UNIVERSITY OF CAPE COAST

ASSESSING THE LEVEL OF INTERNET USE AMONG SENIOR HIGH

SCHOOL STUDENTS IN THE ATWIMA NWABIAGYA DISTRICT OF

THE ASHANTI REGION

BY

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Dissertation submitted to the Centre for Continuing Education of the Faculty of Education, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Education Degree in Information and Communication Technology

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DECLARATION

Candidate's Declaration

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

Candidate's Signature:……………………..……… Date:………………

Name: Michael Bruce-Ennin

Supervisor's Declaration

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

Supervisor's Signature:……………………............... Date:………………

Name: Dr. Clement Agezo

ABSTRACT

The study sought to find out three main things. First, the general knowledge level of the students and whether or not there is any significant relationship between one's gender and the knowledge of the internet. Second, the level of internet use among the students and finally, to find out whether students use the internet in a manner that will enhance their studies. Data were gathered from 370 students from four (4) senior high schools in the Atwima Nwabiagya District of the Ashanti Region out of a total accessible population of 11,729 students. These students were selected through stratified and random sampling. The sample composed male and female students, day and boarding students from all the levels (forms 1, 2, 3 and 4). Questionnaire was the only instrument used for gathering the data.

The study found out that students have very high general knowledge of the Internet. It was also found that there is a significant relationship between the students' gender and their knowledge of the Internet with male students demonstrating higher knowledge of the Internet than their female students.

The level of internet use among the students in the district was equally very high. At least 80% of the students use the internet. But what engages the attention of students was more of things that had little or no direct positive impact on their academic work. Majority of the students indicated that they spend more time on watching movies, chatting, surfing, playing games, among others, rather than on academic related issues.

DEDICATION

To Kwame Nhyira

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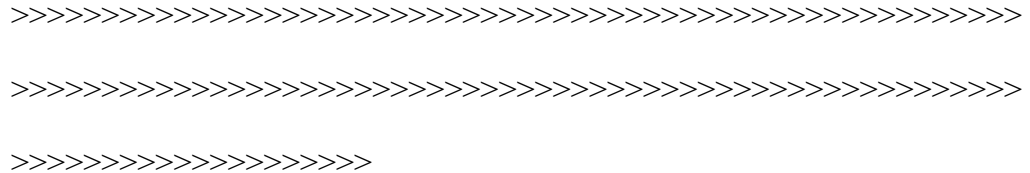
(http://en.wikipedia.org/wiki/Blog) The Internet is complex, its interior is full of all kinds of information, like reactionary, violence, yellow, too many things, like this kind of good and evil are mixed together, young teenagers independent ability is limited and it is hard to resist Internet remarkable attraction

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"COMMUNICATE"

1. To share information with others by speaking, writing, moving your body or using other signals.

2. To talk about your thoughts and feelings, and help other people to understand them

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"COMMUNICATION"

1. To express thoughts, feelings, or information to someone else, for example by speaking or writing.

COMMUNICATE

1. The process of giving information or of making emotions or ideas

    known to someone.

CHAPTER ONE

INTRODUCTION

Background to the Study

Technological advancement has grown speedily in the latter part of the 20th and the early part of the 21st centuries and its impact on human activity cannot be overemphasised. The old order has given way to the new in many facets of human life: education, sports and recreation, commerce, agriculture, entertainment, politics, medicine, architecture, art and music, communication, transportation and religion have all felt the irresistible influence of technological advancement (Dubow, 2005; Kouzes, Myers, & Wulf, 1996). The Macmillan English Dictionary for Advanced Learners, International Student Edition (2002) also defines "Technology" as: "advanced scientific knowledge used for practical purposes, especially in industry" (p.1474).

Technology is indeed a new way of doing things that require the use of modern equipment and modern knowledge for practical purposes. In all these facets of life where modern technology has permeated, the impact has been diverse and largely positive (Hauben & Hauben, 1997; Katz & Rice, 2002; Rosen, 2010). Technology has either made moving money around much easier than it used to be in banking or it has made communication much easier and faster. It has not only improved crop yield by large margins in agriculture, but has also brought about improved and cost effective methods of farming and has made it possible for new and better species to be created in both crop and

animal production. If it is not improvement in architecture where intricate and mind-boggling designs of roads and buildings have been constructed, technology has made the hitherto impossibility possible in space exploration where men without wings have 'flown' to the moon. In transportation, the cost of moving goods and people, in terms of money and time, from one location to another has been greatly reduced as well as enhancing comfort and convenience. There has been a great deal of improvement in the arts, the sciences, in education, in sports, entertainment and others. In all these aspects of human life there is one indisputable conclusion that one can draw— technology has made life easier (Slevin, 2000; Schuler & Day, 2004).

Some of the blessings that technology gives include the availability of information and the ease with which it is accessible. "Through the Internet, society has access to global information and instant communications", (Shelly, Cashman & Vermaat, 2007, p.50). It is much easier today to access almost any kind of information on any subject matter within a short period of time over long distances, and this began with the advent and evolution of computers (Legris, Ingham, & Collerette, 2003). The old order of communication and means of sending and receiving information through letter writing, money order, postal order, literal and geographically stationary libraries gave way to modern knowledge and a new set of devices whose output and speed are comparatively supersonic. These include the evolution of the telephone and the advent of the computer and the Internet. Shelly et al., (2007) stated that:

More than one billion people around the world use the Internet daily for a variety of reasons, including the following: to communicate with and meet other people; to access a wealth of information, news, and research findings;

to shop for goods and services; to bank and invest; to take a class; to access sources of entertainment and leisure, such as online games, music, videos, books, and magazines; to download music; and to share information (p.8).

There are many social networks today that provide diverse Internet services to clients of diverse backgrounds including students. These social networks include Yahoo, Google, Skype and Facebook (Liaw & Huang, 2003). Services and facilities the Internet provides include email services; a virtual library of dictionaries, encyclopaedia, course books, articles; PowerPoint presentations on various topics; formulae, worked examples on many problems; tutorials, books, personal suggestions and opinions on various topics; audio and video recordings, pictures, music, answers to questions, chatting, upload and download of information, calls, games, et cetera. Virtually any piece of information is searchable and accessible on the Internet. These Internet services are available 24 hours a day and seven days a week for anyone who may access them (Berman, & Phillips, 2001; Griffiths, 2002; Kleinrock, 2008; Nelson, 2010; Shah, Cho, Eveland, & Kwak, 2005).

Statement of the Problem

There is undisputed evidence that students of today have access to information on the Internet. The Internet is gaining more and more popularity and is fashionable especially among the youth today (Bonebrake, 2002). Technological advancement in communication has made it possible to access the world from the click of a button anywhere. Access to information is much easier now than ever before. Mobile phones are relatively more affordable and available today and with increase in technology people can access the Internet on their phones making the Internet even more popular. Consequently, the

Internet enjoys a huge patronage today around the globe. But are students really taking due advantage of it?

It is the desire of every nation, educational institution, parent or guardian that their wards do well in school and at the end of their course receive a certificate that is worth the investment that has been made. Over the years, many government regimes in Ghana have made some strides through policy formulation, building of infrastructure and other educational interventions. All these efforts were aimed at improving upon education in Ghana. Key among these policies include the Free Compulsory Universal Basic Education (fCUBE), Capitation Grant to schools and the School Feeding Programme.

The Internet is, by all standards, a formidable supplementary source of information and an aid to research. However, the Internet is a mixed bag. That is to say that the Internet itself plays host to both the good and the bad. Despite the fact that it has something educationally beneficial to offer, the Internet itself can also be a source of distraction to students who do not know how to decipher the chaff from the pearls (Luppicini, 2010). Much as educationally beneficial pieces of information are available on the Internet, the pornography, the chats, the games, music clips, and the rest are also there (Conn, 2002; Goldsmith & Wu, 2006; Jenkins, 2001; White, 2006). Furthermore, the Internet also accommodates the phenomenon of using the Internet facility for all sorts of criminal and immoral activities (Langford, 2000; Spinello, 2000; Jenkins, 2001). How many students really access the Internet today? Do those students use the Internet today to enhance their learning? To what extent has the Internet been a blessing or a curse to students who patronise it?

Purpose of the Study

The purpose of the study was to establish the level of Internet use among students against the backdrop that the Internet is readily available and has resources to help them. It also sought to find out students' basic knowledge level of the internet. In this respect the research was aimed at also finding out whether there is any significant difference in gender (male or female) among students as far as such knowledge is concerned. Furthermore, the study sought to establish the kind of use that students put the Internet to. In other words, the purpose of the study was to establish whether those that use the Internet use it in a manner that is beneficial to them as students.

Research Questions

The research was conducted in an attempt to find answers to certain questions that concern students and the Internet. The questions bother on students' knowledge of the Internet as well as the frequency and direction of Internet use. These questions provided scope and direction for the research. The research questions include the following:

1. What is the student's general knowledge of the Internet? Is there any significant difference between male and female students with respect to general knowledge of the Internet?

2. What is the student's level of Internet use?

3. What use do students usually put the Internet to?

Significance of the Study

The Internet has a lot to offer students. However, as a tool the benefits derived from the facility will depend on how students use the Internet with respect to frequency (the level of use—how often) and manner (direction) of

Internet use. It is hoped that the findings of the research will significantly contribute to knowledge as to the level and direction of Internet use of students in the district. It is also envisaged that the findings of the research would serve as a basis for a more detailed work by other researchers; that it will be a reference point for teachers, parents and counsellors who deal with issues concerning students to enhance their work; and enable policy makers to have a better view of the level and direction of Internet use among students.

Delimitation of the Study

I restricted the scope of the research mainly because of time and other constraints. First, the study was limited to finding out the level of Internet use among students and only those in the senior high school category were considered. The sample for the study was gathered from the Ashanti Region out of the ten regions in Ghana and specifically from senior high schools in the Atwima Nwabiagya District. I used only questionnaire as the tool for gathering information from respondents.

Limitations of the Study

There were many more boys than girls and this is partly because one of the schools was a purely boys school. Again, in each of the schools there were more boys than girls, so right from the beginning the proportion was skewed in favour of boys. This reflected in the sample. Out of a sample of 370, 255 were boys with only 115 girls, representing approximately 69% for boys and 31% girls.

In almost all of the schools it was very difficult to get the exact student population at any point in time. I visited the schools several times before some figures were given. Even the relevant officials could not give the figures

mainly because of mid-stream admissions. Almost every week, especially during the first term and in the early part of the second term, more and more continuing students were being admitted mid-stream, making it difficult to quote the exact population of the school. There were also instances where some students would leave one school for another for one reason or the other without any notice. For some schools the admission of the first year students spanned almost throughout the first term. The situation was worse when specific details like class enrolment and the male-female proportions by class were required. It is even possible that the figures quoted in this research may not exactly reflect the reality on the ground.

There were also too many spoiled questionnaires. Even though the researcher took time to vividly explain the process to students as well as clarify all the questions that the students asked before attempting to answer the questionnaires, there were still a lot of invalid questionnaires. Out of the 370 questionnaires administered, as many as 156 were spoiled leaving only 214 that were found to be valid for the analysis.

Definition of Terms

Computer: A computer is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use.

E-Mail (Electronic Mail): A system that allows you to send and receive messages by computer.

Ethernet: A system used for connecting computer networks

Extranet: A computer system in a company that allows better communication between the company and its customers by combining Internet and intranet systems, so that some customers can view some of the company's private information that is not normally available on the Internet.

File Transmission Protocol (FTP): a set of rules that allow you to send documents from one computer to another

Hypertext: It is text displayed on a computer or other electronic devices with references (hyperlinks) to other text that the reader can immediately access, usually by a mouse click or by touching the screen. Apart from running text, hypertext may contain tables, images and other presentational devices. Hypertext is the underlying concept defining the structure of the World Wide Web. It is an easy-to-use and flexible format to share information over the Internet.

The Internet: "A computer system that allows millions of computer users around the world to exchange information"

Intranet: A computer network used for exchanging or seeing information within a company.

Internet Protocol (IP): An established method or rules for connecting computers so that they can exchange information. It is the principal communications protocol used for relaying datagrams across an Internetwork using the Internet Protocol Suite. It is the primary protocol that establishes the Internet and is responsible for routing packets across network boundaries.

Log In/On: To do the necessary actions on a computer system that will allow you to begin using it.

Octet: An octet is a unit of digital information in computing and telecommunications that consists of eight bits. The term is often used when the term byte might be ambiguous, as historically there was no standard definition for the size of the byte.

Packet: A quantity of information that is sent as a single unit from one computer to another on a network or on the Internet.

Router: A piece of electronic equipment that makes sending messages between different computers or between different networks easier and faster.

Server: The main computer on a network, which controls or performs a particular job for all the other computers. It is one of the computers on a network that provides a special service.

Software: The sets of programmes that tell a computer how to do a particular job.

Telecommunication: Communication over long distances

The Web: The system on the Internet that allows you to find and use information that is held on computers all over the world

Transmission Control Protocol (TCP): It is one of the core protocols of the Internet Protocol Suite. TCP provides reliable, ordered delivery of a stream of octets from a programme on one computer to another programme on another computer. TCP is one of the two original components of the suite, complementing the Internet Protocol (IP), and therefore the entire suite is commonly referred to as TCP/IP. TCP is the protocol used by major Internet applications such as the World Wide Web, email, etc.

