THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON THE EDUCATION OF STUDENTS WITH HEARING IMPAIRMENT IN BENIN CITY

BY

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CERTIFICATION

I certify that this project titled "The Impact of Information and Communication Technology (ICT) on the Education of Students with Hearing Impairment in Benin City" is a research conducted by OJO ALLI EUGENIA EMILEOMI with Matriculation Number EDU2103437 it was carried out under my supervision. It has been examined and found to have met the regulations of the University of Benin. I therefore recommend the work for the award of Bachelor of Education.

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DECLARATION

I, Ojo Alli Eugenia Emileomi with Matriculation Number EDU2103437 hereby declare that this work titled “The Impact of Information and Communication Technology (ICT) on the Education of Students with Hearing Impairment in Benin City” is a product of my research work under my supervision of Uwoye E. B (Mrs) has not been presented in any previous publications.

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DEDICATION

This work is dedicated to God Almighty and to my parents, Dr. Ojo Alli Festus and Mrs. Gloria Ojo Alli Festus

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I thank the Almighty God who in his infinite mercy, goodness and compassion made me succeed in the course of my study. I acknowledge and express my hearty profound gratitude to Him, the source and the sustainer of my life.

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ABSTRACT

The study investigated the impact of information and communication technology (ICT) on the education of students with hearing impairment in Benin City. Four research questions were tested to guide the study. In order to achieve the intended objectives of the study. Literature was reviewed according to the sub variables of the study. The study adopted descriptive survey research design. Purposive sampling was used in selecting fifty students with hearing impairment in Ihogbo College. The instrument for data collection was a structured questionnaire title "The Impact of Information and Communication Technology (ICT) on the Education of Students with Hearing Impairment in Benin City". The internal consistency of the instrument was established at 0.910 using Cronbach's Alpha correction co-efficient. The data collected were statistically analyzed using descriptive and inferential statistics to answer research questions. Result of the study indicated that use of Information and Communication Technology (ICT) has high impact on the education of students with hearing impairment, Information and Communication Technology (ICT) has minimal influence on the academic performance of students with hearing impairment, Information and Communication Technology (ICT) plays minimal role in facilitating communication and social interaction among students with hearing impairment and there are little benefits and some challenge of Information and Communication Technology (ICT) integration of students with hearing impairment. It was concluded that utilization of Information and Communication Technology (ICT) has high impact on the education of students with hearing impairment, Information and Communication Technology (ICT) has minimal influence on the academic performance of students with hearing impairment, Information and Communication Technology (ICT) plays minimal role in facilitating communication and social interaction among students with hearing impairment and there are little benefits and some challenge of Information and Communication Technology (ICT) integration of students with hearing impairment. Based on the findings, it was recommended that the government should try

its possible best to build an Information and Communication Technology (ICT) facility centre in Ihogbo College.

Keywords: Information and Communication Technology, Education, Students with hearing impairment

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CHAPTER ONE

INTRODUCTION

Background to the study

Information and Communication Technology (ICT) is a set of computer-aided devices that help in imparting of knowledge. Information and Communication Technology (ICT) can introduce new teaching and learning practices as it acts as a catalyst in transformation of an education system. Information and Communication Technology (ICT) helps in transferring of information and this can result in creation of new knowledge. Students with hearing impairment require the knowledge and utilization of Information and Communication Technology (ICT) to participate in and benefit from educational programs. Students with hearing impairment who have access to appropriate information and communication technology solutions are more likely to be successful in their educational programme (Masson, 2010).

Rapid developments in Information and Communication Technologies (ICTs) in Nigeria education in recent years have resulted in significant changes in the way the world operates and communicates this in turn has an impact on educational and training needs, Both in terms of the content and the delivery of educational and training services,

Information and Communication Technology (ICT) in education has multiplier effect throughout education system by enhancing learning and providing students with hearing impairment with new set of skill; by reaching students with hearing impairment with poor or no access; by facilitating and improving the training of teachers; and by minimizing costs associated with traditional instruction (UNESCO, 2014). Information and Communication Technology (ICT) is an electronic technology used for accessing, processing, gathering, manipulating, presenting and communicating information. He emphasized that when Information and Communication Technologies (ICTs) are employed in education, they can accelerate, enrich and deepen basic skills in reading, writing, arithmetic and the sciences beside motivating and encouraging students with hearing impairment to learn as they became more independent are responsible for their learning (Dhital, 2018).

The implementation of the technology tools alone may not be sufficient to improve in the education of students with hearing impairment. Whether the effect of Information and Communication Technology (ICT) on education is positive or negative is still unclear. Information and Communication Technology (ICT) are changing ways of learning, empirical research conducted does not consistently verify the efficacy of such changes. Students with hearing impairment perceive the cell phone primarily as a leisure device, and most commonly used cell phones for social networking, surfing the internet, watching videos and playing games. If typically utilized for leisure than education, the cell phones may disrupt learning within academic settings.

Education refers to the process of training and developing the knowledge, skill, mind and character of people. It is also the process by which the latent abilities of individuals are developed so that they may be useful to themselves and the society. The importance of teachers and the roles they play in the educative process are central to basic education. Teachers undoubtedly remain the managers of knowledge. Therefore, teacher education in Nigeria is, and should be, the foundation of quality and relevance of education at all levels.

Students with hearing impairment are individuals who have partial or complete hearing loss, which can affect their ability to communicate and interact with their environment. They may use various assistive technologies and strategies to enhance their learning experiences. Students with hearing impairment affects learning experiences in a persistent way to ensure that students with hearing impairment receive an adequate education, students with hearing impairment need some special education service. Information and Communication Technology can play a significant role in supporting students with hearing impairment. Some examples of Information and Communication Technology that can help students with hearing impairment include: sign language interpretation software, captioned videos and multimedia, communication access realtime translation, mobile apps for communication and accessibility.

Utilization of Information and Communication Technology (ICT) is a diverse set of Information and Communication Technology (ICT) tools to communicate, create, disseminate, store, and manage information. Information and Communication Technology (ICT) has also become integral to the teaching-learning interaction, through such approaches as replacing chalkboards with interactive digital whiteboards, students with hearing impairment' own smartphones or other devices for learning during class time, and the "flipped classroom" model where students with hearing impairment watch teaching at home on the computer and use classroom time for more interactive exercises. When teachers are digitally literate and trained to use Information and Communication Technology (ICT), these approaches can lead to higher order thinking skills, provide creative and individualized options for students with hearing impairment to express their understandings, and leave students with hearing impairment better prepared to deal with ongoing technological change in society and the workplace.

The effect of Information and Communication Technology on learning is in relation to use of digital media, primarily computers and internet to facilitate teaching and learning. Information and Communication Technologies are the technologies used in conveying, manipulation and storage of data by electronic means. They provide powerful tools that may help in transforming the isolated teacher-centered and text-bound classrooms into rich-student-focused, interactive knowledge environments. To meet these challenges, learning institutions must embrace the new technologies and appropriate act of Information and Communication Technology tools for learning (Valasidou and Bousiou, 2015). Information and Communication Technology gives students with hearing impairment a better understanding and enhances their retention capability by using different information technology tools. The use of Information and Communication Technology gives students with hearing impairment a better understanding and enhances their retention capability by using different information technology tools such as videos, graphics, animation, etc. in a complete and entertaining way.

Information and Communication Technology integration refer to the use of Internet- and computer-based applications in the classroom setting to facilitate communication and information access and thereby assist the learning of students with hearing impairment. The successful integration of Information and Communication Technology into the learning environment engages students with hearing impairment in higher-order thinking. Information and Communication facilities are helping to develop in the education of students with hearing impairment by bridging the digital device and providing equitable access to technologies, grounded in the motion of development and globalization. Information and Communication Technology (ICT) is designed to support the students with hearing impairment to have access to learning beyond the four walls of the classroom with already existing infrastructure on ground. The institution can utilize the facilities to serve as a E-learning Centre. Libraries were more focused towards collecting information than making it accessible to students with hearing impairment. With the use of information and communication technology facilities like the computer and internet makes learning easier.

Information and Communication Technology enhances learning by personalizing education, fostering collaboration, and equipping students with hearing impairment with essential digital skills. Information and Communication Technology reduces the workload for teachers and provides an environment where students with hearing impairment can easily concentrate and become more interested in learning**.** It is apparent that several challenges arise from Information and Communication Technology adaptation but most developing nations face drawbacks such as weak internet connection and high cost of using the internet which makes so many students with hearing impairment lose interest in the technology especially students with hearing impairment from rural communities. Other challenges experienced are the complexity of the system and the adaptability struggle due to the lack of experienced technical personnel. It is based on the aforementioned that the researcher sought to assess the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment in Benin City.

Statement of the problem

The problem inherent in the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment cannot be overemphasized considering the problems of students with hearing impairment' shortage of instructional material and human resources, inadequate infrastructural facilities coupled with poor funding of secondary education which appear to be militating against effective secondary school administration. The advent of Information and Communication Technology (ICT), students with hearing impairment who find it difficult to use vital information generated from the internet to carry out effective and result-oriented class work. This has in any case, affected their education, because a situation students with hearing impairment cannot access information in order to carry out their assignments, or do other important academic work through the materials gathered with the aid of Information and Communication Technology (ICT), their education suffer a set back.

This ranges from slow speed of computer, poor signal in internet connection, virus threats in the computers, poor working condition of the computers, load sheading and lack of access to internet and the computer laboratory. At time, these computer laboratories are functioning but the students with hearing impairment are not allowed to make use of them.

Students with hearing impairment focus their attention on watching television, fiddling their smartphones and so on instead of reading effectively their books. This has caused students with hearing impairment to lag behind in their education career, because the time they would have used for intensive studies, is diverted to watch television and other unwanted acts associated with Information and Communication Technology (ICT). There is limited literature on the process of Information and Communication Technology (ICT) focusing on the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment. hence the need for a study on the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment in Benin City.

Purpose of the Study

The purpose of the study is to investigate the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment in Benin City.
Specifically, the study seeks to:

1. Ascertain the impact of utilization of Information and Communication Technology (ICT) on the education of students with hearing impairment;
2. Examine the effect of Information and Communication Technology (ICT) on the academic performance of students with hearing impairment.
3. Explore how Information and Communication Technology (ICT) facilitates communication and social interaction among students with hearing impairment
4. Identify the benefits and challenges of Information and Communication Technology (ICT) integration on the education of students with hearing impairment

Research questions

The following research questions were raised to guide the study.

1. To what extent does utilization of Information and Communication Technology (ICT) impact on the education of students with hearing impairment in Benin City?
2. What are the effect of Information and Communication Technology (ICT) on the academic performance of students with hearing impairment in Benin City?
3. How does Information and Communication Technology (ICT) facilitate communication and social interaction among students with hearing impairment in Benin City?
4. What are the benefits and challenges of Information and Communication Technology (ICT) integration on the education of students with hearing impairment in Benin City?

