KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INVESTIGATING THE INTEGRATION LEVEL OF ICT IN HEALTH CARE DELIVERY AT THE HOHOE MUNICIPAL HOSPITAL

MAVIS DUHOE

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MAVIS DUHOE

A MASTER'S THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE HEALTH INFORMATICS.

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DECLARATION

Student's Declaration

I, **DUHOE MAVIS**, declare that this thesis, with the exception of quotations and references from other researchers' works and consults which I have well identified and duly acknowledged, is entirely my original work and that it has neither in whole nor part be submitted anywhere for another degree.

Signature..

Date..

Certified by: Internal Supervisor

Name: **Mr. J. K. Panford**

Signature..

Date..

Certified by: Head of Department

Name: **Dr. Michael Asante**

Signature..

Date..

DEDICATION

I dedicate this work to my son, Jerome Sefakor Kwame Kotokor Jnr. and all well wishers.

ACKNOWLEDGEMENT

ABSTRACT

The purpose of this study is to 'Investigate the integration level of ICT in healthcare delivery at the Hohoe Municipal Hospital'. A descriptive survey approach was adopted for the study. Questionnaire was used to elicit responses from 150 purposefully selected respondents (60 clinicians and 90 patients) in order to frankly answer four strategic research questions guiding the study. The research questions sought to know the current level of ICT integration into healthcare delivery at the Hohoe Municipal Hospital in the Volta Region of Ghana through identification of the available integrated ICT tools, benefits of integrated ICT into healthcare, the level of competence and preparedness of both clinicians and patients in using technological devices as well as the barriers to the successful integration of ICT into healthcare delivery. The findings revealed that there is a low status of much feasible ICT tools which must be acquired and networked to boost services offered by the hospital in a more detailed and effective manner. Furthermore, lack of policies, human and other material resources to establish and augment effective integration of ICT into healthcare delivery was identified. These generate lack of much knowledge on the relevance of ICT in healthcare to patients and clinicians, complications in treatment as well as the exhibition of negative attitudinal characteristics by some clinicians towards using available technological facilities. The researcher recommends on the findings that, more ICT tools must be acquired and properly networked; if possible, personnel must be employed and trained to be in charge of the facilities and to evaluate their functions. Also, a national policy must be constituted to champion health affairs instead of party politics enshrinements and ICT education must be part of every national curriculum and training services across formal, semi-formal and nonformal educational enterprises. Finally, public institutions must be decentralised rather than depending on the central government for all needs.

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CHAPTER ONE

INTRODUCTION

Overview

This chapter covers the background of the study, statement of the problem, purpose of the study, significance of the study, research questions, delimitations and limitations of the study.

1.1   Background to the study

The use of technological knowledge has made the world a global village. As the development, application and utilisation of technology takes control over the world's services, Information Communication Technology (ICT) has become the sole productive entity within which everything develops, exists and functions. ICT has become an imperative part of life, engulfing every function and activity of man and healthcare delivery is never an exception. Healthcare delivery, apart from knowledge acquisition and knowledge access measures, is indisputably the bedrock of life and the means through which every need of a nation, institution or individuals could be addressed.

Healthcare services demand quality, accuracy, reliability, timeliness, effectiveness and efficiency in all its formulation, delivery and assessment processes hence the need to integrate ICT into healthcare delivery. A major challenge for developed, developing and under developed nations is how to adequately meet the health needs of their citizens. This challenge can best be addressed through the use of highly improved, accessible and sophisticated technological methods and devices. It could also be achieved through integrative service delivery mechanisms and ICT is the best complementary medium.

Integrating this into healthcare and other necessary service areas of man will help in curtailing the enormous fast growing needs and challenges of man. An adage goes that ''Good health is maximum wealth'' and this is very paramount to every individual. Access to quality health

services becomes a necessary requirement for increasing the quality of labour force and productivity. Diagnosis, treatment and other related services, necessary for achieving total wellbeing of man can best be achieved through ICT and its integrative modes of application.

Technological devices and other electronic gadgets that are used to investigate, find, retrieve, process, store, access, manipulate, transmit and receive information in a digitally oriented manner help in addressing most challenges of man. These orientations on ICT include the use of personal computers, e-mail, robots, digital televisions, teleconferencing, specialist diagnostic equipment, web pages, SMS text messages, mobile phones and other automatic user-friendly digital or electronic devices on any data and or information. Information in this context refers to any data that has been processed for use, and data could mean any unprocessed finding. This information, if well captured, processed, manipulated, verified, stored and retrieved, will remain authentic.

Since information can be shared over a distance through communication between individuals, groups and organisations via technological or digital tools to achieve specific goals, the researcher believes that integrating ICT into healthcare services will help to alleviate and control many challenges of man. Despite the Human Right dispensations on every individual, ICT integration in healthcare will provide a wide and suitable ground for patients to have access to and be observed, diagnosed and treated by several health experts in a given time.

As ICT makes communication or information delivery and transmission very effective, easy and convenient, promotes access to resources and services in remote environments, enhances storage and retrieval of information for future use, helps in the manufacturing and prescription of drugs, diagnosis as well as in obtaining expert advice over a distance, the position of ICT for integrative healthcare is necessary towards the realisation of a sound being in a sound environment and for accomplishing needed services posed by life.

In this respect, clinicians can communicate with other units and organisations within and outside the hospital for logistics and other services needed without asking patients or their caretakers to go round the hospital on errands before getting treatment. Additionally, guidance and counselling services, alerts and reminders for patients concerning their medication, booking of appointments, discussion of lab results, support messages/first aid services, access to results from various departments of a health facility, announcements and self assessment needs can be met through the use of ICT.

For the use of ICT to be effective and efficient in any field, it requires appropriate human and material resources and some level of competence. Zwizu, (2007) posited that, 'The level of utilization of ICT is dependent on the potentials of the citizens to display the needed skills'. This assertion informs that skilled human resource coupled with requisite digital materials and logistics are needed for establishing effective digital based health delivery practices. Dogbey (2011) asserted that, the increasing growth of calls for the use of ICT in every sector of health service delivery for widening access, quality and equitability maintains an affordable economic status within the shortest possible time. One can infer from this assertion that the use of ICT in health care delivery provides the opportunity for clinicians to widen their scope in using technological and other communication devices for effective health care and to avoid redundancy and unforeseen complications thereby making healthcare delivery effective, efficient and timely in any environment.

The 2012 Annual report of the Hohoe Municipal Hospital, a document presented by the hospital administrator positioned that 'Hohoe Municipal Hospital is a renowned hospital in the Volta Region of Ghana which serves the health needs of people within the Hohoe Municipality and beyond. Hohoe Municipal Hospital as it is known today started on the 5th of April 1935 as a small clinic by the son of a German missionary called Dr. Huppenhaver. The late Dr. Kwame Nkrumah officially commissioned it on 21st December 1952 with 40

beds and 6 cots. Since then a lot of developments have taken place in the hospital. Presently, it has a bed capacity of 178 and it is the referral point for most patients from other clinics and hospitals within and outside the Municipality. Majority of the referrals come from the seven northern districts of the region namely Nkwanta North, Nkwanta South, Krachi East, Krachi West, Kadjebi, Biakoye and Jasikan districts as well as neighbouring Togo'.

Considering the Vision statement adopted for the hospital as "Excellent Health Care Delivery, Healthy Life for All" and the Mission statement "As an Empathetic, Innovative and Hardworking Team, Hohoe Municipal Hospital is Committed to providing 24 Hour Quality Health Care Services to exceed the Expectations of our Clients", the hospital is doing its best to provide maximum healthcare for all.

The Hospital is located within the administrative capital (Hohoe) of the Hohoe Municipality and about 78 km from Ho, the Volta Regional Capital. The municipality covers a total area of 1,172 sq. Km. It shares its Eastern boundary with the Jasikan District to the North, Republic of Togo to the East, Kpando District to the West and the South, Ho District.

According to the 2012 annual report, 'the municipal population stands at 275,312 as at 2012 with an annual growth rate of 1.8% and a population density of 86 per sq. km. However, the hospital serves more than five administrative Districts of the region hence the need for the integration of ICT in their services. In view of this, considering the annual report, Vodafone Ghana has commissioned a new telephone digital machine providing a wide range of telephone and broadband internet services both internally and externally to the Municipal capital. This makes communication within and across the hospital very easy and convenient. The hospital uses the inter-com system to communicate across departments and units. The hospital has two generating plants, which are used during power outages'.

The 2012 annual report further expatiates that, 'the hospital has a total of 311 employees as at the end of 2012. This was made up of the nursing staff forming about 39% of the total workforce and 61% for the non clinical staff. Total staff wastage in the year was 4.49% of total workforce'.

It is obvious that there is an acute shortage of critical staff and this is negatively affecting the delivery of service at the hospital. The most affected categories of staff are the medical officers, nurses, midwives, dispensing and laboratory technologists. Some critical staff e.g.: Dispensary Assistants were recruited on temporary basis to supplement the efforts of the few technical staff available. This is to cope with the increasing number of clients who visit the hospital due to the benefits of the National Health Insurance Scheme.

In relation to staffing (strength and capacity), the report noted that 'the hospital has two (2) Medical Doctors, three (3) Medical Assistants, two (2) Specialists at Oncho, two (2) temporal Cuban Doctors, seventy-nine (79) Nurses of all categories, thirty one (31) Midwives, twelve (12) Health Assistants, sixty eight (68) Temporal Staff as well as (116) auxiliary staff totalling three hundred and eleven (311). Due to its strategic location in the mid of the Volta region and being surrounded by a cluster of towns, villages and hamlets, it receives a substantive patronage averagely 360 patients daily'.

The hospital has a number of wards namely; Paediatrics (children's ward), Male, Female, Obstetrics/Gynaecological, Special (Isolation) Wards, Maternity and Delivery, Radiology, Laboratory as well as Surgical wards. In addition to these, the hospital has an Emergency/Casualty ward at the Out-Patient's Department (OPD). It also has the Records department which is the first point of call for every client who enters the hospital. This department has a good number of staff who works as a team. These team members take records of out-patients, ensure these records are properly kept and make monthly analysis of

clients who visit the hospital among others. Several units of diverse operational definitions exist within this department. Each unit, depending on their mode of operation, integrate ICT in diverse ways.

In order to facilitate the vision, mission and goals of the Hospital for quick and efficient health service delivery, taking into consideration the large number of clients as well as the limited number of critical staff, the hospital requires a team approach from the various categories of health workers regardless of their schedule.

Despite the aforementioned merits, the use of ICT has a number of challenges which can as well affect healthcare delivery. For instance, during acute conditions, patients may not be able to take readings on their own. Also clinicians might become over reliant on technology and forget to interact with the patient directly for effective diagnostic information. Naturally, no machine is 100% efficient hence errors and malfunctions could set in leading to wrong information access and deliveries. Furthermore, confidentiality may be compromised and the rights of the patient infringed upon, since there is no written account on conversations, data can be intercepted elsewhere and manipulated. It could also encourage fraud and information might be misinterpreted since no visual clues are provided. In order to overcome these shortfalls, the number of critical staff as against the number of patients and their expertise in ICT must be taken into consideration.

This study looked at the level at which ICT has been integrated into healthcare delivery at the Hohoe Municipal hospital, and identified the setbacks associated with it for future improvement.

