CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The eye is a visual organ as well as beauty. Many eyes sub-serve the two functions excellently well. It is of note that the visual function of the eye supersedes that of beauty for human functioning. It is not uncommon to see 'beautiful' eyes lagging behind in its visual role. This may not be easily noticed until the eye is challenged to visually tasking activities. An important visually tasking activity that has far reaching effect on human and world development is learning. Individuals especially students, age notwithstanding know that they need normal vision to succeed in their learning activities including among others reading, studying, writing and copying. Through normal visual functioning the students can appreciate what the teachers writes, draw on the chalkboard, screen projections (visual aids). Vision though has greater effect than hearing in comprehension; it complements hearing in audiovisual aids. Normal visual functioning ensures colour appreciation, depth perception and contrast appreciation.

It is of interest that many students have 'apparently beautiful eyes' but with 'sub-optimal visual functioning'. These suboptimal visual functions may be in terms of visual acuity, visual field, colour perception, contrast sensitivity, depth perception, and ocular alignment. Visual acuity related challenges may range from selective blurring to near and far objects to absolute loss of vision. Visual field defects narrow the width of vision while colour vision defects may range from inability to appreciate closely related colours to inability to identify a particular colour. Depth perception is challenged in inability to appreciate dimensions and ocular misalignment can produce worrisome double vision.

Visual conditions of learning implications exist as a spectrum (ranging from mild to severe in terms of adverse effects on learning) among Nigerian students as elsewhere. However; it is of great concern that while efforts are far advanced elsewhere especially in developed economies to reduce visual burden having adverse effects on learning among students, it is not so in Nigeria. Yet, many students are either having poor school performances or out rightly dropping out of schools due to visual challenges. Interestingly, this may not necessarily be appreciated by the stakeholders in education including the students, guardians/parents, teachers, schools, proprietors and government. Yes, it is better late than never. There is the need to start somewhere by first appreciating what the visual challenges that can have implication on learning are from the students and teachers who are major stakeholders. One can always build on this foundation in future.

1.2 Statement of the problem

Emphasis on literate population continues as it has direct link to societal growth and development. It is a fact that learning and vision are inseparable entity. Estimate indicates that 80% of what we learn comes through the visual processing of information (Glezer, 1995; Zeki, 1993; Gazzaniga, Ivry, Jangun, 1998; Parker, 1989). Vision disorders are among the most common disability in our society and one of the most prevalent handicapping conditions in childhood. It has been estimated as many as 25% of all schoolchildren have visual problems. Many of these children with vision problems end up with poor academic performance. Good vision is a prerequisite learning tool and must not be overlooked while efforts are being made to improve schools and providing educational materials/aids (books, computers) for the students.

The processes of identifying eye conditions and appropriate management to improve visual performance vis-à-vis learning among students have been institutionalised elsewhere (Dusek, Pierscionek, McClelland, 2010), it is of interest that there is virtually nothing of such in Gwagwalada Area Council. Almost all schoolchildren in Gwagwalada Area Council, do not receive any standard preventive vision care before entering elementary school and thereafter. Yet Gwagwalada, is an Area Council in FCT and potentially learning related visual conditions have been found among students in Nigeria (Adegbehingbe, Adeoye, Onakpoya, 2005; Ayanniyi, Mahmoud, Olatunji, 2010). At present the information on students eye health in Gwagwalada Area Council is non existence; there is no data on magnitude, the pattern, and the existing treatment options. Once children enter schools, the problem only gets worse.

The objective of this study is to determine visual challenges to learning among secondary school students in Gwagwalada Area Council, Abuja, Nigeria

1.3 Purpose of the study

The **objective** of this study is to identify visual challenges to learning among secondary school students.

The **specific objectives** include:

1. To determine knowledge of importance of vision to learning among students and teachers
2. To determine the knowledge of some causes of eye conditions among students and teachers
3. To find out if secondary schools specifically request students to do eye test before admission
4. To find out the use of eye glasses among students
5. To find out the common eye complaints of learning importance among students
6. To find out learning difficulties consequent on eye complaints

7. To find out the effects of eye complaints on students' learning activities
8. To determine actions students/teachers take to manage students eye complaints
9. To find out how students/teachers would manage eye complaints that affect students learning
10. To determine the opinion of teachers on Nigeria schools/education and education of visually challenged students

1.4 Research Question

1. What is the degree of importance of vision and hearing to learning?
2. What are the causes of eye diseases?
3. What is student's experience of eye test?
4. What is student's experience of eye glasses use?
5. What is/are the eye complaint(s) student's use to have during learning activities?
6. What are learning difficulties consequent on eye complaints?
7. What are the effects of student's eye complaint(s) on learning activities?
8. What action(s) students/teachers take about the eye complaint(s) students experience?
9. How do students/teachers think eye complaint(s) affecting student learning should be managed?
10. What is the teacher's opinion on Nigeria schools/educational system and education of visually challenged students?

1.5 Significance of the study

As far as students' eye health is concerned Gwagwalada Area Council remains unresearched, unreported. It is largely a virgin area. This study would be one of the first documentations on

students' eye health. It will provide base line information on magnitude and pattern of visual complaints relevant to learning in Gwagwalada Area Council, Abuja. Furthermore, it will catalogue learning difficulties consequent on eye complaints, the effects of eye complaints on students' learning activities, and existing management options for eye complaints among students in Gwagwalada Area Council. Also, it will provide first hand information on knowledge of students and teachers on: importance of vision to learning and causes of eye conditions. It will also document the use of pre-school admission eye test by schools and use of eye glasses among students.

The aforementioned has potential to be utilized by stakeholders in students' eye health. The research findings can be a powerful advocacy tool to convince Government, NGOs, corporate organization, and Educational planers to put in place vision related services that can improve learning among students. The findings when published will provide baseline data and ready reference materials for researchers among others.

1.6 Scope and delimitation of the study

This research work is intended to cover all secondary school students in Gwagwalada Area Council. The researcher would make efficient use of secondary school students in JSS II – SSS III in this study.

1.7 Operational definition of terms

1. **Antiallergic eye drops:** drugs used in treating allergic eye conditions
2. **Analgesics:** drugs used to prevent or relief pain
3. **Anti-inflammatory drugs:** drugs used to prevent or relief inflammation
4. **Blindness:** inability to see; usually taken as visual acuity of less than 3/60

5. **Contact lenses:** disc shaped lenses worn over the cornea

6. **Colour vision defect:** inability to perceive/identify different colours

7. **FCT:** Federal Capital Territory, Abuja. (Nigeria National capital and seat of federal government)

8. **Irreversible blindness:** Visual acuity of no perception of light (NPL)

9. **Magnifying devices:** lenses that make objects appear bigger/ increased in size

10. **Mast cell stabilizers:** drugs used in treating allergic conjunctivitis

11. **Optical devices:** materials having optical power especially glasses used in eye care including medicated eyeglasses (spectacles with concave, convex or cylindrical lenses),

12. **Photochromic lenses:** coated lenses that screen harmful rays in the spectrum/reduce intensity

13. **Systemic drugs:** drugs administered orally, intravenously or intramuscularly

14. **Topical drugs:** drugs administered to the specific area of the body especially eyes

15. **Vision:** perception of light rays by the eye and its processing

16. **Visual acuity:** ability of the eye to appreciate the details of an object

17. **Visual field:** the width (horizon and vertical extent) of how individual can see

18. **Visual impairment:** vision below acceptable normal vision (sub-normal vision)

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter reviews the literature including the following

1 Theoretical frame work

2 Concept of learning

3 Concept of vision

4 Visual conditions that can affect learning

5 Management of visual conditions

6 Roles of stakeholder in management in visual conditions

7 Summary

2.1 Theoretical frame work

A literate population is the pivot of a healthy society. Literacy has been defined as ability to read and write to a competent level. This definition has been reviewed to mean how people use written information in order to function in society rather than merely basic reading ability. The growing societal sophistication requires individuals to have a higher level of literacy to function well and low-skill jobs are disappearing. It is a fact that inadequate levels of literacy among a broad section of the population potentially threaten the strength of economies and the social cohesion of nations. (Literacy, Economy, and Society: Results of the First International Adult Literacy Survey, Otawa, 1995). As the students are the future of any nation, stakeholders in education are working to improve educational opportunities for children. Surprisingly, only a

few organizations, outside of those dedicated to eye care, are addressing one of the elemental issues affecting literacy today – poor vision in children. Essentially, the children with untreated vision problems are left behind before they even start school (Zaba, Mozlin, Reynolds, 2003) and those who start have difficulty coping or drop out.

While there is growing interest in literacy and children visual function elsewhere, such concern is yet to receive deserved attention in Nigeria. When students do not see well, their school performance suffers. Concern for students' good vision must not be left behind in an effort to improve schools and make available learning materials (books, computers) to students. Experts estimate that 80% of what we learn comes through the visual processing of information (Glezer, 1995; Zeki, 1993; Gazzaniga et al., 1998; Parker, 1989). Nevertheless, most students across the globe especially Nigeria, cannot access preventive vision care. For instance, in United States, report shows two out of three children do not receive any preventive vision care before entering elementary school (CDC and Prevention, Morbidity and Mortality Weekly Report, May 6, 2005). The problem appears aggravated following the children placement in the school; as the National Parent Teacher Association posited, more than 10 million children in United States suffer from vision problems that may contribute to poor academic performance (*Learning Related Vision Problems: Education and Evaluation*, Resolution adopted at the National PTA Convention, June 1999).