Significance of the Study

The study would provide significant useful information to the students with hearing impairment, teachers, parents, Ministry of Education and the society who are interested in the education of students with hearing impairment.

The finding of this study will help students with hearing impairment to discover Information and Communication Technology (ICT) in sourcing for information for improving their education and shaping workforce opportunities. Hence, enabling the students with hearing impairment to use Information and Communication Technology (ICT) facilities as reference tools to browse the Internet. With Information and Communication Technology (ICT), students with hearing impairment can learn at their own pace, optimising time and resources.

The finding of the study will help teachers at all levels of education in making provision of knowledge and information to the students with hearing impairment. It will also help teachers to encourage students with hearing impairment to make use of internet to augment their understanding in terms of various concepts.

The study will help parents to navigate the digital landscape and harness its benefits to enhance supporting their children's growth, and create meaningful connections in the modern world.

The study will assist Ministry of Education to be able to know more about Information and Communication Technology (ICT) and its functions as it relates to teachers and students. The study will also to expand its policy on the availability and usage of Information and Communication Technology (ICT) in the school system in the state.

Scope and delimitation of the Study

The study focused on the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment. The study covered primary and secondary schools in Ihogbo College. It was delimited to students with hearing impairment in primary and secondary school in the study area.

Operational definition of terms

Information and communication technologies (ICT): It is a diverse set of technological tools and resources used to transmit, store, create, share or exchange information.

Education: It is the process of acquiring knowledge, skills, values, and beliefs through formal or informal instruction.

Hearing impairment: It refers to reduction in one’s ability to hear sounds, either partially or completely. It can affect one or both ears and can be temporary or permanent.

Students with hearing impairment: These are students who have difficulties hearing and processing sound, which can impact their communication, social interaction and academic performance.

CHAPTER TWO

LITERATURE REVIEW

Concept of hearing impairment

Hearing impairment means impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance. The term hearing impairment has been used to describe all cases of hearing disorders. (Abang, 2015) states that hearing impairment is a generic term that connotes hearing impairment that ranges from mild, moderate, severe to profound conditions. It describes a condition or state of an individual who has none or little hearing ability. According to (Ugwuanyi, 2009), students with hearing impairment are students who due to accident or diseases are either born with hearing impairment or develop hearing impairment later in life.

(Olawale, 2010) states that persons with hearing impairment are those who have lost some but not all of their hearing ability and who can or cannot benefit from the use of hearing aids in order to understand and use speech. An individual is therefore said to be hearing impairment, if the person may find it difficult to hearing any form of sound or noise which could result in partial or total deafness. This means that hearing impairment could be hard of hearing for those who may benefit from aids, and total deafness depending on the degree of hearing impairment or the class of the hearing impairment.

The views of these authors have shown that hearing impairment is in degrees with regard to language, there is pre-lingual and post-lingual hearing impairment. Pre-lingual hearing impairment is a hearing impairment at birth or before the child has learned or acquires language while post-lingual hearing impairment occurs after the child has developed language.

Hearing impairment can be classified using several criteria such as; the degree of hearing impairment which is the severity of the hearing problem, whether mild, moderate severe or profound. Hearing impairment can also be classified according to the time of onset which is the time when the problem started. (Hallahan and Kauffman, 2010) classified hearing impairment based on the degree of hearing impairment such as mild (26-54dB), moderate (55-69dB), severe (70-89dB) and profound (90dB and above). (dB refers to decibel meaning a unit for measuring how loud a sound is). This cut across the broad classification of deaf and hard of hearing and stresses the degree at which speech and language are affected. They also classified hearing impairment based on the time of onset as thus: congenital deafness (those who were born deaf) and adventitious deaf (those who acquire deafness at some time after birth). Other used terms as pre-lingual and post-lingual deafness which points to individual language acquisition. Pre-lingual deafness refers to loss of speech occurring at birth or early in life prior to the development of speech or language while post lingual deafness occurs after the development of speech or language. In this study, therefore both categories of deafness as described above are referred to hearing impaired students

Hearing impairment affects the effective functioning of the total personality no matter the period of onset (Okeke, 2011l). He also estimated that about one in every hundred students has some degree of hearing impairment and the effect of hearing impairment is worse when the disability occurs before birth. She adds that people with hearing impairment may differ in use of language though has the same intelligence as those without hearing loss. Some observable characteristics exhibited by persons with hearing impairment as enumerated by (Okeke, 2001) and (Aiyeleso, 2014) include: inability to respond to when called from a distance, confusing verbal directions, showing no response patterns, complaining of ringing of buzzing sounds in the ear when they sit close to television or radio sets which leads them to turn the volumes so loud that it becomes uncomfortable to other people. They also complain of discharge from their ears and they misarticulate some words. The above characteristics as noted by (Okeke, 2011) and (Aiyeleso, 2014) create educational and emotional difficulties. There are many identified problems or effects of hearing impairment on students with hearing impairment which could be addressed through supportive services such as counseling, use of sign language interpreter and hearing aids. One of the prime problems of these students is inability to hear, which create problems for students and makes it possible for them to learn maximally like other hearing counterparts.

(Obi, 2016) posited that early identification of hearing impairment is very important in order to achieve as normal developmental as possible. This is because the handicapping effect of hearing impairment could lead to increasing difficulties in attaining developmental milestones. She enumerated some of the following as the traits of children with hearing impairment. Receiving inadequate feedback when sounds are made, tend to speak in loud voice, may seem disinterested in oral conversation, more aggressive, make poor pronunciation and vocabulary, perform below in school and a host of others characteristics.

(Ademokoya, 2018) opined that a child with hearing disability in many developing countries would hardly have a future to cheerfully hope for. This is because his/her educational programme are grossly deficient to adequately compensate for his deficits and meaningfully equip him to face life challenges in future. She identified lack of proper audiological assessment procedure and necessary therapeutic interventions, inappropriate school placement and instructional practices, unfavourable cultural norms are some of the problems characterizing the education of children with hearing impairment in Nigeria.

The consequences of hearing impairment are many. (Ansari, 2014) says reduced hearing acuity during infancy and early childhood not only interferes with development of speech and language skills, but also adversely affects the developing auditory nervous system. Often the language development of hearing loss students is delayed, which in turn affects their communication skills, socialization and reading skills.

The degree of hearing impairment is described in terms of Hearing Threshold Levels (HTL) for auditory pure tones. (Davis and Silverman, 2017) differentiated five (5) classes in terms of the severity of the handicap, the extent of loss, and functional ability to understand speech. These five groups are:

- Normal Hearing: -10 - 25 dB
- Mild Hearing loss: 26-40 dB
- Moderate Hearing loss: 41- 60 dB
- Sever Hearing Loss: 61-90 dB
- Profound Hearing Loss 90 dB and above.

The degree of hearing variable is mainly for educational placement.

Hearing impairment can be divided into three types based on the site the loss is present. They are conductive, sensorineural and mixed. A conductive hearing impairment occurs in a situation in which there is a decrease in the transmitted sound through the canal and middle ear into the inner ear. This may be caused by a problem in either the outer or middle ear. In sensorineural hearing impairment the problem is in the inner ear or along the nerve pathway between the inner ear and the brain. Sensorineural hearing impairment is usually difficult to treat and may require a hearing device or implant. When a child has both a conductive and a sensorineural loss, it is called a mixed hearing impairment.

A number of terms are used when discussing age at onset. Two important reference points are:

1. Congenital/pre lingual: refers to the fact that deafness was sustained at birth, before the acquisition of speech and language.
2. Acquired /Adventitious/ post-lingual: refers to the fact that deafness was sustained sometime after birth, after having already acquired language and speech.

The impact of hearing impairment is greatest in those who are born with or develop hearing impairment soon after birth. A pre-lingual hearing impairment occurs where the hearing is lost before a child has completely developed speech and language. Pre-lingual hearing impairment may be congenital or acquired in the first few years of life, and can affect how well a child learns to speak. All congenital (present at birth) hearing impairment is pre-lingual, but not all pre-lingual hearing impairment is congenital. Hearing impairment that occurs at this stage can have a far-reaching impact on verbal and social skill development. A post-lingual hearing impairment is more common and means the hearing impairment is acquired after speech and language have developed (usually considered to be after six years of age). This hearing impairment can still affect communication and educational development. Adolescents who develop hearing impairment may experience social isolation, difficulty in communicating with and being accepted by peers, and reduced educational achievement

The effect of impairment on the education of students with hearing impairment

Untreated hearing impairment can have a significant impact on the education of students with hearing impairment. It can lead to difficulties in understanding and processing spoken language, which can affect their ability to follow classroom instructions, participate in discussions, and comprehend lectures. This, in turn, can lead to academic struggles, reduced motivation, and even social isolation.

- Speech perception and understanding: The struggle to comprehend speech, particularly in crowded or loud places like classrooms and lecture halls, can make it overwhelming for students living with hearing impairment. In addition, being unable to understand what is being said may lead to frustration and confusion about the material.
- Social interaction: Students with hearing impairment often have difficulty engaging in conversations and socializing, which can lead to feelings of isolation from their peers. It also makes it difficult for them to form relationships or comprehend group discussions. This impairment can create a serious obstacle between these students and the full academic experience that they deserve.
- Overload of auditory input: School can be an intimidating environment for students with hearing impairment due to the sheer amount of audible information they are required to process. The lack of focus associated with their condition can lead to diminishing grades and below-average academic achievement.

- Reduced academic performance: Hearing impairment can have a detrimental effect on school performance, leading to poor grades, missed assignments, and difficulty remembering information due to the challenge of understanding what is being said in class.
- Anxiety and depression: For students with hearing impairment, their impairment can often cause emotional turmoil, such as anxiety, depression, and a diminished sense of self-esteem. This distress is frequently the result of struggles in schoolwork or social interactions – making everyday life more demanding than it already may be.
- Safety issues: On top of the educational obstacles, students with hearing impairment also struggle to understand and recognize auditory safety warnings. Without being able to hear potential threats, these individuals are in danger of getting injured or becoming victims of violence if they do not have an environment that can offer them the proper protection and guidance.

For students with hearing impairment, tools such as hearing aids can be life-changing. These products empower them to understand speech more easily and process auditory information more adequately so that they can keep up in school like everyone else. There are three primary styles of hearing aid available: behind-the-ear, in-the-ear, and in-the-canal aid;

Behind-the-ear, the most common type of hearing aid available on the market, are designed to rest comfortably behind your ear and connect to an open-fit receiver in your ear canal with a small tube. This style is ideal for those who require higher levels of amplification or have specific needs due to their particular degree of hearing impairment.