1.2   Statement of the problem

Absence of permanent and regular health experts at the Hohoe Municipal Hospital makes patients to be treated by different Doctors at different times. This generates interruptive and fluctuating treatment processes which affect the continuous treatment plan of a patient. Since the hospital caters for many surrounding villages in the Municipality, the Doctor -topatient ratio which is supposed to be 1: 20, increases beyond normal and swells many a times to 1:80 hence quality time is not spent on effective diagnoses and treatment of patients. The 2012 annual report of the hospital clearly indicated that:

> ''It is worth noting that there is a shortage of critical staff and this is negatively affecting the delivery of service at the hospital. The most affected categories of staff are the medical officers, nurses, midwives, dispensing and laboratory technologists. Some critical staff e.g.: Dispensary Assistants were recruited on temporal basis to supplement the efforts of the few technical staff available''.

It is an undeniable fact that, every patient is new during any hospital attendance as it is impossible for one to meet and be treated by the very doctor who once treated and called for a review or a follow up on a particular condition during the patient's last visit to the hospital.

Sometimes, the clinicians are faced with challenging situations due to the size of the population demanding their attention on varied needs in a given time to an extent that they become confused and forget to apply the requisite expert techniques on diagnosis, prescriptions and treatment. Most clinicians have electronic devices such as mobile phones, office phones and computers among others but during some critical situations, they forget to use them for enquiries, clarifications or services from other units. Some personnel even lack the necessary skills for operating these devices and some usually want to follow bureaucratic processes before rendering the least possible service which can lead to complications and loss of life. For instance, a patient was treated at Hospital A in 2012 and was referred to Hospital B where she was given blood transfusion. Her blood group was wrongly quoted by

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Hospital A and without any confirmation test carried out by Hospital B, the wrong blood was given to her and she nearly died with her pregnancy.

Most often, patients' records are difficult to locate at the records units hence one could possibly be provided with new diagnostic and treatment folders or temporal jackets any time one is accessing the health facility. This practice leads to the misplacement of patients' past health records which should have served as reference entities for rendering new and or improved treatments. The outcome is usually, complication. In other circumstances, patients get to the hospital before realising that their health insurance has expired and if there is no immediate measure to renew their insurance cards, they are totally denied if they cannot afford the 'cash and carry' alternative. Patients in this situation become so disappointed and frustrated that their conditions get worse leading to complications and even death.

To access any unit of the hospital demands being in long winding queues for hours. The situation used to be like that over the years at the Ho Municipal hospital until recently when they adopted the Electronic Health Record system which brought about an improvement in their management of records and provision of healthcare services as well as the time spent by patients at the hospital.

In view of the aforementioned problems, the researcher sort to investigate the extent to which ICT has been integrated into healthcare delivery at the Hohoe Municipal Hospital, taking into consideration the tools available, how they are used and the challenges they pose or might pose to clinicians and patients in trying to provide and access healthcare respectively.

1.3 Purpose of the study

The study investigated the extent to which ICT is integrated into healthcare delivery at the Hohoe Municipal Hospital. Thus the ICT tools available, the value attached to the use of ICT in healthcare delivery by both patients and clinicians, the availability and utilisation of

networked communication devices, the level of competence of both clinicians and patients in the use of these ICT devices, the benefits involved as well as the challenges it might pose.

1.4 Objectives of the study

In order to obtain accurate results, the following objectives were set for the study. To

i. find out the technological tools available in the hospital for the successful integration of ICT into healthcare delivery.

ii. ascertain the benefits of using these ICT devices in healthcare delivery.

iii. examine clinicians and patients' competency and preparedness level to integrate ICT into health care delivery.

iv. explore the barriers to ICT integration in healthcare delivery.

1.5 Research questions

In order to achieve the objectives of the study, the study was guided by the following research questions:

i. Which ICT devices are available for the successful integration of ICT into healthcare delivery at the hospital?

ii. What are the benefits of integrating ICT into healthcare delivery at the Hohoe Municipal Hospital?

iii. What is the competency and preparedness level of clinicians and patients to integrate ICT into healthcare delivery?

iv. What could be the militating factors to ICT integration in healthcare delivery at the Hohoe Municipal Hospital?

1.6 Significance of the study

The rationale for the study was to find out the level at which ICT is integrated into healthcare delivery at the Hohoe Municipal hospital and how it could affect health access and healthcare delivery.

The researcher is of the view that this study will provide the platform for clinicians to improve their competence level in using communication devices in healthcare delivery and to integrate ICT successfully in health services so as to make health care delivery effective and efficient.

It will also open up new avenues for discoveries, studies and further enquiries on other sectors utilised by humans.

1.7 Delimitation

This work focused on the level at which ICT is integrated into healthcare delivery at the Hohoe Municipal hospital as well as its benefits and challenges to both clinicians and patients.

1.8 Organisation of the study

The study was organised into five major chapters. Chapter one introduced the lesson and delved into the background of the study, statement of the research problem, purpose and objectives of the study, research questions guiding the study among the lot.

Chapter two presented a review of relevant literature on the topic under various subheadings. The third chapter provided the methodology adopted for the study. It outlined the research design and its relevance to the topic under study, the population, sampling techniques and the sample size. Instrumentation, data collection and data analysis procedures were other items defined within the methodology.

Chapter four talked about data presentation and analysis according to the research instruments. The fifth chapter finally ended the study and presented the summary of findings,

conclusion and recommendations for further research according to the generated information by the research instruments as well as responses to the research questions.

1.9   Definition of terms

Operationalised definitions of the following key terms as used in the study are provided as:

ICT: Information and Communication Technology

Computer: An electronic device that performs input and output services.

Clinician: Medical staff who are directly in contact with patients.

OPD: Out patients department

Theatre: Unit within a hospital facility where various kinds of surgical operations are carried out

Clinical Decision Support Systems (CDSS): Any computerised program used to make clinical decisions; e.g. Diagnostic assistance, Prescriptive assistance, Alert and Reminder systems, etc.

CHAPTER TWO

LITERATURE REVIEW Introduction

Pantheons of scholars have literary works in diversity on Integrating ICT in various fields of human enterprises. However, only relevant literature on the topic under study which is 'the level of ICT integration into healthcare delivery' has been considered in this chapter.

In this respect, the chapter has been developed under the following subheadings.

- Integrated ICT devices for healthcare delivery

- Benefits of integrated ICT in healthcare delivery

- Competency and preparedness level for ICT integration

- Barriers to the successful integration of ICT in health care delivery

2.1 Integrated ICT devices for healthcare delivery

ICT is an umbrella term for several substantive fields brought together hence adequate provision of the requisite materials alongside their logistics must be advocated in order to achieve the desired objectives. As posited by Dogbey (2011:35), tools are agents that aid the transformation or translation of a developed knowledge and ushers it into the physical state. They define the practical state of a thought as well as exhibit it. In this respect, availability of tools for support and spare services is crucial for effective integration of ICT in to healthcare services.

This observation supports what Tinio (2005) said that ''The potential of ICTs to promote the acquisition of 21st Century skills is tied to its use as a tool for raising educational quality, including promoting the shift to a beneficiary-centered environment''. The National Research Council of the U.S. defines beneficiary-centered environments as those that "pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring with them to the classroom."The impetus for beneficiary-centeredness is derived from a theory of learning called constructivism which advocates that knowledge is not "out there", independent of the beneficiary.

In unconditional explanations, ICT choices are growing but no one tool/medium or combination is necessarily the perfect solution for information sharing and learning related to development because most learning situations have their unique sets of people, problems and variables. The place of ICT in a mix or blend of learning enhancers will be examined. Also, new and emerging innovative use of ICT for development activities will be described".

The integration level of ICT with regards to the integrated ICT devices available at the Hospital is evident below.

2.1.1 The integration leve l of ICT across the various departments of the Hohoe Municipal hospital.

Out-patients' department (OPD): There are computers bearing the data of patients which facilitates the search of folders. They also have a public address system which helps to amplify patients' names for it to be heard anywhere within the hospital. There are pressure gauges which they use to check the pulse of patients, weighing scales which are used to check the weight of patients and thermometers for detecting the body temperature of patients. There are telephones (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Consulting rooms: There stethoscopes which Doctors use to examine patients, telephones (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital. Also, there adjustable beds on which some patients lie when the need be.

Information desk: There are computers storing information about the hospital including the daily totals of out-patient visits, admissions, referral, births and deaths.

Dispensary: There are computers storing information on all drugs received as well as drugs dispensed for easy access of their health insurance claims. Also, there is a telephone (intercom services) which the staff uses to communicate with each other within the hospital

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as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Wards: There are adjustable beds, water heaters, pressure gauges which they use to check the pulse of patients, wheel chairs for moving patients with walking difficulties, weighing scales which are used to check the weight of patients and thermometers for detecting the body temperature of patients. There is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Administration: There are computers storing information on all activities of the hospital including staffing as well as annual reports. Also, there is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Physiotherapy: There is a computer storing the demographic data of patients who visit the unit, electro-therapy equipments for various purposes, electronic wheel chairs and massagers for massaging patients with lying difficulties, pressure gauges which they use to check the pulse of patients, weighing scales which are used to check the weight of patients and thermometers for detecting the body temperature of patients. There is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital. There are adjustable beds on which patients lie to be massaged, water heaters used to boil water for therapeutic treatment, adjustable weight for strengthening exercises, ergometric cycles for

Dental hospital: There is an adjustable bed on which patients lie and an adjustable light which aids in proper examination of patients' mouth as well as other equipment used to extract and fill patients' teeth.

Ear, nose, chest and throat unit: Ear, nose, chest and throat examiners, special lighting systems to aid in patient examination, special gadgets for washing the ears of patients, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Emergency ward: There are adjustable beds, water heaters, pressure gauges which they use to check the pulse of patients, weighing scales which are used to check the weight of patients and thermometers for detecting the body temperature of patients, an oxygen concentrator to be used in resuscitating unconscious patients. There is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Ante-natal clinic: There is an ultra-sound machine for checking the heartbeat of fetus, pressure gauges which they use to check the pulse of pregnant women, weighing scales which are used to check the weight of expectant mothers, adjustable beds on which expectant mothers lie to be examined, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Labour ward: There is an ultra-sound machine for checking the heartbeat of foetus, pressure gauges which they use to check the pulse of pregnant women, weighing scales which are used to check the weight of expectant mothers, adjustable delivery tables on which expectant mothers lie to be examined and delivered, an oxygen concentrator to be used in resuscitating unconscious mothers, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Laboratory: There is a refrigerator for preserving specimen, an adjustable bed on which patients lie when necessary, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Delivery ward/lying in: There are adjustable beds, water heaters which are used to boil water for bathing babies, pressure gauges which they use to check the pulse of mothers, weighing scales which are used to check the weight of mothers and thermometers for detecting the body temperature of mothers. There is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Radiology /x-ray department: There is an X- ray tube and ultrasound machines for diagnosis.

Blood bank: There is an adjustable bed on which patients lie when necessary, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Public health unit: No ICT device is available here.

Eye clinic: There is a snelling chart used for diagnosis, slit lamp for examining patients' eyes, an adjustable bed on which patients lie when necessary, a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Theatre: There are adjustable beds, water heaters, pressure gauges which they use to check the pulse of patients, weighing scales which are used to check the weight of patients and thermometers for detecting the body temperature of patients, an oxygen concentrator to be used in resuscitating unconscious patients and other surgical equipment for carrying out operations. There is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

Stores: There is a computer storing information on drugs and other equipment available at the hospital as well as those delivered. Also, there is a telephone (intercom services) which the staff uses to communicate with each other within the hospital as well as privately owned mobile phones which they use to communicate both within and outside the hospital.