Teenagers with mediocre high school academic records and low Scholastic Aptitude Test (SAT) scores have been found to have significant numbers of undetected or untreated vision problems. They are at risk of not completing their college programs (Johnson and Zaba, 1995). By any measure, the level of inadequate vision care for children is significant. Moreover, its societal

consequences have been linked to high school drop-out rates, social and emotional problems, juvenile delinquency, adult literacy problems, and incarcerations. The impact on workforce quality and productivity is evident as well. Research has found that Title 1 students, juvenile offenders, illiterate adults, academically at-risk college students, and academically and behaviorally at-risk public school students have a higher prevalence of undetected vision problems (Zaba, 2001). Previous research has shown a significant number of undetected and untreated vision problems in adults in the lowest levels of literacy (Thau, 1991). When evaluating adults with literacy problems, studies have indicated ranges of 66% to 74% of their populations failed vision screenings (Johnson and Zaba, 1994). Between 1992 and 2003, there was a decline in the average prose literacy of adults between the ages of 25 and 39.32 (Kutner, Greenberg, Jin, Boyle, Hsu, Dunleavy, 2007). Many of these adults are the children of yesterday who had undiagnosed and untreated vision problems and grew up to become part of the adult literacy problem of today (Zaba and Johnson, 1992). Vision problems can lead to inadequate academic performance in school, self-esteem issues with attendant emotional components and, when triggered by other factors, antisocial behavior (Johnson and Zaba, 1999).

Vision disorders are among the most common disability in our society and one of the most prevalent handicapping conditions in childhood. Many children across the globe suffer from vision problems that contribute to poor academic performance. In United States estimates show vision problems are prevalent in 25% of all schoolchildren. Ocular morbidity in children affects learning ability, adjustment in school and personality (Pratab and Lal, 1989). It reduces employability and productivity and in general impairs the quality of life, which has a direct

bearing on the economy of the nation and gross domestic product (GDP) (Jose, Rothore, Rajshekhar, Sachdeva, 2008)

It is estimated that 1.5 million children suffer from blindness and severe visual impairment worldwide (Sihota and Tandon R, 2007) majority being from Africa and Asia. Fifty percent of childhood blindness are preventable (Sihota and Tandon R, 2007). Early detection and treatment of ocular diseases and visual impairment in children is very important in this respect.

2.2 Concept of learning

The word 'learn' by Webster Dictionary means 'to gain knowledge or understanding or skill by study, instruction or experience'. Learning has been defined by education experts as acquisition of skills and attitudes that lead to a relatively permanent change in behaviour. Behaviour is a neural reaction to a given stimulus and it may be overt or covert. (NTI, Kaduna, 2011).

Learning has basic characteristics that distinguish it from other processes and these include relatively permanent behavioural change, associated experience, being an internal process, occurrence under conditions of directed attention and deliberate effort and being distinct from biological maturation and imprinting.

Learning has four elements according to Gagne (1970), ***(i) the learner***, a human being with sense organs (eyes, ears, skin, nostrils and tongue) for stimulation, the brain for transformation of stimuli from the sense organs, and the muscle for necessary action (to exhibit learning); ***(ii) the stimulus situation***, refers to all the events that stimulate the learner's senses; ***(iii) previous knowledge in the memory***, refers to the content of the learner's memory which is retrievable and; ***(iv) the response***, the actions that follow the inputs and their subsequent transformation.

There are three major schools of thought on how human beings learn as there are psychologists; ***(i) Behaviourist-Associationist*** views learning as resulting from the forming of connections between stimuli and observable response; ***(ii) Cognitive-Gestaltists*** believe that learning results from the re-organisation of perceptions and forming of a new relationship. It advocates that the whole (Gestalt) is more than just the sum of a group of separate parts; ***(iii) Information-Processing Approach*** is a contemporary learning memory and is different from the above two traditional schools. It proposes that the stimulation encountered by the learner is transformed, or processed in a number of ways by internal structures during the period in which the changes identified as learning takes place.

Learning is a process that occurs in three stages according to psychologists and the stages are interconnected; ***(i) acquisition*** involves the learner receiving the information; ***(ii) retention*** entails the mental processing including meaningfulness, interpretation and encoding. Retention may be into ***short or long*** term memory; and ***(iii) recall***, involves retrieval of already acquired and stored information.

It is important to note from aforesaid '***concept of learning***' that learning depends on functional five sense organs including eyes (vision), ears (hearing), skin (touch), nostrils (smell) and taste (tongue). Of all the five senses both eyes (vision) and ears (hearing) are majorly required for learning. However; vision appears the utmost in learning processes including reading and writing necessary for literary or scholarly activities.

2.3 Concept of vision

Visual perception is the ability to interpret information from the effects of visible light reaching the eye from the body's surroundings. The resulting perception is known as sight or vision. The

visual system in humans allows individuals to assimilate information from the environment. The act of seeing starts when the lens of the eye focuses an image of its surroundings onto a light sensitive membrane in the back of the eye called the retina. The retina is isolated as a transducer for the conversion of patterns of light into neuronal signals. The lens of the eye focuses light on the photoreceptor cells of the retina which detect the photons of light and respond by producing neural impulses. These signals are processed in a hierarchical fashion by different parts of the brain, from the retina upstream to the central ganglia of the brain. (Visual Perception. Wikipedia, www.wikipedia.com)

Vision has been defined as a continuous and integrative process that can be divided into three components: ***(i) visual acuity***, including refractive status; ***(ii) visual efficiency***, which is composed of oculomotor, accommodative and binocular vision skills; and ***(iii) visual perceptual-motor skills***, which represent the ability to recognise and discriminate visual stimuli and interpret them correctly in the light of previous experience (Garzia, 1996). While it is recognised that all of these components are equally important the emphasis will be placed on visual efficiency. Visual disorders such as hyperopia, convergence insufficiency, poor fusional vergence reserves, fixation disparity, hyperphoria, anisometropia, accommodative dysfunctions. among other dysfunctions have been shown to adversely affect reading performance and sustainability. Some children and adults, who have difficulty with reading, experience visual perceptual distortion and complain of asthenopic symptoms when viewing a page of print. The Letters may appear to move, jumble or to blur; white paper may glare and cause eyestrain or headaches. The resulting visual and physical discomfort is very likely to interfere with reading, and often attention and concentration are reduced. These distortions can be caused by a conventional optometric

anomaly such as hyperopic astigmatism, a deficit in the binocular vision system (reduced visual efficiency), by Meares-Irlen Syndrome or a combination of some or all of these. Lightstone and Evans (1995) have suggested a sequential assessment and management plan to determine the cause of these signs and symptoms.

Visual acuity is the degree to which details and contours of objects are perceived and it is usually defined in terms of the shortest distance by which two lines can be separated and still be perceived as two lines. On a general note, visual function is subject to nutritional, genetic and environmental factors. Visual acuity is affected by a large variety of factors, including optical factors like the state of the image-forming mechanisms of the eye, retinal factors like the state of the cones, and stimulus factors like illumination, brightness of the stimulus, contrast between the stimulus and the background and length of time the subject is exposed to the stimulus (Barrett, Boitano, Barman, Brooks, 2010).

The World Health Organization's International Classification of Diseases describes four levels of visual function. These are normal vision (6/6-6/18), moderate visual impairment (<6/18-6/60), severe visual impairment (<6/60-3/60) and blindness (<3/60) Moderate visual impairment combined with severe visual impairment is grouped under the term "low vision": low vision taken together with blindness represents all visual impairment (WHO, Visual Impairment and Blindness Factsheet, April, 2011).

WHO statistics show that about 284 million people are visually impaired worldwide; 39 million are blind and 245 million have low vision. Furthermore, about 90% of the world's visually

impaired live in developing countries including Nigeria and the many of the visually impaired are children.

2.4 Visual conditions that can affect learning

Theoretically any visual condition that can render visual functioning sub-optimal can adversely affect learning. Furthermore, any ocular condition that produce bodily discomfort especially pain would imparts negatively on learning. Interestingly, many individuals with sub-optimal visual functions have been known to have better education in human history. However, given the same benefits (environmental and genetic make-ups) individuals with optimal visual conditions should fare better in learning compare to one with sub-optimal vision. A number of common visual conditions that can adversely affect learning among students are as follow:

Refractive errors: Refractive error is a disorder of optical power of the eye resulting in inability to focus light rays on the retina. The main symptom is blurred vision. It is the most common eye disorders in human being and very common among the students. Refractive errors are thought to be caused by a combination of genetic and environmental factors (Weale, 2003; Hammond**,** Snieder**,** Gilbert, Spector, 2001). Studies have shown higher prevalence of refractive error among children in urban settings than in rural settings (Dandona, Dandona, Srinivas, 2002; Lithander, 1999; Murthy, Gupta, Ellwein, 2002). Astigmatism and hypermetropia are inherited disorders, and myopia is caused by a combination of hereditary and environmental factors. Exposure to near work, such as reading has been the most consistent environmental factor that has been linked to the development of myopia (Richler and Bear, 1980). There are different forms namely myopia, hyperopia, astigmatism and presbyopia. ***Myopia (shortsightedness)*** is a refractive error

whereby paraxial light rays are brought to focus before (in front) the retina. The myope, usually sees close objects but would fail to appreciate far ones. A student myope would not be able to see/appreciate what is written on the chalkboard while sitting at the back or middle of the class depending on its severity. On the other hand ***hyperopia (longsightedness)*** is a refractive error whereby paraxial light rays are brought to focus after (behind) the retina. The hyperope, usually sees far objects but would fail to appreciate near ones. A student hyperope would not be able to see/appreciate what is written on the chalkboard while sitting in front or middle of the class depending on its severity. ***Astigmatism*** has to do with differences that exist in refractive powers across the eye major meridians. This results in paraxial light rays being brought to focus at more than one foci. The locations of the foci are function of whether the astigmatism is simple, complex or mixed. An astigmatic students would not be able to see clearly (distinctly) the chalkboard at all distances in the class. Such students may also experience selective blurring to objects depending on its shape/size and this includes letters or alphabets. ***Presbyopia*** is an age dependent loss of accommodation. Typically affected individual is above age 35 and cannot read at the normal near point of 25-33cm especially in dim light. The equivalent of presbyopia does exist among individuals below age 35 especially the students in form of ***accommodative insufficiency***. Differences in refractive power between two fellow eyes, ***anisometropia***, can produce ***asthenopic symptoms*** including blurring of vision, eyes discomfort/pain, brow aches, headaches that would adversely affect learning among students.

