Web-based information behavior of high school learners in Oshana region, Namibia

by

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DECLARATION

I, Tertu Ponhele Shiweda declare that:

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Date

DEDICATION

This dissertation is lovingly dedicated to my late parents, Mrs Ruth Abisai and Mr Phillemon Jeremia Haixwa, my late grandparents, Mrs Hanna Jeremia and Josef Abisai,, my God parents, Mr Wiclief and Mrs Lina Haimbodi, who made sure that I knew how to read while I was still young.

ABSTRACT

The aim of this study was to investigate the Web-based information behaviour of high school learners in Oshana Region in Namibia. The study also considerd the challenges faced by learners when searching the Web for information. For many years in the history of library and information services, print-based information had been the main source of information. However, since the emergence of the Internet and its rapid development, the Internet has provided an almost unlimited pool of Web-based resources, thus becoming a powerful source of information. The Web is now established as the main medium for the wide dissemination of information across the Internet. Within the academic context learners throughout the world are able to retrieve seemingly endless volumes of information across all disciplines and from all over the globe. It is therefore important to study the behavior of young people in relation to Web-based information because it is today one of their most important sources of knowledge.

The findings of this study could assist in curriculum design, especially with regard to Basic Information Science (a subject offered in schools in Namibia), which incorporates information literacy and information-seeking skills development. In addition the study provides some insight into the information and computer literacy levels of learners and proposes ways of responding to these, thus assisting in further developing these important literacies.

The study was guided by Wilson's (1999) model of information behaviour. The model attempts to describe an information-seeking activity and suggests relationships among stages in information-seeking behaviour. The study has adopted a quantitative approach as its methodology. Data from a total of 160 respondents was collected using a questionnaire that consisted of both open ended and closed questions. The study's research questions investigate how, where and when do Grade 12 learners access the Internet, for what purposes do Grade 12 learners use the Web when looking for information, how do Grade 12 learners search for information on the Web, what are the Web information searching skills of Grade 12 learners, what sources of information on the Web do Grade 12 learners use, how do Grade 12 learners evaluate and use information found on the Web, and what are the challenges faced by Grade 12 learners when searching the Web for information. The survey concentrated on Matric learners (grade 12) from Mweshipandeka HS and Gabriel Taapopi SSS in the Oshana region of Namibia. The results were analysed using SPSS as a tool for data analysis.

An interpretation of the findings of this study shows that learners Web-searching skills are inadequate. Overall, there was a high level of familiarity with various Web-information sources

such as search engines, although users limited themselves mainly to a few sources such as the search engines Google and Yahoo and the online encyclopedia, Wikipedia. Learners were not aware of Google's limitations and of the existence of academic, often library-funded, information sources such as databases and electronic journals.   The present study found strong indications that grade 12 learners lack information-evaluation skills as well as acknowledgement skills and that they are not aware of what constitutes plagiarism. This appears to be a result of poor training in schools. However, the status of learner's access to the Internet is good. Both schools involved in this study provide learners with physical access to the Internet.

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LIST OF ABBREVIATIONS

ALA   American Library Association

BIS   Basic Information Science

BRC   Biography Resource Center

GT   Gabriel Taapopi

ICTs   Information and Communication Technologies

ISP   Information Search Process

IT   Information Technology

NLAS   Namibia Libraries and Archives Services

PC   Personal Computer

UKZN   University of KwaZulu-Natal

UNISA   University of South Africa

URL   Uniform Resource Locator

WWW   World Wide Web

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

This chapter will cover the background to and outline of the research problem, the statement of the research problem and key questions to be asked. The significance of the study, its theoretical framework and the research methodology employed will also be briefly outlined. Background information on the two high schools involved in the study will be given and the chapter will end with an outline of the remainder of the thesis as well as a summary.