All clinicians have mobile phones which they use to communicate both within and outside the hospital. Some clinicians have their privately owned laptop computers which they use for their personal activities.

2.2 Benefits of integrated ICT in healthcare delivery

One of the many challenges facing countries the world over, with particular reference to developing countries today is preparing their societies and governments for globalization and

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the information and Communication revolution (Lallana, 2003). The terms "technological society," "technocratic society" and "technotronic society," "digitally native generation" have been used by authors to refer to the modern social nature (Prinloo & Du Plessis 2008:127 cited in Dogbey, 2011:34). It is envisaged that, man can no longer live without information technology; in the absence of technology, life is totally boring and meaningless. Furthermore, Dogbey, (2011:34) citing Prince and Driscol (2000) noted that, technology is more a necessity in every field of man's endeavours and it is unfortunate most institutions especially in developing countries are not much sophisticated and challenging enough to accommodate the quest for this service in order to satisfy the needs of the generation X and Z or the digitally native citizens of modern time. Despite the fastness, friendliness, reliability and time saving potential of technology and its applications, it has an astronomical fiscal value; a factor which militate its access to a good number of people who need it most. Andrew Chetley et al, (2006), in a framework paper to assess the role of ICTs in the health sector of developing countries, identified some crucial roles ICT application will bring to the healthcare industry. These include:

- Improved dissemination of public health information and facilitates public discourse and dialogue on major public health threats.

- Enabling remote consultation, diagnosis and treatment through telemedicine

- Facilitating collaboration and cooperation among health workers, including sharing of learning and training approaches

- Supporting a more effective health research and the dissemination and access to research findings

- Strengthened ability to monitor the incidence of public health threats and respond in a more timely and effective manner

- Improved efficiency of administrative systems in healthcare facilities.

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Making reference to specific developing country scenarios, the paper identified the prevention of avoidable maternal deaths by the effective use of ICTs in the health sector of Peru, Egypt and Uganda; and the use of mobile phones to provide timely reminders to TB patients in South Africa to take their medication. Similar to the situation in Ghana, the paper identified the use of multimedia communication programs to increase awareness of how to strengthen community responses to HIV and AIDS in Cambodia, Rwanda, South

Africa and Nicaragua. It further pointed to the use of global satellite technology in Bangladesh and India to track outbreaks of epidemics and ensure that effective prevention and treatment reach the public in time.

Owing to the immense contribution of ICT to the advancement of healthcare delivery and practice, there is a very wide spread research and healthcare terminology adopted to suite the integration of ICT in healthcare. Some of these adopted terminology include, e-Health, telemedicine, Tele-health, health informatics and bio-informatics. The applicability of ICTs in healthcare cut across several sectors of the healthcare industry including; medicine, medical laboratory technology, diagnosis, pharmaceutics, public health and many others. According to Houghton, J. (2002) in study of the impacts of ICTs on the pharmaceutical and healthcare industries, assessed improvements in healthcare costs, health outcomes and pharmaceutical industry development made possible by the introduction of ICTs into healthcare practice and the entire healthcare industry.

A program completion report, produced by TDLC, enumerated the following as impacts made by ICT in health service delivery:

2.2.1 ICT enables information and knowledge to travel faster and further

"ICT is, and will continue to be, a catalyst in advancing economic growth and poverty reduction as well as improve the system of doing things more proficiently toward achieving desirable goals at a cheaper cost within the shortest possible time. New

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information and communication technologies overcome the barriers of distance and time, and significantly improve the accessibility of information and knowledge. As a result, the sharing of information and knowledge is quicken and effectively becomes feasible as well as acts as a key element in achieving development goals and mitigating the impact of unforeseen events such as natural disasters or outbreaks of disease. In the views of Roblyer (2003), recent advancement in communications technology has contributed immensely to minimize the effect of distance in the way we do business or respond to any kind of situation. Roblyer (2003) aptly describes the situation as the "death of distance". She writes that the death of distance has given new life to education. Another significant milestone on the necessity of ICT was drawn by World Bank (1998), in the assertion that "ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities of business for the rich and the poor. One of the greatest hardships endured by the poor, and by many others, who live in the poorest countries, is their sense of isolation.

Inculcating ICT in any kind of services delivery offer potential for in-depth learning opportunities on a situation under study and what is yet to be discovered.

The report establishes that access to information and knowledge is critical to development learning. Generally, ICT is suited to be quickly reaching larger numbers of people across a wide geographical space. The ability of radio and television to reach into both urban concentrations and remote areas is unquestioned. The Internet is fast becoming the communication tool that is unrivalled for its power, speed and ability to reach a vast number of users world-wide. Video conferences that allow people to see each other and to exchange information and ideas in real time can also reach large numbers. The mobile phone is becoming commonplace and contributes greatly to information transmission

among small businesses and entrepreneurs. E-mail is another familiar ICT product that allows large numbers of people to communicate directly, cheaply and fast.

In reality, the use of ICT in health service delivery via Video conferencing, E-mails, Intercoms, mobile phones, etc promote effective diagnosis and prescription, proper utilisation of patient data, acquisition of quality guidelines and skills from competent medical practitioners over a distance, saving of patients lives no matter the location of the health facility as well as reduction in the time spent by patients at the hospital, among others.
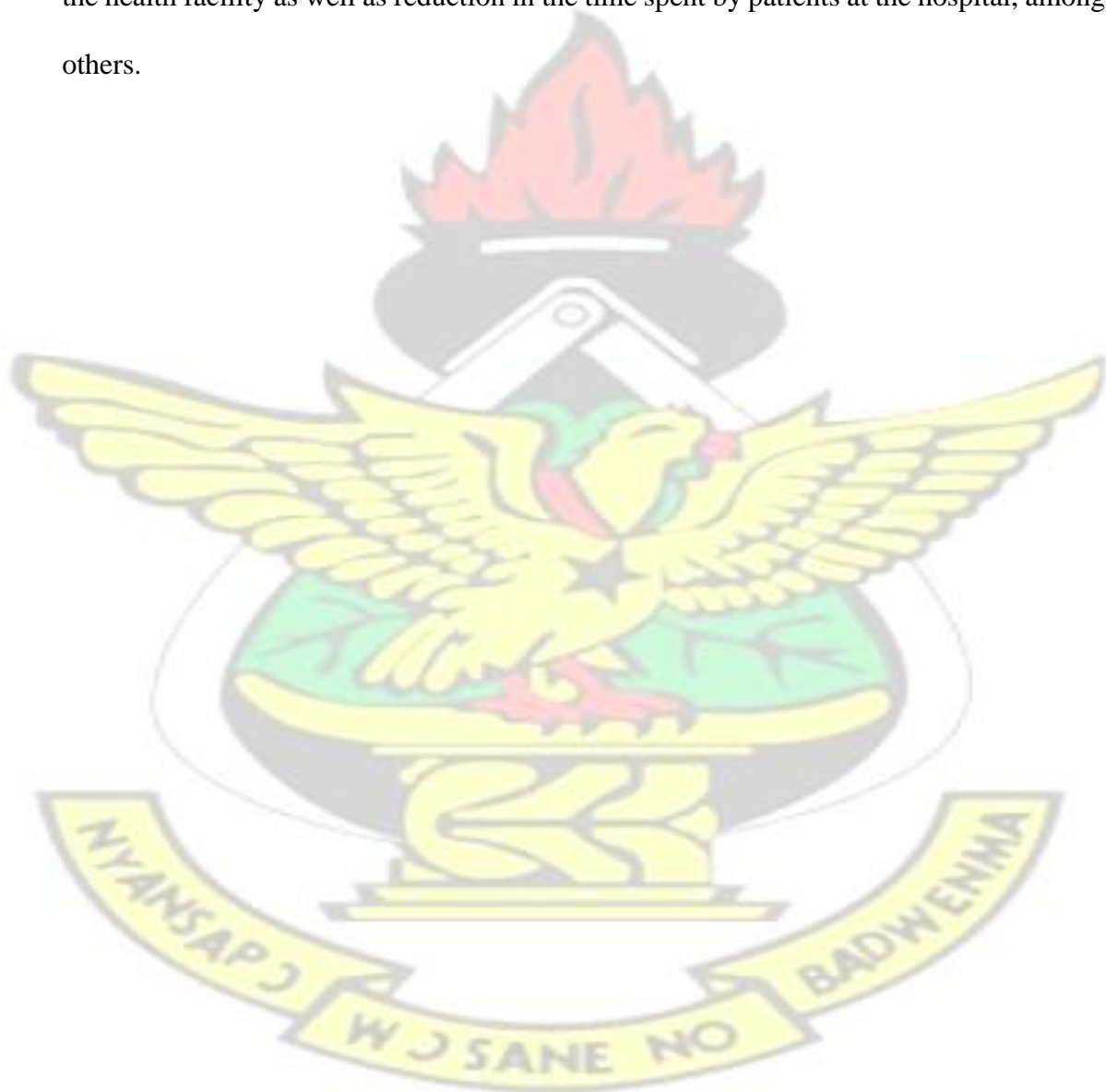
2.2.2 ICT supports information and knowledge sharing on a large scale

Knowledge sharing and learning are increasingly recognized as being powerful contributors to the development process. The classic training model which has been and

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continues to be widely used to transmit knowledge and information to trainees does not usually promote knowledge sharing and learning in the manner now considered more effective in contributing to the growth of individuals and communities but the application of knowledge rather.

As ICT continues to innovate and advance, its capacity to support interactivity, from one way broadcasting to two way interaction, from asynchronous (not real time) to synchronous (real time) grows, the development and increasing availability of new and affordable information communication technology, such as email, e-discussion tools, instant messaging, IP phone and VC, offers promise for widening the scope and scale of knowledge sharing and learning for development. Many practitioners seek guidance on how best to use these technologies in meeting their specific developmental challenges.

2.2.3 ICT makes available just-in-time information and knowledge for learning Millions of students and trainees participate in education and training programs to acquire knowledge and skills that may have future application and the health sector is not an exception. In the workplace and in everyday living people seek specific knowledge and skill when and where they need it. In this reference term, a specific ICT assistance development depends on the diagnosed problem at hand, outlined techniques and objectives positioned on it as well as the nature of the environment where it will be applied. ICT makes available and accessible just-in-time information and knowledge and provides opportunities for continuing and life-long learning and application. A Justin-time learning and or application mean acquisition of knowledge and skills as they are needed. It is driven by each learner's need and the content can be customized. It happens

at the moment when the learner is going to apply the knowledge and skill, so the learner is in an active and ready-to-learn mode.

In its more defined and specific form, those who own or have access to computers and the Internet can open up a wealth of information and learning resources either by online searching or by using CD-ROMs or DVDs for self-paced learning. Well developed and organized websites and various online publications, as well as specialized search engines can offer a tremendous amount of information and knowledge at any purposed time of need.

Residing in the modern state of information age, demand people learning and function, 'just-in-time' for just what they need at the moment and the immediate future. Information and learning becomes more relevant to needs and can be immediately applied. Learning and knowledge utilization or consumption is more likely to take place when the individual needs information, knowledge or skills to apply to the solution of an immediate problem or to complete a task.

Regarding these developments, ICT potentially offers the possibility of structuring and delivering learning and application resources as well as opportunities when individual most need them. "Consumers can use technology to create just-in-time learning and decision support systems that harnesses and disseminates the knowledge of the organization and helps managers make better decisions while learning," (Wind & Reibstein, 2000).