As elsewhere (Murthy et al., 2002; Dandona et al., 2002; Lin, Chen, Hung, 1988; Garner, Owens, Kinnear, 1999; Lithander, 1999; Wedner, Ross, Todd, 2002), ocular health studies have

confirmed refractive errors as an important health challenge among Nigerian school age children (Adegbehingbe et al., 2005; Ayanniyi et al., 2010).

Visual impairment due to refractive errors is an important public health problem as it affects performance at school and impairs social and behavioral development of children. Generally, refractive errors can adversely affect learning in a number of ways. It can affect visual acuities ranging from mild visual impairment to blindness. Also, it can produce annoying asthenopic symptoms. Therefore, untreated refractive errors can adversely affect learning resulting in either poor school performances or outright drop outs.

Allergic conjunctivitis: This refers to allergic or hypersensitivity reactions of the conjunctiva. It is a common ocular condition across the globe especially among Nigerian schoolchildren and students. The common one below age 20, ***vernal conjunctivitis*** typically is associated with eye itching, sandy eye sensation (grittiness), mucoid eye discharge and redness. Aside its annoying aforementioned symptoms/signs, it produces varying degree of visual blurring and rarely blindness in very severe form (Hall and Shillo, 2005). Allergic conjunctivitis can affect learning by impairing vision, and majorly by its annoying intense itching (producing scratching) and sandy sensation. Allergic conjunctivitis remains a leading cause of absenteeism from school due to its discomfort, chronicity and recurrence (Ayanniyi et al., 2010; Wood, 1999; Ajaiyeoba, 1994; Onwasigwe, Umeh, Onwasigwe, Aniebue, 1996)

Squint: This results from misalignment of the eye muscles leading to imbalance in fellow eyes movement. Its causes may be genetic, traumatic, systemic illnesses, tumours and degenerative conditions that affect ocular muscles or their nerve supply. The two forms are latent (phoria) and manifest (tropia). The phorias include esophoria and exophoria. The tropias include esotropia

and exotropia. Squint can affect vision by producing annoying double vision leading to confused vision/blurring.

Ocular trauma: Ocular injuries are not uncommon among students. It is more common among boys than girls. The injuries usually occur at play, during corporal punishment and during fight. The injury may lead to ocular morbidity and mortality ranging from mild visual impairment to blindness. Many ocular injuries produce physical damage that would be self-evident. However, some may not be known to non eye-witnesses including guardians/parents/teachers especially when students fail to report it for fear of guardian abuse. This would even be possible in injuries that are confined to the inner parts of the eye especially the posterior segment when outer segment remains essentially normal. Ocular trauma may have adverse effect on learning by producing impaired visual acuity and through associated eye discomfort/pain.

Ocular infections: A number of eye infections including bacteria, viral and fungal are vision threatening especially when left untreated. Some may produce complications that compromise visual acuity or lead to ocular morbidity /mortality. Ocular infections may have adverse effect on learning by producing impaired visual acuity and through associated eye discomfort/pain.

Ocular tumours: Tumours are new growths and may be benign or malignant. Tumours either benign or malignant produce mechanical obstruction which interferes with vision causing impaired visual acuity. On the other hand malignant tumours may infiltrate the ocular tissue leading to loss of vision. A number of eye tumours have been reported among students including optic nerve glioma, Burkitt lymphoma, rhabdomyosarcoma, meningioma and pituitary adenoma.

Genetic abnormalities: A number of genetic abnormalities have visual implications and can affect learning. Leber's optic neuropathy (mitochondria abnormality) can produce visual loss in

teenage years. Colour vision abnormality (a sex–linked disorder) produces varying degree of colour vision defects.

Cataract: This is an opacification of the crystalline lens. It is the most common cause of blindness across the globe especially in developing economy like Nigeria. Cataract is common among individuals above age 40. However, for a number of reasons including eye injury, infections, metabolic disorders (diabetic mellitus, galactosemia) and genetic, cataract may be found among students. Cataract can interfere with learning in a number of ways by causing blurred vision, impaired contrast sensitivity, double vision and glare.

Glaucoma: A group of eye diseases characterized by optic neuropathy/atrophy and in which one of the risk factors is raised intraocular pressure. It is the second cause (next to cataract) of blindness across the globe. Like cataract, it is common among individuals above age 40. However, for a number of risk factors including family history, Black race; glaucoma may be found among students.

Ocular degenerations: Pingueculum and pterygium are common ocular degenerations in our environment. Pterygium especially is of learning implication. It presents with ocular discomfort including pains, sandy sensation in addition to visual impairment, double vision, impaired contrast sensitivity and glare. These symptoms can adversely affect learning among students.

Others: There are a number of other ocular conditions that can adversely affect learning. This is varied and may include the treatment received in managing eye conditions. For instance the use of **Harmful Eye Medications** can lead to ocular morbidity/mortality. Many eyes have been visually compromised through self-medication or application of potentially injurious substances

to the eyes due to ignorance, poverty and illiteracy. Sickle cell retinopathy can compromise vision in sickle cell patients (Babalola and Wambebe, 2000).

2.5 Management of visual conditions

Optical: A number of visual conditions that can adversely affect students learning activities can be corrected by optical appliances. Usually refractive errors including among others myopia, hyperopia, astigmatism, presbyopia are generally managed using optical devices including medicated eyeglasses (spectacles with concave, convex or cylindrical lenses), contact lenses, prisms and magnifying devices (Weale, 2003; Ayanniyi et al., 2010; Bourne, Dineen, Huq, Ali, Johnson, 2004). Furthermore, squints can be managed using prisms. Photochromic lenses can be used to manage light induced eye pain while reading or working on computer monitor. A population based cross sectional survey of refractive errors in children aged 5 to 15 years showed that more than 9% of rural Chinese, 2% of rural Nepalese and 7% of urban children would benefit from spectacle correction (Wedner and Dineen, 2003; Zhao et al., 2000; Pokharel et al., 2000; Maul et al., 2000).

Medical: Advances in Medicare have produced a number of potent medications that can relief pains of ocular conditions that have adverse effect on learning. For instance vernal conjunctivitis (it produces intense eye itching, peppery/sandy sensation, which elicits scratching) impairs students' concentration and causes absenteeism can be managed using antiallergic eye drops including mast cell stabilizers and ones that mop up released chemicals. Asthenopic symptoms including eye discomfort/pains, and headaches of eyes origin can be managed with a number of topical and systemic analgesics and anti-inflammatory drugs. Furthermore, there are potent medication that can be used to control raised intraocular pressure in glaucomatous eyes.

Surgical: Surgery is a gold standard in managing visual conditions that is/may not be amenable to optical and medical treatment. Ready examples of such eye conditions are cataract and squint. The only effective treatment for cataract till date is surgery and many squints are amenable to surgical intervention. Both cataract and squint are not uncommon among students and are potentially adverse to learning activities. Refractive errors can also be corrected using refractive surgery (Weale, 2003; Bourne et al., 2004; Ayanniyi et al., 2010). Surgery is also useful in managing glaucoma.

Rehabilitation services: Many youngsters who are irreversibly blind would need education and vocational training to cope with life. Such students would require simple and sophisticated equipments for their education and training. There are special schools (SS) and integrated schools (IS) for education and training of visually challenged. In SS for irreversibly blind students the resources (human and materials) can be mobilized (concentrated) and students can be pooled for specialized education and training. Such SS do exist across Nigeria, though other handicapped students but not necessarily visually challenged are co-educated/trained in such schools. While SS serve as ready referral centres it may not necessarily be the best. The IS where the visually 'challenged' are co-educated with visually 'normal' students provide opportunity for social integration among 'normal' and 'challenged' students. This presents real life situation and provide avenue for interaction between the 'normal' and the 'challenged' students. This would engender positive attitudes including love, sympathy, empathy among others that can positively shape the future life.

2.6 Roles of stakeholders in management of visual conditions among students

Students: They should promptly inform teachers/schools and guardians/parents of their eye complaints for necessary actions. Also, they can report in the school clinics or eye clinics for necessary attention/ help.

Guardians/Parents: The guardians and parents should take interest in their wards' ocular health. They should pay attention to students' eye complaints and school performances and requests from schools concerning the wards eye health. They should accompany students for eye consultations and comply with eye specialists' prescription when it is given. The guardian/ parents should ensure that all their wards having difficulty with learning should have eye test in the eye clinic.