1.2 Background and outline of the research problem

We live in what is called the information era. Information, arguably, has become the most important element for securing progress and survival in society. For many years in the history of library and information services, print-based information has been the main information resource. However, since the emergence and development of the Internet, offering a pool of resources, the World Wide Web has become a powerful source of information (Kebede, 2002:14). Advances in information technology have changed the way that users seek and use information. "The exponential growth of the World Wide Web (Web) and its ubiquitous adoption as a vital information retrieval tool is exerting power over the evolution and development of information-seeking behavior" (Nahl cited in Bilal, 2000:646).

The Web is now established as the medium for the wide dissemination of information across the Internet. Within the academic context learners throughout the world can retrieve seemingly endless volumes of information across all disciplines from all over the globe (Dalgleish and Hall, 2000). It is therefore important to study the Web-based information behavior of young people. Fidel *et al.* (1999, cited in Kadli and Kumbar, 2011:np) emphasizes that the increase in information available on the Web has affected information-seeking behavior, as many types of information from many different locations are available in one place.

According to Quintana (2012:514) there is plenty of everything on the Web but not all of it is of a high quality. So, where to search, how to search, and how to find the best and most appropriate material is a real issue. There is no quality control on the Net and anyone who has access to an

Internet linked device is able to add content. Hence, learners need to be able to evaluate the quality of Internet information which underscores the importance of equipping them with information literacy skills. Only if learners have the skills required for finding, evaluating and using the available information, can the Web be of benefit to them.

"Gatekeepers" such as editors and peer reviewing, used in the case of printed material to filter information, are missing from the Web. As a result, Web users have to be their own "gatekeepers" and sift information (Lorenzen 2011:151). McKenzie (1998, cited in Gunn 2003:np) in this regard notes that "When students are using the web as an information source they are faced with eliminating a lot of irrelevant information." The Internet provides unique challenges for information seeking: "The Internet is difficult to search not simply because it is large, but because of how it has become large, through loosely related, flexible, self-organizing efforts distributed across the globe through a process with relatively little common structure" (Bruce and Leander 1997, cited in Gunn 2003:np). Many Internet sites have no relevance to the school curriculum and may be quite unsuitable for school purposes (Large and Beheshti 2000, cited in Gunn 2003:np).

The current study focuses on Grade 12 learners at two Namibian high schools. Underscoring the need for the study is the fact that the Grade 12 learners in the two high schools under study can be categorized as belonging to what is referred to as Generation Y (Adams 2009:1). Students from the Generation Y era are born between 1980 and 2000. Generation Y is also known as the Millennial and the Digital generation (Partridge and Hallam 2006:406), or as the Google generation (William and Rowlands, 2007). Walker (2006:8) argues that the students of this generation approach learning in ways different to those of previous generations. Holliday and Qin (2004) and Partridge and Hallam (2006) cited in Adams (2009:2) state that Generation Y students are exposed to the use of the Internet or the Web from a very young age onward. Generation Y students want information that is "quickly and readily accessible with one click of a button". Walker (2006:8) refers specifically to undergraduate students but his remarks are arguably equally applicable to grade 12 learners.

Hinson (2005:22) emphasizes the importance of learners having adequate access to Web-based information. He notes that "After acquiring Web access, students said that they felt smarter, read more, and thought their study skills had improved. Parents commented that their children were more interested in learning and were getting better grades". In addition, high school learners (also referred to as "precollege students" (Lorenzen 2001:152)) whose information skills are not nurtured, will experience problems when they get to universities where they are expected to interact with the Web as part of their studies. As Walton and Archer (2004:2) point out, once students graduate from high school and enter university "their dominant mode of learning will be

self-directed and exploratory and the Web will be a key information source". The Web thus plays an important role in terms of high school learners' current and future studies. On the basis of this, the current investigation of the Web-based information behaviour of Namibian grade 12 learners is considered an important undertaking

1.3 Statement of the research problem and key questions to be asked

The problem addressed by this study is the Web-based information behaviour of grade 12 learners at two high schools in Namibia. To deal with this problem the following key research questions were formulated:

