source: Field Survey (2017) *Significant, p<.05

The results show that there was significant difference in compensatory access skills, F (2, 90) = 4.16, p = .019, η^2 = .09; sensory efficiency skills based on the levels of respondents, F (2, 90) = 3.46, p = .036, η^2 = .07; assistive technology skills, F (2, 90) = 3.34, p = .040, η^2 = .07; orientation and mobility skills, F (2, 90) = 3.72, p = .028, η^2 = .08; social interaction skills, F (2, 90) = 3.46, p = .036, η^2 = .07.

The multiple comparisons for the dependent variables that showed significant effect or differences were done to see which of the levels at which the respondents were introduced were significantly different. The Scheffe multiple comparisons method was used for compensatory access skills and sensory efficiency skills because the error variance across the groups (levels) were equal, but the Games-Howell method was used for the non-equal error variance dependent variables. The results are presented in Table 12.

Table 12: Multiple comparisons following significant effects of between-subject effects of levels on ECC

Dependent variable	Methods	(I) level	(J) levels	Mean Diff (I-J)	Std Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Compen-satory skills	Scheffe	basic level	secondary	4.20*	1.47	.020	.54	7.85
			Both	.93	1.65	.855	-3.19	5.04
		secondary	basic level	-4.20*	1.47	.020	-7.85	-.54
			Both	-3.27	1.82	.205	-7.80	1.26
		Both	basic level	-.93	1.65	.855	-5.04	3.19
			secondary	3.27	1.82	.205	-1.26	7.80
Sensory Efficiency skills	Scheffe	basic level	secondary	3.79*	1.47	.040	.13	7.45
			Both	.57	1.66	.943	-3.55	4.69
		secondary	basic level	-3.79*	1.47	.040	-7.45	-.13
			Both	-3.23	1.82	.215	-7.76	1.31
		Both	basic level	-.57	1.66	.943	-4.69	3.55
			secondary	3.23	1.82	.215	-1.31	7.76
Assistive Technolo-gy skills	Games-Howell	basic level	secondary	-2.75*	1.13	.050	-5.51	-.00
			Both	-1.59	1.35	.477	-4.97	1.78
		secondary	basic level	2.75*	1.13	.050	.00	5.50
			Both	1.16	1.60	.751	-2.75	5.06
		Both	basic level	1.59	1.35	.477	-1.78	4.97
			secondary	-1.16	1.60	.751	-5.07	2.75
Orienta-tion and Mobility skills	Games-Howell	basic level	secondary	-2.90*	1.13	.037	-5.66	-.14
			Both	-1.74	1.35	.414	-5.11	1.62
		secondary	basic level	2.90*	1.13	.037	.14	5.66
			Both	1.16	1.60	.750	-2.74	5.06
		Both	basic level	1.74	1.35	.414	-1.62	5.11
			secondary	-1.16	1.60	.750	-5.01	2.74
Social Interaction skills	Games-Howell	basic level	secondary	8.84	6.07	.320	-5.77	23.45
			Both	16.49*	5.43	.010	3.38	29.59
		secondary	basic level	-8.84	6.07	.320	-23.45	5.77
			Both	7.65	6.13	.432	-7.23	22.52
		Both	basic level	-16.49*	5.43	.010	-29.59	-3.38
			secondary	-7.65	6.13	.432	-22.52	7.23

Source: Field Survey (2017) *Significant, p<.05

The results of the post hoc shows a significant difference between only respondents introduced to the expanded curriculum at the basic and secondary levels on compensatory access skills, sensory efficiency skills, assistive technology skills, and orientation and mobility skills ($p < .05$). For compensatory access skills and sensory efficiency skills, the respondents who

were introduced at the Basic level of education had higher competence than those introduced at the Secondary level of education. However, for assistive technology skills and orientation and mobility skills, those were introduced at the Secondary level had significantly higher competence than those introduced at the Basic level. The results therefore showed a significant difference in social interaction skills between only the respondents introduced at the Basic level and those trained at both levels, with those introduced at the Basic level having higher competence (Mean diff. = 16. 49, p = .035).

Compensatory Access Skills

Compensatory access skills are one of the elements of the ECC which can have a significant impact on the academic achievement of the students with visual impairment. It can be inferred from the results that there are statistical differences among the levels of contribution of compensatory access skills learned to the overall competence of the students with visual impairment. The conclusion is that the more compensatory access skills learned at the basic level the more competent the students become in the University in the use of the skills for academic achievement.

This, therefore, implies that compensatory access skills learned at the basic level of education have an influence on their competence more than other levels. This finding tends to support the notion that students who are congenitally blind and for that matter begin to learn the compensatory access skills at an early stage of their education are more likely to become competent and skillful in the use of Braille (Johns, 2010).

Compensatory access refers to the skills that must be learned in order for students with visual impairments have access to information, to be able to

communicate and to be literate. Mastery of compensatory access means that the student who is visually impaired will have access to learning in a manner equal to that of sighted peers. The compensatory access of the visually impaired is significant, but it appears they are not being addressed with sufficient specificity in the existing core curriculum (Guerette, 2014).

Barclay (2014) also asserted that students with visual impairments need to access all areas of the general education curriculum at levels that are commensurate with their sighted peers. This includes concept development, spatial understanding, study and organisational skills, speaking and listening skills, and adaptations that are necessary to access all areas of the core curriculum. Compensatory access varies on the basis of the students' needs but may include braille, tactile symbols, calendar systems, or recorded materials.

The compensatory needs of the students cannot be met within the existing core curriculum and therefore must be addressed by teachers (Jacobson, 2013). Compensatory access skills are needed by the visually impaired to access the regular curriculum presented in the regular classroom, and also to enhance their ability to participate in the home and the community as well. Communication needs of students with visual impairment will vary, depending on the degree of functional vision, the effects of additional disabilities (Guerette, 2014). It is therefore important for schools for the visually impaired to develop capacities in teaching compensatory access skills at the early beginning especially in the kindergarten schools.

Sensory Efficiency Skills

Sensory efficiency skill is one of the elements of the expanded core curriculum. The findings indicate that the difference lies between the Basic

and the Secondary levels. The results give statistical evidence to conclude that students with visual impairment who are more proficient in sensory efficiency skills are taught at the basic level.