Schools and Teachers: The schools should observe and ensure adequate attention to students' eye health. The schools should request all prospective students to have eye test before admission. Results of such test should be interpreted and communicated to students and guardians/ parents for necessary action when necessary. Furthermore, the school should have in place modalities for yearly eye tests for the students. The school clinic should be equipped so as to provide basic eye test and care to students who need it. The teachers should identify students who may benefit from eye care consultations in his/her class periodically. These may include among others known students with ocular conditions, students with specific eye complaints and students with learning difficulties.

The Society: The society should imbibe a value system that will ensure there is adequate attention to eye health of the students in view of its importance to learning, growth and development of individuals and the society. There should be social support system for visually challenged students. The society should support and build social institutions that will enable

visually challenged students to function optimally within the society. Eye care services should be supported/strengthened so as to be able to render the required eye care services to the students.

Government: There should be provision of adequate resources for eye health. There should be adequate legislation and enforcement of such provision among government owned and private schools. Government should ensure that schools are granted licensed only after meeting the conditions that will guarantee optimal eye health of students. This may include well equipped school clinic with emphasis on availability and competence in use of basic eye testing materials especially visual acuity chart. Evidence of the school capability to get eye care personnel (Ophthalmologist, Optometrist, Ophthalmic nurse) services should the need arise. The eye care personnel services should include at least yearly eye screening for students prompt attention to students eye needs as at when necessary. Eye care personnel services should also involve counseling, optical, medical and surgical eye care services. The standard among schools should be encouraged (by award) and enforced through regular inspection of facilities and conditions that will ensure relicensing or withdrawal of license to operate.

Eye care personnel: These include among others ophthalmologists, optometrists, ophthalmic nurses, opticians, orthoptists and ocularists. They should serve as watchdog on eye health of the populace in general and students in particular. They should advocate for students' eye health. They should make case for how eye care services should be made affordable, available and accessible to the populace especially the students.

2.7 Summary

This chapter highlights the fact that many students suffers visual challenges that affect learning and its social implications including childhood development, learning performance, self-esteem,

social-emotional behavior, academic achievement, high school drop-out rates, and juvenile delinquency if unattended to. From the standpoint of society in general, the failure to detect and treat children's vision disorders affects the rates of adult criminality, literacy, and labor productivity. It defines learning, its basic features, its major schools of thought and its relationship to vision. The basic concept of how vision is achieved is also examined. The common eye conditions that can adversely affect learning among students including refractive errors, ocular trauma, ocular misalignment (squint), eye infections, cataract, glaucoma, genetic disorders and tumours and the management modalities were discussed. The roles of the stakeholders in education and eye care were also discussed.

CHAPTER THREE

RESEARCH DESIGN AND METHODS

3.0 Introduction

This chapter dealt with the method adopted in accomplishing the objectives of the study. This include research design, population of the study, sample and sampling technique, instrument for data collection, validity of the instrument, reliability of the instrument, method of data collection and method of data analysis.

3.1 Research design

This was a cross-sectional survey of secondary school students and teachers in selected schools in Gwagwalada Area Council, Abuja. A multistage random sampling technique was used in students' selection.

3.2 Population of the study

This comprised of secondary school students and teachers in Gwagwalada Area Council, Abuja.

3.3 Sample and sampling technique

The sample size of the students was determined using the equation $n = z^2pq/d^2$. Where n is the desired sample size, z is the standard normal deviate (1.96 which corresponds to the 95%

confidence level was used), p is the proportion (prevalence) of the students population estimated to have visual problem and d is the degree of accuracy. The prevalence (p) of ocular pathology among student from previous study in Nigeria was 20% (Ayanniyi, et al., 2010). Thus p = 0.2, q = 1- p = 0.8 and d was set at 2.5%. Thus the calculated sample size (n) was 983.

The multistage random sampling technique was accomplished using generated random numbers to select 4 secondary schools from a list of secondary schools in Gwagwalada Area Council. Then, the students were selected from each school by simple random technique. The senior secondary schools students were sampled as they would comprehend better the questionnaire, which was written in English language. A total number of 1000 copies of the questionnaire were administered on students in 4 selected schools including School for the Gifted, Gwagwalada 250; Government Secondary School, Gwagwalada 270; Government Day Secondary School, Gwagwalada 300 and Government Secondary School, Dobi 180. However, not all copies of questionnaire so distributed were retrieved and only 963 copies were eventually analysed. Three additional schools including Al-Mohass Secondary School, Gwagwalada; Christ Academy International School, Gwagwalada and Sheikh Hamdan Model Secondary School, Gwagwalada were incorporated for teachers' survey.

3.4 Instrument for data collection

Structured self-administered questionnaire were used in collecting information from the students on their visual complaints affecting learning. The questionnaire was in two sections including the students' demography such as age, gender, religion, tribe, school and class. The second section was on the visual challenges to learning with a Likert 4 point scale 4, 3, 2, 1 (Strongly Agree, SA; Agree, A; Strongly Disagree, SD; and Disagree) response. This section include importance

of vision, causes of eye diseases, experience on eye test, experience on eye glasses use, eye complaints that affect learning, learning difficulties due to poor vision, effects of eye complaints on learning, actions on eye complaints, management options for eye complaint (appendix I). The class teachers were also requested to fill questionnaires on visual challenges of their students and the questionnaire followed the same format like that of the student but with added information such as the highest academic qualification, duration of teaching experience and teachers' opinion on Nigerian schools/educational system in relation to the education of students with visual challenge (appendix II).

3.5 Validity of the instrument

The supervisor reviewed the self-constructed questionnaire for face and content validation before the study.

3.6 Reliability of the instrument

In order to test the reliability of the instrument, a pilot study was conducted among students in a school that was not included in the study. The results were collected through test-retest method. The results were corrected and index of 0.72 was obtained which was sufficient and adequate enough to make the instrument reliable for the study.

3.7 Method of data collection

Through the assistance of class teachers, all available students in all the arms of each class (SS I - III) were given the opportunity to be selected. The selected students from each class were requested (after accenting/consenting to participate) to fill self-administered structured questionnaire (appendix I). To ensure that students did not copy themselves or influence one another, the questionnaire carried bold instruction '**Please fill it yourself. Do not copy from**

others. It is not about right or wrong answer. It is not a test or exam' (appendix I) and also, this was verbally emphasized to the students by researcher. Furthermore, students were supervised by the teachers, the researcher/research assistants. Sufficient time was given to the selected students to fill the questionnaire. The teachers were also requested to fill questionnaires on the visual challenges of their pupils (appendix II).

3.8 Method of data analysis

Data were collated, entered, cleaned and analyzed using Statistical Package for Social Sciences (SPSS) version 16.0. The mean values of 2.4 - 4.0 was taken as significant and 0 - 2.4 as insignificant. Simple proportion, percentages and mean scores were employed.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter deals with data presentation, analysis and interpretation under the following sub-headings:

1 Demographic data of sampled respondents

2 Research question analysis for sampled students

3 Research question analysis for sampled teachers

4 Major findings

5 Discussion of major findings

4.1 Demographic data of Sampled Respondents

The respondents include the secondary school students and their teachers. The demographic characteristics of the sampled populations include age, gender, religion, ethnicity, the school and the class. Others include the teacher's highest academic qualification and duration of teaching experience.

(a) Sampled Secondary School Students

Table 4.1: Demographic Distribution of the Respondent Students

Demographic Parameter	**Number (%)**
Age Range 11-24; Mean 15.75, SD 1.959	
Age group (N=963)	
11-15	444 (46.1)
16-20	507 (52.7)
21-25	12 (1.2)
Gender (N=963)	
Male	533 (55.3)
Female	430 (44.7)
Selected Secondary Schools & the number of the Students (N=963)	
School for the Gifted	241 (25.0)
Government Day Secondary School, Gwagwalada	298 (30.9)
Government Secondary School, Dobi	159 (16.5)
Government Secondary School, Gwagwalada	265 (27.5)
Selected Grade levels & the number of the Students (N=963)	
Senior Secondary I	312 (32.4)
Senior Secondary II	326 (33.9)
Senior Secondary III	325 (33.7)
Religion & the number of the Students (N=959)	
Christianity	803 (83.7)
Islam	151 (15.7)
Others	5 (0.5)
Ethnicity (93 ethnic groups) & the number of the Students (N=943)	
Igbo/Ibo	309 (32.8)
Yoruba	192 (20.4)
Igala	55 (5.8)
Ebira/Igbira	47 (5.0)
Gbagi/Gwari	41 (4.3)
Edo	36 (3.8)
Hausa	35 (3.7)
Idoma	32 (3.4)
Nupe	18 (1.9)
Tiv	17 (1.8)

Bassa	14 (1.5)
*Others	147 (15.6)

N, sample size; *Ibibio 8, Calabar 8, Fulani 7, Efik 6, Jaba 5, Eggon Mada 5, Ishan/Esan 5, Urhobo 4, Ibibio 4, Akwa Ibom 4, Ogoja 4, Isoko 4, Ijaw 3, Delta 3, Koro 3, Berom 3, Gwandara 3, Benin 2, Deomak 2, Dukkawa 2, Mwaghavul 2, Igarra 2, Gade 2, Igede 2 and one each of other 53 ethnic groups including Angas, Bajju, Ron, Yala, Okepella, Buji, Kaje, Adara, Yaskwa, Ikulu, Kaduna, Ebira Koto, Ndokwa, Igeda, Igako, Ibgo, Baruba, Nukwle, Eket, Cham, Ewkahi, Marige, Aytpa, Qyan'pam, Jukun, Ninzo, Eggad, Yarkur, Oworo, Yangdang, Afor, Bura, Ora, Ado, Abawa, Ebora, Kagoma, Etsako, Bekwarra, Dibo, Amaka, Ebu, Egbemumeh, Tigun, Tula, Alago, Ekereku, Arum, Taroh, Ogoni, Eak, Ugep, Bachama

Table 4.1 shows that average age of student was 16 years and 951 (98.8%) were in the age range 11 to 20. Male to female ratio was 1.2. The sampled students were evenly distributed among the three senior secondary classes. Most students were Christians 803 (83.7%). The students cut across over 90 ethnic groups with dominant one being Igbo 309 (32.8%) followed by the Yoruba 192 (20.4%).