Search Engine: A search engine is a service provided on the Internet and is used to find web pages on a particular topic or area by entering key words or phrases.

Modem or Dial-Up Modem: The word MODEM is derived from the combination of the words, mo̲dulate, meaning to change into an analogue signal, and de̲modulate, to convert an analogue signal into a digital signal. It is a communication device that performs this task.

Internet Service Provider (ISP): An ISP is an organisation or company that provides Internet access or connectivity to customers. The service provides Internet connectivity to homes and companies. Also sometimes referred to as Internet Access Provider (IAP).

Morse Code: a series of dots and dashes, which was used to communicate between humans

Organisation of the Rest of the Study

Chapter Two is dedicated to review of related literature and under that I looked at history and evolution of the Internet, the birth of the network, reasons for creating the Internet, the growth of the Internet, the development of the Internet, challenges or impediments to the growth of the Internet and the Internet today. Again, I discussed Internet usage statistics in this chapter and areas that I looked at include Internet usage and statistics with specific statistics for the World, for Africa and for Ghana. Figures on Internet usage by gender were also discussed.

In chapter three I discussed the Methodology of the study and the spotlight was on the research design, the population, sample and sampling

procedure, data gathering instrument, data gathering procedure and data analysis.

Chapter four was devoted for results and discussion. Then chapter five was composed of the summary of the study, the conclusion of the study, recommendations and then possible areas for further study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Pre-Internet History

"Communication" is defined by the "Longman Dictionary of Contemporary English" (2007) as: "the process by which people exchange information or express their thoughts and feelings"…"the way people express themselves so that other people will understand"…"ways of sending information, especially using radio, telephone, or computers" (p307). And before these gadgets (computers, radios and phones) came, men communicated. Communication is so vital to human existence and humans will find every means possible to express their views, thoughts and feelings. The challenge to effective communication is really more with telecommunication—communication over long distances. In primitive ages people communicated over long distances by the use of talking drums, messengers on horseback and bonfires with the smoke ascending high into the skies. The advent of correspondence, aided by the development of the railway system which enabled letters and parcels to be transported over relatively longer distances, was seen as much improvement until the quest for a better and a more convenient ways of doing things led to the discovery of the waves as a mode of communication. The invention of the radio, television and today the computer, has raised standards in communication to almost unbelievable heights as huge volumes of information can be sent to very far distances

within seconds at the click of a mere button. But before the Internet came, strategic inventions had been made that served as bedrock for the success story of the Internet today (Kleinrock, 2010).

In 1836, Telegraph was patented by Cooke and Wheatstone. This revolutionised human (tele) communications. It used Morse Code, a series of dots and dashes, to communicate between humans. This is not too different from how computers communicate via binary (0/1) data today, although the former is much slower. Again between 1858 and 1866, the Transatlantic Cable came into existence. It allowed direct instantaneous communication across the Atlantic. Today, cables connect all continents and are still a major hub of telecommunications. Then in 1876 came the Telephone through Alexander Graham Bell. Telephone exchanges provide the backbone of Internet connections today. Modems provide Digital to Audio conversions to allow computers to connect over the telephone network (Leiner, Cerf, Clark, Kahn, Kleinrock, & Lynch, 1997; Kleinrock, 2010; Roberts, 1999).

In 1957, the former Union of Soviet Socialist Republic (USSR) launched the Sputnik, the first ever (artificial) satellite to go round the earth. According to Salus (1995) and Strickland (2010), this was the start of global telecommunications. Satellites play an important role in transmitting all sorts of data today. The US also formed the Advanced Research Projects Agency (ARPA) within the Department of Defence (DoD). The formation of ARPA was later to become the genesis of the Internet story. The above inventions prepared the grounds for the advent of the Internet and still contribute significantly to its success (Salus 1995; Roberts, 1999; & Strickland 2010).

Between 1962 and 1968 the Packet-switching networks were developed. This was also significant because the Internet today relies on packets to transfer data. In this technology data is split into tiny packets that may take different routes to a destination. Again there is more than one route available—if one route goes down another may be followed. Networks can withstand large scale destruction e.g. a nuclear attack. The qualities of these networks enhance utmost security in transferring information of networks because there is no single outage point. (Cerf & Kahn, 1974)

The Birth of a Network

The Internet was the result of some visionary thinking by people in the early 1960s who saw great potential value in allowing computers to share information on research and development in scientific and military fields. J.C.R. Licklider of MIT, was the first to propose a global network of computers in 1962 (Kleinrock, 1996; Hafner & Lyon, 1998). The early Internet was used by computer experts, engineers, scientists and librarians. There was nothing friendly about it. There were no home or office personal computers in those days, and anyone who used it, whether a computer professional or an engineer or scientist or librarian, had to learn to use a very complex system (Leiner, Cerf, Clark, Kahn, Kleinrock, Lynch, et al. 2009; Kleinrock, 2010).

Reasons for Creating the Internet

The Internet as we know it today, traces its origins back to a USA Defence Department project in 1969. The subject of the project was wartime digital communications. At that time the telephone system was about the only

theatre-scale communications system in use. A major problem had been identified in its design—its dependence on switching stations that could be targeted during an attack. Would it be possible to design a network that could quickly reroute digital traffic around failed nodes? A possible solution had been identified in theory. That was to build a "web" of datagram network, called "*CATENET*", and use dynamic routing protocols to constantly adjust the flow of traffic through the *CATENET*. The Defence Advanced Research Projects Agency (DARPA) launched the DARPA Internet Programme. The Internet was designed in part to provide a communications network that would work even if some of the sites were destroyed by nuclear attack. If the most direct route was not available, routers would direct traffic around the network via alternate routes. (Gromov, 1996; Salus, 1995; Strickland 2010).

Growth of the Internet

In December, 1969, ARPA went online connecting four major U.S. universities—universities in the south-western US. They were University of California, Los Angeles (UCLA), Stanford Research Institute, University of California, Santa Barbara (UCSB), and the University of Utah. Designed for research, education and government organizations, it provided a communications network linking the country in the event that a military attack destroyed conventional communications systems (Gromov, 1996).

By 1965 many people had invented many aspects of the Internet and had come up with ideas that helped improve upon the facility and by so doing had in diverse ways contributed to the building of the Internet that we have today. They included identifying new ways of doing things, development of theories and trials that showed viability of wide area network. These were J.C.R.

Licklider, Leonard Kleinrock and Lawrence Roberts. These visionaries and many more are the real founders of the Internet (Gromov. 1996)

By June 1970, Massachusetts Institute of Technology (MIT), Harvard, Business Branding Network (BBN), and Systems Development Corp (SDC) in Santa Monica, California, were added. By January 1971, Stanford, MIT's Lincoln Labs, Carnegie-Mellon, and Case-Western Reserve U were added. After that, there were far too many to keep listing here. The Internet matured in the 70's as a result of the TCP/IP architecture first proposed by Bob Kahn at BBN and further developed by Kahn and Vint Cerf at Stanford and others throughout the 70's. It was adopted by the Defence Department in 1980 replacing the earlier Network Control Protocol (NCP) and universally adopted by 1983. (Cerf & Kahn, 1974; Ryan, 2011).

Al Gore and the Internet

Among individuals who are on record to have contributed significantly towards the growth of the Internet was Al Gore, the former vice president to Bill Clinton and the presidential candidate for the Democrats for the 2000 presidential elections in the United States. Mr. Gore was elected to Congress in 1976. Although he was not yet in Congress in 1969 when ARPANET started or in 1974 when the term Internet first came into use, Mr. Gore's contribution to the development of the Internet is widely recognised and it is said that he has probably done more than any other elected official to support the growth and development of the Internet (Cerf & Kahn, 1974).

The Development of the Internet

DARPA Internet, largely the plaything of academic and military researchers, spent more than a decade in relative obscurity. As Vietnam,

Watergate, the Oil Crisis, and the Iranian Hostage Crisis rolled over the (American) nation, several Internet research teams proceeded through a gradual evolution of protocols. In 1975, DARPA declared the project a success and handed its management over to the Defence Communications Agency. Several of today's key protocols (including IP and TCP) were stable by 1980, and adopted throughout ARPANET by 1983. ARPANET started in 1969 and in 1974 the term INTERNET first came into use (Hauben & Hauben, 1997).

The Advent of E-mail

E-mail was adapted for ARPANET by Ray Tomlinson of BBN in 1972. He picked the '@' symbol from the available symbols on his teletype to link the username and address. The telnet protocol, enabling logging on to a remote computer, was published as a Request for Comments (RFC) in 1972. RFC's are a means of sharing developmental work throughout community. The FTP protocol, enabling file transfers between Internet sites, was published as an RFC in 1973, and from then on RFC's were available electronically to anyone who had use of the ftp protocol. In 1986, the National Science Foundation funded NSFNet as a cross country 56 Kbps backbone for the Internet. They maintained their sponsorship for nearly a decade, setting rules for its non-commercial, government and research uses (Cerf & Kahn, 1974).

In 1989 another significant event took place in making the Internet easier to use. Tim Berners-Lee and others at the European Laboratory for Particle Physics, more popularly known as CERN, proposed a new protocol for information distribution. This protocol, which became the World Wide Web in 1991, was based on hypertext—a system of embedding links in text to link to

other text, which you have been using every time you selected a text link while reading these pages. Although started before gopher, it was slower to develop (Gillies, & Cailliau, 2000).

In 1991, the first really friendly interface to the Internet was developed at the University of Minnesota. The University wanted to develop a simple menu system to access files and information on campus through their local network. The development in 1993 of the graphical browser *Mosaic* by Marc Andreessen and his team at the National Centre for Supercomputing Applications (NCSA) gave the protocol its big boost. Later, Andreessen moved to become the brain behind Netscape Corp., which produced the most successful graphical type of browser and server until Microsoft 'declared war' and developed its Microsoft Internet Explorer (Leiner et al. 2009; Kleinrock, 2010).

Since the Internet was initially funded by the government, it was originally limited to research, education, and government uses. Commercial uses were prohibited unless they directly served the goals of research and education. This policy continued until the early 90's, when independent commercial networks began to grow. It then became possible to route traffic across the country from one commercial site to another without passing through the government funded NSFNet Internet backbone. Delphi was the first national commercial online service to offer Internet access to its subscribers. It opened up an email connection in July 1992 and full Internet service in November 1992. All pretences of limitations on commercial use disappeared in May 1995 when the National Science Foundation ended its sponsorship of the Internet backbone, and all traffic relied on commercial

networks. Since commercial usage was so widespread by this time and educational institutions had been paying their own way for some time, the loss of NSF funding had no appreciable effect on costs (Leiner et al. 2009; Kleinrock, 2010).

The emergence of anonymous file transfer protocol (FTP) sites provided a distribution mechanism that almost anyone could use. Network newsgroups and mailing lists offered an open communication medium. Last but not least were individualists like Richard Stallman, who wrote EMACS, launched the GNU Project and founded the Free Software Foundation. In the 1990s, Linus Torvalds wrote Linux, the popular (and free) UNIX clone operating system (Cerf & Kahn, 1974).

The First to Use the Internet

Charley Kline at UCLA sent the first packets (messages) on ARPANet as he tried to connect to Stanford Research Institute on October 29, 1969. The system crashed as he reached the G in LOGIN! While the number of sites on the Internet was small, it was fairly easy to keep track of the resources of interest that were available. But as more and more universities and organizations—and their libraries—connected, the Internet became harder and harder to track. There was more and more need for tools to index the resources that were available (Roberts, 1999).

Ethernet, a protocol for many local networks, appeared in 1974, an outgrowth of Harvard student Bob Metcalfe's dissertation on "Packet Networks." The dissertation was initially rejected by the University for not being analytical enough. It later won acceptance when he added some more equations to it (Gromov, 1996).

Clark, Field & Richards (2010) said there was nothing friendly about the early Internet. It was a complex system used by only computer experts. But as the commands for e-mail, FTP, and telnet were standardized, it became a lot easier for non-technical people to learn to use the nets. It was not easy by today's standards by any means, but it did open up use of the Internet to many more people in universities in particular. Other departments besides the libraries, computer, physics, and engineering departments found ways to make good use of the nets—to communicate with colleagues around the world and to share files and resources.

At about the same time, Brewster Kahle, then at Thinking Machines, Corp. developed his Wide Area Information Server (WAIS), which would index the full text of files in a database and allow searches of the files. There were several versions with varying degrees of complexity and capability developed, but the simplest of these were made available to everyone on the nets (Ryan, 2011).

Challenges

The early days of the web was a confused period as many developers tried to put their personal stamp on ways the web should develop. The web was threatened with becoming a mass of unrelated protocols that would require different software for different applications (Abbate, 2000; Ryan, 2011). The visionary Michael Dertouzos (1936—2001) of MIT's Laboratory for Computer Sciences persuaded Tim Berners-Lee and others to form the World Wide Web Consortium in 1994 to promote and develop standards for the Web. Proprietary plug-ins still abound for the web, but the Consortium has ensured that there are common standards present in every browser. The 1987 Internet

Worm was the largest security failure in the history of the Internet. All things considered, it could happen again (Gromov, 1996; Hafner & Lyon, 1998).