The findings support the claim by Piaget (2013), that the use of the senses and movement for exploration are primary activities of learning at the stage of cognitive development. The development of cognitive concepts and skills lay the foundation for understanding. According to Langley (2004), the ability to understand and make use of what is seen, heard, touched, smelled and tasted and to react appropriately to that information, is the foundation for development and learning. This demonstrates that the study of sensory efficiency skills by the visually impaired must fundamentally begin at the sensory-motor stage. The implication is that the environment in which children with visual impairment grow up must have adequate sensory inputs including, good auditory stimulation, language development and the provision of objects that will evaluate the cognitive development of the child with visual impairment. Again, multi-sensory approach to teaching must be emphasized when teaching children at the basic level. All learning including all the components of expanded core curriculum depends on the efficient and effective use of the sensory system (Smith, 2014). Efficiency and effective use of the non-visual senses is essential to the development of students with visual impairment (Lohmeier, Blankenship & Hatlen, 2009).

Assistive Technology Skills

To accomplish the purpose of the study, the level at which students with visual impairment are taught assistive technology skills can have an influence on their competence.

The results indicated that a significant difference existed among the levels with respect to assistive technology skills. The secondary level was found to have high influence on incompetence in assistive technology skills (mean=12.37, SD=5.22). Both levels followed the secondary level. (mean= 11.21, SD= 5.44). The basic school was identified as the least (mean=9.61, SD=3.50). Considering the descriptive statistics, it can be concluded that students with visual impairment become more competent when they are taught assistive technology skills at the secondary level.

Games-Howell test to find the differences in assistive technology skills of students with visual impairment among levels. According to Field (2009), Games-Howell test as a post-hoc comparison is appropriate when the data do not meet the assumption of variance. Considering the Levene's test for this data, the assumption of homogeneity of variance was not met therefore Games-Howell test was conducted. From the Post Hoc test, the results indicate that the mean score between Basic Level and Secondary Level (mean= -2.753, SR= 1.130, n=93, $p<0.05$, Sig. = .050) was significantly significant.

This means that students with visual impairment at the secondary level can learn assistive technology skills better and become more proficient than learning it at the basic level. However, between secondary and both level, the results show that there was no statistical significant difference (mean= 1.159, SR= 1.602, n=93, $p<0.05$, Sig. = .751). The findings from the study give statistical evidence to the fact that students with visual impairment are better prepared to learn assistive technology skills (computer) at the secondary level.

The study of assistive technology is crucial in the education of the visually impaired. This is supported by the views of Koweru, Omoke, and

Orodho (2015). According to them, an assistive technology device is any item that is used to increase, maintain, or improve the functional capabilities of students with visual impairment. An assistive technology service means any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device. The term includes the evaluation of the needs, selecting, designing, fitting, customizing, adapting, applying, retaining, repairing, and technical assistance for an individual with visual impairment, family members or, professionals (Sah, 2013). Assistive technology as a component of the expanded core curriculum, focuses on the knowledge and skills that are essential to learning, how to use technology to access all aspects of daily living at school, at work, at play and at rest (McNear & Farrenkopf, 2014). From the findings of these researchers, it can be concluded that assistive technology should be taught at a basic level through to secondary level to the tertiary level for the acquisition of its competence.

Orientation and Mobility Skills

Examining the role of orientation and mobility skills in the education of students with visual impairment it was deemed appropriate to find out how competent they are. The researcher, therefore, tested the level at which when students with visual impairment are taught orientation and mobility skills could influence their competence.

Games-Howell post-hoc test was conducted. The conclusion from the results is that it is good and better to teach the students with visual impairment at the basic level orientation and mobility skills since they are likely to be competent at that level than all the other levels.

Wall and Corn (2006), supported the early teaching of orientation and mobility skills. According to them, the safe and efficient travel throughout the environment is a critical component in the education of students with visual impairments. Orientation and mobility evaluation and instruction should begin in infancy with basic spatial concepts, purposeful and exploratory movement. Instruction should then progress through more independent, age-appropriate motor and travel skills in increasingly complex environments.

Ferrell (2011), stated emphatically that orientation and mobility is the systematic way in which individuals with visual impairments orient themselves to their environments and move as safely, efficiently, and independently as possible in those environments. In the views of Hill and Ponder (1976), orientation and mobility concepts begin with understanding one's own body and progress to include all the concepts that are necessary to plan a trip in rural and urban environments. Orientation and mobility skills begin with the simple understanding of how to move one's body with control and advance to the skills that are necessary to navigate complex environments safely, cross streets, and access transportation (Ferrell, 2011). Specially prepared Orientation and mobility specialists are required to provide students with the experiences they need to develop orientation and mobility concepts and acquire orientation and mobility skills that will allow them to travel as independently as possible and it should be done from infancy.

Independent Living

Determining the level at which independent living skills are taught to students with visual impairment could enhance their competence, the result indicates that the between-subject effects show that there were no differences

in mean scores of the levels. This implies that the levels at which students with visual impairment are taught independent living skills did not associate with their competence. It does not, however, suggest that it is not advisable to start at the basic level. Looking at its importance to the visually impaired as claimed by Bardin (2014) it would be appropriate if the visually impaired are taught independent living skills at the basic level.

According to Bardin (2014), independent living is key to students' achievement, independence, and life success. There are a number of behaviours and skills in the independent living area that needs to be intentionally taught to students with visual impairments. Specific behaviours and skills to be taught depend on the individual characteristics of each student, including physical and cognitive abilities, needs, age, health condition and family culture and priorities. In order to develop success in academics and other areas of the expanded core curriculum, students with visual impairments need to be proficient in independent living. Also, according to Chen (2014), most activities of daily living, which sighted people, perform without thinking, must be taught to students with visual impairments. Some of these independent living skills are part of the general curriculum for all students, but they are not usually presented in a sequential, organised manner sufficient for students who are visually impaired or provide adequate hands-on experiences for these students. Achieving a satisfying and rewarding adult life will be difficult for individuals with visual impairments if they are not well grounded in independent living skills.

The expanded core curriculum area of independent living contains a diverse group of skills that students with visual impairment will need to master

to achieve a level of independence. They are the chores people perform, according to their abilities, which enable them to manage their homes and personal lives. In order to develop success in academics and other areas of the expanded core curriculum, students with visual impairment must have proficient organisational skills. These behaviours and skills transfer to efficiency at home and in the world at large. In order to be independent, people with visual impairment need to know where to find their possessions and other items in the environment and where to put them after they have finished using them. In addition to organising personal items, the visually impaired need to learn how to organise information in the form of both print and electronic materials in a systematic way (Bardin, 2014).

Traditional classes in home economics and family life are not enough to meet the learning needs of most students who are visually impaired since they assume a basic level of knowledge, acquired incidentally through vision. Students without visual impairments acquire skills and knowledge by casually and incidentally observing and interacting with their environment but this is extremely difficult if not impossible for students who are visually impaired. They must learn with direct, sequential instruction by knowledgeable persons.

Social Interaction

To accomplish the purpose of the study, the researcher tested the level at which social interaction skills will be more appropriate to be taught to students with visual impairment. The between-subject effect shows that there were statistically significant differences among the levels.