4.2 Research question analysis for Sampled Students

Research question one: What is the degree of importance of vision and hearing to learning?

Table 4.2: Degree of value of vision and hearing to learning

SN	Statement	N	SA	A	D	SD	X
1	Vision is not important to learning	948	103	119	221	505	3.19
2	Hearing is more important to learning than vision	947	216	297	296	138	2.38
3	Vision is more important to learning than hearing	939	126	226	389	198	2.70
4	Hearing and Vision are of equal importance to learning	952	561	245	84	62	1.63
	Overall Mean (X)						**2.48**

N, sample size; SA, strongly agree; A, agree; D, disagree; SD, strongly disagree; X, mean

Table 4.2 shows that many students 222 (23.4%) at least agreed 'vision is not important to learning'. Most students 513 (54.2%) at least agreed 'hearing is more important to learning than vision' and 587 (62.5%) at least disagreed 'vision is more important to learning than hearing' (X=2.70). Most student 806 (84.7%) at least agreed 'hearing and vision are of equal importance

to learning' (X=1.63). *Vision and hearing are important to learning (X=2.48). Many sampled students were yet to appreciate the importance of vision to learning.*

Research question two: What are the causes of eye diseases?

Table 4.3: Causes of eye diseases

SN	Statement	N	SA	A	D	SD	X
5	Eye disease is caused by witchcraft/spirits	947	45	125	256	521	3.32
6	Eye disease cannot be inherited from parents	945	136	212	312	285	2.79
7	Eye disease cannot be caused by infections/germs	944	81	115	277	471	3.21
8	Eye disease can result from injuries/trauma	951	381	363	100	107	1.93
9	Refractive errors can make one not to see well	842	198	437	108	99	2.13
	Overall Mean (X)						**2.68**

Table 4.3 shows that many students at least agreed 'eye disease is caused by witchcraft/spirits' 170 (18%), 'eye disease cannot be inherited from parents' 348 (36.8%) and 'eye disease cannot be caused by infections/germs'196 (20.8%). Also, many students disagreed 'eye disease can result from injuries/trauma' 207 (21.8%) and 'refractive errors can make one not to see well' 207 (24.6%). *Most sampled students were knowledgeable about some causes of eye diseases (X=2.68) and many students were yet to appreciate them.*

Research question three: What is your experience of eye test?

Table 4.4: Experience on eye test

SN	Statement	N	SA	A	D	SD	X
10	You have done eye test before	949	169	173	285	322	2.80
11	Eye test was done for you when you went to the hospital for eye treatment	948	164	171	283	330	2.82
12	Eye test was done for you during a free eye care programme	936	104	141	331	360	3.01
13	Your secondary school specifically asked you to do eye test before admission	948	87	148	321	392	3.07
14	Nobody informed you of the outcome of the eye test which was done for you	945	68	131	349	397	3.14
15	During the eye test you were only asked to stand and read some number or letters from a distance	945	199	198	232	316	2.70
16	During the eye test you were only asked to hold a written material and read from it	942	96	147	320	379	3.04
	Overall Mean (X)						**2.94**

Table 4.4 shows that most students 607 (64%) (X=2.80), 613 (64.7%) (X=2.82), 691 (73.8%) (X=3.01), 713 (75.2%) (X=3.07), 746 (78.9%) (X=3.14), 548 (58%) (X=2.70) and 699 (74.2%) (X=3.04) at least disagreed statements affirming their experience of eye tests. *Most students never had their eye tested/examined (X=2.94).*

Research question four: What is your experience of eye glasses use?

Table 4.5: Experience on eye glasses use

SN	Statement	N	SA	A	D	SD	X
17	You are using eye glasses	947	71	71	208	597	3.41
18	Eye glasses you use makes you see well	933	158	177	216	382	2.88
19	Eye glasses you use is only for fashion	933	117	167	229	420	3.02
20	Eye glasses you use protects your eyes	924	212	345	129	238	2.43
21	You use eye glasses to imitate your friends	937	29	55	268	585	3.50
	Overall Mean (X)						**3.05**

Table 4.5 shows that many students agreed to 'use of glasses' 142 (15.0%), 'to see well' 335 (35.9%), 'for fashion' 284 (30.4%), 'to imitate friends' 84 (9%). However, majority 557 (60.3%) (X=2.43) at least agreed to use of eye glasses to protect their eyes. *Most sampled students never experienced eye glasses use (X=3.05), but many had used eye glasses.*

Research question five: What are the eye complaint(s) you use to have during learning activities?

Table 4.6: Eye complaints that can affect learning

SN	Statement	N	SA	A	D	SD	X
22	You cannot see clearly notes on the chalkboard at all distances in the class	949	92	141	244	472	3.15
23	You cannot see clearly notes on the chalkboard only at close distance in the class	948	69	108	287	484	3.25
24	You cannot see clearly notes on the chalkboard at far distance in the class	950	119	163	230	438	3.04
25	You cannot identify different colours or colour objects clearly	946	57	79	239	571	3.40
26	You hold book too close while you are reading	943	77	152	265	449	3.15
27	You cannot see clearly far object(s) after reading	938	71	136	278	453	3.19
28	You have eye itching whenever you are reading	939	94	163	252	430	3.08
29	You have headache whenever you are reading	937	92	195	254	396	3.02
30	You have watering eyes /tearing whenever you are reading	940	121	198	233	388	2.94
31	You have eye discomfort/pain whenever you are reading	941	92	164	278	407	3.06
32	You have eye pain/discomfort after reading	929	74	155	257	443	3.15
33	You have eye pain/discomfort whenever you are writing or copying notes	941	63	134	286	458	3.21
34	You have eye pain/discomfort after writing or copying notes	933	56	103	299	475	3.28
35	Words become double whenever you are reading	926	51	105	284	486	3.30
36	You see words jumble or move on the page whenever you are reading	934	47	110	270	507	3.32

37	You lose place, line to line and word to word whenever you are reading	941	67	208	242	424	3.09
38	You use finger to maintain a place/trace words while reading	930	83	192	252	403	3.05
39	You have to re-read a paragraph to understand what you read	939	200	357	154	228	2.44
	Overall Mean (X)						**3.12**

Table 4.6 shows that most students had no eye complaints that can affect learning (X=3.12). However, many students, 233 (24.6%) could not see clearly notes on the chalkboard at all distances, 177 (18.7%) could not see clearly notes on the chalkboard only at close distance, 282 (29.7%) could not see clearly notes on the chalkboard at far distance, 136 (14.4%) could not identify different colours, 229 (24.3%) held book too close while reading, 207 (22.1%) could not see clearly far object(s) after reading, 257 (27.4%) had eye itching while reading , 287 (30.6%) had headache while reading and 319 (33.9%) had watering eyes /tearing while reading. Others eye complaints by students include, 256 (27.2%) had eye discomfort/pain while reading, 229 (24.7%) had eye pain/discomfort after reading, 197 (20.9%) had eye pain/discomfort while writing or copying notes, 159 (17.0%) had eye pain/discomfort after writing or copying notes, 156 (16.9%) words became double while reading, 157 (16.8%) words jumbled or moved on the page while reading, 275 (29.2%) lost place, line to line and word to word while reading, 275 (29.6%) used finger to maintain a place/trace words while reading and 557 (59.3%) had to re-read a paragraph to understand what was read. *Many students had eye complaints that could affect learning.*

Research question six: What are learning difficulties consequent on eye complaints?

Table 4.7: Learning difficulties consequent on poor vision

SN	Statement	N	SA	A	D	SD	X
40	You have word reversal when you are reading (‘was’ for ‘saw’, ‘on’ for ‘no’etc)	938	68	136	280	454	3.19
41	You experience letter Reversal when writing (b for d, p for q, etc)	938	44	139	300	455	3.24
42	You experience transposition of letters and numbers whenever you are reading (12 for 21, etc)	936	44	131	293	468	3.27
43	You omit small words whenever you are reading	936	68	235	255	378	3.01
44	You confuse small words whenever you are reading	933	62	215	247	409	3.08
45	You have poor handwriting	933	62	109	251	511	3.30
46	You have difficulty reading for long (short attention span)	924	113	216	244	351	2.90
47	You assume awkward (distorted) posture when reading or writing	921	72	204	301	344	3.00
48	You have to close or cover one eye before you can read	917	22	42	238	615	3.58
49	You cannot see clearly this questionnaire	918	31	53	220	614	3.54
	Overall Mean (X)						**3.21**

Table 4.7 shows that most students had no learning difficulties from eye complaints (X=3.21). However, many students 204 (21.8%) had word reversal while reading, 183 (19.5%) experienced letter reversal while writing, 175 (18.7%) experienced transposition of letters and numbers while reading, 303 (32.4%) omitted small words while reading, 277 (29.7%) confused small words while reading, 171 (18.3%) had poor handwriting, 329 (35.6%) had difficulty reading for long (short attention span), 276 (30%) assumed awkward (distorted) posture while reading or writing, 64 (7.0%) had to close or cover one eye before being able to read and 84 (91.5%) could not see clearly printed materials. *Many students had learning difficulties due to eye conditions.*

Research question seven: What are the effects of your eye complaint(s) on your learning (reading, writing etc)

Table 4.8: Effects of students' eye complaints on learning

SN	Statement	N	SA	A	D	SD	X
50	Your eye complaint(s) slows down your reading	919	82	180	232	425	3.09
51	Your eye complaint(s) makes writing difficult for you	918	38	129	275	476	3.30
52	Your eye complaint(s) make you unable to concentrate properly on your learning	920	57	147	256	460	3.22
	Overall Mean (X)						**3.20**

Table 4.8 shows that most students had no effects of eye complaint(s) on learning (X=3.20) (since they did not even had eye complaints). However, many students at least agreed eye complaint(s) slowed down their reading 262 (28.5%), made writing difficult for them 167 (18.2%) and unable them to concentrate properly on learning 204 (22.2%). *Many students suffered eye complaint(s) that affect learning (X=3.20).*

Research question eight: What action(s) are you taking about the eye complaint(s) you experience?