In-the-ear, or in-the-ear hearing aids, are custom designed to fit snugly in the ear and offer greater discretion for wearers. Thanks to their small size, they can be hidden behind a hat or hairstyle, making them an ideal choice for people seeking more subtle hearing assistance.

In comparison to in-the-ear, in-the-canals are extraordinarily petite and fit snugly inside the ear canal. Ideal for those who seek both sound clarity and subtlety, in-the-canal offer a perfect balance of discretion and impressive amplification capacities.

Concept of Information and Communication Technology

Information and Communication Technology has been variously researched by many scholars in this modern and rapidly changing global community. Thus, Information Technology is considered in the library to be concerned with acquisition, processing, organization and dissemination of information-textual, numerical, photographic and vocal. In other words, it is considered as a broad-based term comprising the acquisition, organization, storage and retrieval of information that can be in textual or numerical, vocal and photographic forms or audio–visual which could be best described as multimedia, using a coalition of computer and telecommunication gadgets. According to (Marshall, 2014), Information Technology is the process of computing and telecommunications for the purpose of handling information; the application of technologies to information handling; including generation, storage, processing, retrieval and dissemination. (Emuakpor, 2012) described Information Technology as all forms of technology applied to the processing, storing and transmitting information in electronic form; stressing that the physical equipment used for this purpose include computers, communication equipment and networks; fax machines and electronic, pocket calculator etc. Essentially, (Ayo, 2011) viewed it as the use of computer system and telecommunications equipment in information handling; consisting of essentially three basic components which are: electronic processing using the computer; transmission of information using telecommunication equipment; and dissemination of information multimedia. Therefore, Information Technology in libraries consists of all electronic infrastructure and equipment engaged by librarians for an efficient service delivery. Such equipment, in broad term, consist of hardware, software and communication networks between the service channels of different libraries to facilitate the sharing of available materials; particularly the library webs. In a related development, (Osundina, 2013) pointed out that the library of today should not merely store documents and preserve them, it must also devise means by which the contents of such documents can be rapidly and effectively transmitted for use. (Ogunsola, 2014) observed that the pace of change brought by new technologies has had a significant effect on the way people live, work and play worldwide.

(Capron, 2010) revealed that mail, telephone, television, radio, books, newspapers and periodicals are the traditional ways users send and receive information. However, data communication system (computer system) also transmits data over communication lines such as telephone lines since the mid-1960s. Internet use nowadays, metamorphosed access to information for the world where libraries enjoy its application in all aspects of their services.

Some of the most widespread technological devices include e-mail, FTP (File Transfer Protocol), WWW (World Wide Web), Telnet and Usenet. All these technological devices are regarded as primary to the image of globalization. The internet persists to have extreme impacts on the advancement of information usage, particularly in the academic communities, making workable speedy communications among trades and holding up global cooperation among organizations and individuals. These technologies have the potentials to develop “virtual campuses” and “virtual libraries” thus, increasing students” access and participation (Ogunsola, 2014). In a study conducted by (Daniel, 2010), it was revealed that Nancy Schiller was one of the first writers to use the expression “virtual library” which she defined in 1992, simply as “libraries in which computer and telecommunications technologies make access to wide range of information resources possible”. Today, the concept is referred to variously as “digital library”, “electronic library”, “community network”, or simply “library without walls”.

Recent advances in Information and Communication Technology have not only increased tremendously the ability to access, store and process information within the library but also have brought significant changes in the concept, organization, functioning and management of library and information systems (Peyala, 2011). The Information and Communication Technology revolution has facilitated the processes of searching for and retrieving information. Information and Communication Technology improves the efficiency of organizational management processes and provides new ways of improving the capacity of response to its users (López, 2019). Use of Information and Communication Technology applications can assist in creating, storing, transferring and using tacit and explicit knowledge (Okumus, 2013).

(Anunobi and Edoka, 2010) reported how university library plays a pivotal role as an information providing system, how it supports teaching, learning, and research with information materials of various types. Amongst the different information materials, serials or periodicals are most obligatory mainly for faculties and researchers. Earlier, the serials operation was manual, but with the development of Information and Communication Technology the acquisition of serials or periodicals became its retrieval. In line with the foregoing perspective, users‟ curiosity for seeking information changed from print to e-resources. (Haneefa, 2017) investigated the application of Information and Communication Technology in special libraries in Kerala, India. The study revealed that the library catalogue was the common section for automation. The study has proposed to improve automation process and to effectively and efficiently adopt of Information and Communication Technology. (Chandrakar and Arora, 2010) provided the Indian approach on the use of information technology on copy cataloguing from different trusted sources such as IndCat, and catalogue of Library of Congress. Therefore, the general review emphasized that the proper use of Information and Communication Technologies in library are much crucial.

Usefulness of Information and Communication Technology on the education of students with hearing impairment

Information and Communication Technology plays an important role in supporting the students with hearing impairment. According to (Wastiau, Blamire, Kearney, Quittre, Van de Gaer & Monseur, 2013), Information and Communication Technology increases education of students with hearing impairment through enhanced visual and retention capabilities. Students with hearing impairment require Information and Communication Technology in order to boost and to benefit from education programs. According to (Salaudeen, 2015), Information and Communication Technology increases the learning potential of students with hearing impairment besides increasing their proficiency through provision of ability to access knowledge using appropriate digital devices. Information and Communication Technology helps students with hearing impairment to effectively communicate with their peers and through this, a collaborative and social learning environment is fostered (Lasa, 2010).

Information and Communication Technology has been advocated as one of the most effective ways to progress students with hearing impairment in learning. Many of the developed countries are using different Information and Communication Technology programs among students with hearing impairment to advance learning in their educational programs. The developing and less-developed countries are following suit in adopting the use of Information and Communication Technology in teaching of the students with hearing impairment due to its inherent advantages. Some of the benefits accrued from the use of Information and Communication Technology in education for students with hearing impairment include greater efficiency in running school programs as educational programs are automated and improved communication channels between students with hearing impairment and their teachers. These students with hearing impairment benefit from the use of Information and Communication

Technology as learning is tailored to suit the needs (strengths and weaknesses) of the students with hearing impairment hence better performance. The use of Information and Communication Technology also increases the motivational level of both teachers and students with hearing impairment.

With Information and Communication Technology, students with hearing impairment can continue using computers to learn outside the school. Another great advantage of Information and Communication Technology is that it allows for flexibility of learning as it can be self-paced and allows for self-regulation for different students with hearing impairment needs. Information and Communication Technology is beneficial as it reduces the level of stigma of failure as the online environment provides enough privacy and space since students with hearing impairment do not feel miserable about minor failures. They are more motivated, and it encourages independence and self-responsibility for learning and active learning. If these are some of the benefits accrued in learning, then Information and Communication Technology would equally be beneficial to students with hearing impairment (Gichana, 2011).

According to (Salaudeen, 2015), Information and Communication Technology assists students with hearing impairments, by providing them with aids to learning capacities and also increasing their learning potential. Information and Communication Technology makes the children with hearing impairment proficient by providing them with the capacity to get to learning with the assistance of appropriate computerized media. It also plays a crucial role in helping the children with hearing impairment communicate with peers, thereby promoting them with a collaborative and social learning environment. Information and Communication Technology also helps students with hearing impairment in reading and writing through visual processes (Lasa, 2010).

Assistive innovation is a conventional term that incorporates adaptive, assistive, and rehabilitative gadgets for people with incapacities and incorporates 'basically anything that may be utilized to make up for absence of specific capacities' (Reed and Bowser, 2015). They include hearing aids and calpers. These can be used in teaching and learning through internet usage which help teachers to get a variety of the latest information in special education (Asmal, 2014). Internet facilities are educational resources in which teachers can use to facilitate learning. Internet usage enhances learning by helping in curriculum adaptation to meet the unique needs of students with hearing impairment (Jegbefume, 2013). It gives a variety of great instruments that help with changing the by and by separated educator focused and message bound classroom practices into rich student-focused and interactive learning environments. To effectively meet these expected results in special schools, teachers must, therefore, embrace the new technology learning tools (Handel & Harold, 2016). There are different sets of Information and Communication Technology devices used for students with hearing impairment. An example of these devices includes loop systems, personal hearing aids and sound field systems.

According to (Asmal, 2014), the vast majority of deaf children never attended school or attend at a very late age due to ignorance of Information and Communication Technology usage in teaching students with hearing impairment. There are very few Information and Communication Technology teachers who are equipped to teach students with hearing impairment. The few that there are in major urban cities teaching the schools of elites. The elite students with hearing impairment experiences a cutting-edge technology like their first world counterparts while most of the students with hearing impairment in less privileged schools for the deaf experience a less advantaged side of the digital Information and Communication Technology divide. The use of Information and Communication Technology is incorporated in Hearing Aids devices which are either behind the-ear, body worn, eyeglass or in the ear by special school. They also use Frequency-modulated (FM) Amplification systems (auditory trainer) which create a direct link between the students with hearing impairment and teacher, who wears a hearing aid. Others are infrared systems, audio loops, cochlear implants, captioned television, live speech captioning and telecommunication devices for the deaf (TDDS), (Asmal, 2014).

A web benefit called Sign Support was intended to encourage students with hearing impairment and hearing to converse with one another when a human gesture based communication mediator isn't accessible. Sign Support is intended to be open on a cell phone and can be utilized by illiterate students with hearing impairment. Sign language based communication video is utilized to direct students with hearing impairment through an arrangement of inquiries that are made to help them in certain predefined circumstances.

The students with hearing impairment answer the inquiries by connecting with graphic symbols. Sign Support turns their answers into text for the hearing person they are planning to visit. (Looijesteijn, 2019) noted that if Sign Support would be made accessible on the web, it could satisfy an incredible want for better comprehension between Deaf and hearing people (Looijesteijn, 2019). In Nigeria, the importance of Information and Communication Technology in special schools is well outlined in the Basic Education Act of 2013. The (Basic Education Act, 2013) provides that special public schools be created and maintained. This shows governments' interest and desire in accessibility of Information and Communication Technology to all students with disabilities. Several government projects have been commenced to promote Information and Communication Technology usage in schools and even in special schools.

The government has commenced the rural electrification project. This adjustment in electricity connection is one of the projects by the government in aid of the usage of Information and Communication Technology devices that are powered by electricity for both the special and the normal school units. The government has equally given computers that are solar-powered to children that would equally promote education for both children in regular and special schools. Promotion of science and technology is one of the eight National Goals of Education in Nigeria. Innovation is a basic type of riches to any country. Therefore, advancement, investigate, improvement, data, and Information and Communication Technology. With advancement in technology, then students with hearing impairment stand to benefit from new inventions and innovations. This is how important Information and Communication Technology is to the nation and in particular to the inclusion of students with hearing impairment.