The post hoc test indicated that there is the difference between basic and both levels and as such it is better to inculcate social interaction skills of

students with visual impairment at the basic level than both levels. However, there was no difference between basic and secondary as well as secondary and both levels.

Social interaction skill is an essential area of the expanded core curriculum for students with visual impairments. Social interaction skills permeate all aspects of the lives of students with visual impairment and also an integral part of other areas of the expanded core curriculum such as compensatory access, recreation, and leisure, independent living, and self-determination (Sacks, 2014). According to Wolffe (2006b), social interaction skills contain components and behaviours that are needed to participate in social situations appropriately and to prevent social isolation and stigmatization. It sets the stage for appropriate and necessary interaction with others. The need to develop these skills is so fundamental that it can often mean the difference between social isolation and a satisfying and fulfilling life as an adult. Institutions like universities are miniature societies and therefore students with visual impairment are expected to relate very well with their peers to promote co-existence, peer tutoring, and cooperative learning but it seems that is not what is on the ground (Sacks, Wolffe & Tierner, 1998).

Relationships between the Elements of the Expanded core Curriculum and Academic Achievement

Relationships between the elements of the expanded core curriculum and academic achievement of the respondents were also explored. Table 13 presents the means, standard deviation and the correlation coefficients between the elements of the expanded core curriculum, as well as their relationships with academic achievement of the respondents.

Table 13: Means, Standard Deviation and Correlations Coefficients among the ECC Skills

	Mean	SD	1	2	3	4	5	6	7
1. Com. access skills	15.68	6.29	1						
2. Sensory efficiency	15.61	6.25	.956**	1					
3. Assistive Technology	10.74	4.62	-.172	-.167	1				
4. Orientation & Mobility	10.67	4.64	-.165	-.156	.990**	1			
5. Independent living	37.02	25.23	-.274**	-.278**	.201	.202	1		
6. Social interaction	32.24	24.67	.057	.053	-.014	.000	-.627**	1	
7. Aca. Achievement	18.26	25.41	.599**	.502**	.852**	.902**	.920**	-.191	1

**. Correlation is significant at the 0.01 level (2-tailed); N = 93

The results (Table 13) shows that there is a significant strong positive correlation between sensory skills and communication skills, $r = .96$, $p < .01$. The two variables share a variance of .92 (92%). The results also showed a significant strong positive correlation between assistive technology skills and orientation and mobility, $r = .99$, $p < .01$. The result implies that 98% of the variance in orientation and mobility was explained by assistive technology skills. There was a significant weak but negative correlation between independent living and communication skills, $r = -.27$, $p < .01$. The two variables shared a variance of 7%. Similarly, there was a significant weak but negative correlation between independent living skills and sensory efficiency skills, $r = -.28$, $p < .01$. The two variables shared a variance of 8%. A significant moderate negative correlation between independent living skills and social interaction skills, $r = -.63$, $p < .01$, with a 40% variance shared between these variables. Compensatory access skills and sensory efficiency skills had significant positive moderate relationships with academic achievement; compensatory access skills, $r = .51$, $p < .01$, sensory efficiency

skills, r = .50, p < .01. Each of compensatory access skills and sensory efficiency skills shared 26% and 25% variance respectively with academic achievement. The results however showed that assistive technology skills, r = -.29; orientation and mobility skills, r = -.29; independent living skills, r = -.42; and social interaction skills, r = -.19 had significant weak negative associations with academic achievement.

Hypothesis Two

$H_0$2: There is no relationship between compensatory access skills and academic achievement of students with visual impairment.

H_A2: There is a relationship between compensatory access skills and academic achievement of students with visual impairment.

This research hypothesis was meant to explore the relationship between compensatory access skills and academic achievement of students with visual impairment. To achieve this, Pearson Product Moment correlation was used for the analysis. In the analysis, correlation (r) was used to determine the degree and the direction of a relationship between the variables (compensatory access skills and academic achievement of visual impairment). Correlation coefficient (r) values from 0 to 0.39 indicated a low correlation between the variables, from 0.4 to 0.59 indicates a moderate correlation between the variables and values from 0.6 to 1.0 indicates a strong correlation. The findings are presented in Table 14.

Table 14: Relationship between Compensatory Access and Academic Achievement of SVI

Variables		Compensatory Access Skills	Academic Achievement
Compensatory Access Skills	Pearson Correlation	1	.599*
	Sig. (2-tailed)		.000
	N	93	93
Academic Achievement	Pearson Correlation	.599*	1
	Sig. (2-tailed)	.000	
	N	93	93

Source: Field Data (2017) *Significant, p<.05

The results in Table 14 revealed that there was a statistically significant positive relationship between compensatory access skills and academic achievement of students with visual impairment (r=.599, n=93, p=0.000). This, therefore, implies that compensatory access skills relate to the academic achievement of the visually impaired students. In other words, students with competence in compensatory access skills perform well academically.

The finding is in line with the views expressed by Barclay and Staples (2012). According to them, access to literacy through braille is required by the regulations implementing Individual with Disability Education Act, 2004. The Act stated that, in the case of a student who is visually impaired, the IEP team must provide for instruction in braille and the use of braille. Specialised instruction in concept development may be of significant importance when visual observation is limited. It is essential to offer specific and sequential hands-on, sensory-based lessons to build a broad base of experiences.

In higher grades, there are many mathematical, geographical and scientific concepts that must be taught with adapted materials and strategies for students unable to learn from pictures and visual diagrams. A student with

little or no vision may have fragmented understandings of the world without systematic tactile exploration and clear verbal explanations. Some concepts are totally visual, such as colours, rainbows, clouds, and sky. Some are too large to experience completely, such as a building, mountain ranges, and oceans. Other items are too tiny or delicate to understand through touch, including small insects, or an item under a microscope. Some items are inappropriate to explore through touches such as wild animals or toxic substances. Fragmented concepts can impede social, academic, and vocational development (Barclay & Staples, 2012).

Hypothesis Three

$H_0$3: There is no relationship between sensory efficiency skills and academic achievement of students with visual impairment.

H_A3: There is a relationship between sensory efficiency skills and academic achievement of students with visual impairment.

This hypothesis sought to find out if sensory efficiency skills of students with visual impairment will have a relationship with their academic achievement and were tested with Pearson Product Moment correlation. The results are presented in Table 15.