The Internet Today

As the Internet has become ubiquitous, faster, and increasingly accessible to non-technical communities, social networking and collaborative services have grown rapidly, enabling people to communicate and share interests in many more ways. Social network sites like Facebook, Twitter, Skype, Linked-In, YouTube, Flickr, Second Life, delicious, blogs, wikis, and many more let people of all ages rapidly share their interests with others everywhere.

Internet Usage Statistics

Today Internet users, including students, have the luxury of accessing the Internet from many different types of devices including mobile phones. Many schools today have Internet access on their campuses where students may access the Internet. Again, students may also access the Internet at Internet cafés in town and some even have the facility at home. In Ghana, Internet access is much easier now than few years back where only few Internet cafés provided the service. The estimates in the following statistics are derived from either household surveys or from Internet subscription data by reputable international bodies.

Table 1: Internet Users Statistics—Africa Against the World

Region	Population (2011 Est.)	Pop. % of World	Internet Users, 31-Dec-11	% of World
Africa	1,037,524,058	15.0 %	139,875,242	6.2 %
Rest of World	5,892,531,096	85.0 %	2,127,358,500	93.8 %
World	6,930,055,154	100.0 %	2,267,233,742	100.0 %

SOURCE: www.Internetworldstats.com.

There are about 2,267,233,742 estimated Internet users worldwide. Out of this figure Africa accounts for 139,875,242 and the rest of the world accounts for 2,127,358,500. With these figures Africa controls only 6.2% while the rest controls 93.8%. It is obvious that the proportion of Internet users in Africa is not commensurate with its population (1,037,524,058) which constitutes about 15% of the world's population (6,930,055,154).

Table 2: Percentages of Internet Users and Non-Users Worldwide from 2006 to 2011.

Worldwide Internet Users and Non-Users		
	2006	2011
World population	6.5 billion	7 billion
Not using the Internet	82%	65%
Using the Internet	18%	35%
Users in the developing world	8%	22%
Users in the developed world	10%	13%
Users in China	2%	8%

Global Internet usage is generally gaining ascendancy. At the close of the year 2011 as the world's population turned seven billion, the percentage of Internet users worldwide moved from 18% in 2006 to 35% in 2011. During

the same period the percentage of the world's population that does not use the Internet reduced from 82% in 2006 to 65% in 2011. While users in the developed world increased from 10% to 13% between 2006 and 2011, users in the developing world also increased from a low 8% to a significant 22% during the same period.
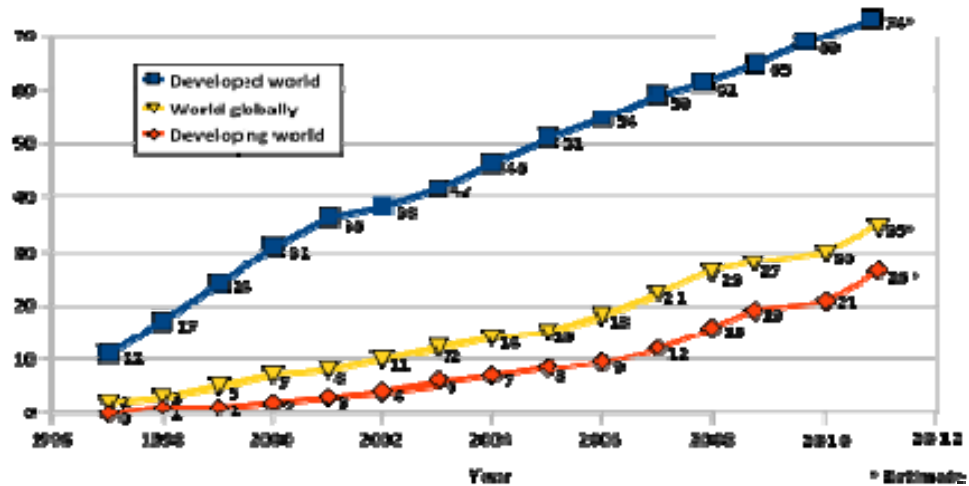
Figure 1. Internet Users per 100 Inhabitants

SOURCES: www.Internetworldstats.com

Figure 1 shows number of Internet users per one hundred inhabitants between 1997 and 2012. The estimates show figures for the developed world, developing world and global averages. It is evident from the graph that there have been increases on all fronts. By 1997, the number of Internet users per 100 inhabitants stood at 11people. This figure had increased to 74 by 2011. The number of Internet users in the developing world was negligible in 1997, but by 2011 the figure had increased to about 26. Global average of Internet users per every 100 inhabitants moved from equally negligible figure in 1997 to an estimated 35 users by 2011.

Table 3: Internet Usage Statistics By Region, 2006 to 2011

Region	2006	2011	Percentage Increase
Africa	3%	13%	333.3%
Americas	39%	56%	43.6%
Arab States	11%	29%	163.6%
Asia and Pacific	11%	27%	145.5%
Commonwealth of Independent States	13%	48%	269.2%
Europe	50%	74%	48.0%

NOTE: The Percentage Increase column was added by the researcher.

Table 3 also shows Internet users by region between 2006 and 2011, a period of six years. Africa, with the least figure had moved from 3% from 2006 to 13% in 2011 indicating over 333 percentage increase. The Americas had moved from 39% to 56%, the Arab States from 11% to 29%, Asia and Pacific also from 11% to 27%, Commonwealth of Independent States from 13% to 48% and then Europe also had from 50% to 74% during the same period. Africa was the fastest growing region in the world with over 333% increase in the number of people using the Internet while the Americas recorded relatively the least growth of approximately 43.6% increase. The commonwealth of Independent States, the Arab States, Asia and Pacific and Europe occupied the second, third, fourth and fifth positions in that order with 269.2%, 163.6%, 145.5%, and 48.0% respectively. However, absolute figures indicate that Africa is still lagging behind in terms of Internet usage.

Table 4: Global Ranking of Countries According to Number of Internet Users

Rank	Country	Internet Users	Percentage of Population
1	China	456,238,464	34.30
2	United States	243,542,822	79.00
3	Japan	102,063,316	80.00
4	India	87,983,101	7.50
5	Brazil	81,748,504	40.65
6	Germany	66,825,986	81.85
7	Russia	59,937,788	43.00
8	United Kingdom	52,996,180	85.00
9	France	51,879,480	80.10
10	Nigeria	45,944,229	28.43
11	Korea, South	40,708,389	83.70
12	Mexico	34,865,345	31.00
13	Italy	32,610,044	53.68
14	Turkey	30,981,601	39.82
15	Pakistan	30,943,124	16.78
16	Spain	30,940,417	66.53
17	Canada	27,547,949	81.60
18	Philippines	24,975,044	25.00
19	Vietnam	24,685,803	27.56
20	Poland	23,970,571	62.32

Table 4 continued

21	Indonesia	22,110,119	9.10
22	Egypt	21,518,178	26.74
…	…	…	…
180	Liberia	2,580	0.07
181	Timor-Leste	2,425	0.21
182	Nauru	556	6.00

Table 4 shows aspects of the ranking of 182 countries based on the number of Internet users. China ranks number one in the world with 456,238,464 Internet users which constitutes 34.30% of China's population. The United States is ranked second worldwide with 243,542,822 Internet users while Japan is ranked third with 102,063,316 users. The country with the largest number of Internet users in Africa, Nigeria, is ranked tenth in the world with 45,944,229 users which is equivalent to 28.43% of the country's population. The last three of the 182 countries ranked are Liberia, Timor-Leste and Nauru with 2,580, 2,425 and 556 Internet users respectively.
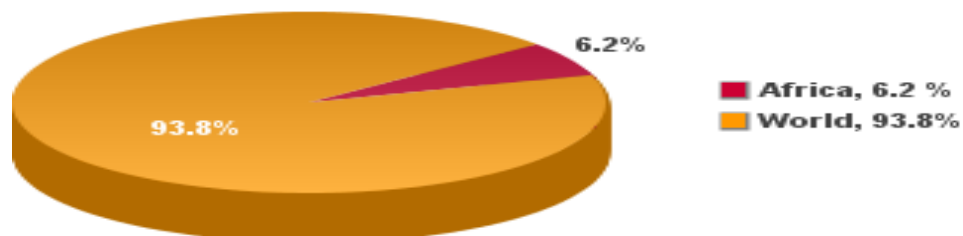
Figure 2. Statistics of Internet Users in Africa

Figure 2 shows the percentage of Internet users in Africa as against the world's figure. Internet users in Africa constitute only 6.2% of the world's population of Internet users with the rest of the world controlling the remaining 93.8%.

Table 5: Internet Usage Statistics for Africa from December, 2000 to December, 2011.

Country	Population (2011 Estimate)	Internet Users Dec/2000	Internet Users 31-Dec-11	Percentage %
Angola	13,338,541	30,000	744,195	0.5 %
Benin	9,325,032	15,000	744,195	0.2 %
Botswana	2,065,398	15,000	167,180	0.1 %
Burkina Faso	16,751,455	10,000	230,562	0.2 %
Burundi	10,216,190	3,000	176,040	0.1 %
Cameroon	19,711,291	20,000	783,956	0.6 %
Cape Verde	516,100	8,000	148,800	0.1 %
Central Afr. Rep.	4,950,027	1,500	123,800	0.1 %
Chad	10,758,945	1,000	190,863	0.1 %
Comoros	794,683	1,500	37,472	0.0 %
Congo	4,243,929	500	295,132	0.2 %
Congo, Dem. Rep.	71,712,867	500	915,400	0.7 %
Cote d'Ivoire	21,504,162	40,000	968,000	0.7 %
Djibouti	757,074	1,400	61,320	0.0 %

Table 5 continued

Egypt	82,079,636	450,000	21,691,776	15.5 %
Equatorial Guinea	668,225	500	42,024	0.0 %
Eritrea	5,939,484	5,000	283,699	0.2 %
Ethiopia	90,873,739	10,000	622,122	0.4 %
Gabon	1,576,665	15,000	108,845	0.1 %
Gambia	1,797,860	4,000	159,012	0.1 %
Ghana	24,791,073	30,000	2,085,501	1.5 %
Guinea	10,601,009	8,000	95,823	0.1 %
Guinea-Bissau	1,596,677	1,500	37,123	0.0 %
Kenya	41,070,934	200,000	10,492,785	7.5 %
Lesotho	1,924,886	4,000	83,813	0.1 %
Liberia	3,786,764	500	20,000	0.0 %
Libya	6,597,960	10,000	391,880	0.3 %
Madagascar	21,926,221	30,000	352,135	0.3 %
Malawi	15,879,252	15,000	716,400	0.5 %
Mali	14,159,904	18,800	414,985	0.3 %
Mauritania	3,281,634	5,000	100,333	0.1 %
Mauritius	1,303,717	87,000	323,494	0.2 %
Mayotte (FR)	209,530	n/a	10,620	0.0 %
Morocco	31,968,361	100,000	15,656,192	11.2 %
Mozambique	22,948,858	30,000	975,395	0.7 %
Namibia	2,147,585	30,000	148,414	0.1 %
Niger	16,468,886	5,000	128,749	0.1 %

Table 5 continued

Nigeria	155,215,573	200,000	45,039,711	32.2 %
Reunion (FR)	834,261	130,000	300,000	0.2 %
Rwanda	11,370,425	5,000	818,048	0.6 %
Saint Helena	7,700	n/a	900	0.0 %
Sao Tome & Principe	179,506	6,500	31,012	0.0 %
Senegal	12,643,799	40,000	1,989,396	1.4 %
Seychelles	89,188	6,000	33,900	0.0 %
Sierra Leone	5,363,669	5,000	48,520	0.0 %
Somalia	9,925,640	200	106,000	0.1 %
South Africa	49,004,031	2,400,000	6,800,000	4.9 %
South Sudan	8,260,490	-	n/a	0.0 %
Sudan	45,047,502	30,000	4,200,000	3.0 %
Swaziland	1,370,424	10,000	95,122	0.1 %
Tanzania	42,746,620	115,000	4,932,535	3.5 %
Togo	6,771,993	100,000	356,300	0.3 %
Tunisia	10,629,186	100,000	3,856,984	2.8 %
Uganda	34,612,250	40,000	4,178,085	3.0 %
Western Sahara	507,160	n/a	n/a	0.0 %
Zambia	13,881,336	20,000	882,170	0.6 %
Zimbabwe	12,084,304	50,000	1,445,717	1.0 %
TOTAL AFRICA	1,037,524,058	4,514,400	139,875,242	100.0 %

Table 5 indicates Internet usage statistics for the fifty-eight (58) countries in Africa by alphabetical order. As of December 31, 2011, the total population of Africa was estimated at 1,037,524,058 as against 5,892,531,096 as estimated population of the world. Out of these figures, the estimated number of people using the Internet in Africa stood at 139,875,242 representing 6.2% while the percentage for the rest of the world was 93.8 translating into 2,127,358,500 Internet users. Again, by the end of the year 2011 Internet penetration as percentage of the total population in Africa stood at 13.5% while that of the rest of the world stood at 36.1%.

Internet Usage Statistics for Africa

Nigeria is ranked highest in Africa in terms of number of Internet users. By December 31, 2011, over 45,000,000 people were using Internet in Nigeria. That figure represents about 32.2% of all Internet users in Africa making Nigeria a towering figure in Africa. That means about a third of all Internet users in Africa are in Nigeria. Egypt is ranked second in Africa with approximately 21,700,000 Internet users. Nigeria's figure is more than twice that of Egypt which ranks second in Africa. Ghana is not ranked among the first 10 countries in Africa. Ghana is ranked 11th in Africa. With about 2,085,501 Internet users, it forms just about 1.5% of Internet users in Africa and about 0.09% of Internet users globally.