In connection to advancement in technology, much has been done. For example, a metastudy research into the use of Information and Communication Technology among secondary school teachers in Nigeria was done by (Kiptalam and Rodrigues, 2011). The study showed that students with hearing impairment could accomplish tasks working at their pace, and independent access to education can be improved. The study further established that students with hearing impairment using voice communication aids The study revealed that an increase in Information and Communication Technology confidence amongst students with hearing impairment motivates them to use the internet at home for school work and leisure interest.

Effect of Information and Communication Technology (ICT) on the academic performance of students with hearing impairment.

According to (WHO, 2014) World Health Organization defines hearing impairment as partial loss or a complete of the ability to hear from one or both ears. Study indicates that 250 million people in the entire world are having a disabling hearing impairment. The barriers encountered by students with hearing impairment in inclusive schools relate to communication. (UNESCO, 2014) contends that persons with hearing impairment remain excluded in society. Education is an important part of enabling students with hearing impairment to reach their full potential, accessible Information and Communication Technology hold the potential to facilitate access to education, job training, and employment for students with hearing impairment.

Students with hearing impairment may have difficulties in hearing audio information in different levels. They need different types of assistive technologies. (Egaga & Aderibigbe, 2015). According to (Anido-Rifon, 2018), the most commonly used Assistive Technologies software for the hearing impaired is the I-Communicator. I-Communicator is an assistive tool for the students with hearing impairment. It assists independent communication for persons who are deaf or hard-of-hearing. It translates contents in real-time, like Speech to Text, Speech/Text to video sign-language and Speech/Text to Computer Generated Voice.

Content once translated can be used by the user for obtaining definitions, synonyms, and antonyms, with the help of an inbuilt dictionary in the system. This is the ideal assistive technology software that should be available and used in special schools and units for the students with hearing impairment to promote teaching and learning. (Sylvia, 2019) commenting on the general use of Information and Communication Technology in schools for students with hearing impairments stated that Information and Communication Technology could have a positive reaction on studying for students with hearing impairment. Use of Information and Communication Technology teaching and learning process goes past the utilization of computers by instructors since not just a computers and the web are utilized, yet in addition computerized cameras, cell phone and different innovations that can change the process of teaching students with hearing impairment. Nevertheless, Information and Communication Technology has not revolutionized teaching methods so far as students with hearing impairment are concerned.

The use of Information and Communication Technology as noted by (Sylvia, 2019) is mostly focused on supporting the subject content of students with hearing impairment. Information and Communication Technology-based exercises by hearing-debilitated students are significantly more to do with devouring than delivering. They work independently more regularly than together. In any case, the effect of coordinating Information and Communication Technology in training students with hard of hearing can be estimated in student's commitment separation and innovativeness and by the way that less time is squandered however the effect of Information and Communication Technology is extremely subject to how it is utilized. The benefits of using Information and Communication Technology by students with hearing impairment are many and varied. According to (World Bank, 2019) reported that students with hearing impairment as there are improved literacy levels through the use of Information and Communication Technology and specialized software. The World Bank reported that Information and Communication Technology could serve as a teaching, communication and learning tool; a helpful guide; a learning environment; a demonstrative guide and a device for the authoritative assignment in Special Educational Needs (SEN) arena. Different investigations have demonstrated that Information and Communication Technology can reduce the impact of incapacity among students with hearing impairment, which would somehow or another make a boundary to learning and active cooperation in the learning procedure for students with hearing impairment (Florian, 2014)**.**

Information and Communication Technology can enable students with hearing impairment to partake in the learning society and help them in building up their correspondence and social aptitudes (Thorpe, 2018); (Xin, 2019). Information and Communication Technology is a useful instrument for students with hearing impairment, who might have generally confronted trouble in getting to data (Myhill, 2012). Students with hearing impairment are generally subject to other people; and Information and Communication Technology is viewed as an essential instrument in making them moderately free (Grimaldi & Goette, 2019); (Watkins, 2014).

In specific terms, there is increased independence, confidence, motivation and social contact between students with hearing impairment and others who may be "normal" with no hearing challenges. The use of Information and Communication Technology offers excellent forms of communication, email, fax, and video conferencing for students with hearing impairment.

Alongside comprehensive training, another change motivation in instruction is driven by Information and Communications Technology (ICT). Students with hearing impairment live in a computerized age where the trading of such data happens through Information and Communication Technology (Brodin, 2010). Innovation has profoundly affected academic performance of students with hearing impairment across the world (Lily, 2011). According to (UNESCO, 2010): “Information and Communication Technology may have a role to play in disseminating and sharing special forms of education especially among students with hearing impairment”. (Florian, 2014) recommended that "innovation is an extraordinary equalizer which fills in as an intellectual prosthesis to remunerate the distinctions among students with hearing impairment.

Proof from the created nations recommends that the utilization of Information and Communication Technology in supporting students with hearing impairment have developed fundamentally over the most recent couple of years. He noticed that Information and Communication Technology could be a powerful apparatus for learning among students with hearing impairment (Buckingham, 2017); (Hegarty, 2014). In Nigeria, it has been noticed that Information and Communication Technology can be utilized to satisfy a scope of capacities with regards to students with hearing impairment. In his report Information and Communication Technology in Special Educational Needs (SEN) venture by Nigeria Agency. (Watkins, 2014) made reference to that every student with hearing impairment has unmistakable necessities and the product utilized should supplement these requirements. The capacity to impart among students with hearing impairment basic to their passionate, social, and subjective advancement. Teaming up on an Information and Communication Technology action can energize a gathering of students with hearing impairment expand their utilization of dialect and their comprehension of ideas as they plan and do their work..

The role of Information and Communication Technology on the education of students with hearing impairment

Aside from drastically changing the methods of educational information delivery, Information and Communication Technology can perform basic jobs in information development by making conceivable administration, the creation and sharing of learning (Hallahan, Kauffman and Pullen, 2011). Information and Communication Technology, are intense social change frameworks injected with the mission of creating and improving attractive qualities and practices among people in general and particularly among the adolescent. Information and Communication Technology supports cognitive development of students with hearing impairment (Besio, 2014). At the tender age of under 2 years, Information and Communication Technology is useful to help students with hearing impairment to utilize objects as tools to attain desired results. Later, (2-6 years), the design and use of Information and Communication Technology is such that students with hearing impairment can deal with objects more symbolically. Older students with hearing impairment (7-11 years) use Information and Communication Technology more variably as they are in a position to apply logical operations to specific sets of problems. Finally, the design of Information and Communication Technology for adolescent students with hearing impairment (over 11 years) can be based on decision making and problem solving.

(Hasselbring & Glaser, 2010) stated that the use of technology to assist students with hearing impairment in Nigeria. The study noted that governments should come up with strategies for using Information and Communication Technology in promoting education for students with hearing impairment. There should be a national Information and Communication Technology strategy in education and training for both the teachers and students with hearing impairment. Such strategies include conducting Information and Communication Technology training courses for the teachers who will teach students with hearing impairment, having a national strategic plan to be adopted by all special schools and units in the educational plan; providing the necessary resources and materials for the schools, teachers, and students with hearing impairment. These strategies are put in place to improve access, quality and equity in the delivery of education services to those with hearing impairment in different special schools and units (Hasselbring & Glaser, 2010).

The general goal of the Information and Communication Technology vital arrangement is to guarantee that the deliberate endeavors are made towards strengthening, selection and utilization of Information and Communication Technology in training area with appropriate consideration given to instruction improvement needs as sketched out in the Big-Four Agenda (GoK, 2018). Financing Information and Communication Technology in the ordinary schools and the special schools is one of the key initiatives by both the national and county governments. Financing as a strategy comes regarding funding the acquisition of the Information and Communication Technology programs, gadgets, and systems to promote the use of Information and Communication Technology in training the teachers and in teaching the students in special school setting.

The Education strategic plan of the (MOEST, 2013-2018) considers and proposes that Information and Communication Technology can contribute substantially towards the realization of the National Information and Communication Technology Strategy objectives. Likewise, Information and Communication Technology can possibly bolster execution of Free Primary Training (FPE) and to address rising difficulties, for example, high Pupil-Teacher Ratios (PTRs) especially in unique schools, packed classrooms, and semi-arid-dry regions, units, the deficiency of instructors taking care of students with hearing impairment debilitation and moderately high expense of learning and educating materials. This system traces zones for coordination of Information and Communication Technology in showing students with hearing impairment in Nigeria to address the difficulties and to secure the situation of the country as concerns the quickly growing training requirements for students with hearing impairment.

(Starcic & Niskala, 2010) examined how internet can be utilized to teaching students with hearing impairment in Nigeria. The study noted that there are four key pillars critical to effective implementation of Information and Communication Technology initiatives to meet Information and Communication Technology integration in the education sector. These are; teacher capacity development, relevant digital content, deployment of Information and Communication Technology infrastructure and robust policy and strategy (Nigeria Education Management Institute – NEMI, 2014). The study further established that implementation of Information and Communication Technology in special schools makes information-exchange faster, easier and more cost-effective among students with hearing impairment. Information and Communication Technology makes education more accessible especially to the students with hearing impairment who are hampered regarding communication. Information and Communication Technology equally improves the quality of education among students with hearing impairment as knowledge is easily amassed and shared electronically among them. (Koech, 2010) posits that the school educational modules is wrong in that there is absence of clear strategy rules and lawful status on students with hearing impairment arrangements, deficient instructing offices, equipment and services for students with hearing impairment and inadequate teachers who use rigid teaching approaches which may only benefit the average students among others.

According to the Policy on Special needs, a document launched by the Ministry of Education, the curriculum materials for students with hearing impairment are inadequate at all levels of education. The curriculum also lacks flexibility in terms of time, learning resources, methodology, and modes of access, presentation and content for students with hearing impairment. There is lack of sufficient trained personnel for curriculum development to handle students with hearing impairment. In addition, there are no clear staffing norms and recommendation on pupil-teacher ratios in institutions and programs for students with hearing impairment. Information and Communication Technology integration is one of the concerns of sessional paper. It strengthens the integration of Information and Communication Technology into the teaching and learning in schools (ECD to secondary) by training of trainers and building computer labs.

On the provision of computers and laptops, the sessional paper. Though elaborate with precision, most of the Information and Communication Technology strategies are silent on students with hearing impairment. Using Information and Communication Technology can make education among students with hearing impairment increasingly free of the constraint of distance, makes education easier and cheaper to access for students with hearing impairment. The use of Information and Communication Technology can also change the ways students with hearing impairment are taught and this result into better learning outcomes.