Table 15: Results of PPM Correlation of Sensory Efficiency and Academic Achievement of SVI

Variables		Sensory Efficiency Skills	Academic Achievement
Sensory Efficiency Skills	Pearson Correlation	1	.502*
	Sig. (2-tailed)		.000
	N	93	93
Academic Achievement	Pearson Correlation	.502*	1
	Sig. (2-tailed)	.000	
	N	93	93

Source: Field Data (2017) *Significant, p<.05

Table 15 shows the results of the Pearson product moment correlation coefficient of the sensory efficiency skills of students with visual impairment and their academic achievement. It is evident from the table that there was a moderate statistically significant positive relationship between sensory efficiency skills and academic achievement of students with visual impairment (r=.502, n=93, p=0.000). This, therefore, means that sensory efficiency skills have a moderate relationship with the academic achievement of the students with visual impairment. In other words, when students are effective in the use of non-visual senses on a moderate level, this translates to the increase in their academic achievement.

In support of the findings, Lohmeier, Blankenship, and Hatlen (2009) had stated that efficiency and effective use of the non-visual senses is essential to the development of students with visual impairment. Piaget (2013) and Smith (2014) also claimed that the use of the senses and movement for exploration are primary activities of learning at the stage of cognitive development. The development of cognitive concepts and skills laid the foundation for understanding. All learning including all the components of expanded core curriculum depends on the efficient and effective use of the sensory system. Smith (2014), had added that tactile functioning is very important in the education of the visually impaired. Smith stated that the sense of touch assists students with visual impairment to discriminate characteristics of objects. Information provided by the sense of touch encourages students with visual impairment to explore their environment and learn important skills. Efficient acquisition of sensory information is required for all learning throughout life. Students with visual impairment need to use effective

strategies to overcome barriers imposed by lack of vision by making effective use of the non-visual senses (Smith, 2012).

Topor (2014), on his part, explained that sensory efficiency skills include the development of advanced tactile skills. It has long been recognised that visual efficiency skills must be taught to children with any level of remaining vision so that all sensory inputs can be used in the process of learning. Topor emphasized that when print and braille reading is supplemented with listening skills, the students' learning is enhanced. Moreover, when the students reach senior high school, because of the variety of reading materials in inaccessible formats, in all likelihood they will need to depend partially on recorded books or live readers. Tactile graphics are a necessary part of the books and other learning materials that students with visual impairments use, but the profession has only recently recognised that a deliberate, sequential system is required for teaching students to correctly interpret such graphic materials. To allow a student to take a high-stakes test without the requisite skills in reading tactile graphics is to put the student at a decided disadvantage.

Students who are visually impaired need to learn, in a gradual, developmental manner, that there are systems for displaying real things in abstract form (Corn & Lusk, 2010). Holbrook, Koening, and Rex (2010) had also identified that an increased reliance on tactual skills is essential to learning. These skills should be considered as part of Individualized Education Plan development. It takes more detailed "hands-on" interaction and repetition to tactually understand a concept, such as relative size, that may be readily captured with a glance by sighted individuals. Systematic instruction in

auditory skills may be needed for successful mobility and learning.

Hypothesis Four

$H_0$4: There is no relationship between assistive technology skills and academic achievement of students with visual impairment.

H_A4: There is a relationship between assistive technology skills and academic achievement of students with visual impairment.

Table 16: Results of PPM Correlation of Assistive Technology and Academic Achievement of SVI

Variables		Assistive Technology Skills	Academic Achievement
Assistive Technology Skills	Pearson Correlation	1	.852*
	Sig. (2-tailed)		.006
	N	93	93
Academic Achievement	Pearson Correlation	.852*	1
	Sig. (2-tailed)	.006	
	N	93	93

Source: Field Data (2017) *Significant, p<.05

The results of the Pearson Product Moment correlation coefficient of the assistive technology skills of students with visual impairment and their academic achievement are presented in Table 16. The results show that there was a strong positive relationship between assistive technology skills and academic achievement of students with visual impairment (r=-.852, n=93, p=0.006). The result, therefore, implies the high level of skills students develop in assistive technology correspondingly increases students' academic achievement.

The results lend support to the assertions of McNear and Farrenkopf (2014) who considered assistive technology as a component of expanded core curriculum focuses on the knowledge and skills that are essential to learning

how to use technology to access all aspects of daily living at school, at work, at play and at rest. According to Chen (2014), technology permits students with visual impairments to access the general curriculum, to increase literacy options, and to enhance communication. Cohen sees technology as part of living and those living without it are considered to be living in darkness. Students with visual impairment have the same uses of technology as their sighted counterparts.

Similarly, McNear and Farrenkopf (2014) again said that the role of assistive technology in the lives of the visually impaired is indispensable. It enables them to participate in the school curriculum and also promotes independence for them. With assistive technology, the visually impaired are able to accomplish tasks with greater speed, ease, and independence. They added that assistive technology empowers the visually impaired to take personal control of their learning environment. The visually impaired are able to complete their assignments independently of the teacher. For instance, a student who is visually impaired can prepare an assignment on a computer using braille display software to proof-read, emboss a copy in braille for reference and produce a print copy for submission.

The transformative and empowering aspects of assistive technology for the visually impaired cannot be overemphasized. McNear and Ferrenkopf (2014), had reiterated that students with visual impairment need to learn the use of technological devices that are appropriate for the ways in which they most efficiently access the environment and make effective use of sensory input. According to Zhou, Parker, Smith, and Griffin-Shirley (2011), assistive technology plays a tremendous and crucial role in the development of

individuals who are visually impaired. They reiterated that even the success of the other skills in expanded core curriculum depends on their competence in the assistive technology and without assistive technology the visually impaired would have been the most miserable people on earth. Technology is seen as a tool to unlock learning and expand the horizons of all students. It is added to the expanded core curriculum because technology is an integral component of the education of students who are visually impaired. For the student who communicates using braille, it allows him or her to access and produce materials identical to typically sighted peers. It gives students who are blind the capability of independently storing and retrieving information. Technology has leveled the playing field for individuals with visual impairment and is an essential part of the expanded core curriculum.

We live in an economy powered by technology, fueled by information, and driven by knowledge. Technology has, therefore, become the integral part of life for the visually impaired. Assistive technology to the visually impaired refers to a wide range of devices and equipment which are used to increase, maintain or improve functional capabilities of the visually impaired (McNear & Farrenkopf, 2014). The use of these assistive technologies needs to be learned by the visually impaired to make life comfortable for them, hence being one of the components of the expanded core curriculum.

McNear (2001), added that assistive technology enables students who are visually impaired to access information, participate in age-appropriate activities, or complete a task independently or with minimal assistance. Instruction in the use of assistive technology begins in the preschool years and evolves as the needs of the student change. It enables students who are

visually impaired to access and store information from libraries around the world and the internet. Assistive technology assists the visually impaired in note taking, studying for tests, research and a variety of academic uses.