Table 6: Internet Usage Statistics for Ghana

Statistics of Internet Users In Ghana	
Population (2011)	24,791,073
Country Area (sq km)	238,538
Capital	Accra
Internet Users (Dec. 31,2011)	2,085,501
Facebook Users on Dec 31, 2011	1,146,560
Penetration Rate (%)	4.6

Ghana, as of December, 2011, had an estimated 2,085,501 Internet users. With the current population around 24,791,073, Internet users constitute 8.4% of the population. Though Ghana's Internet growth rate is said to be fast, this figure is still very low on the global scene. Ghana is ranked 11th in Africa and 77th in the world and constitutes only about 0.09% of Internet users worldwide.

CHAPTER THREE

METHODOLOGY

This chapter describes how the study was conducted. It describes the research design and the population used for the research. It also describes the sample and sampling procedure, the data-gathering instrument, validity and reliability of the instrument used, the data gathering procedure and the data analysis.

Research Design

The descriptive survey research design which is quantitative in nature was chosen for the study. This is the type of design that entails collection of numerical data with the view to establishing an objective conception of social reality. In this design, social life is quantified and deductions drawn (Wiersma, 1995). According to Babbie (2005, p.91)

A major purpose of many social scientific studies is to describe situations and events. The researcher observes and then describes what was observed. Because scientific observation is careful and deliberate, however, scientific descriptions are typically more accurate and precise than casual ones.

Apart from describing how things are, quantitative researchers also concern themselves with an attempt to explain why things are the way they are. They do this by examining causes so that potential future occurrences can be predicted. In a survey, the researcher typically chooses a sample of respondents and administers a standardised questionnaire to every member of

the sample (Babbie, 2005, p. 252). And such sample must be chosen such that findings of the study could be legitimately generalised beyond the confines of the geographical location or the social context in which the research was conducted. One way this can be achieved is by selecting a sample and sample size that is to a very large extent representative of the larger population.

Population

The target population for the study were students in senior high schools in Ghana. The accessible population was 11,729 which is the total of students from all the four senior high schools in the Atwima Nwabiagya District of the Ashanti Region. The schools include Toase Senior High School at Toase (mixed school), Nkawie Senior High Technical School at Nkawie (mixed school), Osei Tutu Senior High School at Atwima Akropong (boys' school) and Barekese Senior High School at Barekese (mixed school). Tables 7, 8, 9 &10 show the various student enrolments of the schools under consideration.

Table 7: Toase Senior High School (TOSS) —Student Enrolment

Class	Boarders			Day Students			Total
	M	F	Sub Total	M	F	Sub Total	
Form 1	376	335	711	172	212	384	1095
Form 2	345	290	635	119	107	226	861
Form 3	256	229	485	144	90	234	719
Form 4	256	254	510	125	81	206	716

NB: M=Male, F=Female.

Table 8: Nkawie Senior High Technical School (NSHTS) Student Enrolment

CLASS	Boarders			Days Students			TOTAL
	M	F	Sub Total	M	F	Sub Total	
Form 1	252	217	469	147	111	258	**727**

Table 8 continued

Form 2	297	221	<u>518</u>	187	80	<u>267</u>	**785**
Form 3	183	168	<u>351</u>	193	85	<u>278</u>	**629**
Form 4	224	125	<u>349</u>	206	86	<u>292</u>	**641**
TOTAL	**956**	**731**	**1687**	**733**	**362**	**1095**	**2782**

NB: M=Male, F=Female.

Table 9: Barekese Senior High School—Student Enrolment

	Boarding			Day			
Class	M	F	Sub Total	M	F	Sub Total	**Total**
Form 1	371	356	727	113	103	216	**943**
Form 2	472	467	939	100	96	196	**1135**
Form 3	496	309	805	89	79	168	**973**
Form 4	330	322	652	70	66	136	**788**
Total	**1689**	**1474**	**3163**	**392**	**364**	**756**	**3839**

NB: M=Male, F=Female.

Table 10: Osei Tutu Senior High School (OT) —Student Enrolment

Class	Boarding	Day	Total
Form 1	391	168	559
Form 2	409	136	545
Form 3	350	181	531
Form 4	413	148	561
Total	**1,172**	**465**	**1,637**

NB: This is all-boys school.   (This is all-boys school)

Sample and Sampling Procedure

Out of an accessible population of 11,729, I chose a sample size of 370 to
work with. The sample was selected from the four schools according to their

proportion to the accessible population of 11,729. The sample size represents approximately 3% of the accessible population which is the total enrolment of the four schools.

Table 11: Breakdown of School Enrolment and Sample Size

| Name of School | TOTAL ENROLMENT | | | | SAMPLE SIZE | | | | |
	M	F	Total	% Of Total	F1	F2	F3	F4	Total Sample
TSHS	1793	1598	3391	29	**26**	**27**	**27**	**27**	**107**
NSHS	1689	1093	2782	24	**22**	**22**	**22**	**23**	**89**
OTSHS	1637	0	1637	14	**13**	**13**	**13**	**13**	**52**
BSHS	2081	1838	3919	33	30	30	31	31	**122**
Total	7200	4529	**11729**	100	91	92	93	94	**370**

NB: M=Male, F=Female.

The choice of the sample size was guided by a table for determining the random sample size from a determined population by Krejcie & Morgan (1970). Table 12 shows relevant portions of that table.

Table 12: Determining random sample size from a determined population.

If your population is:	Then your random sample should be:
…	…
6,000	361
7,000	364
8,000	367
9,000	368
10,000	370
15,000	375
20,000	377

According to Table 12 with the accessible population of 11,729, the ideal sample size is 370. As indicated earlier, the sample was selected from the four schools according to their proportion to the accessible population and Table 11 shows a breakdown of the sample distribution from each school.

I chose stratified sampling as the procedure for selecting the sample. Stratified sampling is a type of probability sampling in which the population is divided into a number of subgroups or strata, each subgroup constituting elements that share common characteristics. For instance, Strata One may be Male, Two, Female, and so on. Then a random sampling is done within each of the strata or the homogenous subgroups to get the sample. In this research the subgroups or strata mainly consisted of the various levels, i.e. Forms 1, 2, 3 and 4.

In each school, after permission had been officially sought from the school authorities, two classes were randomly selected from each of the four year batches or levels i.e. from Forms 1, 2, 3 and 4 two classes were randomly selected making a total of 8 classes from each school. To select those classes I first gathered all class captains and grouped them according to their levels. So I had four groups of class captains—all class captains of Form 1 were in group 1, class captains of Form 2 in group 2 and so on. I got pieces of paper for each group. On some of the papers I wrote the inscription YES and on others the inscription NO. For each group, the papers bearing the inscription YES were only two. This is because I needed only two classes from each batch or level and the classes whose class captains chose YES were the ones that were selected to respond to the questionnaires. After the exercise eight classes were chosen. This was the first stage of the sample selection process.

In each school, after the eight classes were randomly selected, the second round of random selection was done to finally select the respondents for the school. Students from those eight classes were seated class by class. Again, I got pieces of paper according to the number of students in each of the classes. I wrote on some of the papers the inscription 'YES' and on others the inscription 'NO'. Since I already had in mind the number of respondents that I needed in each school, I divided that number into eight (the number of classes selected from the school) to get the approximate number of respondents to choose from each of the eight classes. For example, 107 respondents were required in Toase Senior High School, 89 from Nkawie Senior High School, 52 from Osei Tutu Senior High School and 122 from Barekese Senior High School. Each of these figures was divided into eight to obtain the respondents from each of the eight classes in the four schools. In each class the number of papers bearing the inscription YES was equivalent to the number needed from that particular class. Those who picked YES were selected to respond to the questionnaire while those who picked NO were asked to leave. Students who picked YES from the eight classes constituted the sample from that particular school and samples from all the four schools together formed the sample for the study. Table 11 shows respondents selected from each of the eight levels from the four schools.

Instrument

The instrument used to collect data was questionnaire. This was because all the respondents were SHS students and were therefore expected to have the basic level of proficiency in written English that was required to respond to the set of questions in the questionnaires. The questionnaire was made up of

five (5) parts. Part 1 was to elicit personal information from the students. Part 2 was on students' general knowledge of the Internet. Part 3 was on students' level of Internet use while part 4 was to elicit information on how students use the Internet. Part 5 was to find out information on non-Internet users. The questionnaire consisted of both closed-ended and open-ended items. In all, there were 41 items.

Data Collection Procedure

I collected the data all alone. Immediately after the sample from a particular school was selected, the students were given the questionnaires. After having seated the respondents, some explanation was given to guide them on how to answer the questionnaires. Then enough time was given them to respond to the questionnaires in writing and after that I collected the feedback immediately. In all the four schools that the questionnaires were administered, I was able to get students to respond to the questionnaires. Of the four schools, three were mixed schools while one was a purely boys' school. The sample was composed of both male and female students from form one to form four. I was able to administer all the 370 questionnaires within two weeks.

In all, 370 questionnaires were administered in the four schools. After collecting and examining the questionnaires, only 214 were found to be usable for the analysis. The rest 156 of the questionnaires were discarded. Some were found to be incomplete and in this case either some vital details like gender, class and or age were not provided, or large portions of the questionnaire were not responded to. Again, there were instances where some students could not be categorised because for gender for instance, they ticked both male and

female instead of ticking only one of the two, even though there were clearly written instructions to that effect.

Data Analysis

Completed questionnaires obtained from the respondents were first inspected and cleaned to eliminate outliers and incomplete questionnaires. Responses were then coded and template laid. Data were then inputted into the Statistical Product and Service Solutions (SPSS version 16) software. This facilitated the use of cross-tabulation, Chi Square statistical test. Data were transformed in order to guide suggestions, conclusions and decision-making. Moreover, the data were presented in the form of tables, pie-charts and bar graphs using Microsoft Excel & Word to enhance reading and comprehension.

Specifically, research question one was analysed using both descriptive and inferential statistics. For instance, the Chi-square non-parametric test was used to test for relationships between respondents' profile and general knowledge. The remaining two research questions were analysed with only descriptive statistics in the form of tables, bar graphs and pie-chart for easy comprehension. For instance, with respect to research question two pie charts (Figure 11, 12, and 13) were used to present the data. The same tool (Figure 15) was used to present data on research question three. A 5-point Likert scale was used to present responses from non users (Table 19). The scoring was done as follows: *SA= Strongly Agree; A= Agree; N/C=Not Certain; D=Disagree, SD=Strongly Disagree.* Moreover, respondents' demographics were presented in cross-tabulations.

CHAPTER FOUR

RESULTS AND DISCUSSION

Overview

This chapter presents the discussion of the results of the study. Two hundred and fourteen (214) questionnaires were analysed. The analysis was done to elicit students' view on the research questions for the study. The research questions sought to find out the students' general knowledge level of the Internet, the students' level of Internet use and the kind of use the student puts the Internet to. It begins with the personal details of the respondents and ends with the discussion of results.

Personal Details

This part looks at the social demographic features of the respondents. The socio-demographic variables captured in this research include Gender, Age, Level and Status. The variables for Gender are as usual male and female. Respondents were categorised into three (3) main age brackets namely Below 15 years, Between 15 and 19 years and then 20 years or more. For the Level the respondents were grouped into SHS1, SHS2, SHS3 and SHS4 students while Status referred to Boarders and Day students. Statistics of these variables are captured in Tables 13, 14 and 15.

Table 13: Students' Gender against Age, Level and Status

VARIABLE		GENDER		
		Male n=153 (%)	Female n=61 (%)	Total n=214 (%)
AGE (Years)	Below 15	5 (55.56)	4 (44.44)	9 (100.0)
	Between 15 and 19	131 (71.19)	53 (28.81)	184 (100.0)
	20 years or more	17 (81.95)	4 (19.05)	21 (100.0)
LEVEL	SHS1	40 (70.18)	17 (29.82)	57 (100.0)
	SHS2	38 (71.69)	15 (28.31)	53 (100.0)
	SHS3	50 (75.76)	16 (24.24)	66 (100.0)
	SHS4	25 (65.79)	13 (34.21)	38 (100.0)
STATUS	Boarder	124 (70.45)	52 (29.55)	176 (100.0)
	Day	29 (76.32)	9 (23.68)	38 (100.0)

Table 13 presents a cross analysis between Gender on one side and then Age, Level and Status on the other. It could be noticed from the table that at all age levels male students outnumber female students. In all there are 153 male students constituting 71.50% and only 51 female students constituting 28.50%. The number of male students is almost three times more than that of female students. Furthermore, it is noticed that as students climb the educational ladder, the ratio further increases in favour of boys. At below 15 years the ratio of boys to girls was 55.56% to 44.44% which was relatively closer. As the students advance in years to between 15 and 19 years the gap widens with boys constituting 71.19% while the girls reduced to 28.81%. Then among students who are 20 years or above, the gap further widens with boys increasing to 81.95% and girls reducing to only 19.05%.