Utilization of Information and Communication Technology (ICT) on the education of students with hearing impairment

Utilization is the process of using materials for practical purpose. It refers to the act of using object, event or substance in improving a situation or practice. Utilization is the process of using object to improve educational practice. Utilization of Information and Communication Technology (ICT) in teaching refers to the process of using Information and Communication Technology (ICT) devices in improving the practices of teaching. It could be seen as the process of using Information and Communication Technology (ICT) facilities in improving the practice of teaching and learning (Hormby, 2012). Utilization of Information and Communication Technology (ICT) facilities involves various methods which include systematized feedback system, computer-based operation/network, video conferencing and audio conferencing, Internet/worldwide website and computer assisted instruction. Information and Communication

Technology (ICT) utilization is the presentation and distribution of instructional content through web environment (E-Teaching) to support learning and communication (Yusuf, 2014).

Observation has shown that there are no functional internet facilities in secondary schools. This appears to hinder the extent of students' exposure to the use of Information and Communication Technology (ICT) in learning. When it is appropriately utilized, it constitutes potent tools for enriching traditional means of teaching and learning and conducting research. He provided innovation opportunities for teaching and learning and they have engendered advance in research about how students learn, thereby, bringing about re-thinking the structure of education. Information and Communication Technology (ICT) can be used to improve the quality of teaching and learning in any secondary school. Information and Communication Technologies are fast becoming natural part of man's daily life, thus, their use in education by staff in teaching and learning process are becoming a necessity (Ekundayo, 2010).

Students with hearing impairment' lack of competence and willingness to utilize Information and Communication Technology (ICT) facilities in their learning is a problem to effective utilization of Information and Communication Technology (ICT). The students with hearing impairment need to be competent in the use of a variety of software, particularly those that have specific applications in different ways. For instance, apart from word processing and data processing that are important to the students, government should be able to use software packages that have specific application to learning. They should possess realistic Information and Communication Technology (ICT) skills (Dabesaki, 2010).

Students with hearing impairment' qualification on Information and Communication Technology (ICT) skills is the mark of education of students with hearing impairment on pedagogical knowledge of content, method and materials that promote teaching and learning towards better education. Hearing impaired students' qualification is the professional, education or vocational growth of students with hearing impairment acquired through training in a formal educational institution which determine the skills, knowledge of a subject matter, competence and experience of the students with hearing impairment in a particular field of education (Onyishi, 2015). It is a programme of study completed by the students with hearing impairment which exposes them to pedagogical knowledge of skill, subject matter, methods and materials as to be able to perform efficiently and effectively in the field of study they specialize (Asiwe, 2012). It is expected that due to computer course, students with hearing impairment are exposed to the course of attaining the qualification, they would prepare themselves towards utilization of Information and Communication Technology (ICT) facilities training (Federal Republic of Nigeria, 2015)

The emergence of Information and Communication Technology (ICT) has totally revolutionized ways we access, process, store and disseminate information within organizations or across the globe. Whether it is in vocal, pictorial, textual, numeric, or macro-electric based, Information and Communication Technology (ICT) is now a topical issue in Nigeria. It may not be because it is relatively new in this part of the world but because Information and Communication Technology (ICT) encompass a range of technologies and application systems of microprocessors that have had profound importance on the society and its way of life.

Information and Communication Technology (ICT) facilities revaluation is gradually affecting the nature of learning and the production of knowledge and transforming the world in unexpected way (Arunachalam, 2012). This has facilitated the paradigm shift from the traditional instructional materials or traditional pedagogical methods to a more modern and innovation technological based teaching and learning methods. The importance of Information and Communication Technology (ICT) is becoming more pronounced world -wide such that rarely is anything mentioned in any area of human endeavour without reference to this type of technology. Information and Communication Technology (ICT) refers to the process of gathering accessing and dissemination of data for an enhanced learning (Miller & Akume, 2010).

Information and Communication Technology (ICT) is giving to new concept, new ideas and making important in the education of students with hearing impairment.. Information and Communication Technology (ICT) has simplified education through the application of electronic media and internet. The production and introduction of calculators and computers in the education system worldwide, has helped in simplifying teaching and learning in secondary schools, thereby, promoting national stability and economic survival. Today, organizations such as educational research institution as well as the students with hearing impairment turn to the internet for accurate and up-to date data /information, online collaborators which refers to sharing of information working or trading with various students with hearing impairment at different schools through the internet is becoming common practice. The use of computer is continually gaining grounds in many aspects of human endeavour. These have shown that Information and Communication Technology (ICT) evolutional trends to have transformed the global perception on the application of our daily task. Subsequently, the effect of Information and Communication Technology (ICT) on every human performance that it has been viewed as the back bone and information super highway of our modern lives (Ndukwe, 2015)

When properly used, Information and Communication Technology (ICT) improves education of students with hearing impairment in addition to shaping work force opportunities Poole (2015). Technology-based teaching might not be essential in all classes but generally it was facilitative as a result of providing relevant examples and demonstrations; changing the orientation of the classroom; preparing students with hearing impairment for employment; increasing flexibility of delivery; increasing access; and satisfying public demands for efficiency. “The whole purpose of using technology in teaching was to give better value to students with hearing impairment”. This better value was meant to impact the education of students with hearing impairment (Miller, 2010)

Information and Communication Technology (ICT) could effectively improve teaching and learning abilities, hence increasing education of students with hearing impairment. As Information and Communication Technology (ICT) had the means to aid in the preparation of students with hearing impairment by developing cognitive skills, critical thinking skills, information access, evaluation and synthesizing skills. The application of Information and Communication Technology (ICT) in classroom had the capacity to provide higher interactive potential for students with hearing impairment and teacher in order to develop their individual, intellectual and creative ability (Belts, 2013)

The application of Information and Communication Technology (ICT) such as internet applications, CD-ROMs, Video technology and various computer attachments and software programs had caused many changes in the teaching and learning processes in schools (Agommuoh & Nzewi, 2013). The presence and use of the Information and Communication Technology (ICT) resources by the students with hearing impairment and teachers provided an avenue of availability of internet, computers, projectors, TVs, computer Labs, video conferencing etc. Accessibility in the Library, Computer Lab, classrooms, Resource centers, dormitories etc. (Scott, (2012) These interactions provided feedback which acted as a reinforcement towards the learning Process. Multimedia applications like games, drills, animation and other graphical applications provided practices that took the form of questions (stimulus) and answers (response) frames which exposed the students with hearing impairment to the subject in gradual steps consequently generating more interest in the subject matter which in the long run affected their education and gave them the desire to try and use this acquired knowledge in a different setting outside school.

The impact of Information and Communication Technology (ICT) on learning was in relation to use of digital media, primarily computers and internet to facilitate teaching and learning. Information and Communication Technology (ICT) were the technologies used in conveying, manipulation and storage of data by electronic means, they provided an array of powerful tools that might help in transforming the present isolated teacher-centered and text-bound classrooms into rich, student-focused, interactive knowledge environments.

A variety of models of usages could be identified leading to the same outcome. Information and Communication Technology (ICT) brought widened possibilities for the learning processes that were independent from place and space. Information and Communication Technology (ICT) also allowed more flexible (asynchronous) and more personalized learning. It offered new methods of delivering higher education. Taking advantage of these opportunities needed a profound change in the organization of the higher education system.

The role of Information and Communication Technology (ICT), especially internet in the education sector played an important role in the process of empowering the technology into the educational activities. Education sector could be the most effective sector to anticipate and eliminate the negative impact of Information and Communication Technology (ICT). Technology (internet) in another side could be the most effective way to increase hearing impaired students' knowledge.

Being aware of the significant role of Information and Communication Technology (ICT) in our life, especially in the educational activities, education authorities were to be wise enough in implementing the strategies to empower Information and Communication Technology (ICT) in supporting the teaching and learning process in the classroom. Information and

Communication Technology (ICT) was not just the bloom of the educational activities, but also it would be the secondary option to improve the effective and meaningful educational process.

Benefits of Information and Communication Technology (ICT) integration on the education of students with hearing impairment

Information and Communication Technology (ICT) is widely utilized by our country and it impacts our lives every day. It makes a big effect in education for the students with hearing impairment and teachers. Information and Communication Technology has become the key driver in education choice, and it has been described by the variety of significant wider benefits of Information and Communication Technology in teaching and learning to students with hearing impairment. This positive effect of Information and Communication Technology on students with hearing impairment' accomplishments and cooperation are included.

The benefit of using Information and Communication Technology for students with hearing impairment faced by the teacher, according to (Cassady, 2011), stated that students with hearing impairment learn more independently simultaneously. They can get more responsibility for education activity. Information and Communication Technology will help both powerful and vulnerable students with hearing impairment. The other studies revealed that teachers become more enthusiastic for teaching because students with hearing impairment are also passionate for learning, (Nordin, 2013). Another benefit faced by teacher by implementing Information and Communication Technology for Students with hearing impairment come from (Alotaibi & Almalki, 2016), they found that Information and Communication Technology greatly contributes to overall improvement of the learning and teaching processes and the social interaction skills of students with hearing impairment. Therefore, (Sulaimani, 2017) said that the teachers are benefited from the use of Information and Communication Technology, because Information and Communication Technology plays in enhancing interaction in the classroom, increasing educational attainment, and comprehension. With implementing Information and Communication Technology in teaching and learning process for students with hearing impairment, it makes them easier to interact with students with hearing impairment. Besides, it also helps the teachers to improve their teaching process.

It is crucial for all companies involved in supporting students with hearing impairment to take possible benefits and also the challenges of using Information and Communication

Technology. Information and Communication Technology will offer a safe, comfortable environment for students with hearing impairment. They may seem more in power, be familiar with the functions needed, and there is much little need to interact with others, which may have a positive and negative implications. Information and Communication Technology will encourage students with hearing impairment to grow more independent at business jobs and improve skills they can also have at home, (Carlotti, 2014).

Students with hearing impairment use the Information and Communication Technology for their learning process. The use of Information and Communication Technology even becoming a familiar thing for them. It is proven that the use of Information and Communication Technology has spread widely in every element of education includes the education for students with special needs, (Gardner, 2018). One of the studies conducted by (Baglama, Haksiz, & Uzunboylu, 2018), revealed that Information and Communication Technology increased students with hearing impairment' motivation in learning. They also found that Information and Communication Technology can make the positive effects to students with hearing impairment on their literacy skills. (Yildirim & Saban, 2014) found that the implementation of Information and Communication Technology even can affect students with hearing impairment' geometric academic achievement positively. From that studies above, the researcher can conclude that Information and Communication Technology is very important to be implemented for students with hearing impairment. There are so many advantages that they will get when they are interact with Information and Communication Technology. Both the normal students and students with hearing impairment, they live in millennial era, which all of the aspects in this life are having a close relation with technology. Therefore, if they do not adjust themselves to the development of this era, they will be left behind.