Abner and Lahm (2002) had emphatically stated that the mastery of assistive technology contributes to the development of literacy and academic success, social interaction among peers, independence and the potential of future employment. To support the views of Abner and Lahm, Sah (2013) had put forward that technology can increase productivity and independence by facilitating the performance, simplifying tasks, allowing greater speed and less physical energy. It can also enhance our knowledge, understanding, and participation by expanding access to information, places, and people. Assistive technologies are used by individuals with visually impaired in order to perform functions that might otherwise be difficult or to some extent impossible. It really improves the quality of life in the individuals who are visually impaired.

Smith and Penrod (2010), had considered that visual impairment is perhaps the disability area in which the most technological advances have been made, it is therefore imperative that the students who are visually impaired have an effective level and quality of access that is essential to full participation in new ways of learning especially in an inclusive setting.

Hypothesis Five

$H_0 5$: *There is no relationship between orientation and mobility skills and academic achievement of students with visual impairment.*

$H_A 5$: *There is a relationship between orientation and mobility skills and academic achievement of students with visual impairment.*

Table 17: Results of PPM Correlation of Orientation and Mobility and Academic Achievement of SVI

Variables		Orientation and Mobility Skills	Academic Achievement
Orientation and Mobility Skills	Pearson Correlation	1	.902*
	Sig. (2-tailed)		.005
	N	93	93
Academic Achievement	Pearson Correlation	.902*	1
	Sig. (2-tailed)	.005	
	N	93	93

Source: Field Data (2017) *Significant, p<.05

Table 17 presents the Pearson Product Moment correlation coefficient on orientation and mobility skills and academic achievement of students with visual impairment. The results show that there was a strong positive relationship between orientation and mobility skills and academic achievement of students with visual impairment (r=.902, n=93, p=0.005). The result, therefore, implies that students with adequate skills in orientation and mobility do well in academic skill. The positive relationship is indicative of the fact that, the development of orientation and mobility skills is very crucial for students with visual impairment, as this knowledge will enhance their academic achievement.

Vision provides the primary motivation for infants to begin to move their bodies, to raise their heads to see people, to reach toward objects, to move through the environment, and to begin to play. Significant delays and differences in meeting motor milestones can impact overall development. An individual who is blind needs to know how classrooms or other environments are arranged in order to move independently with confidence. Systematic orientation to space may be needed before placement and function of furniture

personal lives.

In order to develop success in academics and other skill areas, students with visual impairment must independence. Skills in these behaviours are likely to be transferred to performance at home and in the world at large. In order to be independent, people with visual impairment need to be taught how to locate their possessions and other items in the environment and how to keep them safe them after they have finished using them. In addition to organising personal items, the visually impaired need to learn how to organise information in the form of both print and electronic materials in a systematic way to enhance academic performance (Bardin, 2014), and this will eventually lead to their academic achievement.

Hypothesis Seven

$H_0$7: There is no relationship between social interaction skills and academic achievement of students with visual impairment.

H_A7: There is no relationship between social interaction skills and academic achievement of students with visual impairment.

Table 19: Result of PPM of Social Interaction and Academic Achievement of SVI

Variables		Social Interaction Skills	Academic Achievement
Social Interaction Skills	Pearson Correlation	1	-.191*
	Sig. (2-tailed)		.066
	N	93	93
Academic Achievement	Pearson Correlation	-.191*	1
	Sig. (2-tailed)	.066	
	N	93	93

Source: Field Data (2017) *Significant, p<.05

Table 19 depicts the Pearson Product Moment correlation coefficient of social interaction skills and academic achievement of students with visual impairment. The result shows that there was a negative low correlation between social interaction skills and academic competence of students with visual impairment (r=-.191, p = .066). From the analysis, the results, therefore, suggest that social interaction skills of students with visual impairment had negative low correlate with their academic competence.

The results are agreement with the views of Chen (2014) and Sack (2014), who indicated that among all developmental process, social development for students with visual impairment is the most highly dependent on others. They further said that how others react to and interact with students with visual impairment can play a significant role in the students' self-perception. Again, the visually impaired can become socially isolated and experience low self-esteem, which may negatively affect their success in the academic achievement if they are not given the opportunities to engage with others, make choices and decisions, and learn the social rules of their environment.

In fact, isolation and stigmatisation have been a worry to the visually impaired but with the acquisition of social skills this canker will be reduced to the barest minimum (Sacks & Wolffe, 2006a).

Students with visual impairment have unique social and emotional needs that must be addressed in educational programmes to ensure successful academic performance. These students must receive special support for unique identity issues that may be associated with their visual impairment. They require systematic instruction in social skills, self-advocacy, and

communication skills so that they achieve both academic and social success as they move from school to adult life. A sense of independence and interdependence in social and vocational pursuits can only happen when students with vision impairment feel that they are as competent and confident as their sighted peers (Sacks & Wolffe, 2006).

The visually impaired may exhibit appropriate body language, social communication, effective conversation pattern, cooperative skills, interaction with others, social etiquette, development of relationships and friendships knowledge of self and interpretation and monitory of social behaviour (Sacks & Wolfe, 2006b; Sacks, 2014; Chen, 2014). However, if they are not properly directed these attributes cannot relate to academic achievement. Despite the fact that the findings do not support the literature, social interaction is very crucial in the education of the visually impaired its overuse can be a disadvantage.

Research Question

Which expanded core curriculum area or combination of areas best predict academic achievement of the students with visual impairment?

To accomplish the purpose of the study, the researcher again sought to find out which of the elements of expanded core curriculum contribute most to the academic achievement of the students with visual impairment. To achieve this, the multiple regression was utilised to show the direction and magnitude of the effects and relationship between elements in the expanded core curriculum and academic achievement of the students with visual impairment. Prior to conducting multiple regression, certain assumptions must be met and it includes normality test and multicollinearity. The researcher checked for the

assumption before conducting the regression test. The graph below shows that normality test for the test variables.