The phenomenon that is observed at the age brackets is also noticed at the various levels and it is the fact that at each level of the educational ladder there are more boys than girls. At all levels from the first year (SHS1) to the fourth year (SHS4) male students outnumber female students. As the ratio of male students increases from 70.18% through 71.69% up to 75.76%, that of female students decreases from 29.82% through 28.31% down to 24.24% up to the third year (SHS3). But the fourth year sees a slight difference in that pattern. Even though male students are still more than their female counterparts, the proportion of the female students in SHS4 picks up to 34.21% while that of the male student experiences a decrease to 65.79%; a phenomenon which is contrary to the general trend observed so far.

The predominant phenomenon of male students outnumbering their female counterparts is again noticed when it comes to their status. With both

boarders and day students, there are more males than females. Of all the boarders, male students constitute 70.45% with 29.55% female students. With the day students 76.32% were male and 23.68% female students.

Table 14: Students' Level against Age and Status

AGE & STATUS			LEVEL		
	SHS1	SHS2	SHS3	SHS4	Total
AGE (Years)					
Below 15	8	1	0	0	9
	(88.89)	(11.11)	(0.0)	(0.0)	(100.0)
Between 15	48	50	57	29	184
and 19	(26.08)	(27.17)	(30.99)	(15.76)	(100.0)
20 years or	1	2	9	9	21
more	(4.76)	(9.52)	(42.86)	(42.86)	(100.0)
STATUS					
Boarder	49	42	59	26	176
	(27.84)	(23.87)	(33.52)	(14.77)	(100.0)
Day	8	11	8	11	38
	(21.05)	(28.95)	(21.05)	(28.95)	(100.0)

Table 14 shows the relationship between students' level against their age and status. It is noticed that majority of those aged below 15 years are found in SHS1 constituting 88.89% with only 11.11% in SHS2. None of the respondents in this age brackets was found in SHS3 and SHS4. What could explain this situation is that in Ghana the average student begins the senior high school education at the age of 15. This is because basic school normally

begins at age 6 and lasts for 9 years, so by the time he or she gets to the senior high school level the student is around the age of 15 years. So the few students (9) below 15 years who are found in senior high school are those that may be referred to as the 'early starters'. They are those who either started the basic school (Class One) before age 6 or those who might have been made to skip a class because they were deemed to be exceptionally brilliant. They are students whose academic performance was markedly much higher than their peers. So those in this age brackets are very few (9) in the second cycle institutions with majority of them (8) in the first year and just one in the second year. As they grow they leave that age bracket that is why none of them is found in SHS3 and SHS4. The age range between 15 and 19 years is actually the average age for students in the second cycle schools in Ghana, so majority of the students (184) are found in this group. This explains why the proportion in this bracket looks fairly evenly distributed among all the four level: 26.08%, 27.17%, 30.99% and 15.76% for SHS1, SHS2, SHS3 and SHS4 respectively. Students in the third category, which is 20 years or above, are those that may be referred to as 'laggards'. Several factors can result in this and some of these factors may include students being made to repeat some classes, students who might have stopped schooling and continued later and those who had to start SHS1 a year or two after completing junior high school, sometimes as a result of financial problems at home. Their number (21) is also relatively few.

Boarders and day students are nearly evenly distributed at all levels but at each level, there are many more boarders than day students. In the fourth year, while the proportion of day students increases that of the boarders rather

reduces. Consequently, day students in the fourth year are more than twice the proportion of boarders with a ratio of 14.77% to 28.95% in favour of day students.

Table 15: Students' Age against Status

| STATUS | AGE(years) | | | |
	Below 15	Between 15 and 19	20 years or more	Total
Boarder	7	152	17	176
	(3.98)	(86.36)	(9.66)	(100.0)
Day	2	32	4	38
	(5.26)	(84.21)	(10.53)	(100.0)

Table 15 shows statistics on students' age against their status. Again for both boarders and day students, a majority of 86.36% and 84.21% for boarders and day students respectively are in the age brackets between 15 and 19 years with just a few in the other two age categories.

Research Question 1: What is the student's general knowledge of the Internet?

In all there were eleven questions that tested how informed the students generally are about the Internet. These ranged from question 5 to question 15. Five out of the eleven questions had *True*, *False* and *Not Certain* options. These were questions 5, 6, 8, 10 and 15. Another set of five questions required respondents to write down their answers in spaces provided. It was so because answers to these questions were either too wide-ranged or required subjective responses like providing one's own e-mail address. These were also questions

7, 9, 11, 13 and 14. Then the last one, question 12, had options lettered A to D from which students had to choose the correct option by circling the corresponding letter. Table 16 shows the performance of the students with respect to their knowledge of the Internet.

Table 16: Students' Knowledge of the Internet against Personal Details

Profile	High Knowledge	Low Knowledge	X^2
GENDER			
Male	73.2	26.8	0.006
Female	54.1	45.9	
AGE			
Below 15 years	66.7	33.3	
Between 15 and 19	70.1	29.9	0.113
20 years or more	47.6	52.4	
STATUS			
Boarder	69.1	30.9	0.358
Day	61.5	38.5	
LEVEL			
SHS1	68.4	31.6	
SHS2	73.6	26.4	0.294
SHS3	59.1	40.9	
SHS4	73.7	26.3	

Table 16 shows students' knowledge of the Internet. Students were categorised into two groups namely those who had High Knowledge and those who had Low Knowledge. Out of the 11 questions, those who obtained six or

more correct, representing 50% or more were deemed to have high knowledge while those who got less than six correct, representing less than 50% were deemed to have low knowledge. Variables considered for discussion as far as general knowledge of the Internet is concerned include Gender, Age, Status and Level.

It is important to establish whether or not there is any significant difference between one's personal detail and knowledge of the Internet. This is indicated on the table under Chi Square (x^2). If the figure under x^2 is less than 0.05 then there is a significant difference, otherwise the difference is insignificant. For all the variables considered, the statistics showed that there is a significant relationship between gender (0.006) and knowledge. There is no significant relationship between knowledge of the Internet and age (0.113), level (0.294) and status (0.358).

The difference between the knowledge levels of male and female students was significant. Though both male and female students had majority falling in the High Knowledge category, the performance of the male students was significantly higher than that of the female students. For the boys 73.2% were deemed to have high knowledge while 26.8% fell in the low knowledge group. However, for the girls, 54.1% fell into the high knowledge category with 45.9% falling into the low knowledge group. Unlike that of the boys, this is quite close. The figures suggest that a greater percentage of the boys demonstrated higher knowledge of the Internet than the girls. Generally, the research has shown that the students have very high basic knowledge of the Internet but as far as gender is concerned, male students demonstrated higher knowledge of the Internet than female students. With respect to knowledge of

the Internet, Hong, Ridzuan, & Kuek (2003) found that most of the students possess adequate or good basic knowledge of the Internet. Then with reference to male students demonstrating higher knowledge of the Internet than female students, other research findings have reported that male users use the Internet or the Web significantly more than their female counterparts (Lubans, 1999; Morahan-Martin, & Schumacher, 2000). However, several other researchers have also indicated that the gender gap is closing or diminishing rapidly (Odell, Korgen, Schumacher & Delucchi, 2000; Weiser, 2004; Sherman, End, Kraan, Cole, Campbell, Birchmeier & Klausner, 2000). According to Lubans (1999) the gender gap is even non-existent.

On the issue of age and knowledge, with exception of those in the 20 years or more category, the rest demonstrated high knowledge. For those below 15 years, 66.7% demonstrated high knowledge while 33.3% were low in knowledge of the Internet. For those between 15 and 19 years, 70.1% showed high knowledge with 29.9% falling under the low knowledge group. But those 20 years or above, surprisingly, 47.6% demonstrated high knowledge and 52.4% showed low knowledge. It is only this age group that showed such low level knowledge of the Internet. It has already been indicated that this group constitutes those above the normal age range for senior high school. It is not clearly known why more of them demonstrated low level knowledge of the Internet.

With the issue of students' level also, at each level more students demonstrated high knowledge of the Internet. With students in SHS1, 68.4% demonstrated high knowledge of the Internet with 31.6% who had low knowledge. For SHS2, 73.6% were in the high knowledge category while

26.4% fell under low knowledge. Though the figures for SHS3 were closer, many students still showed high knowledge representing 59.1% as against 40.9 who fell under low knowledge. Finally, 73.7% of the students in SHS4 fell under the high knowledge group while the low knowledge category had 26.3%. Again, concerning the student's level, there is no basis to conclude that there is any significant relationship between their level and their knowledge of the Internet whether they are beginners, continuing or final year students. But this finding contradicts Lubans (1999) who, in a similar study on Duke University's East Campus, reported that freshmen (first year students) claim significantly more use of the Web than the 7—10th graders

On the issue of status, Table 16 indicates that both boarders and day students demonstrated high knowledge of the Internet. For the boarders 69.1% demonstrated high knowledge whilst 30.9% also demonstrated low knowledge. For the day students, 61.5% demonstrated high knowledge while 38.5% fell under the low knowledge group. Clearly, there is no basis to conclude that one's status, whether as a boarder or a day student, has any significant influence on his level of knowledge of the Internet.

Table 17: Respondents' knowledge of the Internet

No.	Statement	Frequency	True	False	Uncertain	Total
5	The Internet allows exchange of information	214	96.7	1.9	1.4	100.0
6	Internet is possible without computers	214	48.1	48.6	3.3	100.0

Table 17 continued

8	Exchange of information is the basic function of the Internet	214	86.4	8.9	4.7	100.0
10	A search engine enables you to find information on the Internet	214	88.3	9.8	1.9	100.0
15	A modem is a device used for downloading multimedia files	214	65.9	28.0	6.1	100.0

Generally, the students demonstrated a higher-than-average knowledge of the Internet. For instance, there were two questions (questions 5 and 8) on the basic function of the Internet which is the exchange of information and 96.7% and 86.4% respectively got it correct. In question 5 only 3.3% got it wrong made up of 1.9% who said it is false and 1.4% who were not certain about the answer. Then 8.9% got question 8 wrong by saying it was false with 4.7% saying they were not certain. All the rest (86.4%) got the question correct.

Question 6 states that it is possible to have Internet without computers and a surprising 48.1% of the respondents said it is true while 3.3% said they were not certain. The statement is actually false because without computers it

is not possible to have an Internet. Less than half (48.6%) however got it correct by saying that the statement is false.

The next is question 10 which states that 'A search engine enables you to find information on the Internet.' This statement is true and 88.3% of the respondents got it right. While 9.8% wrongly indicated that the statement is false, 1.9% said that they were not certain.

Question 15 states that 'A modem is a device used for downloading multimedia files.' This statement is actually false. A modem is rather used to change analogue signals into digital signals and vice versa. Surprisingly, 65.9% of respondents erroneously thought it is true and 6.1% said that they were not certain. That means a total of 72% did not know the correct answer. Only 28.0% of the respondents got it correct by indicating that it is false.
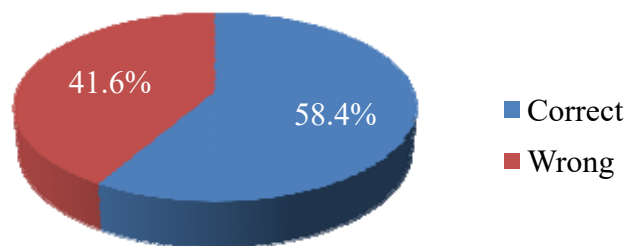

Figure 3. Internet Providers in Ghana

Figure 3 indicates respondents' view on question 7 which requires them to name any one service provider in Ghana that provides Internet services to customers. Though majority of respondents were able to provide correct responses, the percentage of those who got it wrong was equally significant.

About 58.4% were able to write down the name of a service provider in Ghana while 42.6% could not.
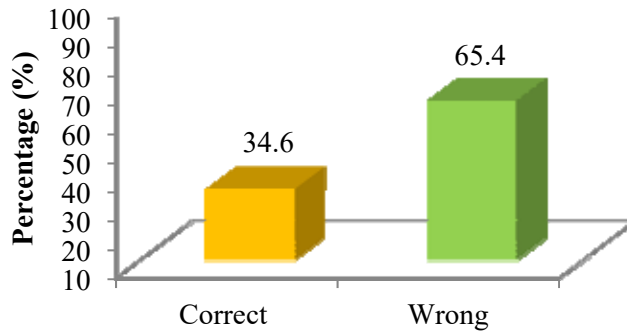
Figure 4. Social Network

Figure 4 shows the result of question 9 where respondents were asked to write down one social network that they know. At least sixty-five percent (65.4%) of them were able to provide correct responses while 34.6% got it wrong. The fact that 34.6% could not provide just a single social network is still unfortunately a large proportion.