2.2.4 ICT has brought about revolutionary advances in every aspect of life

Technology and its relational employment enables a creation and response to take place away from their original environments (they have formulation and utilization terminals through defined channels of transmission). Technological services have a long history including correspondence courses dating as far back as to the mid 19 Century. Records show that radios has been used effectively for education in reaching students on isolated farms in Australia. Typical among these is the fact that a UNESCO sponsored Farm Radio Forum modeled on a 1941 Canadian radio discussion program was successfully employed in the 1950s and 1960s to support agricultural extension in developing countries. From the 1960s to '80s various analogue technologies and satellite-based transmission systems brought about considerable growth in distance learning. The use and popularity of personal computers and related applications, especially digital technologies and the Internet have, since the mid-1990s, continued to bring about revolutionary advancement and have reshaped the landscape for distance learning.

The vital benefit of distance learning is to provide learning opportunities to those who would otherwise be excluded. One of the major strengths of ICT is its ability to reach out to and include learners, service providers and clients who are separated by geography or are prevented from participating in activities incapacitated by infrastructure, personnel, time, financial and other resource and logistic constraints. Due to the great accessibility and flexibility of ICT, service provisions and other amalgamated conducts using ICT has invigorated all class of people and services in general and specific terms.

2.2.5 ICT can significantly reduce access and service provision costs

Due to advances in ICT, the personal computer continues to become more and more accessible and affordable. The internet and cellular phone is becoming commonplace for millions of people including those in developing countries. The cost of videoconferencing connection is also lowered if Internet Protocol (IP) is used. By using ICT, training and learning can reach a large number of people at a low marginal cost. The savings on travel and the economies of scale gained reduce learning costs and bring about cost effectiveness.

Other schools of thought such as Tinio (2005), further expatiates that ICT development and usage encourage **(a) Inventive Thinking, which includes:**

- Adaptability - Ability to adapt and manage in a complex, interdependent world

- Curiosity - Desire to know
- Creativity - Ability to use imagination to create new things

- Risk-taking - Ability to take risks

As well as **(b) Higher-Order Thinking which is;**

- Creative problem-solving and logical thinking that result in sound judgments.

Victoria L. Tinio further developed in the statement that ICT enhances Effective Communication in the following modes:

a. **Teaming** - Ability to work in a team

b. **Collaboration and interpersonal skills** - Ability to interact smoothly and work effectively with others

c. **Personal and social responsibility** - Be accountable for the way they use ICTs and to learn to use ICTs for the public good

d. **Interactive communication -** Competence in conveying, transmitting, accessing and understanding information

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e. **High Productivity -** Ability to prioritize, plan and manage programs and projects to achieve the desired results. Ability to apply what they learn in the classroom to real-life contexts to create relevant, high-quality products.

2.3 Competency and preparedness level for ICT integration

Research works on the use of ICTs over the years invariably identify as a barrier to success, the inability of the individual and agencies to understand why they should use ICTs and how exactly they can use ICTs to help them perform better. It has been recognized that having knowledge about a technological service is much more appreciated by a lot of people than the application and or the manipulation of the knowledge on a task towards solving a given problem. Another unfortunate discovery is that most professional development in ICT is heavy on "teaching the tools" and light on "using the tools to teach or apply them"

The anxiety over human resource being replaced by technology which might lead to losing one's authority and service hunt many people to be at loggerheads with technological services. In this relation, one is assured of being redundant as less human service will be needed at most work places. This finding as an acknowledged barrier to ICT adoption can be alleviated only if the individual can have a keen understanding and appreciation of the changing roles of the modern time.

The most valuable commodity for every entrepreneur is the functional human resource. In this regard the question about how qualified or suitable a person is for a given task, the attitude of the person toward the task or service at hand among others needs to be answered satisfactorily. According to Prince and Driscol (2000) in Dogbey (2011), for any task to be well executed depends on discipline, leadership style, resources and the adequate knowledge on the problem at hand. He asserted that, leadership plays a key role in ICT integration in to

any field of service, hence for ICT integration programs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT in use as well as advocate for the best qualified personnel in charge of its usage.

In this regard, whether provided by an internal staff or external service providers, or both, technical support specialists are essential to the continued viability of ICT use in any given field. While the technical support requirements of an institution depend ultimately on what and how technology is deployed and used, general competencies that are required would be in the installation, operation, and maintenance of equipment (including software), network administration, and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns which will grossly affect the nature of service provisions.

In another development as derived by the theory of constructivism, Knowledge is created through an **active process** (participation) in which the learner or the beneficiary transforms information, constructs hypothesis, and makes decisions using his/her mental models; however, all these were achieved through the actions of the human resource impact.

Further challenges identified on ICT development and consumption for every workplace and of the future was summed up as 'Digital Age Literacy' as propounded by Victoria L. Tinio in the following terms:

- Functional literacy - Ability to decipher meaning and express ideas in a range of media; this includes the use of images, graphics, video, charts and graphs or visual literacy

- Scientific literacy -Understanding of both the theoretical and applied aspects of science and mathematics

- Technological literacy - Competence in the use of information and communication technologies

- Information literacy - Ability to find, evaluate and make appropriate use of information, including via the use of ICTs

- Cultural literacy - Appreciation of the diversity of cultures

- Global awareness - Understanding of how nations, corporations, and communities all over the world are interrelated

2.4 Barriers to ICT integration in healthcare delivery

Barriers refer to obstacles or impediments that militate against the smooth functioning of a system or agent toward achieving a purposed task. Significant barriers identified on successful integration of ICT in health care delivery by some researchers include:

- The kind of technological service needed to be applied

- The nature of the environment that technology will be employed

- The affordability of the defined technological service

- The Level of competence of clinicians in the use of technological devices

- The availability of technological tools for the successful integration of ICT in healthcare

- Defined policy frameworks regarding the operation of devices

2.4.1 The kind of technological service needed to be applied

The kind of technological service to be rendered at a particular sector of health is determined by the kind of diagnosis made by the experts on a problem. It could also be due to emerging issues which need to be identified properly for further actions. In this case, the kind of situation calls for specific technological service to be developed or employed on it.

2.4.2 The nature of the environment where the technological service will be employed

Many valuable assets usually become useless or liabilities due to the nature of the environment they were employed in. Apart from logistics, technical-know-how and suitability of a devised technology on a problem, climatic considerations on given services in addition to cultural and religious acceptability are other factors which affect the application of a given technology in a defined environment.

2.4.3 Affordability of a technological service

Also in close relation to the nature of the environment for a technological service delivery or application is the issue of affordability. Affordability in this context refers to how financially capable is the individual to acquire and or access a provided technological service. For instance, kidney dialysis requires a substantive financial requirement before one could access it in any way. ICTs programs require large capital investments and developing countries need to be prudent in making decisions about what models of ICT use will be introduced and to be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added of ICT use offsets the cost, relative to the cost of alternatives. Another challenging issue relating to the cost was that, despite the high investment in technological knowledge acquisition, human resource employment is still a must to enable the technology to function.

Most industry player see this act as a double expenditure hence chose to stick to human resource labour which is much cheaper as compared to the technological services.

2.5   Chapter conclusion

This chapter reviewed literature on the integrated ICT devices for healthcare delivery, benefits of integrated ICT in healthcare delivery, competency and preparedness level of clinicians and patients for ICT integration as well as barriers to the successful integration of ICT in relation to the findings of given schools of thought.

CHAPTER THREE

METHODOLOGY

Introduction

The methodology looked at the research design, the population, sampling technique, sample size, research instruments, data collection and data analysis procedures among the lot.

3.1   Research design

This is an overall plan employed by the researcher to find answers to the research questions and for testing the hypothesis formulated (Agyedu, Donkor & Obeng, 2007).

This study is a quantitative study which employed the descriptive survey technique.   A descriptive survey is an approach which describes data and characteristics about the population or phenomenon being studied. According to Owu-Ewie (2011:4-5) descriptive survey is multi-method in focus involving an interpretive, naturalistic approaches in an inquiry process of understanding a subject matter based on a clear methodological processes

that identifies and uses a social or human problem in deriving solutions. It is nonnumeral in nature and involved detailed verbal descriptions of characteristics, cases and settings by using interviews, observations and documents as the data collection procedure. The descriptive survey has advantage over other research approaches as it has the main purpose of describing, clarifying and interpreting events in relation to education as they exist.

The researcher finds this descriptive survey approach prudent for this study because it will enable the researcher to sample and position the opinions of the sampled population on the use of ICT in healthcare services at Hohoe Municipal Hospital in a more friendly and naturalistic manner towards solving the problem under study and any other emerging social problem.

3.2   Population

Avoke, (2005) refers to population as the entire group of people of interest to the researcher. The population for this research work were the clinicians and out-patients of the Hohoe Municipal hospital in the Volta region of Ghana. The 2012 annual report of the hospital showed a record totalling 315 as available staff strength.

This comprised of 131 medical staff and 184 non-clinical staff (comprising of supporting staff and temporary staff). A summary of this staff strength of the hospital is presented on Table 3.I. It is also projected that between 350-600 patients daily patronise the hospital.

Table 3.1   Summary of Staff Strength- 2012

SR. NO	GRADE	NO.

1	Temporal Cuban Doctors	2
2	Medical officers	2
3	Specialists at Oncho	2
4	Medical assistant	3
5	Nurses all categories	79
6	Midwives	31
7	Health assistants	12
8	Support services staff	116
9	Temporary staff	68
TOTAL		**315**

3.3   Sampling technique

The adopted sampling technique for this study is the Convenience sampling technique. This is the method of choosing subjects who are available or easy to find/access with relevant characteristic that could be recommended on a situation. A convenience sampling is sometimes being referred to as the reliable/convenient/haphazard/accidental or availability sampling technique (Owu-Ewie, 2011: 33). Due to the inconsistent nature (non-permanence staffing nature) of the clinicians and patients, the researcher finds the convenience sampling approach very convenient in investigating the issue under study and using this sampling technique will enhance access to relevant information from the respondents in relation to the problem under study. The researcher also chose the Hohoe

health facility due to its proximity, renowned status in healthcare delivery and its high patronage due to its strategic location in the mid of the Volta Region of Ghana.

3.4 Sample size

The sample size refers to a selected portion of the population which a researcher finds comfortable or suitable to work within a given study. In this study, a total of one hundred and fifty (150) respondents were purposively sampled for the study. This is made up of sixty (60) clinicians and ninety (90) patients. The researcher observed whether a respondent can talk (depending on the severity of the illness) if s/he is a patient as well as can read and write in English before being admitted among the participants. This is because some level of literacy is needed for the completion of parts of the questionnaire with respect to ICT tools. The purposive sampling approach was adopted so as to access relevant information from the respondents in a more naturalistic manner.

3.5   Instrumentation

Questionnaire was used to elicit pieces of information from respondents. This the researcher believes will give the respondents enough time to think and provide the correct responses and will also help the researcher in making good analyses. The questionnaire was designed in the open ended form. The researcher designed the questionnaires for the categories of respondents in this way so as not to limit the respondents in any way in giving out their thoughts on the concept under discussion. A total of 33 question items were positioned for participants to faithfully respond according to their unique categories.

3.6 Data Collection Procedure

An introductory letter was collected from **Kwame Nkrumah University of Science and Technology** to enable the researcher gain access to the field. This letter was photocopied for the Municipal Director of Health services as well as the hospital administrators. After approval has been officially allowed, the researcher met and addressed some members of the population on the topic under study in order to gain their consent. This was followed by other familiarization visits to the hospital prior to the researcher administering the research questionnaires. This act was again purposed to establish cordial relations between the researcher, and the respondents.