Table 4.9: Actions students take on their eye complaints

SN	Statement	N	SA	A	D	SD	X
53	You continue to cope with it without any treatment	913	66	141	239	467	3.21
54	You are praying for the Devine healing	908	171	230	183	324	2.73
55	You have been using traditional medicine/drugs	899	27	62	220	590	3.53
56	You have informed your guardian (teacher, parents, caretaker) about it	912	138	172	206	396	2.94
57	You have been using glasses prescribed in the eye clinic/hospital	911	86	82	214	529	3.30
58	You have been using medicine/drugs prescribed in the eye clinic/hospital	908	92	126	204	486	3.19
	Overall Mean (X)						**3.15**

Table 4.9 shows that most students took no actions on eye complaints (X=3.15) (since they did not even had eye complaints). However, many students continued to cope with eye condition without any treatment 207 (22.7%), prayed for the divine healing 401 (44.2%), used traditional medicine/drugs 89 (9.9%), informed guardians 310 (34%), used prescribed glasses 168 (18.4%) and used prescribed medicine/drugs prescribed 218 (24.0%). *Many students took actions on their eye complaints however; some of the actions were unconventional and potentially dangerous to eye health.*

Research question nine: How do you think eye complaint(s) affecting student learning should be managed?

Table 4.10: Management options for eye complaint(s) affecting student learning

SN	Statement	N	SA	A	D	SD	X
59	Student should continue to cope without any treatment	918	70	85	191	572	3.38
60	Student should just pray for divine healing	916	209	307	185	215	2.44
61	Student should use traditional medication	912	46	136	259	471	3.27
62	Student should inform the guardian (teacher, parents, caretaker)	915	475	313	44	83	1.71
63	Student should go to the clinic or hospital	918	574	232	31	81	1.58
	Overall Mean (X)						**2.48**

N, sample size; SA, strongly agree; A, agree; D, disagree; SD, strongly disagree; X, mean

Table 4.10 shows management options for eye complaint(s) affecting student learning. Many students 155 (16.9%) would continue to cope without any treatment' and most students 516 (56.3%) would just pray for divine healing' (X=2.44). Also, many students would use traditional medication 182 (20.0%), inform their guardians 127 (13.9%) and present in the hospital 112 (12.2%). *Most students would confine management options for eye complaint(s) affecting student learning within acceptable societal norm (X=2.48). However, many would not through neglect of*

eye complaints, reliance only on prayer, not informing the guardians and would not present in the hospital.

(b) Sampled Secondary School Teachers

Table 4.11a: Demographic Distribution of the Respondent Teachers

Demographic Parameter	Number (%)
Age Range 22-63; Mean 37.98, SD 7.63	
Age group (N=121)	
20-29	16 (13.2)
30-39	49 (40.5)
40-49	49 (40.5)
50-59	06 (5.0)
60-69	01 (0.8)
Gender (N=121)	
Male	64 (52.9)
Female	57 (47.1)
Selected Secondary Schools & the number of the Teachers (N=121)	
School for the Gifted	17 (14.0)
Government Day Secondary School, Gwagwalada	31 (25.6)
Government Secondary School, Dobi	14 (11.6)
Government Secondary School, Gwagwalada	21 (17.4)
Al-Mohass Secondary School, Gwagwalada	11 (5.0)
Christ Academy International School, Gwagwalada	21 (17.4)
Sheikh Hamdan Model Secondary School, Gwagwalada	11 (9.1)
Selected Grade levels Being Taught & the number of the Teachers (N=121)	
Junior Secondary I	7 (5.8)
Junior Secondary II	9 (7.4)
Junior Secondary III	14 (11.6)
Senior Secondary I	24 (19.8)
Senior Secondary II	31 (25.6)
Senior Secondary III	36 (29.8)
Teachers' Highest Academic Qualification (N=112)	
Master Degree	14 (12.5)
Post Graduate Diploma in Education (PGDE)	19 (17.0)
Bachelor Degree	66 (58.9)
National Certificate in Education (NCE)	10 (8.9)
Grade II	1 (0.9)
Others	2 (1.8)
Duration of Teaching Experience (N=118)	
<1 year	6 (5.1)
1-2 year	6 (5.1)
2-3 year	7 (5.9)
3-5 year	20 (16.9)
> 5 year	79 (66.9)

Table 4.11b: Demographic Distribution of the Respondent Teachers

Religion & the number of the Teachers (N=121)	
Christianity	94 (77.7)
Islam	27 (22.3)
Ethnicity (27 ethnic groups) & the number of the Teachers (N=102)	
Yoruba	23 (22.5)
Igbo/Ibo	17 (16.7)
Igala	8 (7.8)
Ebira/Igbira	7 (6.9)
Edo	4 (3.9)
Hausa	4 (3.9)
Idoma	7 (6.9)
Nupe	3 (2.9)
Tiv	3 (2.9)
Ishan/Esan	3 (2.9)
*Others	23 (22.5)

N, sample size; *Annang 2, Gbagi/Gwari 2, Efik 2, Isoko 2, Angas 2, Tangele 2, Koro 1, Bajju 1, Jaba 1, Mwaghavul 1, Boki 1, Ijaw 1, Ibibio 1, Ron 1, Utugwang 1, Yala 1, Bahumono 1

Tables 4.11a & b show average age of teacher was 38 years and 98 (81%) were in the age range 30 to 49. Ninety-nine (88.4%) had at least Bachelor degree qualification. Ninety-nine (83.9%) of the teachers had taught for at least three years. The male to female ratio was 1.1. Some of the sampled teachers were teaching in more than one class and at times in both Junior and Senior Secondary classes. Most teachers were Christians 803 (83.7%). The teacher cut across 27 ethnic groups with dominant one being Yoruba 23 (22.5%) followed by Igbo 17 (16.7%).

4.3 Research question for sampled teachers

Research question one: What are the causes of learning difficulty among some of your students?

Table 4.12: Causes of students learning difficulty

SN	Statement	N	SA	A	D	SD	X
1	The student(s) cannot see well	114	17	48	27	22	2.47
2	The student(s) has/have hearing difficulty	113	9	49	30	25	2.63
3	The student(s) has/have subnormal intelligent	111	6	46	35	24	2.69
4	The student(s) has/have multiple problems	110	17	41	30	22	2.52
	Overall Mean (X)						**2.58**

N, sample size; SA, strongly agree; A, agree; D, disagree; SD, strongly disagree; X, mean

Table 4.12 shows that majority of the teachers 65 (57.0%) at least agreed to inability of students to see well as a cause of students learning difficulties (X=2.47). *By the sampled teachers, among other factors, the inability of students to see well was a cause of students learning difficulties (X=2.58).*

Research question two: What is the degree of importance of vision and hearing to learning?

Table 4.13: Degree of value of vision and hearing to learning

SN	Statement	N	SA	A	D	SD	X
5	Vision is not important to learning	119	10	7	15	87	3.50
6	Hearing is more important to learning than vision	119	21	27	41	30	2.67
7	Vision is more important to learning than hearing	116	14	20	56	26	2.81
8	Hearing and Vision are of equal importance to learning	115	59	38	14	4	1.68
	Overall Mean (X)						**2.67**

Table 4.13 shows that most teachers at least disagreed ‘vision is not important to learning’ 102 (85.7%) (X=3.50), ‘hearing is more important to learning than vision’ 71 (60%) (X=2.67) and ‘vision is more important to learning than hearing’ 82 (70.7%) (X=2.81). Most teachers 97 (84.4%) at least agreed ‘both hearing and vision are of equal important to learning’ (X=1.68).

However, many teachers 17 (14.3%) at least agreed 'vision is not important to learning'. *Both vision and hearing are important to learning (X=2.67) but of concern is many teacher agreeing to 'vision is not important to learning'.*

Research question three: What are the causes of eye diseases?

Table 4.14: Causes of Eye diseases

SN	Statement	N	SA	A	D	SD	X
9	Eye diseases are caused by witchcraft/spirits	117	3	15	33	66	3.38
10	Eye disease cannot be inherited from parents	119	10	26	50	33	2.89
11	Eye disease cannot be caused by infections/germs	118	7	19	39	53	3.17
12	Eye disease can result from injuries/trauma	118	37	61	9	11	1.95
13	Refractive errors can make one not to see well	115	25	68	19	3	2.0
	Overall Mean (X)						**2.68**

Table 4.14 shows many teachers at least agreed 'eye diseases are caused by witchcraft/spirits 18 (15.4%), eye disease cannot be inherited from parents 36 (30.3%), eye disease cannot be caused by infections/germs 26 (22.0%) and at least disagreed eye disease can result from injuries/trauma 20 (17.0%) and refractive errors can make one not to see well 22 (19.1%)'. *Most sampled teachers were knowledgeable on some of the causes of eye diseases (X=2.68) while many were not and of concern to students eye health.*

Research question four: What are the eye complaint(s) your students use to have during learning activities?