    1. How, where and when do grade 12 learners access the Internet?

    2. What are specific purposes for which Grade 12 learners search information on the Web?

    3. How do Grade 12 learners search for information on the Web?

    4. What are the Web information-searching skills of Grade 12 learners?

    5. What sources of information on the Web do Grade 12 learners use?

    6. How do Grade 12 learners evaluate and use information found on the Web?

    7. What are the challenges faced by Grade 12 learners when searching the Web for information?

1.4 Significance of the study

According to Rafiq (2009:1) information behavior remains an important research area to pursue. "Libraries and other information providers strive to understand users' information needs and how they try to fulfill these needs" (Rafiq (2009:1). Such understanding assists in providing and designing appropriate user-centered information systems and services. In the digital era research on information-seeking behavior has become even more important worldwide. Academic libraries, in order to adequately address the changing information needs of their patrons, need to become more knowledgeable on the information that students value and on what influences their searching for, and obtaining and usage of information. Bruce (2005:np) highlighted that "information plays a significant role in our daily professional and personal lives and we are constantly challenged to take charge of the information that we need for work, fun and everyday decisions and tasks". Tahir *et al.* (2008:1) also indicate that the understanding of the information needs and information-seeking behavior of several professional groups is vital for the planning, implementation and operation of information systems and services in work settings. These

statements by Bruce and Tahir *et al.* are equally applicable to secondary school learners. Hence, an understanding of their information needs and, in terms of the present study, of their information-seeking behavior, is imperative.

According to Urquhart and Rowley (2007:1188), to understand the information behavior of students we first have to mediate and understand factors that influence student information behavior regarding electronic or digital information sources used to support learning. Factors that affect students' information behavior are, on the one hand, individual (micro) and, on the other hand, organizational (macro) in character. The macro factors "are information resource design, information and learning technology infrastructure, availability and constraints to access, policies and funding, and organizational leadership and culture". Whereas the micro factors "are information literacy, academics' information behavior, search strategies, discipline and curriculum, support and training, and pedagogy" (Urquhart and Rowley 2007:1188). While Urquhart and Rowley are referring to university students, their analysis is equally valid for secondary school learners and, as is clear from the above research questions, some of the factors listed by the authors were investigated in the present study.

Fourie (2002) cited in Nkomo (2009:9) suggests that substantial Web information-seeking or searching studies are necessary in order to improve our knowledge of Web-based information spaces, their design and maintenance as well as training related issues. In the emerging virtual environment, knowledge about the information behavior of learners on the Web is crucial for those willing to help learners to effectively meet their information needs online. According to Rafiq (2009:1), libraries and other information providers strive to understand users' information needs and how best to fulfil these needs. This research project hopes to add to existing knowledge on how learners currently make use of the Web to help them in their learning and research. The study is thus of potential value to learners, teachers and those in the library and information field.

The findings of the study could assist in curriculum design, especially with regard to Basic Information Science (a subject offered in schools in Namibia) which incorporates information literacy and information-seeking skills development. In addition, the study provides some insight into the information and computer literacy levels of learners and proposes ways of responding to these, thus assisting in development of these important literacies.

1.5 Delimitations of the study

In doing research it is necessary to indicate what and how much it aims to cover. Creswell (1994:105) states that "boundaries are necessary in a study to provide direction for the terms used, for the scope of the study and for the potential audience". Due to the limited time available for this study, its scope was delimited to Matric learners (grade 12) at Mweshipandeka HS and Gabriel Taapopi SSS in Ompundja and Oshakati circuits. The researcher chose these two schools on the basis of their meeting the selection criteria, namely that the schools needed to be Ministry of Education beneficiaries in terms of Internet connections and the provision of Internet access to their learners. The assumption underpinning the focus on grade 12 learners was that many of them in the following year would be heading for university where they would, of necessity, have to interact with the Web for their studies and be expected to be "Internet savvy". It was also assumed that, of all high school learners, the grade 12s were the most likely to have used, and to continue using, the Web in order to meet information needs related to their schoolwork.