Figure 5. Search Engine that students have used before

Figure 5 shows students' response on search engines that they have used before. More than fifty-seven percent (57.5%) were able to provide correct

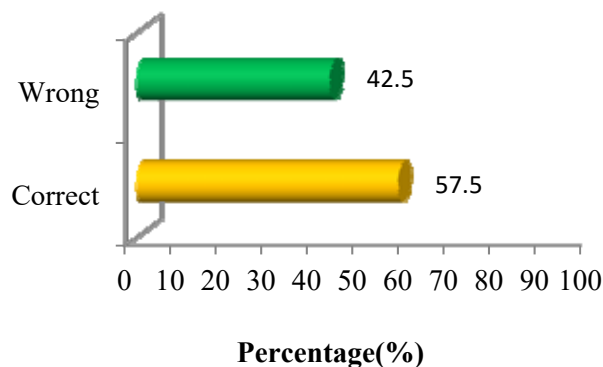examples while 42.5% could not. Search engines are services used in finding web pages on the Internet and so if students really use the Internet they should be able to give examples. Could it be that students use these services but do not know the associated vocabulary? Whatever it is the proportions here do not match question 21 which indicates the proportion of the students who use the Internet. Logically, one would have expected that the percentage of those who would be able to provide a correct example of a search engine would be close to the proportion of those who have used the Internet before. But it is not. The logical conclusion that can be drawn is that there are many students who use the Internet facility but are not familiar with its registers.
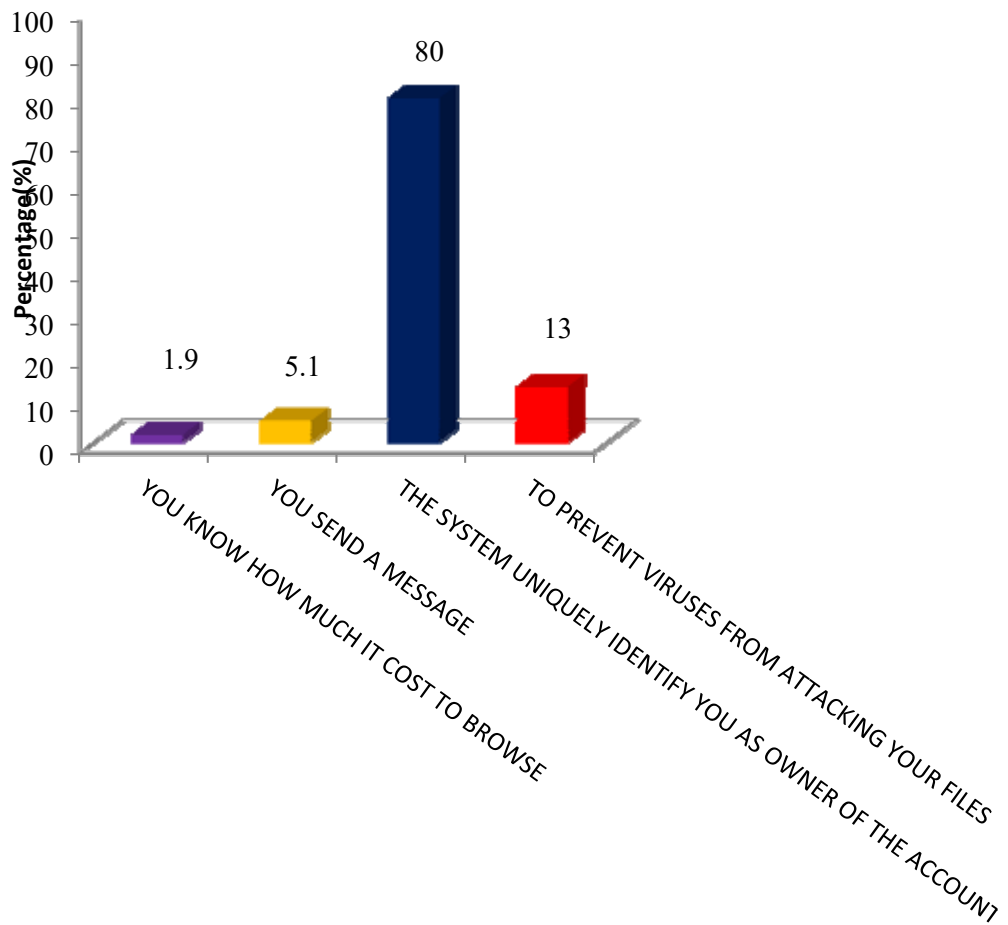
Figure 6. What a Password does

Figure 6 shows respondents' views on question 12 on what a password does. A high percentage of 80% showed clear understanding of the concept that a password helps the system to uniquely identify one as the owner of the e-mail account being accessed. It means four out of every five know what a password is. The rest 20% got it wrong.
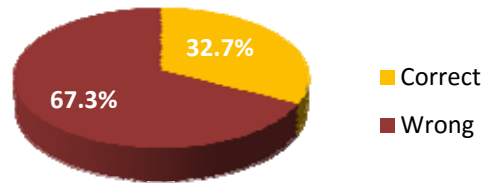
Figure 7. E-mail Address

Figure 7 shows students' response to question 13 which required them to write down any correct e-mail address. While 67.3% provided good examples 32.7% wrote faulty ones. One difficulty that ran through many of the faulty ones include a challenge with the '@' sign. While some omitted the mandatory sign, others too, instead of writing the sign, rather preferred to write it in words as "at". For instance there were examples like "abc at yahoo.com" or "xyz at gmail.com".
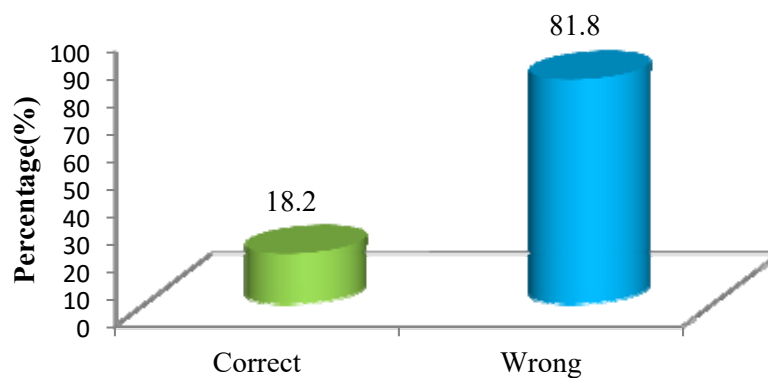
Figure 8. User ID

Figure 8 shows students' responses on question 14 requiring students to indicate only the user ID in the e-mail address they provided in question 13. And this, 81.8% were able to single out the user ID in the e-mail address. However, 18.2% could not make out the user ID from the entire address. This question depends on the previous one and so many of those who got question 13 wrong were likely to get 14 also wrong.

Table 18: Students' view of the cost of Internet use

No.	Statement	Frequency	SA	A	N/C	D	SD	Total
16	The Internet is a helpful tool for students	214	64.5	29.9	3.7	1.4	0.5	100.0
17	The cost of Internet use in Ghana is cheap	214	17.4	33.6	7.9	27.1	14.0	100.0
18	The cost of Internet use in Ghana is expensive	214	37.9	28.0	9.8	18.7	5.6	100.0
19	I don't know about cost of Internet use in Ghana	214	42.1	40.7	8.8	7.0	1.4	100.0

Scale: SA= Strongly Agree; A= Agree; N/C=Not Certain; D=Disagree;

SD=Strongly disagree.

Table 18 contains four five-point Lickert scale questions sampling students' view on the Internet. Question 16 states that "The Internet is a helpful tool for students". Majority of the respondents are in favour of the statement with 64.5% who strongly agree and 29.9% who agree to the statement. However, 1.4% disagrees while 0.5% strongly disagrees with the statement while 3.7% indicated that they are not certain.

Then comes the cost of enjoying the Internet facility. Questions 17, 18 and 19 are all on the cost of Internet use in Ghana. Question 17 states that the cost of Internet is cheap and to this 17.4% strongly agrees while 33.6% also agrees. This sums up to 51% meaning a slight majority of the respondents think Internet is not expensive in Ghana. For the remaining 49%, 7.9% of them were uncertain whether Internet use in Ghana is cheap. But 27.1% and 14.0% disagreed and strongly disagreed respectively meaning that 41.1% of them have the view that Internet use in Ghana is not cheap. Question 18 states that the cost is expensive. While 37.9% strongly agree to this statement 28.0% agree making a total of 65.9% who answered in the affirmative. Question 19 also states "I don't know about the cost of Internet use in Ghana." Again, 42.1% strongly agree while 40.7% agree making a total of 82.8% that agree.

There is an inconsistent trend that can be noticed in the responses of the students with these three statements. First, a total of 51% say they agree that Internet use in Ghana is cheap. Then a total of 65.9% also agree that it is expensive. Finally a total of 82.8% claim that they don't know about the cost

of Internet use in Ghana. Logically, when 51% had said they think Internet use is cheap, it would have been expected that a similar proportion would have disagreed to the statement that Internet use is expensive. Strangely, 65.9% of the same group in another breath agreed that Internet is expensive. And when it comes to question 19, still the same group claims that they don't even know about the cost of Internet use in Ghana.

However, looking at the trend of responses still, a total of 51% agreed that the cost of Internet in Ghana is cheap, a total of 65.9% of the same group agreed that the cost of Internet use is expensive and a total of 82.8% agreed that they don't know about the cost of Internet use in Ghana. The least among the three is the 51% that claimed that Internet is cheap. The majority of 82.8% said they do not actually know the cost. The percentage that said Internet is expensive is greater than the one that said it is cheap, while the percentage of those who said that they didn't know was also greater than that of those who said it is expensive. It seems that the students are not very conversant with the cost of Internet use in Ghana. From the results one cannot clearly say what their opinion on the cost of internet use in Ghana is.

Research Question 2: What is the students' level of Internet use?
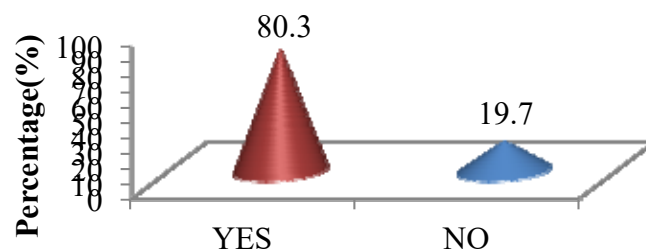
(QUESTION 21: Have you ever used the internet before?)

Figure 9. Students Who Have Used the Internet Before

On Internet use generally, at least four (4) out of every five (5) students, representing 80.3%, had ever used the Internet before. Only 19.3% had never used the Internet before.

Question 22: Do you have an email address?
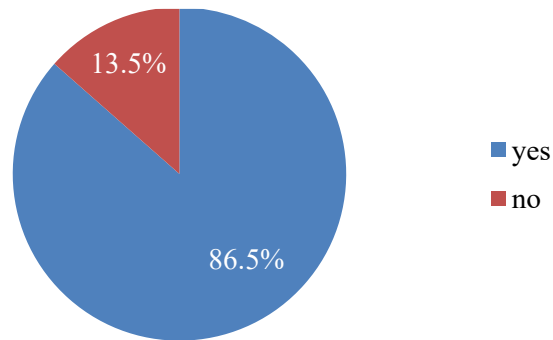
Figure 10. Respondents with e-mail addresses

Of those who use the Internet, 86.5% said that they had e-mail addresses and 13.5% of them said they did not. This finding is definitely an improvement on a much earlier research finding that indicated that just a small number of students had personal web pages (Lubans, 1999). Several years after the inception of the Internet it is not surprising that many more around the globe today patronise the Internet through many applications including the electronic mail (e-mail).
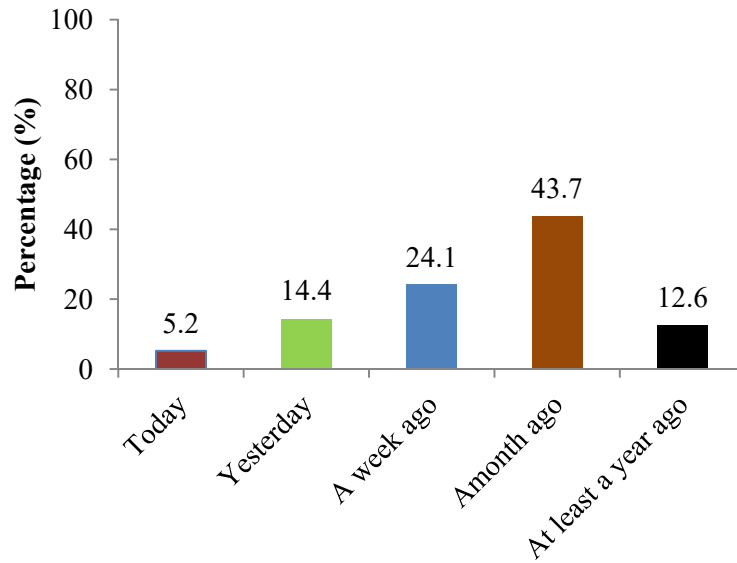
Figure 11. The last time students had visited the Internet

Figure 11 shows the last time students had visited the Internet as of the time the questionnaires were being administered. As of the time of answering the questionnaire, only 5.2% of the respondents had visited the Internet that day. The previous day 14.4% had visited the Internet and 24.1% a week earlier with 12.6% visiting it at least a year earlier. From this it is known that, on the average, 5.2% of the students had visited the Internet within the day. Within the week a total of 43.7% had accessed the Internet and in a month a huge proportion of 87.4% had visited the Internet at least once. The implication is that out of this figure there are some who would visit the Internet more than once within the month. This is encouraging, but whether or not they derived the maximum benefit from this facility would depend on what they used the Internet for and the amount of time they spent browsing. While less than 50% visit the Internet per week, Lubans (1999), in an earlier study said that majority of students use the Internet from several times a week to often.
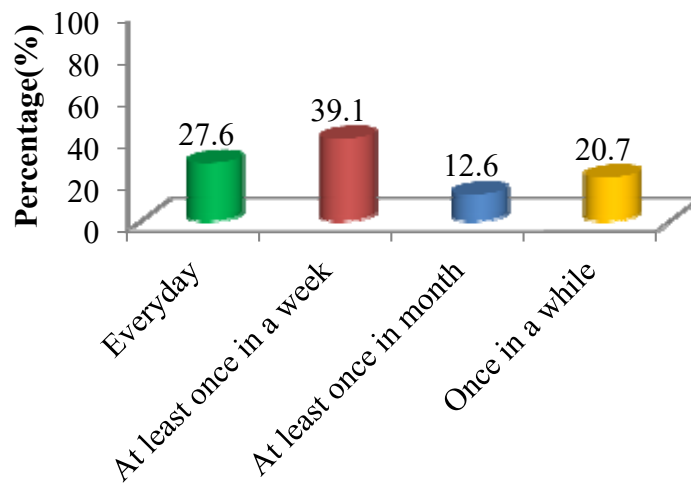
Figure 12: Frequency of Use