The questionnaires were then personally administered on the subsequent visits to the respondents and were personally collected within a day among the patients but two days was allowed for the clinicians.

3.7   Validation of Instrument

The validity of the instrument was established by first submitting the prepared questionnaire to a team of colleagues to go through as well as for them to offer their constructive criticism and suggestions on the question items. After cleaning the questionnaire according to the responses by a team of colleagues, it was again sent to the supervisor who read through and provided his comments. Based on these corrections, the researcher amended the questions.

It was then piloted on eight people at the Ho Regional Hospital who have equal characteristics as the participating respondents in the study. Their responses were critically

analysed by a team of colleagues and the supervisor. Their responses were used to finally amend the questionnaire before administering it to the actual respondents.

3.8 Data Analysis Procedure

Data collected from the respondents were inspected to ensure that the items were properly completed. Data cleaning activity was done on responses which could not be read and were not completed at all to ascertain the credibility of the analyses and findings. Frequency distributions and simple percentages analyses were used to analyse the collected data, using Statistical Package for Social Sciences (SPSS) to facilitate the procedure. Data were tabulated and described in line with the identified statistical procedures. Additionally, comments on the nature of each response were presented as discussions to serve as compliments to the findings. The analysis was done within 5% margin of error.

3.9 Limitations

Limitations are conditions beyond the control of the researcher that may place restriction on the validity of the study (Best & Kalm, 1989). In this study, the limitations stem from the respondents. They were engaged in other sectors and departments of the hospital, run shifts as well as visit other health facilities within the Municipality.

Due to the busy schedule of the respondents, the researcher had to do away with the interview and convert the interview guide to merge totally into the open ended questionnaire solely. This had narrowed the responses to areas stated by the researcher which must be presented in written forms only. An effect of this could be that, it would be easier for respondents to leave out names of devices which they might either forget or not be familiar with.

Bureaucratic procedures in gaining access to and consent of respondents in many ways delayed data collection and analysis procedure.

It could also be observed that despite detailed information and education on the topic under study, some respondents still resisted in giving credible and correct responses to the question items and some even without any explanation either refused to submit the questionnaire, fully complete the responses on the questionnaire or respond to the question items at all hence submitted the questionnaire empty or blank. These grossly affect the nature of the expected results and the findings.

The researcher's urge to satisfy her employers, personal responsibilities as well as the demands of the study within the scheduled time frame was another limitation.

CHAPTER FOUR

PRESENTATION AND ANALYSIS /DISCUSSION OF RESULTS

Introduction

This chapter outlined the systematic presentation of the findings of the study as well as how the findings were analysed with their interpretations.

Bio data of respondents comprising clinicians and patients were presented first followed by their responses to other questions based on the study. Analysis of responses from both categories of participants was carried out to ascertain a continual discussion on the findings for easy comparison and decision making regarding the level of ICT integration in healthcare delivery.

MAIN PRESENTATION AND ANALYSIS /DISCUSSION OF RESULTS:

4.1   Socio-demographic characteristics of respondents (Section A of research questionnaire)

Table 4.1: Socio-demographic status of respondents

ITEM		FREQUENCY			
Status		Patient		Clinician	
		90		60	
Gender		M	F	M	F
		36	54	36	24
Age	20 and below	0	3	0	0
	21-25	6	3	3	3
	26- 30	12	6	3	3
	31- 35	6	15	6	6
	36- 40	18	9	6	6
	41- 45	3	6	6	3
	46- 50	3	0	3	6

	50+	0	0	3	3	
Patient patronises health facility	Very often	15	6			
	Often	27	33			
	Scarcely	3	0			
	Sometimes	3 **150**	3			
TOTAL						

The responses as indicated in Table 2 show that all participants, both patients and clinicians, have faithfully returned their questionnaires for analysis to be carried out on them. Furthermore, the table indicates that 54 (36%) of the total of 90 respondents with regards to patients are females and 36 (24%) are males. Also with respect to the clinicians,

36 (24%) are males and 24 (16%) are females, totalling 60. With regards to age, only 3 (2%) of the respondents who are patients were of age 20 and below; however, the largest number of both the patients and clinicians were within the ages of 21-45 years. This could be explained on the general fact that majority of the working force of today are within the age groups of 21- 45 years and also these classes of people are being most affected with various kinds of diseases.

In response to information elicited from patients with regards to their patronage of the Hohoe Municipal Hospital, 21 out of the 90 patient respondents comprising 15 males and 6 females said they patronise the facility 'very often'. Also, 60 out of the 90 patients comprising 27 males and 33 females said they 'often' patronise the hospital as against 3 people (males) who scarcely patronise the facility and 6 patients (3 males and 3 females) who only 'sometimes' patronise the facility. The 81 respondents who responded on an often patronage (very often-21 and often-60) of the facility informed that they are familiar with the kind of services and facilities used at the Hohoe hospital. It also showed the level of confidence these respondents have in the hospital and hence patronise its services any time they feel or are indisposed. It does not imply that these people regularly fall sick or there are rampant health challenges in

the catchment areas of the hospital, calling for frequent patronage of the facility by these people, or which made people become 'regular customers' of the hospital. The 9 (scarce-3 and sometimes-6 responses) respondents could mean that there are alternative health care services which they access or are not full time residents within the catchment areas of the hospital or do not regularly fall sick.

The following graphs explain Table 4.1 further.

Graph 1

Gender Status of the Respondents
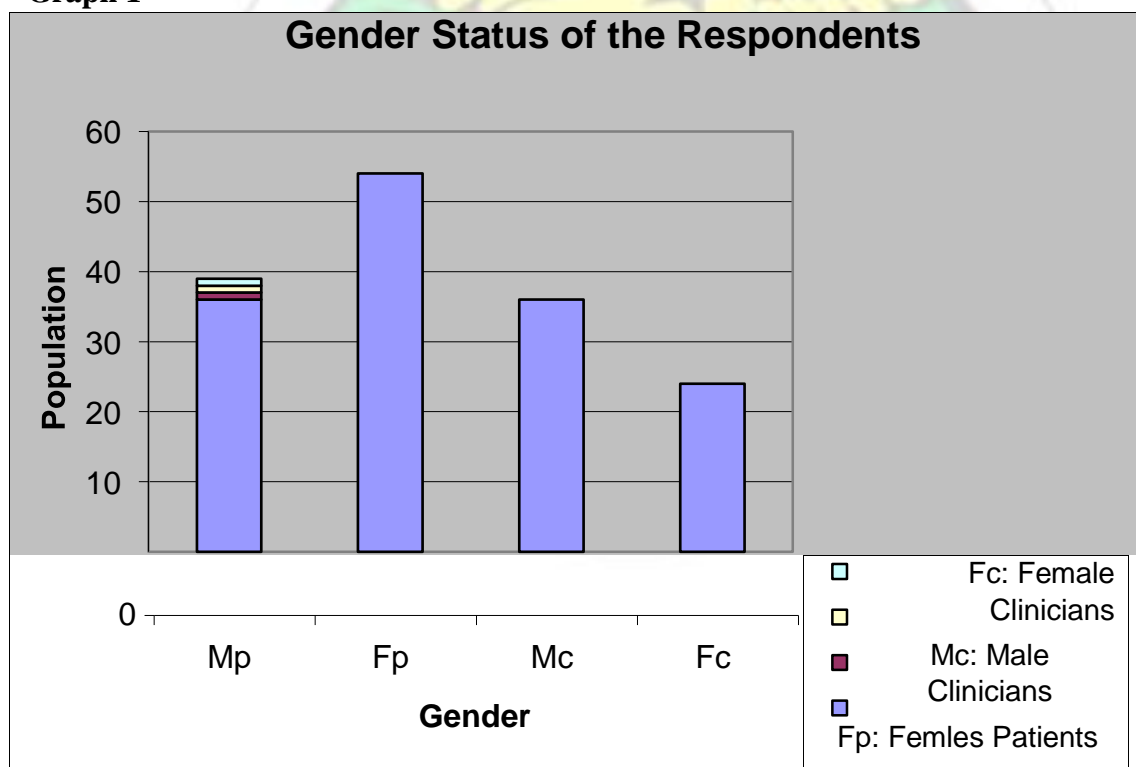
Fc: Female Clinicians
Mc: Male Clinicians
Fp: Femles Patients

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Graph 2   Socio-demographic status of respondents   (MALE AND FEMALE PATIENTS)
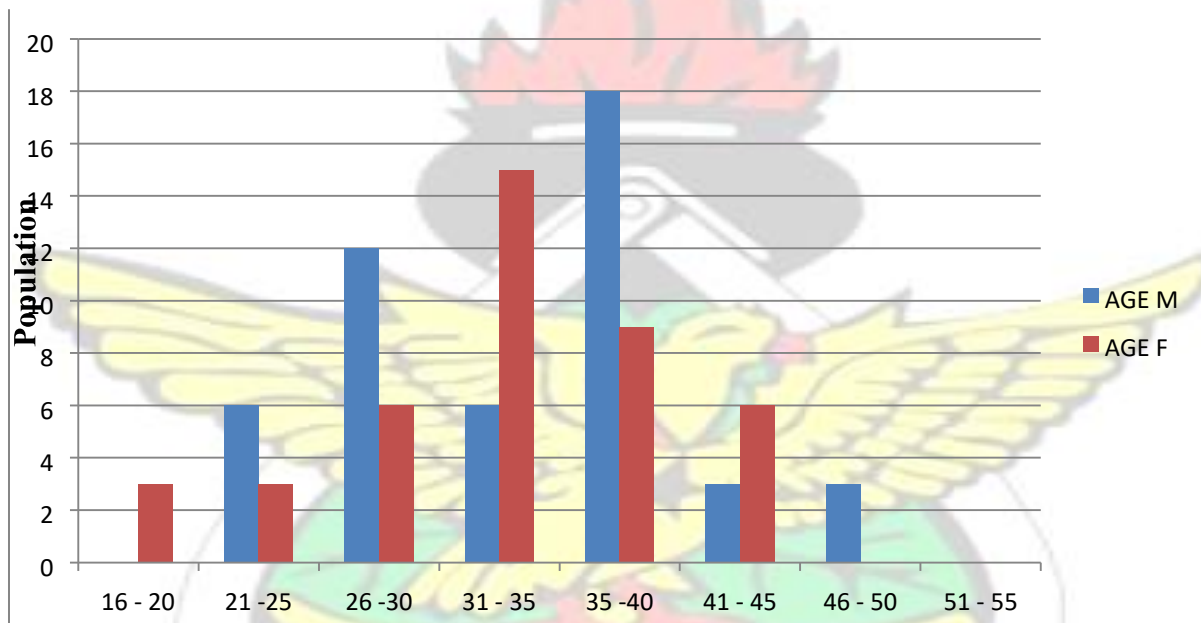
Age

Graph 3

Socio-demographic status of respondents (CLINICIANS MALE AND FEMALE)