Information and Communication Technology (ICT) is widely utilized by our country and it impacts our lives every day. It makes a big effect in education for the learners and teachers. ICT has become the key driver in education choice, and it has been described by the variety of significant wider benefits of Information and Communication Technology (ICT) on teaching. This positive effect of Information and Communication Technology (ICT) on students' accomplishments and cooperation are included.

Challenges of Information and Communication Technology (ICT) integration on the education of students with hearing impairment

(Nigeria Institute of Curriculum Development NICD, 2011) guide reports on Information and Communication Technology training for teachers highlights areas of challenges that teachers face in implementing Information and Communication Technology programs in schools at the level of secondary and primary schools. They include teacher training inadequacy, underdeveloped curriculum, equipment identification problems, lack of training tools, lack of incentives for instructors, lack of assessment tools, the high cost of training and implementation, lack of resources and social or institutional attitudes that persons with hearing impairment should not be educated.

Students with hearing impairment endure long, painful experiences of being taught by untrained teachers who have not mastered the strategies and use of Information and Communication Technology in teaching and learning. Most students with hearing impairment from poor or rather humble backgrounds are computer illiterate. This is due to inadequate exposure to Information and Communication Technology. Another challenge is the inability for the students with hearing impairment to work by themselves. For lack of computers, students with hearing impairment' access to education cannot be improved, and therefore they will not be able to accomplish educational tasks working at their own pace. They may not be able to gain confidence and social credibility at school and in their communities. This may lead to stigmatization and inability to deal with wider issues of exclusion from their peers, society, environment, and culture.

(World Bank, 2019) reported that they give an account of Information and Communication Technology in special schools bringing up that "Society (consistently) requires new abilities: Information and Communication Technology progressively pervades each part of life (health, learning, work, relaxation,). Information and Communication Technology is the dominating apparatuses for information handling, new ages need to end up able in their utilization, ought to get the important skills, and in this way should approach PCs and network systems during their school life" (World Bank, 2019). (Adoyo, 2018) while investigating on educating students with hearing impairment in an inclusive setting in Nigeria: challenges and considerations. Other challenges include communication problem; frustration, isolation depending on the dictates of the environment and students with hearing impairment experienced feelings of anger (Adoyo, 2018).

(Catelli, 2016) observes that one of the problems in teachers training is inadequacy since the present instructors need to figure out how to educate with advanced innovations while a considerable lot of them have not been instructed on how to do so, making them widely incompetent in emerging issues such as computer-generated learning. (Fischer, 2016) commenting on the inadequacy of training for the teachers of students with hearing impairment, observed that the students with hearing impairment are often left behind in the use of Information and Communication Technology in this rapidly changing world. This means that most teachers in special schools still prefer the traditional sign language teaching strategies which are devoid of anything Information and Communication Technology related (Catell, 2016).

Undeveloped curriculum for Information and Communication Technology is another challenge to the teachers. Teaching practices on Information and Communication Technology and Curriculum development have not much attention on Information and Communication Technology and Assistive Technology used in classrooms. The Nigeria Institute of Curriculum Development (NICD) is yet to roll out a comprehensive curriculum inculcated in the syllabus for special schools. This makes it very difficult for teachers to identify Information and Communication Technology equipment (software and hardware) relevant to teaching and learning for the students with hearing impairment, teachers need an appropriate curricular that permits the use of Information and Communication Technology tools for enhancing education in teaching and learning. Lack of these tools, especially the assessment tools is a big problem of teaching and learning using Information and Communication Technology..

(Mundi, 2011) socio-cultural impression of instructors and guardians on comprehensive training in four chose extraordinary and coordinated schools in Nigeria; (Mundi, 2011) noted that while it is not necessary for teachers to have in-depth knowledge of assistive technologies and devices, it is important that they receive support in developing educational materials and resources that are acceptable for all students with hearing impairment. Lack of this support de-motivates teachers who eventually develop a negative attitude towards the use of Information and Communication Technology in teaching students with hearing impairment. Poor funding for developing school Information and Communication Technology capability and negative political and financial commitment (at both government and schools levels) challenges the teachers in deaf schools to have to contend with (Mundi, 2011).

Theoretical framework

Universal Design for Learning is an educational methodology that considers the diversity of its students with hearing impairment.. This model should allow the design of learning programs that are motivating and integrating, as well as offering different channels of assimilation, access and expression of knowledge. The integration of Information and Communication Technology (ICT) in education has opened up endless new possibilities for the creation and delivery of curricular content. Universal Design for Learning is a global instructional model for educational transformation that aims to identify barriers to learning and promote inclusive programs that take advantage of technological tools. The instructional proposals related to this model must be developed in a way that recognizes the diversity of the students with hearing impairment and provides flexible and accessible curricular approaches for students with hearing impairment. In Universal Design for Learning, Information and Communication Technology (ICT) are highly relevant due to their versatility, accessibility, adaptability and ability to promote an active role of students with hearing impairment in their own learning

The principle of Universal Design for Learning are:

Diversifying forms of involvement: It refers to the necessary motivation and commitment for the learning process to be successful. The students with hearing impairment must understand the reason and the importance for the practice, as well as being able to take a leadership role and be involved in his or her own learning.

Provide multiple channels of information and content presentation: It is essential to provide multiple ways of presenting content to accommodate diversity in the classroom. It is important to recognize that each learner with hearing impairment perceives and integrates information differently.

Provide multiple supports for action and expression: Each learner with hearing impairment has specific skills that allow them to unfold their potential in expressing and manifesting their knowledge.

Self Determination Theory was guided by Ryan and Edward Deci (1985). The theory suggests that people tend to be driven by a need to grow and gain fulfilment. They have since refined their theory multiple times, and it's now one of the most frequently cited studies regarding human motivation. After all, it holds a unique position in psychology, as it addresses why people do what they do and the influence our social environment has on promoting behaviour. In the context of self-determination, motivation is what moves us to take action. They suggest that human motivation is based on a variety of different emotional needs and internal or external influences. According to the theory, individuals are motivated by three innate and universal psychological needs. As such, they are only able to become self-determined when they fulfil their needs for

Assumptions of Self-Determination Theory are:

1. The need for growth drives behaviour**:** The first assumption is that a need for growth as a human being drives behaviour. After all, we tend to actively seek opportunities for growth and improvement. As such, gaining mastery over challenges and taking in new experiences is essential for developing a cohesive sense of self.

2. Autonomous motivation is important: While external motivators can be extremely effective, Self-Determination Theory focuses primarily on intrinsic motivation. This means internal sources of motivation, such as a need to gain knowledge to prove yourself.

The use of Information and Communication Technology on the education of students with hearing impairment previously

(Nordini, 2013) revealed that the implementation of Information and Communication Technology is mostly used in schools. All the teachers agreed that the implementation of Information and Communication Technology is beneficial for their teaching process. This research also showed that the teachers want Information and Communication Technology courses include at the curriculum. It is because Information and Communication Technology helps in teaching of the students with hearing impairment for learning. (Zaharudin, Nordin, Yasin, & Embi 2011) showed that most of the teachers did not feel satisfied that students with hearing impairment have no the same equality with the normal-hearing students out there. (Ghavifekr, Kunjappan, Ramasamy, & Anthony 2016) showed the incomplete accessibility and system connection, inadequate technical support, nonexistence of effective training, and limited time and lack of teachers' competency. (Nordini, 2015) showed that Information and Communication Technology gives a benefit for the students with hearing impairment and Information and Communication Technology courses was needed to be developed for students with hearing impairment.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter aims at describing the design and methodology of this study. The chapter is therefore presented under the following sub-headings: Research design, Research population, Sample and sampling techniques, Instrumentation of data collection, Validity and reliability of the instrument, Method of data collection, and Statistical techniques for data analysis.

Research Design

The research design adopted for the study was description survey research design. The design was considered appropriate as it is suitable for collecting data needed for describing the variables of the study (impact of Information and Communication Technology) as they are at present without the need for manipulating them.

Research population

The population of the study constituted students with hearing impairment in primary and secondary schools in Benin City.

Sample and sampling technique

A purposive sampling technique was used for the study. The sample of the study was fifty (50) students with hearing impairment. Using the actual number of students with hearing impairment due to the small number of students with hearing impairment in Ihogbo college.

Instrumentation of data collection

The instrument used for data collection is a self structured questionnaire named "Impact of Information and Communication Technology (ICT) on the Education of Students with Hearing Impairment Questionnaire (IICTESHIQ)".The questionnaire is made up of two parts, part A and B. Part A consisted of personal data of the respondents while part B dwelt on the items of information based on the variables to be studied and is concerned with a 4 point required scale which dropped a four point modified likert-like rating scale. This is categorized into:

Strongly agreed - SA
Agreed - A
Disagreed - D
Strongly disagreed - SD

Validity and reliability of the instrument

Two kind of validity were established for the instruments of the study. These were the face and content validity and was established using two experts from the Department of Educational Evaluation and Counselling Psychology and the project supervisors. The experts certified that the instrument was valid and could be used for the study.

The internal consistency of the instrument was ascertained using Cronbach's Alpha method, the questionnaire yielded an internal consistency reliability coefficient of 0.910. Data collection was personally undertaken by the researchers who visited schools and administered the instruments. Descriptive and inferential statistics were used to answer the research questions.

Method of data collection

The researcher obtained a letter of introduction from the Head of Department to present to the principal and headmistress of schools seeking for the consent of the school head to undertake the research/study in the school. Having gotten the approval, the researcher administered the instruments to the respondents. 100% of the questionnaires were retrieved on the spot from the respondents to avoid loss.

Method of data analysis

Data collected was analyzed using descriptive and inferential statistics. The four (4) point likest scale was employed to measure the degree of agreement and disagreement to questionnaire items on the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Result

The gender, age and class of the respondents are shown in Table 4.1. There were 40% male and 56% female which means that most of the respondents were female. In terms of age, 14% were between 10-15 years, 60% were between 16- 20, 20% were between 21-25 years and 6% were above 25 years. This showed that most of the respondents were young adult. This is beneficial because most of the respondents are in the age bracket that could understand what they want and whose perceptions could be reckon with.