Figure 12 indicates students' views on question 24 on how often students access the Internet. Every day, 27.6% of the respondents visited the Internet. The results show that 39.1% and 12.6% visited the facility weekly and monthly respectively while 20.7% of them accessed the Internet once in a long while. This indicates that a total of 66.7% visited the Internet at least once every week while 79.3% visited the Internet at least once every month. In other words more than two out of every three of the respondents visited the Internet every week and four out of every five students accessed the Internet monthly. This represents a fairly high frequency of use even though 20.7% or approximately one of every five who could be referred to as dormant users is quite significant. This finding lends credence to the fact that the level of Internet use among students is very high now. Several other researchers have revealed that, as a result of increase in Internet use, the gender gap in Internet use is fast diminishing and in some cases it is even non-existent (Lubans, 1999; Odell, Korgen, Schumacher & Delucchi, October 2000; Sherman, End, Kraan, Cole, Campbell, Birchmeier, & Klausner, 2000; Weiser, 2004).
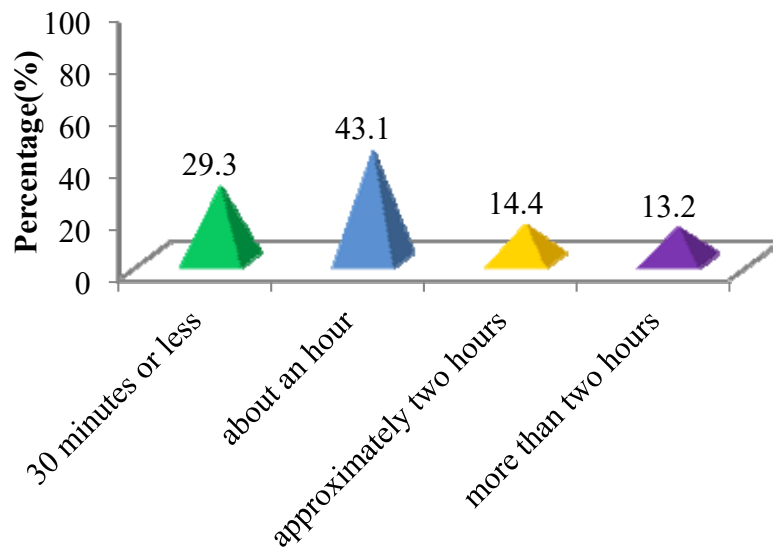
Figure 13. Length of Time Spent per Visit

Figure 13 indicates the length of time users browse the Internet at each visit. According to the figure 29.3% spent a maximum of 30 minutes, 43.1% spent about an hour while 14.4% would stay connected for approximately two hours and 13.2% normally stayed for more than two hours. In the senior high school, the average length of a single lesson is 40 minutes. This means that 29.3% spent less than a period (30 minutes) browsing and 43.1% would browse for about one and a half periods (60 minutes) at a sitting. At each visit, while 14.4% spent approximately three periods (2 hours or 120 minutes), 13.2% would browse for more than three periods.

This could be very promising depending on whether this group of students falls within the category of frequent users and what they do on the Internet within this time frame. There is clear evidence that the level of Internet use among the students is high and this phenomenon is not exclusive to this particular study. While Chou and Ming-Chun (August 2000) confirmed that

Internet addiction does exist among some college students in Taiwan, Nalwa and Anand (December 2003) described the increase in Internet use as dramatic and further stated that it has led to pathological use (Internet addiction) among students. Korgen, Odell, and Schumacher, (2001) on the other hand found that those who use the Internet more also study more than those who use the facility for fewer hours per week.
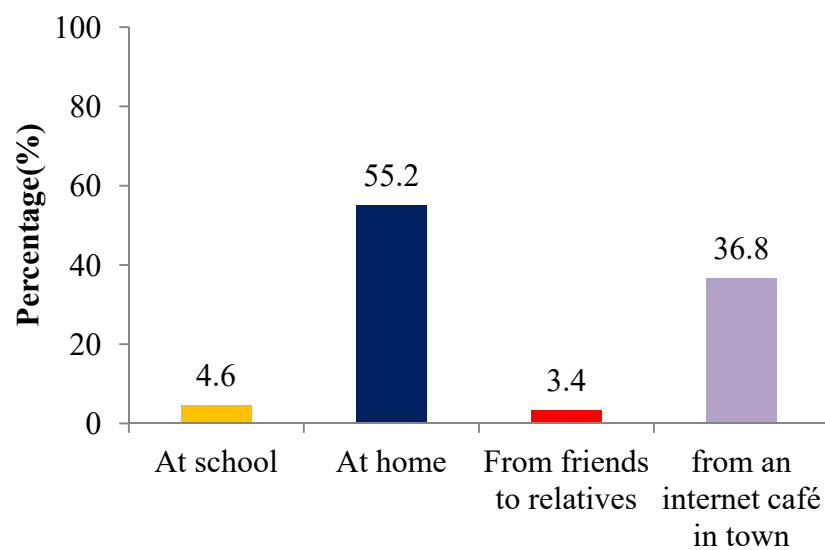
Figure 14. Where Students Usually Access the Internet

According to Figure 14 only few of the respondents (4.6%) accessed the Internet at school. Most students, 55.2% and 36.8% respectively, rather accessed the Internet at home and at an Internet café respectively. With the majority of the respondents being boarders, and the fact that these students spent about nine months in the year at school and about three months at home, one would have expected them to access the Internet often at school. What could explain this phenomenon is figure 12 where we see that a large

proportion (72.4%) of the respondents do not visit the Internet daily. This is because it is not practical for a student in the boarding house to be leaving school every day to go out and browse. It looks more reasonable that those in this category would comprise day students and those who visit the Internet weekly or monthly and also those who would browse once in a long while. The phenomenon where majority of the students (55.2%) accessesd the Internet at home confirms the study by Korgen, Odell, and Schumacher, (2001). They found a significant increase in Internet use among students who have access to a computer (Internet) at home and reported that having a computer at home strongly influenced Internet use by those students. Access to internet has a positive influence on Internet use (Hargittai, 2004).

Non Internet Users

This part captures the views of those who had never used the Internet before. It tries to find out the reason why some students do not use the Internet.

Table 19: Reason for not using the Internet

Statement I don't use the Internet because:	Frequency	SA	A	N/C	D	SD	Total
1. It is expensive	214	35.7	21.4	4.8	28.6	9.5	100.0
2. It is not easily accessible	214	16.7	23.8	2.4	38.1	19.0	100.0

Table 19 continued

		SA	A	N/C	D	SD	Total
3.	I don't know how to use it	214	47.6	28.7	7.1	9.5	7.1	100.0
4.	I just don't like it	214	11.9	16.6	4.8	23.8	42.9	100.0

*SCALE: SA= Strongly Agree; A= Agree; N/C=Not Certain; D=Disagree,
SD=Strongly Disagree*

Of those who didn't use the internet, 57.1% indicated that the reason for their not using the Internet was due to the cost involved. Of this proportion 35.7% says they strongly agree while 21.4% also agree that they don't use the Internet because it is expensive. This confirms the view that Internet use has a direct relationship with affordability (Bozionelos, 2004). Only 28.6% disagree and 9.5% strongly disagree that the use of the Internet is expensive. Then 4.8% was not certain that their not using the Internet could be blamed on the cost of using the facility. Majority of the students are assigning cost as one of the reasons why they do not use the Internet. This puts the responsibility right at the doorstep of government to intervene. The government could install Internet facilities in schools to encourage more students to use the Internet. This is important because on the issue of accessibility, another 40.5% also claims that they do not use the Internet because it is not easily accessible representing 16.7% who strongly agree and 23.8% who agree to this.

When it comes to the skill required to use the internet, 47.6% strongly agree while 28.7% also agree, making a total of 76.3%, who says that their reason for not using the internet is because they don't know how to use it.

Finally, relatively few of them say that they don't use the internet because they just don't like it, and to this 11.9% strongly agree while 16.6% also agree. The others assign different reasons to their not using the internet other than the fact that they don't like the new technology.

Table 20: Non-users' view of their future use of the Internet

Statement	Frequency	YES (%)	NO (%)	Total (%)
Have you used any material downloaded from the Internet before?	214	31.7	68.3	100.0
Do you intend to use the Internet one day?	214	92.7	7.3	100.0

As to whether respondents who do not use the Internet have ever used any material downloaded from the Internet before, like music and video clips, notes, worked examples, etc. 31.7% said they have used materials downloaded from the Internet before while 68.3% answered in the negative. It appears a bit strange for a huge majority of 68.3% of them to claim they have not used any material downloaded from the Internet before.

Asked whether they intend to use the Internet one day, 92.7% of the respondents answered in the affirmative with only 7.3% answering in the negative. This means at least 9 out of every ten respondents who don't use the Internet currently would like to use it one day. This is encouraging. Whatever

the reason for their not using the Internet so far is, there is at least a clear intention to use the Internet as their other friends do.

Research Question 3: What use do students usually put the Internet to?
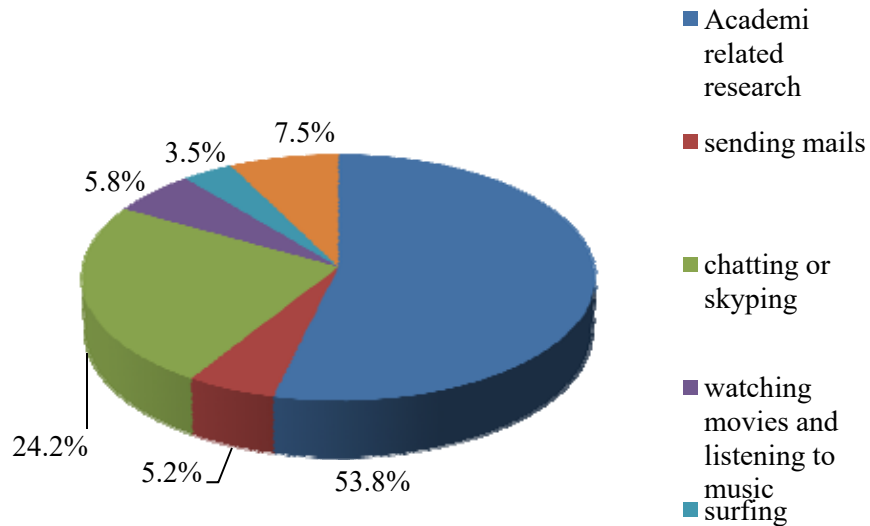
Figure 15. What students spend the most time on

Figure 15 indicates how students use the Internet. It shows students' response as to the specific activity that they spent the most time on whenever they visit the Internet. According to the diagram majority of the students (53.8%) say they spent the most time on academic related research on the Internet. While 24.2% said they spent most of their browsing time on mainly chatting or 'skyping' as the second activity that students spent more time on, others spent the most time on sending mails, watching movies or listening to music, surfing and for other things. It is surprising that while only 28.2% included academic related research as one of the activities they engage in on the Internet (Figure 16), 53.8% of the very same group of respondents claimed that they spent most of their browsing time on academic related research.
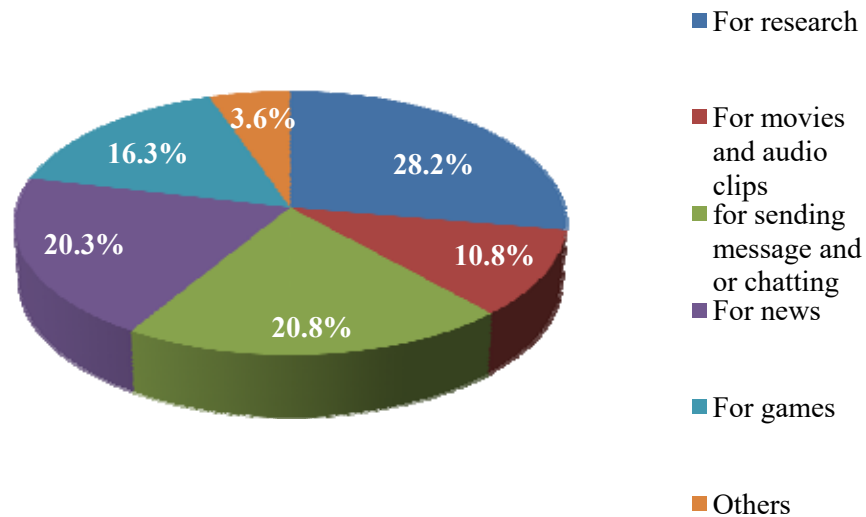
Figure 16. What students usually use the Internet for