Graph 4

PATIENTS PATRONISE HEALTH FACILITY
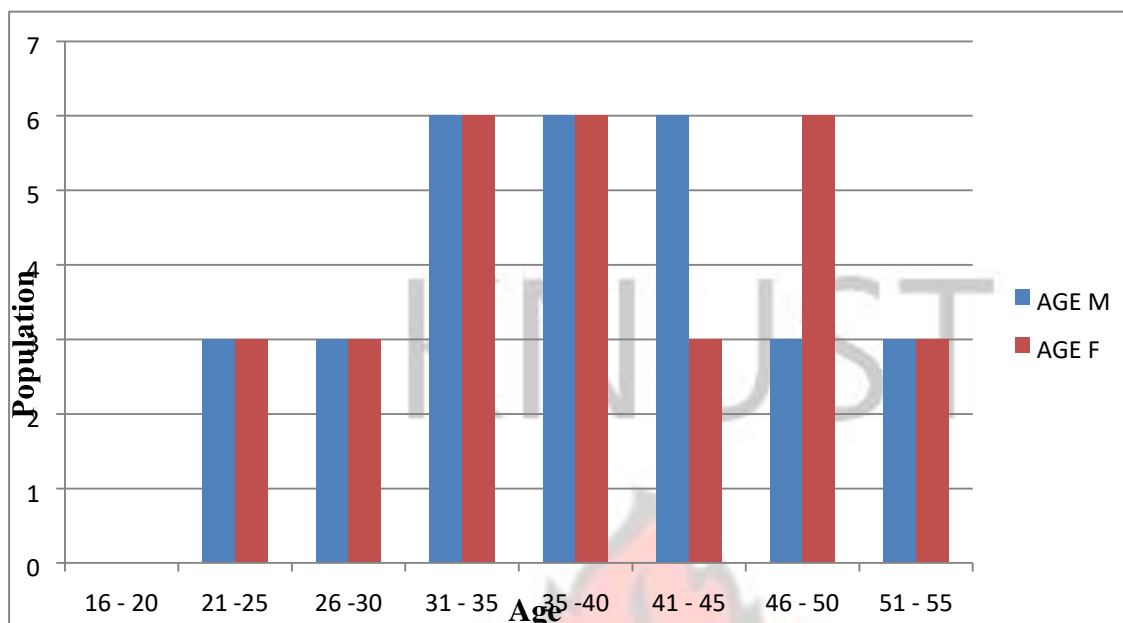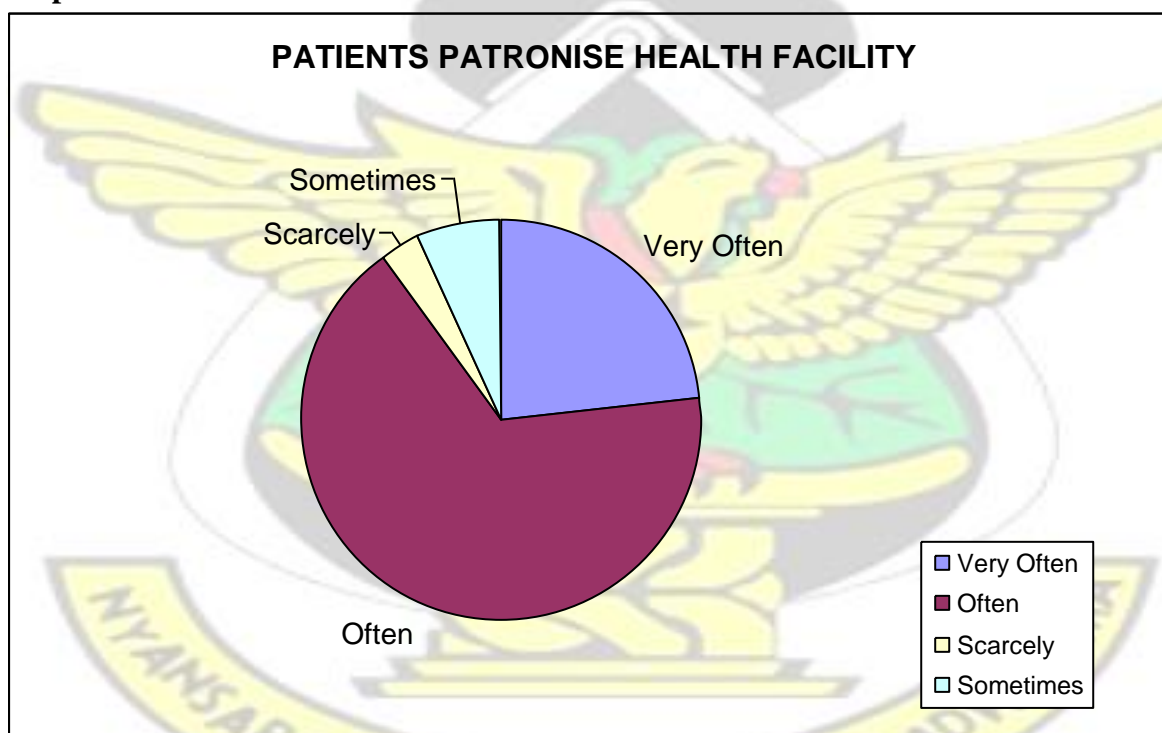
Table 4.2: Clinicians' responses according to department/unit of operation, job description and years of experience

Department/unit	Job Description	Experience (yr)	Frequency

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Information desk	Health statistician, enquiry, information collection and dissemination	7 and 3	2
OPD*	Nursing and preliminary records taking	11, 8, 7, 6, 4, 2 and 1	7
Laboratory	Microscopic diagnoses and clinical laboratory duties	12 and 11	2
Public Health	Nutrition, hygiene and health education	16 and 7	2
Pharmacy	Dispensary and interpretation of prescribed medications	9 and 6	2
Blood Bank	Blood information collection and dissemination, Donor education, recruitment, retention and donor care	12 and 5	2
Dental	Oral health/dental education, care and treatment	13, 10 and 9	3
Post-Natal /lying-in ward	Treatment, counselling	8 and 5	2
Children's Ward/paediatrics	Child healthcare and nutrition	15, 12, 10, 6, 5 and 2	6
Ear, Nose, Throat & Chest clinic	Diagnoses and treatment of ENS &chest effects	10, 8 and 5	3
Eye clinic (Oncho unit)	Diagnoses and treatment of eye diseases and effects	11, 5 and 2	3
Emergency ward	Nursing and treatment	7, 5, 4, 2 and 1	5
Labour ward	Nursing	21, 13, 10, 5 and 2	5
Gynaecology	Female reproductive health, treatment and counselling	22, 9 and 2	3
Stores	Receiving and issuing/supplying items for use records keeping and information dissemination on status of items in stock	14 and 6	2
Physiotherapy	In-&out-patient treatments and education	12, 3 and 1	3
Radiology	Endo-morphological photographic and diagnosis	15, 8 and 2	3
Administration	Administrative, management and quality assurance services	10	1
Dermatology	Skin treatment, nursing and counselling	8, 5 and 2	3
Theatre	Assistant Doctor (During surgery)	9	1
TOTAL			**60**

The responses presented on Table 4.2 indicate that the 60 clinicians come from various departments and units of the hospital and 20 (33%) have between 10 and 20 years of experience in their respective job fields. Additionally, 28 (46.7%) of the clinicians have 3-9

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years of working experience with only 11 (18.3%) clinicians with two years of working experience. The high level of clinicians' years of experience (thus 79.7% which is 3-20 years) on the job as provided by Table 4.2 would provide a fertile ground for adequate information on the necessity of ICT in healthcare delivery especially with respect to Hohoe Municipal Hospital.

Table 4.3: Responses on integrated ICT tools by both Clinicians and Patients

ITEM	FREQUENCY	Tl. freq. %
Mobile phone		

	Clinician	Patient	
	60	72	88
Computers (Desk top, lap top etc)	60	90	100
Internet services/wireless net	42	63	70
Intercom services	48	36	56
Refrigerators	36	27	42
Microscopes	60	27	58
Stethoscopes	60	0	40
Pressure gauges	45	3	32
Ear examiners	24	0	20
Electronic wheel chairs and massagers	15	0	10
Television/video cameras, Projector	45	15	40
Video conference devices	24	18	28
Patient vital monitoring machines (pvm)	57	15	48
Oxygen concentrator, suction machines, glucometres	48	9	38
FBI analyser, Pentra analyser, Cell dyn 1800	15	3	12
BT 300 plus, sysmex	12	0	8
Electro-therapy equipment,	12	0	8
Public address system	36	36	48
Electronic weighing scales	42	45	58
Sphygnomanometers	6	0	4
Ergo-metric cycles	24	0	16
Thermometers (digital, etc	60	57	78
Ultra-sound machines	60	6	44
Scanners, printers & x-ray apparatus	42	12	36
Digitised video conferencing diagnostic & treatment equipment	36	15	34

In response to research question one, the question items 1a, 1b, 1c, 1d and 1e were raised

on the research questionnaire. In response to item 1a which says

'What are being referred to as ICT tools in healthcare delivery?', Table 4.3 presented the elicited responses on their knowledge in reference to what Information and communication technological tools entail. Follow up questions to this on the questionnaire are 1b, 1c and 1d which stated that 'What ICT tools are available for the successful integration of ICT in health care delivery in the Hohoe Municipal Hospital?,

Are these devices sufficient enough to cater for demands of the departments, patients and wards?, which other ICT tools do you recommend for the successful integration of ICT in Health delivery in this Hospital?, respectively.

A statistical representation of the items per respondents is given on Table 4.3

The responses as presented by Table 4.3, vividly informed that respondents are conversant with what ICT tools entail with respect to healthcare delivery. However, clinicians were much conversant with the apparatus and their importance more than the patients.

4.2 Participants' responses on the benefits of ICT integration and its effects on healthcare delivery (Section B of research questionnaire)

These responses are meant to elicit answers for research questions guiding the study.

Research question two:

The question has the statement, 'What are the benefits of integrating ICT in healthcare delivery at the Hohoe Municipal Hospital?' It sort to find out the importance attached to ICT integration in healthcare delivery services by the people and its relevance with respect to peoples' confidence, mind set, objectives and plans for accessing or patronising given facilities.

In response, the following question items were raised on the research questionnaire:

2a- ''Comment on if there is the need for the use of these devices in health service delivery at this hospital?'',

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2b-''What is your assessment of the application (usage) of ICT in health delivery at this hospital?''

2c- 'How beneficial could ICT be to clinicians (or you as a clinician)'',

2d -''How beneficial is ICT services to patient (or you as patients)'',
 2e-''What other benefits do you observe for ICT integration in healthcare for this hospital?

''2f-''Which areas should the ICT integration be applied to enhance quality health service delivery in this hospital?''

2g. Are some of the ICT tools networked across the various departments?

The responses on tables 5, 6 and 7 indicate that, the respondents acknowledge the integration of ICT into healthcare delivery to be highly beneficial to both patients and clinicians. These responses also informed us on the imperative nature of both clinicians and patients on the need to embrace ICT services. This observation agrees with Dogbey (2011) that, ICT is imperatively a crucial component of life in modern day's activities. Also the response 10 on Table 4.6 grossly agrees with Victoria L. Tinio (2005) that ICT enhances effective communication in the modes: teaming, collaboration and interpersonal skills, personal and social responsibility, interactive communication as well as high productivity among the lot. Furthermore, the benefits of ICT were widely elaborated by Roblyer (2003) as he aptly describes that the valuable contribution of ICT brought a situation which could be referred to as the "death of distance". Also, it supports the World Bank (1998), in the assertion that

"[ICTs] greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. The high percentage of the responses in a nut-shell fall in line with the assertions of Wind and Reibstein, 2000) as they stated that ICT has brought about revolutionary advances in every aspect of life ... and also ICT can significantly reduce access and service provision costs. This

agrees with the fact that people are ready to embrace ICT fully into services in their live if defined structures are properly put in place.