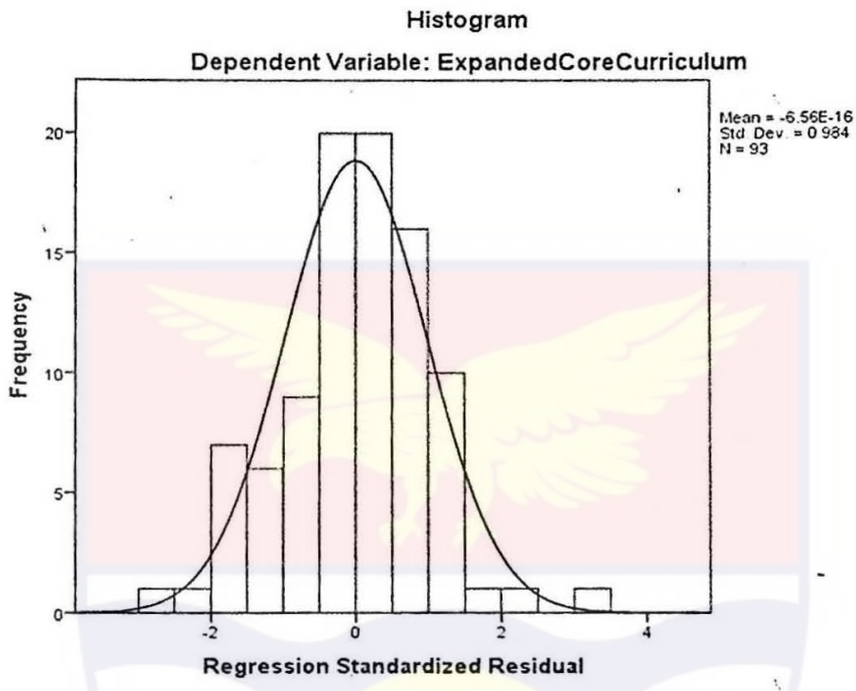

Figure 2: Normality Test

Figure 2 presents the normality of the study variables. The clustering of the variables at the centre of the normality curve shows that the variables were normal and multiple regression could be performed. Table 48 presents the results of the mean and standard deviation of the predicted elements of the expanded core curriculum.

Table 20 presents the descriptive analysis of the elements in the expanded curriculum.

Table 20: Means and Standard Deviation Results of the Elements of ECC

Elements in the Expanded Curriculum	Mean	Std. D
Compensatory Access Skills	15.67	6.286
Sensory Efficiency Skills	15.61	6.250
Assistive Technology Skills	10.74	4.655
Orientation and Mobility Skills	10.66	4.644
Independent Living Skills	17.02	5.245
Social Interaction Skills	9.23	4.169

Source: Field Data (2017) Rated on a 4-point scale n=93

The results from Table 20 show that independent living skills recorded the highest mean score (mean=17.02, SD=5.245) while social interaction scored the lowest and standard deviation (mean=9.23, SD=4.169).

The researcher further conducted regression analysis to gain more statistical evidence to confirm the findings. The findings are presented in Table 21.

Table 21: Results of Multiple Regression Analysis of the ECC Skills

	Unstandardised Coefficients		Standardised Coefficients		
Model	B	Std. Error	Beta (β)	t-value	Sig.
(Constant)	52.30	8.964		5.83	.000*
Compensatory Access Skills	1.115	0.906	.276	1.23	.012*
Sensory Efficiency Skills	.223	0.916	.055	.243	.006*
Assistive Technology Skills	-.952	2.649	-.173	-.359	.008*
Orientation and Mobility Skills	.455	2.639	.083	.172	.004*
Independent Living Skills	-.738	0.092	-.733	-7.98	.000*
Social Interaction Skills	.112	0.056	.342	-5.75	.017*

Source: Field Data (2017) *Significant, p<.05

Table 21 shows the results of the multiple regression analysis between independent variables in the expanded curriculum (compensatory access, sensory efficiency, assistive technology, orientation and mobility, independent

living skills, and social interaction skills) and dependent variable (academic achievement of the students with visual impairment). From the results, it is clear that all the independent variables (expanded core curriculum skills) produced significant results (P=0.000).

The results, therefore, give evidence to aver that all the elements in the expanded curriculum help to predict or determine students' academic achievement. Compensatory access skills produced significant results (t=1.23, Sig. =.012) indicating that it does contribute to academic achievement of the students with visual impairment, sensory efficiency skills also gave significant results (t=.243, Sig. =.006) indicating that it determines the academic achievement of the students with visual impairment. The results on assistive technology skills were not different, producing significant results (t=-.359, Sig. =.008), orientation and mobility skills also gave significant result of (t=-.172, n=93, Sig=.004).

In relation to other the elements in the expanded core curriculum, the independent living skills results show that they predicted students' academic achievements (t=-7.98, Sig=.000). Social interaction skills also produced results to show that it contributes much to the academic achievement of the students with visual impairment (t=-5.75, Sig=.017). The results give evidence to believe that among all the independent variables/elements in the expanded curriculum independent living skills gives a higher prediction to the students with visual impairment competencies.

The findings are supported by Bardin (2014). Bardin had written that the overall mastery of this skills leads to greater independence for students with visual impairment and increases the potential for a more satisfying life.

Independent living is necessary for a student with visual impairment to be successful in other areas of the expanded core curriculum, especially in the areas of compensatory access, sensory efficiency, orientation and mobility, assistive technology and social interaction. It is, therefore, no wonder of all the elements of the expanded core curriculum independent living stood out as the most contributor to the academic achievement of students with visual impairment.

Independent living is a key to students' achievement, independence, and life success. There are a number of behaviours and skills in the independent living area that needs to be intentionally taught to students with visual impairment. Specific behaviours and skills to be taught depend on the individual characteristics of each student, including physical and cognitive abilities, needs, age, health condition and family culture and priorities (Bardin, 2014). Bardin expressed that in order to develop success in academics and other areas of the expanded core curriculum, students with visual impairments need to be competent in independent living. To me, the independent living skill is an epitome of all the skills of the expanded core curriculum. The independent living skill is the ability of the individuals who are visually impaired to do things by themselves. They should be able to read and write braille, participate in social activities, move about with ease, and being gainfully employed. So collectively all the skills of the expanded core curriculum contribute positively to the academic achievement of students with visual impairment.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the findings of the study as well as the conclusions, recommendations, and directions for further research. Thus, the chapter focuses on the implications of the findings of the study for policy formulation and practices and further research. The recommendations are made based on the key findings and major conclusions arising from the study.

Summary of the Study

The main purpose of this study was to explore the relationship between competence in the ECC and academic achievement of students with visual impairment in public universities in Ghana. The study was guided by two theories and these are the Cambourne's theory and the Normalisation theory. The first theory for the study was Cambourne's theory. The theory identified three major conditions for learning and they have been described as important strategies in the effective instruction of students who are visually impaired. The strategies are immersion, demonstration, and engagement. Cambourne's theory further explained that learners are more prepared to learn if these five conditions of learning are present; expectations, responsibility, approximation, employment, and response. Learners are prepared to engage in whatever behaviour or skills they are learning if there is communication of high expectation. The study revealed that with a practical demonstration of the five conditions of learning exposed by the theory students with visual impairment were able to acquire the skills of ECC.

The second theory is the Normalisation theory. The theory means that making available to all the persons with disabilities and other handicap patterns of life conditions of everyday living which are as close as possible to or indeed the same as the regular circumstances and ways of life of society. The findings support the theory that with competence in ECC the visually impaired is capable of living a normal life.