1.6 Theoretical framework and methodology

The study was guided by Wilson's (1999) model of information behavior. According to Wilson (1999:251) the model attempts to describe an information-seeking activity and suggests the relationships among the different stages in information-seeking behaviour. It is a well-established model that has been successfully adopted by other information behavior studies. The current study adopted a quantitative approach and was descriptive in nature. In terms of methodology it comprised a survey of a sample of grade 12 learners from two schools as mentioned above and as described below. Data collection was done by means of a self-administered questionnaire. The theoretical framework will be elaborated on in chapter two and the methodology is described in chapter three.

1.7 Background of the two high schools used in the study

Mweshipandeka High School is a government run, or public, school. It was founded in 1984 by the Ongwediva Town Council. Out of respect for traditions and customs, the school was named after a man who used to live where the school is located, Mr Mweshipandeka Ashipala. At the time when the school was created, Ongwediva was a small developing town. The school is one of the best performing schools in the Oshana region. It accommodates about 700 learners yearly. It is well equipped with a computer laboratory and a library of a good standard. It has a good record of winning awards in most of the subjects on the High and Ordinary levels. Compared to other schools in Oshakati and Ongwediva, Mweshipandeka School sends many learners every year to

continue their studies at universities all over the country. The school is regarded as the pride of the North and this is confirmed by its annual grade 10 and 12 results. Most of the learners at Mweshipandeka are Oshiwambo speaking and from the surrounding northern area of Namibia. (Wikipedia 2013).

Gabriel Taapopi Senior Secondary School (**SSS**) is a government run, or public, high school in Ongwediva, Oshana region, Namibia. The school opened in 1988 and was officially inaugurated in 1989. It is the best rated school in the Oshana region in terms of academic performance. It accommodates approximately 800 learners yearly and, with a staff of 30 teachers, it specialises in science and commercial subjects. It is considered a centre of excellence as the majority of the learners pass with flying colours. It has some of the country's best teachers in science and commerce and, attaining a good pass rate every year, it is renowned for excellence in the region. The school is equipped with a large computer laboratory, a physical science laboratory, a biology laboratory, and a library with a variety of features to cater for most, if not all, learners' wants and needs (Wikipedia 2013).

1.8 Outline of the remainder of the dissertation

The remainder of the dissertation is structured as follows:

Chapter Two - Literature review

The chapter consists of a discussion of the main concepts, integral to the study. The relevant literature is reviewed and the theoretical framework of the study described

Chapter Three - Research methodology

Chapter three outlines the research methodology employed. Relevant issues such as the research design, facts regarding the population, sampling, data collection and data analysis are discussed.

Chapter Four- Data analysis/Results

Chapter four presents the results obtained from the analysis of the questionnaires. These results will be presented in the form of tables and graphs

Chapter Five - Discussion of results

This chapter will further discuss the findings presented in the previous chapter. The discussion is structured around the key research questions listed above.

Chapter Six - Conclusions and recommendations

The final chapter presents the major findings and conclusions of the study. Based on these, recommendations are made and suggestions for further research are presented.

1.9 Summary

The purpose of this research was to investigate the Web-based information behavior of high school learners in Oshana region in Namibia. In chapter one the background and the outline of the research problem has been presented, followed by the problem statement and key questions to be asked. The study's significance and delimitations were discussed. A brief outline was given of the methodology used, and the theoretical framework applied. Thereafter the two schools that provided the grade 12 learners involved in the research were described. In conclusion the content of the following chapters was briefly listed.