Table 4.4: Participants' responses on benefits of ICT integration in healthcare to clinicians

	Items	Freq.	Freq.%
i.	**work with much confidence**	120	80
ii.	**informs on the areas ICT services should be directed to**	63	42
iii.	**work with less stress**	108	76
iv.	**eliminates much human error**	144	96
v.	**protects and improves clinicians level of operation**	150	100
vi.	**saves time**	150	100
vii.	**facilitate easy integration and harmonisation of ICT tools in activities**	75	50
viii.	**make information processing, access and delivery much faster/comfortable**	150	100
ix.	**boost/increase clinicians competence levels regarding the use of the devices**	135	90
x.	**increase their access and manipulative skills on knowledge**	105	70
xi.	**make them more efficient in their deliveries**	126	84
xii.	**easy tracing/monitoring of patients health records and treatment plans**	120	80
xiii.	**facilitate quick and early referrals**	132	88
xiv.	**facilitate easy evaluation of health services**	60	40
xv.	**facilitate clinicians effort in taking informed decisions**	105	70

Table 4.5: Participants' responses on benefits of ICT integration in healthcare to <u>patients:</u>

Items	Freq.	Freq. %
i. quicker and faster access to health facility, care and services	150	100
ii. quicker and faster access to health information	150	100
iii. controls complexities in service deliveries	108	72
iv. saves time	150	100
v. makes health care and treatment much effective and more reliable	150	100
vi. boost patients confidence level on receiving adequate treatment,	129	86
vii. inform the patient psychological of being cared for and treated even in the absence of a physician in person	81	54
viii. makes them more protected, confident and informed on the need to seek health care and its benefits	45	30
ix. eliminate patients' waste of economic resources	123	82
x. eliminate controllable deaths and alleviate worsening conditions	96	64

Table 4.6: Participants' responses on other benefits of ICT in healthcare delivery

Item	Freq.	Freq. %
1. **Control referrals to other health facilities**	114	76
2. **Make referral cases more quicker and less cumbersome**	132	88
3. **advertise the efficiency of the hospital and their staff**	90	60
4. **increase knowledge and competence of clinicians**	135	90
5. **increase knowledge of patients about their health**	120	80
6. **increase income generation capacity of hospital**	108	72
7. **promote distance health delivery/medication services**	150	100
8. **economical in terms of labour and other expenses**	144	96
9. **improves general healthcare and delivery services**	105	70
10. **Enhance effective communication between clinicians, patients as well as patients and clinicians**	150	100

Research question 3:

'What is the competency and preparedness level of clinicians to integrate ICT into healthcare delivery?' is the statement of this question and the question items that were raised on the questionnaire to elicit response for this question are:

3a. Are there personnel in charge of the operation of every available device?

3b. -Are all clinicians competent/exposed/informed on to the use ICT devices?

3c. Are there opportunities for patients to be made aware of the operations of some of devices at least used on/for them?

3d. Are there reliable/favourable policy streamlines defining the use of ICT devices to the satisfaction of every department and patients' needs? 3e. Are there marked out roles for every individual uniquely (patients and staff) toward successful integration of ICT in healthcare services in Hohoe Municipal hospital?

3f. Are the clinicians prepared to embrace ICT devices in healthcare delivery services?

3g. Are patient(s) prepared to embrace ICT devices in healthcare delivery services?

3h. Are you comfortable with the use of ICT in health delivery services?

In response to one being comfortable with the use of the ICT tools (3h), 16 clinicians and 18 patients responded in the affirmative, whilst 4 clinicians and 12 patients responded in a nonaffirmative (no). The non-affirmative respondents stated lack of information and the high cost in using and or repairing ICT tools made them very uncomfortable in utilising them effectively. About the preparedness of respondents in using the ICT or accepting ICT, both patients and clinicians responded in the affirmative.

Some measures that must be put in place to accommodate ICT integration in healthcare delivery services at the hospital are outlined on tables 8 and 9.

Table 4.7: Measures to accommodate ICT in healthcare deliveries

Item	Freq.	Freq. %
i. Establish defined policy frames govern the relevance on use of ICT and its related facilities in healthcare services	150	100
ii. Make available experts in general and specific operation of devices for timely assistance to clients and staff in case of any operational difficulties on the devices	120	80
iii. Make ICT an integral part of the national education curriculum		
iv. Carry out timely and effective/efficient supervision and maintenance of devices to forestall sanity in their operations	93	62
v. Evaluate the efficiency of the equipments in administration and other operational services of the department	90	60
vi. Training staff on the use of some important facilities (eg intercom, internal-data transfer services, patients record access and assessment models etc	150	100
vii. Networking the devices across various departments and units for easy access and operation	126	84
viii. Acquisition of sufficient and relevant ICT devices to boost health delivery services	150	100
ix. Educating staff and patients on some of the uses of the ICT devices in the health delivery services	84	56
x. Educating staff and patients on the values of the ICT devices in the health delivery services	144	96
xi. Source for funds and other resources toward acquisition, implementation, monitoring and evaluation of ICT endeavours	150	100
xii. Education on social, ethical, religious, cultural, political, economical and other issues that could have a militating effect on ICT application in health services	42	28
xiii. Make ICT more renown, feasible and accessible at the most fundamental levels of human activities across life	54	36

Table 4.8: Participants response on measures

Item	Freq. clinicians	patients	Percent %
1. Acquisition of more and relevant ICT facilities to equip the various wards and departments	60	90	100
2. Effective networking of the departments through video conferences, inter-communication services, Local Internet services, among others,	48	27	50
3. Educating staff and patients on the values of the ICT devices in the health delivery services	60	36	64
4. Training staff on the use of some important facilities (eg. intercom, internal-data transfer services, patients record access and assessment models etc	60	21	54
5. Make ICT education part and parcel of educational curriculum at all levels and forms of education (formal, semi-formal and non-formal paradigms)	60	90	100
6. Make available experts in general and specific operation of devices for timely assistance to clients and staff in case of any operational difficulties on the devices	54	72	84
7. Carry out timely and effective/efficient supervision and maintenance of devices to forestall sanity in their operations	51	42	62
8. Making ICT knowledge acquisition and skills exhibitions a prioritised endeavour for promotions, awards and employment opportunities in the health sector.	51	30	54

Research question 4:

The statement of this question is 'What could be the militating factors to ICT integration in healthcare delivery at the Hohoe Municipal Hospital?

To elicit responses, question items

-4a. Does culture or educational background of clinicians and patients affect ICT integration in healthcare delivery, comment on your response?

4b -What other challenging issues are on the use of ICT in healthcare delivery at this hospital?

4c -What technological improvements do you suggest that this hospital should adopt?

4d.-What is/are your reason(s), regarding your proposed technological suggestions' adoption?

4e.-What challenges could you perceive regarding your technological proposal should it be in function? were raised to elicit favourable responses to answer the question. Table 4.9 provides responses elicited from the 150 respondents on militating factors.

Other challenges were buttressed by respondents as insufficient facilities at various wards and departments of the hospital (causing waste of time, stress, loss of interest/confidence, pressure on the machine and easy breakdowns and high cost of maintenance and acquisition). We can infer from the responses and justify that policy frame, lack of funds to acquire, maintain and train personnel on the ICT tools usage were the main challenges as could be observed under responses 1, 3, 4, 5, 10, 12, 13. It could also be observed in comparing the responses of patients to clinicians that, clinicians have more knowledge about their work challenges than the patients. The various statements positioned by Table 4.9, support what Andrew Chetley et al, 2006), Driscol (2000) and Victoria L. Tinio (2005) stated that challenges are inevitable in and around all endeavours of man. Driscol (2000) further expatiates that challenges are never crisis but channels of opportunities into new discoveries and methods of doing things

With regards to the measures to be put in place to improve the challenges, the following question items were raised on the research questionnaires;

4f. What ameliorating/control measures could you propose regarding your technological proposal should it be in function with some challenges?

4g - How should these tools be networked and monitored to achieve the overall best success in the health delivery without any chaos? were raised.

Table 4.9: Factors militating against use of ICT in healthcare delivery

Item	Clinicians	Percent %
1. In sufficient ICT tools	60	100
2. Lack of networked ICT facilities	36	60
3. Incompetence on the part of clinicians and patients in using of ICT facilities	42	70
4. High cost of acquisition, use and maintenance of ICT tools	60	100
5. Lack of effective education on the value and use of ICT tools	54	90
6. Attitudes of clinicians in learning and use of ICT tools	48	80
7. Attitudes of patients in embracing the full use of ICT in their diagnoses and treatments due to their poor economic conditions and lack of knowledge	60	100
8. Lack of experts to be in charge of ICT facilities	60	100
9. Inadequate policy frameworks to define the operation of the hospital regarding ICT usage	54	90
10. Unstable power supply to support most services at the hospital	60	100
11. Christian and Islamic religious challenges on effective use of ICT tools for diagnoses, postmortem examinations blood transfusions etc	15	25
12. Over-dependence of the hospital on the central government (non-availability of decentralisation opportunities)	60	100
13. Politicisation of health needs in the country	60	100
14. A traffic of bureaucratic dispositions on the operations of vital equipments	12	20
15. Frequent breakdown of facilities	54	90
16. Poor monitoring and evaluation of operation of certain devices	9	15
17. Acquisition/provision of sub-standard devices	12	20
18. Insufficient staff/experts	15	25

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter provides a brief summary of the entire research and conclusion based on the findings with few recommendations for future research. The chapter presents all the findings from the analyzed data and how related they were to the objectives of the research before concluding with a general summary and recommendations enumerating suggestions on ways to create a congenial atmosphere in integrating ICT in healthcare delivery at the Hohoe Municipal Hospital.

5.1 Summary of findings

The study was purposed to investigate the level of ICT integration into healthcare delivery at the Hohoe Municipal Hospital. In order to favourably identify the truthful level of ICT status in the Hohoe Municipal Hospital, 150 respondents comprising 60 clinicians and 90 patients were purposely selected and a multi-faceted open ended structured questionnaire was designed to elicit responses from the participants to seek answers for five stated research questions, designed to guide the study.

In the analysis of the studies, the following findings were identified:

1. Though there are a number of ICT tools at the hospital, they are very inadequate and not networked to serve valuable purposes they were intended for at the hospital.

2. There is traffic of bureaucratic dispensations governing the few available ICT facilities which highly obstruct their actual purposes and functions.

3. There are no clear policy frames governing acquisition and maintenance as well as training of personnel or employment of experts to contribute to ICT integration in health delivery at the Hohoe Municipal hospital.

4. Politicising health sector resourcing and logistics have been found to be an obstructive act to quality healthcare delivery.

5. There is a high level of informed awareness on what ICT facilities and functions entailed with their benefits and challenges. Respondents obviously show the singular benefit ICT adoption would bring into healthcare.

6. Clinicians and patients are in dying need of ICT facilities for faster and proper diagnosis and treatments. Respondents predominantly stated poor funding, inadequate personnel, unclear policies as well as insufficient equipment as major factors depriving them from meeting their expectations.

7. The high dependence of the hospital administration solely on the central government as well as the overdependence on hydro-power supply from the national electrification grid show how unprepared, to some extend the hospital is with respect to ICT tools usage in modern day operations.

8. Administrative and or hospital operational service delivery committees exist for the hospital and they consider ICT services as crucial entities which must be adopted for quality health service delivery.