The study was guided by specific objectives which include the level of education at which when students with visual impairment are taught the ECC could influence their competence, relationship between the ECC skills and the academic achievement of the students with visual impairment and the ECC skill that best predicts the academic achievement of the students with visual impairment.

In order to achieve the objective of the study, seven hypotheses and one research question were formulated for the study. Descriptive research design involving the quantitative approach was adopted for the study. The target population of the study was the students with visual impairment of University of Cape Coast and University of Education, Winneba. A sample size of 93 students with visual impairment were selected for the study using purposive sampling method. Likert scale type questionnaire was employed to collect data

Key Findings

The study explored the relationship between competence in ECC and academic achievement of students with visual impairment in public universities in Ghana and it came out with the following findings:

Compensatory access skill was widely investigated. It revealed that students with visual impairment who were taught compensatory access skill at the basic level of education were more competent than those who were taught at the other levels.

The researcher investigated how competence in sensory efficiency skill is influenced by the levels of education at which students with visual impairment are taught. It was revealed that students with visual impairment who were taught sensory efficiency skills at the basic level were more competent.

In relation to assistive technology skills, the study found that students with visual impairment are better prepared to learn assistive technology skills (computer) at the secondary level than the other levels under investigation.

Orientation and mobility skills were also extensively investigated and it was revealed that it is good and better to teach the students with visual impairment at the basic level orientation and mobility skills. This, therefore, implies that students with visual impairment are more competent in orientation and mobility skills when it is taught at the basic level. So orientation and mobility skills should be more emphasised at the basic level since the students with visual impairment can be more competent at that level.

Results on independent living skills revealed that it could be taught at both levels of education. It means that the teaching of independent living skills could be done either at the basic level, secondary level or both.

With respect to the social interaction skills, the study revealed that it is better to teach students with visual impairment these skills at the basic level.

Research hypothesis two explored how compensatory access skills relate to the academic achievement of students with visual impairment. The results showed that compensatory access skills moderately influence academic achievement of the students who visually impaired.

Research hypothesis three was to find out if sensory efficiency skills of students with visual impairment would associate with their academic achievement. The result shows that sensory efficiency skills moderately related to the academic achievement of the students with visual impairment.

Research hypothesis four was to assess whether assistive technology skills of students with visual impairment would correlate with their academic achievement. The results show that assistive technology skills correlate high with academic achievement of students with visual impairment.

Research hypothesis five was meant to assess the correlation between orientation and mobility skills of students with visual impairment and their academic achievement. The results showed that there was a strong relationship between orientation and mobility skills and academic achievement of students with visual impairment.

Research hypothesis six explored the relationship between independent living skills and academic achievement of students with visual impairment. The study established a positive high relationship between independent living skills of students with visual impairment and their academic achievement.

Research hypothesis seven was to determine the relationship between social interaction skill and academic achievement of students with visual impairment. Social interaction skills did not relate significantly with the academic achievement of students with visual impairment.

The research question was to find out the expanded core curriculum skills that best predict academic achievement of students with visual impairment. The results indicated that among all the ECC skills, independent living skills best predicted the academic achievement of students with visual impairment.

To conclude, the study revealed that students with visual impairment who studied compensatory access, sensory efficiency, orientation and mobility, independent living, and social interaction at the basic level of education were more competent and those who studied the assistive technology skills at the secondary level were also competent. There was a positive relationship between the ECC skills and academic achievement of the SVI except social interaction skills which did not relate significantly with the academic achievement of students with visual impairment. The independent living skills best predicted the academic achievement of SVI.

Conclusions

Based on the results of the study the following conclusions have been drawn. The ECC is indispensable when it comes to the academic achievement of students with visual impairment. It forms the core skills that students with visual impairment need to master. The positive relationship found in this study suggests that the mastering of the ECC skills translates into improved academic achievement.

Competence in compensatory access skills help the students who are visually impaired to read and write braille. Competence in sensory efficiency equips the students with visual impairment to use their non-visual senses in their academic work. Competence in assistive technology assists the students

who are visually impaired to make use of technologies which are customised to suit their needs. Being competent in orientation and mobility assists the students who are visually impaired to move about in both familiar and unfamiliar environments. Competence in independent living skills enables students with visual impairment to become self-reliance which is the hallmark of the education enterprise. With competence in social interaction skills, individuals who are visually impaired will be able to make friends and interact with people. Without a doubt, all the elements of the ECC are crucial to the academic achievement of students with visual impairment.

Recommendations

The following recommendations have been made for educational practices and policies.

Implication for Practice

The resource centres of the universities should be equipped with both human and material resources to enhance the competence of students with visual impairment in the ECC skills.

The resource persons should guide students with visual impairment to direct their social interaction skills towards academic achievement.

The universities which admit students with visual impairment should adopt modalities to assess the students in the ECC skills and those who are not competent are given remedial lessons to improve on their competence.

Implication for Policy

The Special Education Division (SED) of Ghana Education Service (GES) should ensure that the SVI in the inclusive secondary institutions are taught all the ECC skills as a continuation of what they learn at the basic level.

The Special Education Division of GES should formalize and intensify the teaching of ECC in the special schools and the inclusive schools for the visually impaired.

The teaching of the ECC skills should commence at the basic level and the Special Education Division of Ghana Education Service should provide the necessary input (both human and material resources) to make its teaching effective.

The Special Education Division of Ghana Education Service should ensure that students with visual impairment in secondary institutions are taught all the elements of the expanded core curriculum.

The Ghana Education Service should train more specialist teachers to handle the various elements of the ECC at both basic and second cycle schools and it should be extended to the universities.

Suggestions for Further Research

The current research was done in the area of competence in ECC skills and academic achievement of students with visual impairment. The research could not cover every aspect of the ECC. There is, therefore, the need to research into other areas of the ECC and consequently, the following areas have been suggested for further studies.

1. Exhibition of ECC skills and their effect on the productivity level of the staff who have visual impairment at workplaces.
2. Using the ECC to address the occupational hazards of staffs with visual impairment at workplaces.
3. Teaching and learning of the ECC skills: The way forward for the visually impaired in the senior secondary school level in Ghana.

4. Evaluate the role of the ECC skills on the lives of educated individuals who are visually impaired.
5. Assessing the accessibility of the ECC skills to the visually impaired. The role of the special education teacher.
6. Examine parental involvement in inculcating the ECC skill to their children with visual impairment.

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APPENDICES

APPENDIX A

UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

FACULTY OF EDUCATIONAL FOUNDATIONS

DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Questionnaire on the relationship between competence in the expanded core curriculum and the academic achievement of students with visual impairment

Questionnaire for Students with Visual Impairment

The questionnaire is aimed at collecting comprehensive and systematic information on the competence of students with visual impairment in expanded core curriculum skills.