Table 4.15: Eye complaints that can affect learning

SN	Statement	N	SA	A	D	SD	X
14	Some students cannot see clearly notes on the chalkboard at all distances in the class	119	21	66	23	9	2.17
15	Some students cannot see clearly notes on the chalkboard only at close distance in the class	120	23	81	13	3	1.97
16	Some students cannot see clearly notes on the chalkboard at far distance in the class	120	24	84	11	1	1.91
17	Some students cannot identify different colours or colour objects clearly	119	13	71	25	10	2.27
18	Some hold book too close while they are reading	120	20	85	13	2	1.98
19	Some cannot see clearly far object(s) after reading	115	17	66	25	7	2.19
20	Some have eye itching whenever they are reading	119	18	77	24	119	2.05
21	Some students have headache whenever they are reading	117	13	70	28	6	2.23
22	Some students have watering eyes /tearing whenever they are reading	119	15	85	16	3	2.06
23	Some students have eye discomfort/pain whenever they are reading	116	19	80	14	3	2.01
24	Some students have eye pain/discomfort after reading	119	15	70	29	5	2.20
25	Some students have eye pain/discomfort whenever they are writing or copying notes	117	14	74	25	4	2.16
26	Some students have eye pain/discomfort after writing or copying notes	116	7	69	35	5	2.33
27	Words become double whenever some are reading	117	10	74	32	1	2.21
28	Some students see words jumble or move on the page whenever they are reading	117	10	66	32	9	2.34
29	Some students lose place, line to line and word to word whenever they are reading	116	17	75	20	4	2.09
30	Some students use finger to maintain a place/trace words while reading	119	17	84	16	2	2.03
31	Some students have to re-read a paragraph to understand what they read	118	30	79	9	0	1.82
	Overall Mean (X)						**2.11**

Table 4.15 shows the eye complaints some students used to have during learning activities by number of teachers including 119 (73.1%) could not see clearly notes on the chalkboard at all distances, 104 (86.7%) could not see clearly notes on the chalkboard only at close distance,108 (90.0%) could not see clearly notes on the chalkboard at far distance, 84 (70.6%) could not identify different colours, 105 (87.5%) held book too close while reading, 83 (72.1%) could not see clearly far object(s) after reading, 95 (79.8%) had eye itching while reading , 83 (70.9%) had headache while reading and 100 (84.0%) had watering eyes /tearing while reading. Others eye complaints by students include, 99 (85.3%) had eye discomfort/pain while reading, 85 (71.4%) had eye pain/discomfort after reading, 88 (75.2%) had eye pain/discomfort while writing or copying notes, 76 (65.5%) had eye pain/discomfort after writing or copying notes, 84 (71.8%) words became double while reading, 76 (65.0%) words jumbled or moved on the page while reading, 92 (79.3%) lost place, line to line and word to word while reading, 101 (84.9%) used finger to maintain a place/trace words while reading and 118 (92.4%) some had to re-read a paragraph to understand what was read. *Many teachers had observed eye complaints that could affect learning among some of their students.*

Research question five: What are learning difficulties students encounter due to their eye complaints?

Table 4.16: Learning difficulties consequent on eye complaints

SN	Statement	N	SA	A	D	SD	X
32	Some students have word Reversal when they are reading ('was' for 'saw', 'on' for 'no'etc)	116	7	59	43	7	2.43
33	Some students experience letter Reversal when writing (b for d, p for q, etc)	116	10	61	34	11	2.40
34	Some students experience Transposition of letters and numbers whenever they are reading (12 for 21, etc)	116	11	53	38	14	2.47
35	Some students miss small words whenever they are reading	114	15	69	25	5	2.18
36	Some students confuse small words whenever they are reading	115	5	79	24	7	2.29
37	Some students have poor handwriting	115	34	68	10	3	1.84
38	Some students have difficulty reading for long (short attention span)	115	25	79	10	1	1.89
39	Some students assume awkward (distorted) posture when reading or writing	117	20	78	13	6	2.04
40	Some students have to close or cover one eye before they can read	116	9	40	54	13	2.61
	Overall Mean (X)						**2.24**

Table 4.16 shows many teachers had observed learning difficulties due to eye complaints among their students (X=2.24). These learning difficulties include word reversal while reading 66 (56.9%), letter reversal while writing 71 (61.2%), transposition of letters and numbers while reading 64 (55.2%), omission of small words while reading 84 (73.7%), confusing small words while reading 84 (73.0%), poor handwriting 102 (88.7%), difficulty reading for long (short attention span) 104 (90.4%), assumed awkward (distorted) posture while reading or writing 98 (83.8%) and closing or covering one eye before being able to read 49 (42.2%). *Many teachers had observed learning difficulties due to eye conditions among some of their students.*

Research question six: What are the effects of your students' eye complaint(s) on their learning?

Table 4.17: Effects of students' eye complaints on learning

SN	Statement	N	SA	A	D	SD	X
41	Students' eye complaint(s) slow down their reading	113	34	60	18	1	1.88
42	Students' eye complaint(s) make writing difficult for them	113	27	60	23	3	2.02
43	Students' eye complaint(s) make them unable to concentrate properly on their learning	114	27	73	11	3	1.91
	Overall Mean (X)						**1.94**

Table 4.17 shows many teachers had observed effects of some of their students eye complaints on learning (X=1.94). These effects on learning include slow reading 94 (83.2%), writing difficulty 87 (77.0%) and poor concentration on learning 100 (87.7%). *Many teachers had observed the effects of eye complaints on learning among some of their students (X=1.94).*

Research question seven: What action(s) did you take about your students' eye complaint(s)?

Table 4.18: Actions teachers take on their eye complaints

SN	Statement	N	SA	A	D	SD	X
44	You took no action	112	8	14	63	27	2.97
45	You asked students to continue to cope with it, since there is no effective treatment	113	8	14	69	22	2.93
46	You encourage students to pray for the Divine healing	112	16	39	41	16	2.51
47	You encourage students to use traditional medicine/drugs	111	3	25	45	38	3.06
48	You notify the students' guardian (parents, caretaker) about it	112	27	82	3	0	1.79
49	You asked students to see eye Doctors	113	50	57	4	2	1.63
50	You asked students to buy eyeglasses	113	12	34	52	15	2.62
51	You asked students to buy eye medicine/drugs at chemist	112	8	12	59	33	3.04
52	You asked students to go to the clinic/hospital	112	55	49	3	5	1.62
	Overall Mean (X)						**2.46**

Table 4.18 shows actions teachers took on some of their students' eye complaints (X=2.46). These include no definite action 22 (19.6%), urged students to continue to cope with eye condition without any treatment 22 (19.5%), enjoined students to pray for the divine healing 55 (49.1%), encouraged students to use traditional medicine/drugs 28 (25.2%), informed the students' guardians 109 (97.3%),asked students to see eye Doctors 107 (94.7%), asked students to buy eyeglasses 46 (40.7%), asked students to buy eye medicine/drugs at chemist 20 (17.9%) and asked students to go to the clinic/hospital 104 (92.9). *Many teachers took actions on their students' eye complaints; some of the actions were unconventional and potentially dangerous to eye health.*

Research question eight: How do you think eye complaint(s) affecting student learning should be managed?

Table 4.19: Management options for eye complaint(s) affecting student learning

SN	Statement	N	SA	A	D	SD	X
53	Student should continue to cope and should not seek treatment	113	10	8	39	56	3.25
54	Student should just pray for divine healing	112	8	23	57	24	2.87
55	Student should use traditional medication	111	9	8	57	37	3.10
56	Student should inform the guardian (teacher, parents, caretaker)	113	53	58	2	0	1.55
57	Student should go to the clinic or hospital	113	59	45	9	0	1.56
	Overall Mean (X)						**2.47**

Table 4.19 shows how teachers expected students' eye complaints to be managed. These include students should continue to cope without any treatment 18 (15.9%), pray for divine healing 31 (27.7%), use traditional medication 17 (15.3%), inform guardians 111 (98.2%) and present in the hospital 104 (92.0%). *The teachers management expectation for their students eye complaints were confined within acceptable societal norm (X=2.47) however; some of the expected management options including neglect of eye complaints, reliance only on prayer and use of traditional medication could compromise eye health.*

Research question nine: Are Nigerian schools prepared for students with visual challenges?