Table 4.2 Demographic characteristics of the Respondents

Characteristics	Components	Frequency	Percentage (%)
Gender	Male	22	44.0
	Female	28	56.0
	Total	50	100.0
Age	10-15	7	14.0
	16-20	30	60.0
	21-25	10	20.0
	Over 25	3	6.0

	Total	50	100.0
Class	PRI 5	1	2.0
	PRI 6	20	40.0
	JSS1	1	2.0
	JSS 2	11	22.0
	JSS 3	6	12.0
	SS 1	9	18.0
	SS 2	0	0.0
	SS 3	2	4.0
	total	50	100.0

Source: Researcher's computation, 2025

4.2. Impact of Information and Communication Technology (ICT) on the Education of Students With Hearing Impairment

The result as shown in table 4.3 shows that most of the respondents were of the opinion that lack of competitiveness and willingness to utilize Information and Communication Technology (ICT) facilities can lead to poor academic performance of students with hearing impairment. They agreed that teacher mastery of learning style of students with hearing impairment can affect his or her teaching effectiveness. They also were of the opinion that teachers knowledge of Information and Communication Technology (ICT) skills can affect academic performance of students with hearing impairment. However, majority of the respondents disagreed that use of Information and Communication Technology (ICT) can improve the quality of teaching and learning for students with hearing impairment and that use of Information and Communication Technology (ICT) can enhance effective assessment and evaluation of the academic performance of students with hearing impairment. It can therefore be deduced that the use of Information and Communication Technology (ICT) on the education of students with hearing impairment has high impact.

Table 4.3. Impact of Information and Communication Technology (ICT) on the education of students with hearing impairment

ITEMS	SA Freq (%)	A Freq (%)	D Freq (%)	SD Freq (%)	Mean	STD	Remark
Use of ICT can improve the quality of teaching and learning for students with hearing impairment	32(64)	14(28)	2(4)	2(4)	1.48	0.762	Low impact
Lack of competitiveness and willingness to utilize ICT facilities can lead to poor academic performance of students with hearing impairment	8(16)	18(36)	17(34)	7(14)	2.46	0.930	High impact
Use of ICT can enhance effective assessment and evaluation of the academic performance of students with hearing impairment	14(28)	25(52)	8(16)	2(4)	1.96	0.781	Low impact
Teacher mastery of learning style of students with hearing impairment can affect his or her teaching effectiveness	13(26)	26(52)	10(20)	1(2)	1.98	0.742	High impact
Teachers knowledge of ICT skills can affect academic performance of students with hearing impairment	25(50)	11(22)	4(8)	10(20)	1.98	1.186	High impact

Strongly Agreed (SA) = 1; Agreed (A) = 2; Disagreed (D) = 3; and Strongly Disagreed (SD) = 4.
Weighted Average (WA) = 1.97

4.3. Effect of Information and Communication Technology (ICT) on Academic Performance of Students With Hearing Impairment

The result as shown in table 4.4 shows that most of the respondents disagree that Information and Communication Technology (ICT) motivates students with hearing impairment to use internet at home and that Information and Communication Technology (ICT) improves students with hearing impairment independent access to education. They also disagreed that accessibility of Information and Communication Technology (ICT) facilitates education, job, training and employment for students with hearing impairment and that they do better in their academics as a result of Information and Communication Technology (ICT). However, majority were of the opinion that adequate and appropriate teaching Information and Communication Technology (ICT) can enhance learning retention of students with hearing impairment. Based on the outcome, it can be inferred that Information and Communication Technology (ICT) has minimal influence on the academic performance of students with hearing impairment

Table 4.4 Effect of Information and Communication Technology (ICT) on academic performance of students with hearing impairment

ITEMS	SA Freq (%)	A Freq (%)	D Freq (%)	SD Freq (%)	Mean	STD	Remark
ICT motivates students with hearing impairment to use internet at home	19(38)	21(42)	7(14)	3(6)	1.88	0.872	Low effect
ICT improves students with hearing impairment independent access to education	21(420	20(40)	4(8)	5(10)	1.86	0.948	Low effect
Accessibility of ICT facilitates education, job, training and employment for students with hearing impairment	24(48)	18(32)	8(16)	2(4)	1.76	0.870	Low effect
Adequate and appropriate teaching ICT can enhance learning retention of students with hearing impairment	14(260	16(32)	13(26)	7(14)	2.26	1.026	High effect
I do better in my academics as a result of ICT	23(46)	16(320	7(14)	4(8)	1.84	0.955	Low effect

Strongly Agreed (SA) = 1; Agreed (A) = 2; Disagreed (D) = 3; and Strongly Disagreed (SD) = 4.
Weighted Average (WA) = 1.92

4.4. Role of Information and Communication Technology (ICT) in Facilitating Communication And Social Interaction Among Students With Hearing Impairment

The result as shown in table 4.5 reveals that majority of the respondents were not in agreement that students with hearing impairment using the internet can access information alongside their hearing peers and that Information and Communication Technology (ICT) improved better social interaction and collaboration with teachers and peers. They also disagreed that the use of Information and Communication Technology (ICT) helps them to integrate into the hearing community. However, most of the respondents were of the opinion that students with hearing impairment that use total communication aids are able to gain confidence and social credibility at school and their community. They also agreed that lack of resources and social or institutional attitude that students with hearing impairment cannot be improved. It can be assumed from the result that Information and Communication Technology (ICT) plays minimal role in facilitating communication and social interaction among students with hearing impairment

Table 4.5 Role of Information and Communication Technology (ICT) in facilitating communication and social interaction among students with hearing impairment

ITEMS	SA Freq (%)	A Freq (%)	D Freq (%)	SD Freq (%)	Mean	STD	Remark
Students with hearing impairment using the internet can access information alongside their hearing peers	15(36)	16(32)	10(20)	9(10)	2.02	1.000	Low role
Students with hearing impairment that use total communication aids are able to gain confidence and social credibility at school and their community	14(26)	19(38)	11(22)	6(12)	2.18	0.983	High role
Lack of resources and social or institutional attitude that students with hearing impairment cannot be improved	12(24)	14(28)	14(28)	10(20)	2.44	1.072	High role
Improved better social interaction and collaboration with teachers and peers through	22(44)	14(28)	9(18)	4(8)	1.90	0.984	Low role

ICT							
The use of ICT help me to integrate into the hearing community	25(52)	16(36)	5(10)	1(2)	1.62	0.753	Low role

Strongly Agreed (SA) = 1; Agreed (A) = 2; Disagreed (D) = 3; and Strongly Disagreed (SD) = 4.
Weighted Average (WA) = 2.03

4.5 Benefits and Challenge of Information and Communication Technology (ICT) Integration of Students With Hearing Impairment

The result as shown in table 4.6 reveals that majority of the respondents were in agreement that insufficient captioning and audio description as well as limited number of Information and Communication Technology (ICT) trained teachers and inaccessibility of Information and Communication Technology (ICT) resources are challenges. However, most of the respondents disagree that availability of electricity supply is a challenge. In terms of benefit, majority of the respondents disagreed that the use of Information and Communication Technology (ICT) can benefit teachers to enhance interaction in the classroom, increasing educational attainment and comprehension. They also disagreed that implementation of Information and Communication Technology (ICT) in teaching and learning processes makes teachers easier to interact with students with hearing impairment. Based on the result, it can be assumed that there are little benefits and some challenge of Information and Communication Technology (ICT) integration of students with hearing impairment

Table 4.6 benefits and challenge of Information and Communication Technology (ICT) integration of students with hearing impairment

ITEMS	**SA Freq (%)**	**A Freq (%)**	**D Freq (%)**	**SD Freq (%)**	**Mean**	**STD**	**Remark**
Insufficient captioning and audio description	11(22)	17(34)	15(30)	7(14)	2.36	0.985	High challenge
Availability of electricity supply	21(42)	16(32)	9(18)	4(8)	1.92	0.966	Low challenge
Limited number of ICT trained	18(36)	19(38)	7(14)	6(12)	2.02	1.000	High

teachers and inaccessibility of ICT resources							challenge
Use of ICT can benefit teachers to enhance interaction in the classroom, increasing educational attainment and comprehension	25(50)	17(34)	5(10)	3(6)	1.72	0.882	Low benefit
Implementation of ICT in teaching and learning processes makes teachers easier to interact with students with hearing impairment	10(36)	22(44)	7(14)	3()6	1.90	0.863	Low benefit

Strongly Agreed (SA) = 1; Agreed (A) = 2; Disagreed (D) = 3; and Strongly Disagreed (SD) = 4.
Weighted Average (WA) = 1.98

4.2. Discussion of the findings

The finding of the study indicated that all the questionnaire items on the utilization of Information and Communication Technology (ICT) on the education of students with hearing impairment were accepted by the rating mean of 2.50 obtained from the response of respondents. This study indicated that (Ekundayo, 2010) asserted that there are no functional internet facilities in secondary schools. This appears to hinder the extent of students with hearing impairment' exposure to the use of Information and Communication Technology (ICT) in learning. When it is appropriately utilized, it constitutes potent tools for enriching traditional means of teaching and learning and conducting research. When properly used, Information and Communication Technology (ICT) improves academic performance of students with hearing impairment in addition to shaping work force opportunities (Poole, 2015). Technology-based teaching might not be essential in all classes but generally it was facilitative as a result of providing relevant examples and demonstrations; changing the orientation of the classroom; preparing students for employment; increasing flexibility of delivery; increasing access; and satisfying public demands for efficiency. "The whole purpose of using technology in teaching was to give better value to students with hearing impairment". This better value was meant to impact the education of students with hearing impairment (Miller, 2010).

The finding of the study indicated that all the questionnaire items on the effect of Information and Communication Technology (ICT) on the education of students with hearing impairment were accepted by the rating mean of 2.50 obtained from the response of respondents. The finding of the study indicated that (Sylvia, 2019) noted that the use of Information and Communication Technology is mostly focused on supporting the subject content of students with hearing impairment. Information and Communication Technology-based exercises by hearing-debilitated students are significantly more to do with devouring than delivering. They work independently more regularly than together. In any case, the effect of coordinating Information and Communication Technology in training students with hearing impairment can be estimated in students with hearing impairment' commitment separation and innovativeness and by the way that less time is squandered however the effect of Information and Communication Technology is extremely subject to how it is utilized. The benefits of using Information and Communication Technology by students with hearing impairment are many and varied. According to (World Bank, 2019) reported that students with hearing impairment as there are improved literacy levels through the use of Information and Communication Technology and specialized software. The World Bank reported that Information and Communication Technology could serve as a teaching, communication and learning tool; a helpful guide; a learning environment; a demonstrative guide and a device for the authoritative assignment in SEN arena. Different investigations have demonstrated that Information and Communication Technology can reduce the impact of incapacity among students with hearing impairment, which would somehow or another make a boundary to learning and active cooperation in the learning procedure for students with hearing impairment (Florian, 2014).