Please, answer the questions as objectively and succinctly as possible. Your responses will be strictly confidential as the purpose of this research is purely academic.

Thank you for accepting to answer the questions.

Edward Kofi Ntim

SECTION A: DEMOGRAPHIC DATA OF RESPONDENTS

Tick (√) or provide your response

1. How old are you?

   15-18yrs [ ] 19-22yrs 23-26yrs 27+yrs

2. What is your sex? Male [ ] Female [.]

3. Which level are you?

   100 [ ] 200 [ ] 300 [ ] 400 [ ]

4. What programme are you pursuing at .....

SECTION B: EXPANDED CORE CURRICULUM

Section B: Tick (√) your correct answer

5. Do you know what the expanded core curriculum is about? Yes [ ] No [ ]

6. Expanded core curriculum helps the visually impaired to live independently.

Strongly Agree [ ] Agree [ ] Disagree [ ] Strongly Disagree [ ]

7. At which level of your education were you taught the various components of the expanded core curriculum (ECC)?

S/N	**Components of ECC**	Level the expanded core curriculum was studied			
		Basic Level	Secondary Level	Both Basic and Secondary Levels	None of the Levels
a.	Compensatory access				
b.	Sensory efficiency				
c.	Assistive technology				
d.	Orientation and mobility				
e.	Independent living				
f.	Social interaction				

8. Arrange the elements of the expanded core curriculum in the order you think you are most competent to the least competent by numbers 5 to 0 (Most competent is 5 and the least is 0).

a. Compensatory access [ ]

b. Sensory efficiency [ ]

c. Assistive technology [ ]

d. Orientation and mobility [ ]

e. Independent living [ ]

f. Social interaction [ ]

From Sections C to H tick (√) please indicate how often you demonstrate competence in the Expanded Core Curriculum skills by using the 6-point scale below.

Never =0, Rarely =1, Sometimes =2, Often =3, Very often = 4, Always =5

SECTION C: COMPETENCE LEVEL IN COMPENSATORY ACCESS

9. What is your competence level in the display of compensatory access skills?

S/N	**Compensatory access skills**	**0**	**1**	**2**	**3**	**4**	**5**
a.	I use braillewriter in an acceptable manner.						
b.	I use contractions when writing braille.						
c.	I use word-signs when writing braille.						
d.	I read advanced braille.						
e.	The write advanced braille.						

SECTION D: COMPETENCE LEVEL IN SENSORY EFFICIENCY

10. What is your competency level in the use of sensory efficiency skills?

S/N	Sensory efficiency skills	0	1	2	3	4	5
a.	I use my auditory sense to acquire information.						
b.	I use my fingers to read braille.						
c.	I use tactile means to explore the environment.						
d.	I am able to identify the environment I found myself.						
e.	I hold the white cane appropriately.						

SECTION E: COMPETENCE LEVEL IN ASSISTIVE TECHNOLOGY

11. What is your competency level in the demonstration of assistive technology?

S/N	Assistive technology skills	0	1	2	3	4	5
a.	I use an assistive device to access the core curriculum.						
b.	I use assistive technology to act independently.						
c.	I use the computer for my academic work.						
d.	I use the latest braille technology.						
e.	I use technology to enhance my personal efficiency.						

SECTION F: COMPETENCE LEVEL IN ORIENTATION AI MOBILITY

12. What is your competency level in the use of orientation and mobility skills?

S/N	Orientation and Mobility Skills	0	1	2	3	4	5
a.	I am able to maintain my safety and well-being.						
b.	I handle the white cane appropriately in the environment.						
c.	I use the white cane attend lectures on my own.						
d.	I am able to interpret environmental cues.						
e.	I can identify the voices of my lecturers and mates.						

SECTION G: COMPETENCE LEVEL IN INDEPENDENT LIVING

13. What is your competence level in the display of independent living skills?

S/N	Independent Living Skills	0	1	2	3	4	5
a.	I organize my personal items myself.						
b.	I organize information, documents, and records						
c.	I dress decently to attend lectures						
d.	I am regular and punctual at lectures.						
e.	I manage my money to buy my needs.						

SECTION H: COMPETENCE LEVEL IN SOCIAL INTERACTION

14. What is your competence level in the exhibition of social interaction skills?

S/N	Social Interaction Skills	0	1	2	3	4	5
a.	I participate fully in group studies.						
b.	I wait for my turn when conversing with others.						
c.	I engage others in cooperative and collaborative manner.						
d.	I demonstrate social etiquette when interacting with others.						
e.	I develop and maintain relationship and friendship.						

Thank you very much for your responses.

APPENDIX B

RELIABILITY TEST RESULTS

Case Processing Summary

		N	%
Cases	Valid	33	100.0
	Excluded[a]	0	.0
	Total	33	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.780	30

PENDIX E

LETTER OF INTRODUCTION

UNIVERSITY OF CAPE COAST
COLLEGE OF EDUCATION STUDIES
FACULTY OF EDUCATIONAL FOUNDATIONS
DEPARTMENT OF EDUCATION AND PSYCHOLOGY

Telephone: 233-3321-32440/4 & 32480/3
Direct: 033 20 91697
Fax: 03321-30184
Telex: 2552, UCC, GH.
Telegram & Cables: University, Cape Coast
Email: edufound@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA
15th December, 2018

Our Ref:

Your Ref:

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION
MR. EDWARD KOFI NTIM

We introduce to you Mr. Ntim, is a Ph.D. student from the Department of Education and Psychology, University of Cape Coast. He is pursuing Ph.D. degree programme in Special Education and is currently at the thesis stage.

Ms. Ntim is researching on the topic:

> *"Relationship between Competence in Expanded Core Curriculum and Academic Achievement of Students with Visual Impairment".*

As part of the programme requirement, he is expected to collect data for his work and have opted to make the study at your institution/establishment for his project.

We would be most grateful if you could provide him the opportunity for the study. Any information provided would be treated as strictly confidential.

Thank you.

Theophilus A. Fiadzomor (Mr.)
Senior Administrative Assistant
For: HEAD

APPENDIX F

ETHICAL CLEARANCE FORM

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/A/2016/189
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0009096

C/O Directorate of Research, Innovation and Consultancy

6TH DECEMBER, 2017

Mr. Edward Kofi Ntim
Department of Education and Psychology
University of Cape Coast

Dear Mr. Ntim,

ETHICAL CLEARANCE –ID: (UCCIRB/CES/2017/23)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research protocol titled *'Competence in expanded core curriculum and achievement of students with impairment'*. This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Dr. Samuel Asiedu Owusu
UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date: 6/12/17