5.2 Conclusion

This research work sort to investigate the extent to which ICT is integrated into healthcare delivery at the Hohoe Municipal Hospital due to the large number of patients who patronise the hospital daily as well as the hassles that both clinicians and patients go through to provide and acquire healthcare respectively. A convenient sampling technique was used to administer questionnaires containing 33 question items to 150 respondents comprising 60 clinicians and 90 patients to get their views on the topic. Simple percentage was used to analyse the responses provided. There is an indication that both patients and clinicians acknowledge that though there are disadvantages, the benefits are greater in number and they will gladly embrace the idea if it becomes a reality. The researcher found out that there are a number of ICT tools at the

Hospital e.g. scanners, public address system, etc. which are put to the best use however, a lot more are still needed e.g. Digitised video conferencing diagnostic and treatment equipment. The Hospital administration is making every effort to adopt the Electronic Health Record (EHR) system, a clear indication that the use of ICT will be beneficial in healthcare.

Despite this realisation, since the hospital is engrossed under full command of the central government which is bedevilled by a wide range of responsibilities per a given term of office of a president, prioritising ICT integration would not be a committed priority of a government unless non-governmental organisations come to take up the challenge. In another perspective, when a national policy is constituted for health sectors instead of the solely political party oriented format practiced in the country, it will help in controlling health activities from the total grip of political party propaganda. The hospital authorities could find solace by being in alliance with nongovernmental bodies as well as find a way of generating funds internally to champion the course of ICT services in its operational endeavours. The researcher made few recommendations to guide policy makers and future researchers.

5.3 Recommendations

Based on the findings on the research questions and the study objectives as well as the conclusions drawn on the findings, the researcher recommends the following:

1. CDSS must be developed and established to facilitate access and maintenance of health care activities.

2. There is the need for provision of Digitised video conference diagnostic and treatment equipment, inter-room intercommunication, and data access and

manipulation devices, digital therapeutic equipment, as well as increasing the capacity of available equipment per departments/units and wards.

3. Every organisation should have a policy to establish budget allocations for a full arsenal of ICT integration in their services.

4. Major health sector operations must be taken out of political dome hence a national policy is needed to control health affairs than solely political party constituted forms.

5. ICT integration should be made a component of all forms of curriculum designs, implementations and evaluations as well as part of every form of training and education.

6. The use of ICT must be employed in a 'refined language' which would be more friendly and easy to be understood by both clinicians and patients than the highly technical registers being recognised in health and technological affairs.

7. Customer care should be inculcated into the training program of Nurses' education.

8. There should be periodic maintenance of all devices at the Hospital to promote longevity.

9. There should be a National policy on the standard of devices to be used in all facilities to eliminate the procurement of sub-standard devices.

10. There should be a motivational package for all clinicians who improve their competence level for the successful integration of ICT into healthcare delivery.

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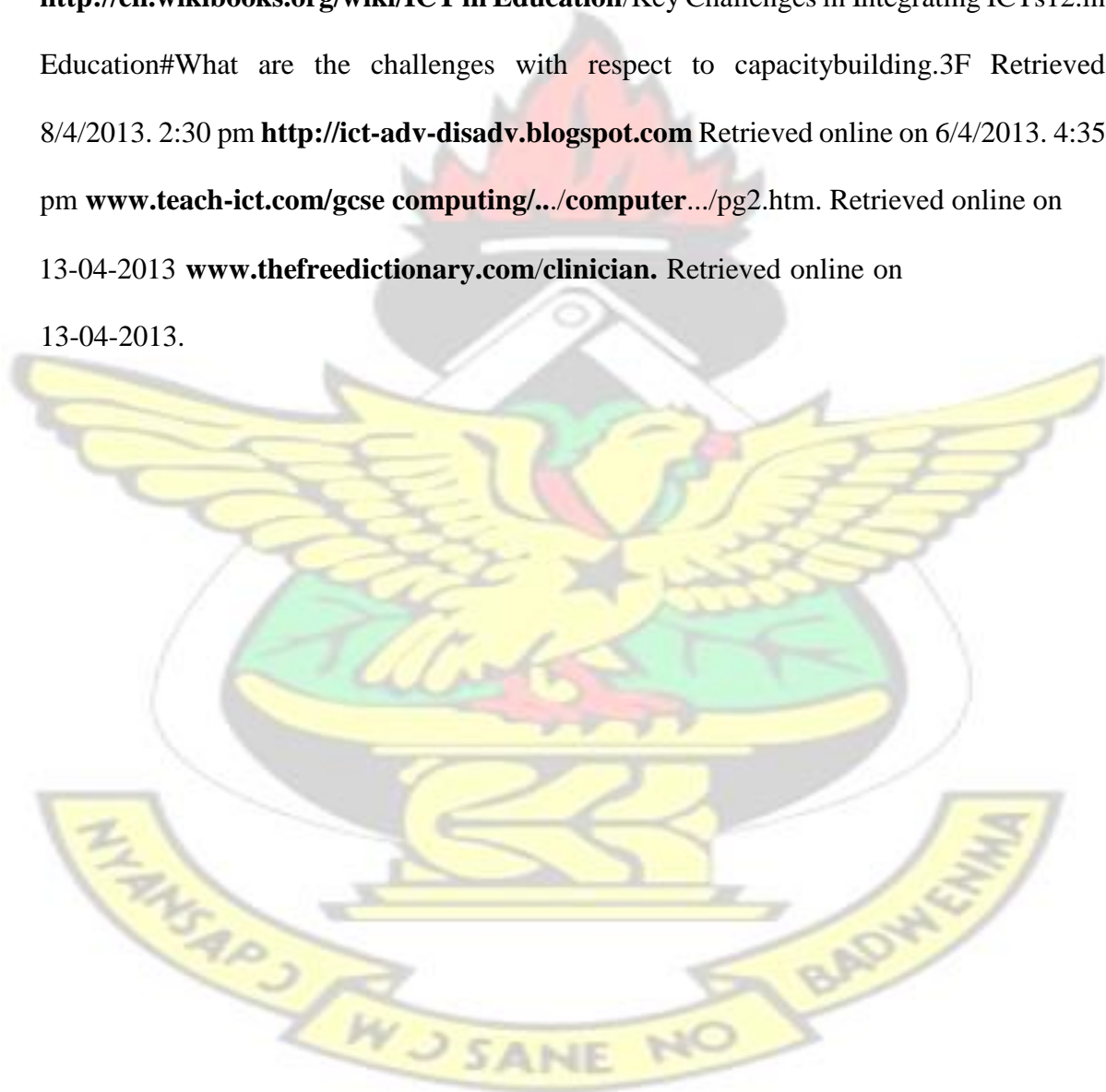
APPENDIX

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
M.Sc. Health Informatics (IDL)
**INVESTIGATING THE INTEGRATION LEVEL OF ICT IN HEALTH
CARE DELIVERY AT THE HOHOE MUNICIPAL GOVERNMENT
HOSPITAL**

QUESTIONAIRE

Dear respondent,

I will be very pleased if you could favourably respond to the following question items with all sincerity on the topic: ***Investigating the integration level of ICT in Health Care Delivery at the Hohoe Municipal Government Hospital.***

Elicited information for this study is purposely for educational use only. Your response is assured the highest confidential treatment. ***Please do NOT write your name, phone number or anything for your identity on any part of the questionnaire***.

Thank you.

NB: *ICT tools include phones, computers, ultra-sound machines, diagnostic assistants, alerts and reminder systems, internet service/wireless net, intercom, refrigerators, microscope, stethoscopes, pressure gauges, ear examiners, electronics wheel chairs and massagers, televisions/videos, camera (CCTVs, etc), projectors, video conferencing devices, Patient Vital Monitoring (PVM) devices, oxygen concentrator, suction machine, glucometre, FBI analyser, Pentra analyser, cell dyn 1800, BT 300 plus, sysmex, electro-therapy equipment, public address system, electronic weighing scales, sphygmomanometer, ergo metric cycles, thermometers, scanners, printers, X-ray apparatus, pairs of scissors, water heaters, syringe and needle, roller bandage, adjustable beds, etc.*

Kindly provide brief but concise responses to the questions.

SECTION 'A'

- **Status:**   Patient   ☐   Clinician ☐

- **Gender:**   .Male ☐   .Female ☐

- **Age (years):** Below 20 ☐   21- 25   26-30   31- 35 ☐   36-40 ☐

    41-45 ☐

               46-50 ☐   51 + ☐

(For patients only)

How often do you attend the Hohoe Municipal Hospital?

Very often ☐   Often ☐ Sometimes   ☐Scarcely   ☐ Indifferent ☐

(For clinicians only)

- Name of Department / Unit: ....

- Job description / schedule: ....

- Number of years in the service: ....

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SECTION 'B'

Integrated ICT devices

1a. What is your understanding of the use of ICT tools in healthcare delivery?

....

....

1b. What ICT tools are available in the Hohoe Municipal Hospital for Health

delivery? ....

....

....

....

1c, Are these devices sufficient enough to cater for the demands of the departments and

wards? Yes [ ]   No [ ]

1d. which other ICT tools do you recommend for the successful integration of ICT in

Healthcare delivery at this hospital? ....

....

....

....

1e. Is there a need for the use of these devices in health service delivery at this hospital?

Yes [ ]   No [ ]

Comment on your choice of response

....

....

....

Benefits of integrated ICT

2a. what is your assessment of the use of ICT in health delivery at this

Hospital? ....

2b. How beneficial are ICT services to clinicians?

....

....

....

2c. How beneficial are ICT services to your patients?

....

....

....

2e. What other benefits do you think this hospital can derive from ICT integration in

healthcare delivery?

....

....

....

2 f. Which areas should the ICT integration be applied to enhance quality health

service delivery in this hospital? ....

....

....

2g. Are some of the ICT tools networked across the various departments?

Yes ☐ No ☐

Competency and preparedness level

3a. Are there personnel in charge of the operation of every available device?

Yes ☐ No ☐

3b. Are all clinicians competent/exposed/informed on the use ICT devices?

Yes ☐ No ☐

3 c. Are there opportunities for patients to be made aware of the operations of some of

devices that are used on/for them? Yes ☐ No ☐

3d. Are there reliable/favourable policy streamlines defining the use of ICT devices to

the satisfaction of every department and patients' needs?

Yes ☐ No ☐

3e. Are there marked out roles for every individual uniquely (patients and staff)

towards the successful integration of ICT in healthcare services in Hohoe Municipal

hospital? Yes No ☐ No ☐

3f. Are the clinicians prepared to embrace ICT devices in healthcare

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delivery? Yes ☐   No ☐

3g. Are patients prepared to embrace ICT devices in healthcare delivery services?

Yes   ☐   No ☐

3h. Are you comfortable with the use of ICT in health delivery services?

Yes   ☐   No ☐

Barriers

4a. Does culture or educational background of clinicians and patients affect ICT

integration in healthcare delivery, comment on your response?

Yes   ☐   No ☐

4 b. What other challenging issues are on the use of ICT in health delivery at this

Hospital?

....

....

....

4 c. What technological improvements do you suggest that this hospital should adopt?

....

....

....

4 d. What is/are your reason(s), regarding your proposed technological suggestions'

adoption?

....

....

....

4 e. What challenges could you perceive regarding your technological proposal should it be in function?

....

....

....

Measure to accommodate ICT

4 f. What ameliorating/control measures could you propose regarding your technological proposal should it be in function with some challenges?

....

....

....

4 g. How should these tools be networked and monitored to achieve the overall best success in healthcare delivery without any chaos?

....

....

....