The finding of the study indicated that all the questionnaire items on the Information and Communication Technology (ICT) facilitates communication and social interaction among students with hearing impairment were accepted by the rating mean of 2.50 obtained from the response of respondents. The finding of the study indicated that (Salaudeen, 2015) stated that Information and Communication Technology assists students with hearing impairments, by providing them with aids to learning capacities and also increasing their learning potential. Information and Communication Technology makes the students with hearing impairment proficient by providing them with the capacity to get to learning with the assistance of appropriate computerized media. It also plays a crucial role in helping the students with hearing impairment communicate with peers, thereby promoting them with a collaborative and social learning environment. Information and Communication Technology also helps students with hearing impairment in reading and writing through visual processes (Lasa, 2010). These can be used in teaching and learning through internet usage which help teachers to get a variety of the latest information in special education (Asmal, 2014). Internet facilities are educational resources in which teachers can use to facilitate learning. Internet usage enhances learning by helping in curriculum adaptation to meet the unique needs of students with hearing impairment (Jegbefume, 2013). It gives a variety of great instruments that help with changing the by and by separated educator focused and message bound classroom practices into rich student-focused and interactive learning environments. To effectively meet these expected results in special schools, teachers must, therefore, embrace the new technology learning tools (Handel & Harold, 2016). There are different sets of Information and Communication Technology devices used for students with hearing impairment. An example of these devices includes loop systems, personal hearing aids and sound field systems.

The finding of the study indicated that all the questionnaire items on the benefits and challenges of Information and Communication Technology (ICT) integration on the education of students with hearing impairment were accepted by the rating mean of 2.50 obtained from the response of respondents. The finding of the study indicated that (Sulaimani, 2017) said that the teachers are benefited from the use of Information and Communication Technology, because Information and Communication Technology plays in enhancing interaction in the classroom, increasing educational attainment, and comprehension. With implementing Information and Communication Technology in teaching and learning process for students with hearing impairment, it makes them easier to interact with students with hearing impairment. Besides, it also helps the teachers to improve their teaching process. (Nigeria Institute of Curriculum Development NICD, 2011) guide reports on Information and Communication Technology training for teachers highlights areas of challenges that teachers face in implementing Information and Communication Technology programs in schools at the level of secondary and primary schools. They include teacher training inadequacy, underdeveloped curriculum, equipment identification problems, lack of training tools, lack of incentives for instructors, lack of assessment tools, the high cost of training and implementation, lack of resources and social or institutional attitudes that persons with hearing impairment should not be educated. Students with hearing impairment endure long, painful experiences of being taught by untrained teachers who have not mastered the strategies and use of Information and Communication Technology in teaching and learning. Most students with hearing impairment from poor or rather humble backgrounds are computer illiterate. This is due to inadequate exposure to Information and Communication Technology. Another challenge is the inability for the students with hearing impairment to work by themselves. For lack of computers, students with hearing impairment' access to education cannot be improved, and therefore they will not be able to accomplish educational tasks working at their own pace. They may not be able to gain confidence and social credibility at school and in their communities. This may lead to stigmatization and inability to deal with wider issues of exclusion from their peers, society, environment, and culture.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary, conclusion and recommendations

Summary

This study investigated the impact of Information and Communication Technology (ICT) on the education of students with hearing impairment in Benin City. Four research questions and hypotheses were formulated to guide the study. Literature was reviewed on related variables.

Descriptive survey research design was adopted for the study. A total of fifty (50) respondents were selected as sample for the study. The main instrument used for data collection was the questionnaire. Descriptive and inferential statistics were employed to answer the research questions.. Result of the study indicated that use of Information and Communication Technology (ICT) on the education of students with hearing impairment has high impact, Information and Communication Technology (ICT) has minimal influence on the academic performance of students with hearing impairment, Information and Communication Technology (ICT) plays minimal role in facilitating communication and social interaction among students with hearing impairment and there are little benefits and some challenge of Information and Communication Technology (ICT) integration of students with hearing impairment.

Conclusions

Four research questions were tested in the course of this study. Based on the results of the study, It was concluded that use of Information and Communication Technology (ICT) has high impact on the education of students with hearing impairment has, Information and Communication Technology (ICT) has minimal influence on the academic performance of students with hearing impairment, Information and Communication Technology (ICT) plays minimal role in facilitating communication and social interaction among students with hearing impairment and there are little benefits and some challenge of Information and Communication Technology (ICT) integration of students with hearing impairment.

Recommendations

Based on the findings, it was recommended that;

1. The government should try its possible best to build an Information and Communication Technology (ICT) facility centre in primary and secondary schools in Benin City.

2. Ministry of Education should provide training to teachers on the Information and Communication Technology tools and how to use them creatively, incorporating them into a participatory teaching approach.

3. Teachers should engage in Information and Communication Technology (ICT) training in other to learn more to equip themselves for the students with hearing impairment.

4. Students with hearing impairment should take Information and Communication Technology (ICT) learning very seriously since it is very important both in school and after school.

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APPENDIX 1

QUESTIONNAIRE ON THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON THE EDUCATION OF STUDENTS WITH HEARING IMPAIRMENT IN BENIN CITY

Department of Educational Evaluation
and Counselling Psychology,
University of Benin,
Edo State.
16th September 2024

Dear Sir/Madam,

I am a final student in the Department of Educational Evaluation and Counselling Psychology, Faculty of Education, University of Benin, Benin City. I am carrying out a research on “The impact of Information and Communication Technology (ICT) on the education of students with hearing impairment in Benin City”. I humbly seek your consent to be allowed to administer my research instruments on your students. I wish to assure you that whatever information that gathered is for research purpose and shall be confidently treated.

Thank you

Yours faithfully,

Ojo Alli Eugenia

APPENDIX 11

QUESTIONNAIRE

This questionnaire is divided into two (2) parts. Part A your bio-data and the part B the question. Please provide answers appropriately.

PART A

Class: PRI 5 [ ]. PRI 6 [ ] SS1 [ ] SS 11 [ ] SS 111 [ ]

Sex: Male [ ] Female [ ]

Age: below 15 [ ] 15 - 20 [ ] 21 - 25 [ ] 25 above [ ]

PART B

Please tick where appropriate

Section A

Research Question 1: To what extent does utilization of Information and Communication Technology (ICT) impact on the education of students with hearing impairment in Benin City?

S/N	Items	SA	A	D	SD
1	Teacher often neglect the use of Information and Communication Technology (ICT) facilities in teaching because students with hearing impairment don't understand when using them				
2	Students with hearing impairment use Information and Communication Technology facilities for academic work				
3	Students with hearing impairment use Information and				

	Communication Technology facilities for assignment				
4	My teacher uses the Information and Communication Technology (ICT) available in my school for teaching				
5	The school authority cooperate with teachers in the use of Information and Communication Technology				

Section B

Research Question 2. What are the effect of Information and Communication Technology (ICT)on the academic performance of students with hearing impairment in Benin City?

S/N	Items	SA	A	D	SD
1	Increased confidence among students with hearing impairment motivate them to use the internet at home for assignment and leisure interests				
2	Information and Communication Technology improve students with hearing impairment independent access to education				
3	Using Information and Communication Technology makes printing and picture reading easy				
4	Students with hearing impairment enjoy computer lessons and are ready to learn				
5	The school authority cooperate with teachers in the use of Information and Communication Technology				

Section C

How does Information and Communication Technology (ICT) facilitate communication and social interaction among students with hearing impairment in Benin City?

S/N	Items	SA	A	D	SD
1	Students with hearing impairment using the internet can access information alongside their hearing peers				
2	Students with hearing impairment use total communication aids are able to gain confidence and social credibility at school and in their				

	community				
3	Lack of resources and social or institutional attitudes that students with hearing impairment cannot be improved				
4	Improved better social interaction and collaboration with teachers and peers				
5	Inadequate exposure to Information and Communication Technology lead to poor academic performance of students with hearing impairment				

Section D

Research Question 4. What are the benefits and challenges of Information and Communication Technology (ICT) integration on the education of students with hearing impairment in Benin City?

S/N	Items	SA	A	D	SD
1	Insufficient captioning and audio description				
2	Availability of electricity supply				
3	Limited number of ICT trained teachers				
4	Information and Communication Technology helps in acquiring skills in technology and ability to work as a team				
5	Enhanced learning experiences through visual and tactile means				

APPENDIX 111

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
0.910	20

APPENDIX IV

CLASS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	PRI 5	1	2.0	2.0	2.0
	PRI 6	20	40.0	40.0	42.0
	JSS1	1	2.0	2.0	44.0
	JSS 2	11	22.0	22.0	66.0
	JSS 3	6	12.0	12.0	78.0
	SS 1	9	18.0	18.0	96.0
	SS 3	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	22	44.0	44.0	44.0
	FEMALE	28	56.0	56.0	100.0
	Total	50	100.0	100.0	

AGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-15	7	14.0	14.0	14.0
	16-20	30	60.0	60.0	74.0
	21-25	10	20.0	20.0	94.0
	OVER 25	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

Statistics

		use of ICT can improve the quality of teaching and learning for students with hearing impairment	lack of competitiveness and willingness to utilise ICT facilities can lead to poor academic performance of students with hearing impairment	use of ICT can enhance effective assessment and evaluation of the academic performance of students with hearing impairment	teacher mastery of learning style of students with hearing impairment can affect his or her teaching effectiveness	teachers knowledge of ICT skills can affect academic performance of students with hearing impairment
N	Valid	50	50	50	50	50
	Missing	0	0	0	0	0
Mean		1.48	2.46	1.96	1.98	1.98
Std. Deviation		.762	.930	.781	.742	1.186

Statistics

		ICT motivates students with hearing impairment to use internet at home	students with hearing impairment independent access to education	accessibility of ICT facilitates education, job, training and employment for students with hearing impairment	adequate and appropriate teaching ICT can enhance learning retention of students with hearing impairment	i do better in my academics as a result of ICT
N	Valid	50	50	50	50	50
	Missing	0	0	0	0	0
Mean		1.88	1.86	1.76	2.26	1.84
Std. Deviation		.872	.948	.870	1.026	.955

Statistics

		students with hearing impairment using the internat can	students with hearing impairment can use total communication	lack of resources and social or institutional attitude that	improved better social interraction and collaboration with teachers	the use of ICT help me to integrate into the hearing community

		access information alongside their hearing peers	aids are able to gain confidence and social credibility at school and their community	students with hearing impairment cannot be improved	and peers through ICT	
N	Valid	50	50	50	49	50
	Missing	0	0	0	1	0
Mean		2.02	2.18	2.44	1.90	1.62
Std. Deviation		1.000	.983	1.072	.984	.753

Statistics

		insufficient captioning and audio description	availability of electricity supply	limited number of ICT trained teachers and inaccessibility of ICTresources	use of ICT can benefit teachers to enhance interraction in the classroom, increasing educational attainment and comprehension	implementation of ICT in teaching and learning processes makes teachers easier to interract with students with hearing impairment
N	Valid	50	50	50	50	50
	Missing	0	0	0	0	0
Mean		2.36	1.92	2.02	1.72	1.90
Std. Deviation		.985	.966	1.000	.882	.863