Chapter two considers the literature related to the study as well as the theoretical framework. Concepts related to the study are also defined.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

World Wide Web (Web) information services have been embraced by the world of education and had a profound effect on the ways in which schools search for and use information today. To understand the ways in which learners of Generation Y or the Google generation acquire Web information and apply it, is therefore important. The literature review presented in this chapter provides an overview of the current status of research in this area. The literature is examined with a view to investigating actions performed by learners in order to obtain Web information. The researcher has also made an effort to identify a range of Web information behaviors that are instinctive in the high school environment. The literature review addresses the key research questions as outlined in chapter one. Other issues considered in the literature review (but not necessarily explicitly tackled by the research questions) are high school education and Web information-seeking, the impact of Web-based information on the learning and teaching process, the importance of ICT literacy skills among learners, the extent to which the Web affects the information-seeking behavior/habits of learners, and the sharing and exchange of information. A brief history and explanation of the Internet is also provided. Finally, the conceptual framework on which the study was based is presented. To begin with, however, the issue of terminology will be addressed.

2.2 Information behavior terminology

When carrying out research, it is imperative to provide clear definitions of key concepts. In the case of the current study we need to sharply define key concepts such as information behavior and information-seeking behavior and how they apply to the study. It seems best to describe information behavior as a first step. Wilson (2000:1) emphasizes the complexity of information-seeking behavior and notes that different terms relating to information behavior are often used interchangeably for all aspects of the search for information. Siatri (1999 cited in Nkomo 2009:15) states that "concepts such as information use or need, information seeking behaviour, and channels of communication all exist in a system of complicated and interdependent relations". This section will define what information behavior entails.

2.2.1 Information behavior

Information behavior, according to Stilwell (2010:3), is "a broad term that covers information needs, information-seeking behavior, information searching and information use". Information behavior is described as "how people need, seek, manage, give and use information in different contexts" (Fisher *et al.* 2005:xix). Wilson (2000:51) has defined information behavior as "the human behavior in total, in relation to sources and channels of information, including both active and passive information-seeking and information use". For the purposes of this study, information behavior is taken to incorporate information, information needs, information-seeking behavior, Web information-seeking behavior, as well as information use.

2.2.2 Information needs

What an information seeker will search for depends on the nature of his or her needs. Information needs differ. Any specific information need functions in a factual situation in which "information" and "need" are interconnected and inseparable. According to McGarry (1981:34) "need" implies a lack of something which, if found, enhances a person's welfare enabling him/her to attain whatever objectives he/she has in mind. The present study looks at information need as defined by Singh and Satija (2006:27), namely as "recognition that one's knowledge is inadequate to satisfy a goal."

2.2.3 Information-seeking behavior

The predicament of scholars when defining information-seeking behavior is attested to by Case (2002:5) who clarifies that "information-seeking behavior is a phenomenon that often defies generalization and escapes observation because it varies depending on people, situations, and objects of interest". Case (2002:5) further states that "a lot of it is intangible and takes place in a person's head, making it difficult to measure." However, a number of studies have examined the phenomenon and come up with various definitions. Information-seeking behavior results from the recognition of information needs which are perceived by the information user, who as a consequence makes demands upon a formal system such as libraries and information centres, the Internet, or another person in order to satisfy the perceived information need/s (Wilson, 2000). Information-seeking behavior is concerned with the interactive utilization of the three basic resources, namely people, information, and system (for example, the Web). For the purpose of this study, the following definition of Wilson (2000:49) was adopted: "the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the

individual may interact with manual information systems (such as newspapers or a library), or with computer-based systems (such as the World Wide Web)".

2.2.4 Information-searching behavior

Information-searching behavior is defined by Wilson (2000:49) as a sub-set of information-seeking, mainly concerned with the interactions between the information user and computer-based information systems. Wilson (2000:49) further describes information-searching behaviour as the "micro-level" of behavior engaged in by the searcher while interacting with information systems of all kinds. "It consists of all the interactions with the system, whether at the level of human computer interaction (for example, use of the mouse and clicks on hyperlinks) or at the intellectual level (for example, adopting a Boolean search strategy or determining the criteria for deciding which of two books selected from neighbouring places on a library shelf is most useful), which will also involve mental acts, such as judging the relevance of data or information retrieved" (Wilson 2000:49).