Table 4.20: Nigerian schools and students with visual challenges

SN	Statement	N	SA	A	D	SD	X
58	Students with poor vision should go to special school for their education	116	45	48	17	6	1.86
59	Students with poor vision should go to normal school for their education to ensure social integration	117	7	47	47	16	2.62
60	The teachers in normal school rarely take special interest in students with poor vision	116	13	55	38	10	2.39
61	Normal schools are not prepared for challenges of educating students' with poor vision	118	27	46	37	8	2.22
62	Nigerian education has never been fair to students with poor vision	118	21	43	47	7	2.34
63	All teachers should be able to educate all category of students	117	10	55	37	15	2.49
64	Only special education teacher should educate students with poor vision	118	26	45	36	11	2.27
65	Schools do not specifically request for students' eye test before admission	118	38	59	16	5	1.90
66	Students progress through schools without knowing their visual status	117	18	58	29	12	2.30
67	Schools do not request students with eye complaints to see eye doctor	118	14	22	59	23	2.77
	Overall Mean (X)						**2.32**

N, sample size; SA, strongly agree; A, agree; D, disagree; SD, strongly disagree; X, mean

Table 4.20 shows opinion of teachers on Nigerian schools/education and students with visual challenges. These include students with poor vision should go to special school for their education 93 (80.2%), students with poor vision should go to normal school for their education to ensure social integration 54 (46.2%), teachers in normal school rarely take special interest in students with poor vision 68 (56.6%), normal schools are not prepared for challenges of educating students' with poor vision 73 (61.9%), Nigerian education has never been fair to students with poor vision 64 (54.2%), all teachers should be able to educate all category of students 65 (55.6%), only special education teacher should educate students with poor vision 71

(60.2%), schools do not specifically request for students' eye test before admission 97 (82.2%), students progress through schools without knowing their visual status 76 (65.0%) and schools do not request students with eye complaints to see eye doctor 36 (30.5%). *Students' eye health is yet to get deserved attention in Gwagwalada Area Council/FCT. Nigerian schools/education system need to be repositioned to addressed the visual challenges of learning significance to promote literacy.*

4.4 Major findings

1. The sampled populations include 963 senior secondary school students and 121 secondary school teachers in Gwagwalada Area Council. The average age of sampled students and teachers were 16 and 38 years respectively. The students and teachers cut across 93 and 27 Nigerian ethnic groups respectively. Most teachers 99 (88.4%) had at least Bachelor degree qualification and 99 (83.9%) had taught for at least three years.
2. Despite the important of vision to learning many students and teachers are yet to appreciate it.
3. Many sampled students and teachers are yet to appreciate some of the causes of eye diseases.
4. Most sampled students never had their eye tested/examined.
5. Many of sampled students used eye glasses indicating presence of eye condition that may affect learning among student.
6. Many sampled students had eye complaints that can affect learning.
7. Many students had learning difficulties due to eye conditions.
8. Many sampled students took actions on their eye complaints, some of which were unconventional and potentially dangerous to eye health including neglect of eye complaints, reliance only on prayer, not informing the guardians and would not present in the hospital.

9. Many teachers confirmed inability of students to see well was a cause of students learning difficulties.
10. Many teachers had observed eye complaints that could affect learning among some of their students.
11. Many teachers had observed learning difficulties due to eye conditions among some of their students.
12. Many teachers took actions on their students' eyes complaints, some of which were unconventional and potentially dangerous to eye health including neglect of eye complaints, reliance only on prayer and use of traditional medication.
13. Students eye health is yet to get deserved attention in Gwagwalada Area Council/FCT. The Nigerian schools/education system need to be repositioned to addressed the visual challenges of learning which is necessary to improve literacy in the society/national development.

4.5 Discussion of major findings

This study attempted to identify visual challenges to learning among secondary school students in Gwagwalada Area Council, Abuja, Nigeria. The two major stakeholders in education, students and teachers were surveyed using structured self-administered questionnaire. The sampled populations cut across gender, ethnic and religion lines thus representative of Nigerian secondary students/teachers in Gwagwalada Area Council.

It is of interest that despite the important of vision to learning many students and teachers are yet to appreciate it. For instance, many students and teachers alike at least agreed to statement like

‘vision is not important to learning’. Furthermore, many sampled students and teachers are yet to appreciate some of the causes of eye diseases.

It is shocking most sampled students never had their eye tested/examined. This was a missed opportunity to detect potentially blinding eye conditions among our future leaders. Pre-admission eye test should give baseline information on eye health of students aside detecting those eyes with treatable conditions. A number of management options that would benefit students such as treatment, referral, counseling and follow up were missed by many of these students. It is a fact some of these eye conditions would interfere with learning processes among students who have them.

This study found many sampled students used eye glasses indicating presence of eye condition that may affect learning among students. Though these students could be assumed to have their eyes condition (say refractive error) corrected, many students with similar condition remain uncorrected with learning implication. Furthermore, many sampled students had eye complaints that can affect learning. These include burring of vision at all distances (astigmatism), close distance (hyperopia) and far distance (myopia). These complaints, if undetected and corrected/managed, lead to poor academic performance, drop out, illiteracy, social maladjustment, economic loss and national growth/development suffers.

Many students could not identify different colours. This has implications for career choice as it is not advisable for such students to pick career where colour identification is critical including among others driving/pilot. Persistent eye itching, headache, watering eyes /tearing, eye pain/discomfort while reading are amenable to management only if known and management sought. However, they may interfere with learning (reading, writing) leading to poor academic

performance. Persistent and intense eye itching is a known cause of absenteeism among students/pupils. Learning becomes uninteresting to students who experience double words, jumble/moving words; loss of place, line to line and word to word while reading. A students' use of the finger to maintain a place/trace words while reading and having to re-read a paragraph to understand what is read no doubt slow down reading speed.

Moreover, this study found many students had learning difficulties due to eye conditions and suffered eye complaints that affect learning. The effects of eye complaints on learning as found in this study include slow reading, writing difficulty and poor concentration on learning.

Also, it is remarkable that many sampled students/teachers would take unconventional and potentially dangerous management actions on the students' eye complaints including endure without treatment, prayer only and use of traditional medication. There are potent drugs/management options in medical eye care and they should be accessed as necessary rather than trying dangerous options. Prayer should be used to support eye health management options rather than being used alone.

Finally, this study found students eye health is yet to get deserved attention in Gwagwalada Area Council. This could be inferred from the fact that normal (conventional) schools are not prepared for challenges of educating students with poor vision and many schools do not specifically request for students' eye test before admission. The Nigerian schools/education system need to be repositioned to addressed the visual challenges of learning which is necessary to improve literacy in the society and accelerate national growth/development.

In conclusion, many secondary school students in Gwagwalada Area Council have visual challenges that can affect their learning. Most students never had eye test/examination to confirm

wellness of their eyes or detect eye conditions. Many students/teachers lack basic knowledge of implication of vision to learning vis –a- vis some causes of eye diseases.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary, conclusion and recommendations on visual challenges to learning among secondary school students.

5.1 Summary

The development of any nation is related to its level of literacy. Among the senses necessary for learning, eye/vision is very unique. However, many students have eye conditions that are impediment to learning yet undetected/remain unmanaged. This study attempted to document visual challenges to learning among secondary school students in Gwagwalada Area Council, Nigeria. A structured self-administered questionnaire was employed to obtained necessary information from two principal stakeholders in education, students and teachers. The data was collated, entered, cleaned and analysed using SPSS 16. The findings showed remarkable visual challenges of learning implication among students. Many students and teachers alike were oblivious of importance of vision to learning. Penchant for unconventional management options were found among both students and teachers alike.

5.2 Conclusion

Many secondary school students in Gwagwalada Area Council have visual challenges that can affect their learning. Most students never had eye test/examination to confirm wellness of their eyes or detect eye conditions. Many students/teachers lack basic knowledge of implication of vision to learning vis –a- vis some causes of eye diseases.

5.3 Recommendations

In view of the importance of normal vision to learning and based on the findings from this study the following recommendations are made.

1. Students should:

(i) have regular and periodic eye tests/examinations by competent eye care personnel. This should be before admission and during the school years.

(ii) notify their caretakers (parents, teachers, guardians) promptly whenever they have eye complaints.

(iii) have basic knowledge of importance of vision to learning. This will enable them guard their vision/eyes jealously through doing simple things to maintain their vision including among others prevent eye injuries and infections.

2. Teachers should:

(i) have basic knowledge of importance of vision to learning.

(ii) know common causes of eye conditions, make effort to pick/ prevent it among their students. For instance students with eye infection like ‘Apollo” should be asked to stay away from the class until confirmed safe by eye care personnel/clinic.

(iii) have basic skills of class management that is relevant to eye condition and learning. For instance, the class sitting arrangement should be for shortsighted and longsighted students to be close to and far from the chalkboard respectively. Also, students who have allergic (vernal) conjunctivitis aggravated by chalk particles should not sit close to the chalkboard, alternatively, it may be a good reason to use marker adapted chalkboard.

(iv) facilitate prompt notification of students' caretakers (parents, guardian) and/ or referral for eye care consultations, any students eye conditions of learning importance.

3. Parents should:

(i) pay particular attention to their wards eye health by being observant and providing necessary support including escorting for eye care consultations and funding.

(ii) comply with school directive on eye tests before and after school admission

4. School should:

(i) ensure regular and periodic eye tests for students. This should include before admission and during the school years.

(ii) encourage teachers to pay particular attention to students eye health.

(iii) provide competently staffed and adequately equipped school clinic. There should be pen torch, Snellen chart, and ophthalmoscope and health personnel who can usefully apply them for students' eye health.

5. Eye Care Personnel should:

(i) conduct relevant researches in students' eye heath and communicate same to stakeholders in education

(ii) advocate for and serve as watchdog on students' eye health

6. Government should:

(i) provide necessary funds to support students' eye health care activities.

(ii) ensure the school meet the required standard to guarantee students' eye health.

7. Society should support students' eye health care activities through donation in cash and kind.

5.4 Suggestion for further studies

Having researched to confirm the presence of ocular conditions of learning importance among students in Gwagwalada Area Council, a further study to detect pattern and specific eye conditions among students is hereby suggested. This would be useful for interventional purposes.

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