Figure 16 shows the activities that engage students' attention on the Internet. Respondents were asked what they normally used the Internet for and were asked to tick as many of the options that applied. The responses indicated that students did a number of things on the Internet because majority of the respondents ticked more than one activity. In fact, almost all of them ticked three or more activities. While 28.2% indicated that doing research to facilitate their academic work was one of the things they engaged in whenever they visited the Internet, 10.8% also mentioned watching movies and listening to audio clips among the activities that engaged their attention on the Internet. Again, 20.8% said that among other things, they sent messages and chatted while 20.3% included watching or listening to news among the things they do on the Internet. Finally, 16.3% of the respondents said they played games before logging off. Only 3.6% of them indicated that they normally engaged in activities other than doing research, watching movies, sending messages or

chatting, listening to news and playing games. To a large extent, the proportion is evenly distributed, and looking at how long it takes to watch a movie or listen to the news or play games, one wonders how much time students actually have to embark on activities relevant to their studies. This is because a total of 72.4% (Figure 11) of the respondents spent not more than an hour on the Internet and so if all these activities or even some of them are performed within a single visit, obviously there would not be enough time left for the students to do meaningful academic research on the Internet. This is because some of the games can be so funny and challenging that one does not even realise the passage of time (Agarwal & Karahanna, 2000). However, with students who know how to manage their time well, it is possible to have fun and still learn. Less than a third (28.2%) of the respondents included academic related research as one of the things that engaged their attention on the Internet and this is not encouraging. As to what students use the Internet for, Weiser (2004) found that male users used the Internet mainly for purposes related to entertainment and leisure, while female users used it basically for interpersonal communication and educational assistance. However, this stance is contradicted by the conclusion drawn by Hong et al (2003) that university students in Malaysia had positive attitudes towards learning using the Internet and added that this perception was not gender specific. Again, Lubans (1999), affirmed that almost all the 7-10th graders claimed they indeed had learned through the Internet and that there were no gender differences.
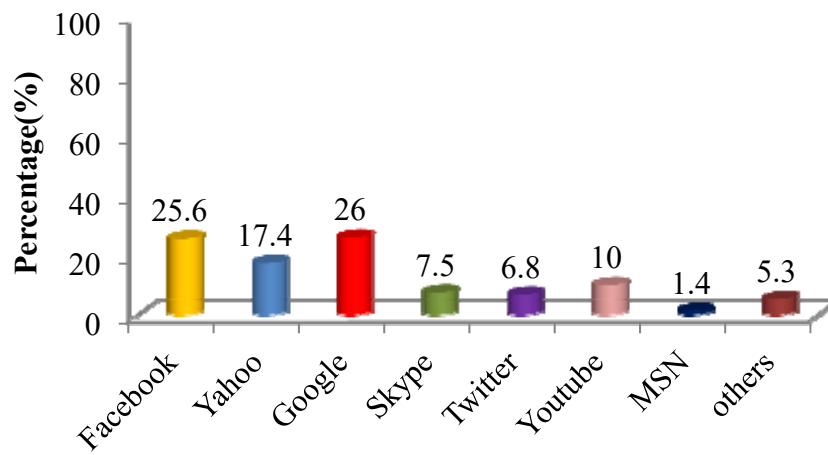
Figure 17. Popular Sites Visited

Among the lot, the three most popular sites with students included Google, Facebook and Yahoo in that order, with 26%, 25.6% and 17.4% respectively. These are sites that are known to aid research a great deal and so depending on what students did at these Internet sites and how much time they spent there, they could be of immense help to students' academic work.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter deals with the summary of the study and also covers the conclusions and recommendations made for policy and practice. It ends with suggestions on related areas for further research.

Summary

The study sought to find out three main things. First, the general knowledge of senior high school (SHS) students in the Atwima Nwabiagya District of the Internet and whether or not there is any significant difference between male and female students as far as this knowledge is concerned. Next, the level of Internet use among these students and finally, whether those who use the facility use it in a manner that enhances their academic work. The research produced some findings on these key areas.

Key Findings

The following were the key findings:

1. On the issue of the general knowledge of the Internet the research indicated that generally, students, especially the male students, had high knowledge of the Internet. In all, 73.2% of the male respondents and 54.1% of the female students respectively, demonstrated a high knowledge level (Table 16). Among the variables considered for the general knowledge of the Internet, namely gender, age, level and status of the

students, the study indicated that it was only gender that had a significant relationship with the knowledge of the Internet with X^2 being 0.006.

2. On the level of Internet use the study looked at the proportion of users and non-users, how often students use the Internet and how much time students spent browsing. The proportion of users to non-users stood at 80.3% to 19.7% representing at least eight out of every ten students who use the Internet.

3. On frequency of Internet use (Table 12), relatively few of these users (27.6%) used the Internet daily. The study showed that every week 39.1% of the Internet users visited the World Wide Web, with 12.6% visiting the Internet monthly. This translates into a total of 27.6% who used the Internet daily, a total of 66.7% who visited the Internet weekly with a total of 79.3% who visited the Internet at least once in a month.

4. As regards the length of time spent at each visit (Table 13), the study also revealed that about 29.3% of these users spent a maximum of 30 minutes each time they went to browse the Internet. About 43.1% also spent approximately an hour whenever they visited the Internet while about 14.4% spend two hours or more each time they went browsing the Internet. This also translates into 29.3% who spent about 30 minutes and about 72.4% who spend about an hour on the Internet.

5. In respect of the direction of Internet use (Figure 16), the study found that less than a third of the Internet users (28.2%) indicated that academic related research was one of the activities that engaged their attention whenever they visited the Internet. This is quite on the low side and shows whether or not students are using the Internet fruitfully. More than half

(53.8%) of them also indicated that they spent more time on academic related research than any other activity on the Internet. This appears to be self-contradictory: when only 28.2% indicated that they used the Internet for academic related research, 53.8% of the same group in another breath claimed that they spent more time on academic related research than any other activity on the internet.

Conclusions

The research found the general knowledge level among students in the district very high. It was found out that there was a significant relationship between gender and knowledge of the Internet. The proportion of Internet users among the students was equally very high. The manner of Internet use however, was a bit doubtful. With most of the students things that engaged their attention on the Internet had little, if any, to do with their academic work.

Again, even though time spent by the students each time they visited the Internet was not short, yet since majority of them did not embark on academic related activities, I have my doubts as to whether they derived the needed benefit from the Internet. The study has thrown more light on the issue of Internet use among students in the district.

Recommendations

Based on the findings of the study, I would like to recommend the following for policy making and practice.

1. All senior high schools should maintain a well functioning ICT lab and Internet access should be made available to all students at no extra cost than the fees they have already paid.

2. The Ghana Education Service, specifically the Curriculum Research and Development Division of the service, should design the curriculum in such a way that knowledge of the Internet and skills in accessing information on the Internet will be taught in all subjects. This would demystify the Internet and better enhance the development of ICT skills rather than the current situation where ICT is taught as an aspect of Integrated Science. It would help students realise that irrespective of the course they pursue, the Internet is still relevant.

3. Teachers should encourage their students to search for information on the Internet, do their given assignments and submit them through the Internet to their teachers. This would persuade all students to attempt using the Internet and also sharpen their skills. It would also reduce the time students use to embark on frivolous ventures on the Internet.

Suggestions for Future Research

With the same topic further research could be conducted in other districts in the region and beyond to determine whether similar results would be realised. Similar studies could also be conducted at the junior high school (JHS) and the tertiary levels as well. Again, further research could be conducted to find out the relationship between Internet use and students' academic performance.

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APPENDICES

APPENDIX

QUESTIONNAIRE

This questionnaire is seeking your view on the general level of Internet use among senior high school students. You are assured that any information provided will be kept highly confidential. This is because the questions do not reveal your identity and so no one will know the responses that you have given. Therefore you are encouraged to respond to all the questions without any reservations.

PART 1: PERSONAL INFORMATION:

Please tick where applicable (Like this "✓ ")

1. **Gender**: a. Male   [   ]   b. Female   [   ]
2. **Age**:   a. Below 15 years [   ]   b. Between 15 and 19 years [   ]

    c. 20 years or above [   ]
3. **Level**:   a. SHS 1 [   ]   b. SHS 2 [   ]   c. SHS 3 [   ]

     c. SHS 4 [   ]
4. **Status**: a. Boarder [   ]   b. Day   [   ]

PART 2: STUDENTS' GENERAL KNOWLEDGE OF THE INTERNET

5. The Internet is a computer system that allows millions of computer users around the world to exchange information.

     a. True [   ]   b. False [   ]   c. Not Certain [   ]

6. Without computers it is still possible to have an Internet

     a. True [   ]   b. False [   ]   c. Not Certain [   ]

7. Name any one service provider in Ghana that provides Internet services to customers. _____

8. The most basic function of the Internet is the exchange of information between two or more users.

   a. True [   ]   b. False [   ]   c. Not Certain [   ]

9. Write down at least one social network that you know

   _____

10. A search engine is a computer programme that helps you to find information on the Internet.

    a. True [   ]   b. False [   ]   c. Not Certain [   ]

11. Mention one search engine that you have used before

    _____

12. A password helps

    a. you to know how much it cost you to browse

    b. you to send a message

    c. the system to uniquely identify you as the owner of the account

    d. to prevent viruses from attacking your files

13. Write any correct e-mail address in the space below

    _____

14. Write only the USER ID of the e-mail address you wrote in question 13.

    _____

15. A modem is a device used in downloading multimedia files onto one's computer

    a. True [   ]   b. False [   ]   c. Not Certain [   ]

Read the following and **Tick** option that applies to you. Tick like this ''✓''

	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree
16. The Internet is a helpful tool for students					

The cost of Internet use in Ghana.

	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree
17. It is cheap					
18. It is expensive					
19. It is reasonable					
20. I don't know					

21. Have you ever used the Internet before?

    a. YES [   ]   b. NO [   ]

NOTE:

  i. *If your answer to question 21 is **YES** continue from **question 22 to 35**, do not answer **questions 36 to 41**.*

  ii. *If your answer to question 21 is **NO** continue from **question 36 to 41**, do not answer **questions 22 to 35.***

PART 3: STUDENT'S LEVEL OF INTERNET USE

22. Do you have an e-mail address   a. Yes [   ]   b. No [ ]

23. When was the last time you visited the Internet?

     a. Today   [   ]   d. A month ago   [   ]

     b. Yesterday   [   ]   e. At least a year ago [   ]

     c. A week   ago   [   ]

24. How often do you visit the Internet?

     a. Everyday [   ]   c. At least once a month [   ]

     b. At least once a week [   ]   d. Once in a long while   [   ]

25. Averagely how long do you stay connected whenever you visit the

Internet?

     a. 30 minutes or less [   ] c. Approximately 2 hours [   ]

     b. About 1 hour [   ]   d. More than 2 hours [   ]

26. Do you own a phone or a computer?   a. Yes [   ]   b. No [ ]

27. If you own a phone or a computer is it connected to the Internet?

     a. Yes [   ]   b. No [   ]   c. I don't know [   ]

28. Does your school have Internet connection?

     a. Yes [   ]   b. No [   ]   c. Not Certain [   ]

29. Where do you normally access the Internet?

     a. At school [   ] c. From friends and relatives   [   ]

     b. At home [   ] d. From an Internet café in town   [   ]

30. From which device do you usually access the Internet? [   ]

     a. From (smart) phone [   ]

     b. From a desktop computer [   ]

c. From a laptop computer [   ]

31. Whenever you visit the Internet which of the following activities do you

spend the most time on?

a. Doing research related to academic work   [   ]

b. Sending mails   [   ]

c. Chatting or skyping [   ]

d. Watching movies and or listening to music   [   ]

e. Surfing—moving from one site to another for fun   [   ]

f. Others (Specify) _____

_____

PART 4: HOW STUDENTS USE THE INTERNET

32. What do you usually use the Internet for? Tick as many as are applicable.

a. [   ]   For research to facilitate my studies

b. [   ]   For movies and audio clips

c. [   ]   For sending message and or chatting

d. [   ]   For news

e. [   ]   For games

f. [   ]   Others (Specify)

_____

33. Which of the following sites do you visit often? Tick as many as are

applicable.

a. [   ] Facebook   b. [   ] Yahoo   c. [   ] Google

d. [   ] Skype   e. [   ] Twitter   f. [   ] Youtube

g. [   ] MSN   h. [   ] Others

34. From which source(s) do you mainly get information for your academic work?

   a. [   ] I use the library

   b. [   ] I depend on my teachers

   c. [   ] I consult my friends and classmates

35. Do you think that the Internet can help enhance your academic work as a student?

   a. Yes [   ]   b. No [   ]   c. I don't know [   ]

PART 5: NON INTERNET USERS

Why do you not use the Internet?

	Strongly Agree	Agree	Not Certain	Disagree	Strongly Disagree
36. It is expensive					
37. It is not easily accessible					
38. I don't know how to use it					
39. I just don't like it					

40. Have you used any material from the Internet before? E.g. music, news, films, etc.

   a. Yes [   ]   b. No [   ]   c. Not Certain [   ]

41. Do you intend to use the Internet one day?

a. Yes [   ]   b. No [   ]   c. Not Certain [   ]