2.2.5 Web information-seeking behavior

According to Nkomo (2009:19), "although information-seeking has a long history, information-seeking using the Web is a relatively new phenomenon". A brief exploration of existing literature shows that there are few definitions of Web information-seeking behavior. Huang (2007:np) defines online information-seeking behaviour as including "all activities that users conduct on the Web, be it goal-directed searching or just surfing without a specific purpose". One might argue though that this definition does not totally give the true essence of Web information-seeking, because "online" often does not refer to whether or not something is available on the Web. This study will adopt Huang's (2007:np) description of online information behaviour, namely "it includes all activities that users conduct on the Web, be it goal-directed searching or just surfing without a specific purpose". This adoption is on the basis of the fact that the concepts 'online' and 'Web' are often used interchangeably.

Thus, given the above, Web information-seeking entails, in the current study, the process in which people engage purposefully in order to "change their state of knowledge by using information sought on the Web", whereas Web information-seeking behavior stands for "the actions and conduct of users while in pursuit of information specifically housed on the web" (Nkomo, 2009:19).   .

2.2.6 Information use

According to Bartlett, Joan and Toms (2005:2), there is a long history of research into information behavior and its constituent elements of information need, information seeking and information use. However, the three elements have been studied in different degrees of detail. Information needs and information seeking and the narrower concept of information search have been well modelled and investigated. By contrast, " information use has received less attention, and remains a poorly defined concept" (Bartlett, Joan and Toms, 2005:2). Wilson (2000:50) describes information use as consisting of the physical and mental acts involved in incorporating the information found in the person's existing knowledge base. Information use in the present study refers to "a dynamic, interactive social process of inquiry that may result in the making of meaning or the making of decisions" (Choo 2002) and in the use of information without plagiarizing (McGregor and Williams 2005).

2.3 Related studies on the Web information behavior of learners

This section provides a review of the literature related to the present study. Over the decades, there has been coverage of human information behaviour, including the information behavior of, for example, learners and students.

2.3.1 Studies done overseas

McFarlane and Roche (2003) have investigated information-seeking behavior of learners in the UK. They focused on how learners from grade 9 to 12 search on the Web and what they do when they find a site that interests them. The study found that learners' Web use was closely tied to other interests such as sports, pets, TV programmes and pop groups as well as to homework. To locate interesting sites they rely on word-of-mouth communication or on user-friendly search engines, often those engines that are aimed at their age group such as Yahooligans!. The authors point out that, "Once they [the learners] have found a site that looks useful, there are some indications that their powers of discrimination are poor. How a site looks is taken to be an indicator of its reliability and validity. Moreover most students lack strategies to extract information from a site in a meaningful way. Many students simply print whole pages and few actually analyse the content of the site and make selections or notes from the source" (McFarlane and Roche 2003:155).

McGregor and Williams (2005) examined the appropriate use of information at secondary school level in terms of understanding the material and avoiding plagiarism. The study found that

students who plagiarized the most knew what constitutes plagiarism although, when they were plagiarizing, they did not necessarily recognize it as such. A study carried out in the USA by Todd (2003) looked at patterns of information seeking and use by learners. The study identified the following problems met by young people in information seeking: low or extremely high counts of results, information overload and, because of limited understanding, an inability to reduce large volumes of information and to use Boolean logic, all of this compounded by a shallow assessment of websites. Lorenzen (2001) conducted a study in the USA on the use by high school students of the Web for the purpose of completing school assignments. The results of this study indicate that the students made use of the Web but that "their ability to evaluate the material they found was weak".

Purcell *et al*. (2012) investigated "how teens do research in the digital world". This was done through an online survey targeting middle and high school teachers. Generally, teachers who participated in the study categorized the impact of today's digital environment on their students' research behaviors and skills as positive, yet multi-faceted and not without shortcomings. It was positive in that the best students manage to access a good depth and breadth of information on topics of their interest and many thus become self-reliant researchers. The study mentioned that some teachers worry about students' overdependence on search engines, about the difficulty many students have to judge the quality of online information and about the general level of information literacy of today's students. The teachers reported that students rely mostly on search engines to conduct research instead of including other resources such as online databases. Overall, the vast majority of these teachers stated that it should be a top priority in today's classrooms to teach students how to judge the quality of online information (Purcell *et al*. 2012:2).

2.3.2 Studies done in Africa

In a study done at the University of Zululand by Nkomo (2009) entitled: "A comparative analysis of the Web information-seeking behavior of students and staff at the University of Zululand and the Durban University of Technology" a number of challenges were identified. Chief among these were connectivity problems. The results shed light on the general information retrieval difficulties students face. For example, many students seemed to be familiar with the Web but not with how to use the Web to achieve optimal results. According to the author, most of these difficulties "appeared to stem from lack of skills due to poor training" (Nkomo 2009:xiii).

Adams (2009:iii) examined the information-seeking behavior of a small group of so-called Generation Y students at Stellenbosch University as they undertook an academic assignment. The study found that, although there is consensus across the world that universities need to adapt to the

needs of Generation Y students brought up with high-level information technology, the Internet and social networking, this does not mean that they are information-literate. Students showed high-tech skills but often did not know how to analyse an information need or how to discriminate between information sources. The two studies above were done at university level but arguably the results could be applicable at senior high school level as well.

However, as noted, few studies have been done on Web-based information behaviour among students and learners in the developing world where problems such as low or poor connectivity, high cost of technological and communication infrastructure and lack of adequate technological infrastructure and facilities are common, a shortcoming also noted by Nkomo (2009:37) and Walton, Marsden & Vukovic (n.d:2). This would highlight the difference that exists between students and learners from developed and developing countries. The obstacles that students from developed countries deal with are minimal in that they, arguably, mainly relate to the use of the resources and not to access. Therefore, this study will generate knowledge on web-based information behaviour based on a developing country in Africa, namely Namibia.

2.4 The Web and information-seeking

Dalgleish and Hall (2000:104) note that "in a short space of time it appears that the rate of production of electronic materials has exceeded that of print-based publications". Lehnert (2001:37) perceives that the Web is the "Internet application that has made the Internet accessible to millions of people" from children to adults. To understand the Web one needs to first understand the nature of the Internet. Often (and even in the current study), the terms Internet and Web are used interchangeably, although there is a difference.

According to Biddiscombe and Upton (1996:6) "the Internet is a worldwide collection of interconnected computer networks". The authors further state that the Internet has become a mechanism for information dissemination. The Internet makes life easier today with fast communication through its communication services and it is regarded as a popular source of information worldwide. Any computer which is connected to the Internet can communicate with any other computer connected to the Internet regardless of where it is. It is used to search for, and retrieve, information on a variety of topics from a range of servers and other computers by moving information from websites to the computer (and other devices which are Internet-enabled and, increasingly, such devices are mobile). By connecting the computer to the Internet one can access a whole world of resources while sitting at one's desk.

In order to understand Web-based information behavior of high school learners, it is necessary to reflect on the foundation of Web-based information delivery. The current study reflects on this in the next section, covering the following aspects:

- A brief history of the Internet as an infrastructural network to create access to Web information and create person collaboration and communication.
- Development of search tools such as Internet search engines and Web directories to find available desired content.

2.4.1 A brief history of the Internet

The Internet's beginning lies in a research program of the United States Department of Defence. In the 1960s, dealing with the possibility of a third world war breaking out, the USA Department of Defence investigated a way to guarantee a permanent command and control network for communication. The project was named ARPANET, an acronym for the "Advanced Research Projects Agency Network" (ARPANET is sometimes referred to as DARPANET, an acronym that includes the D of Defence). The aim was to be able to transfer information across the computer network in such a way that, should part of the network be destroyed (for example, by a nuclear attack), other parts of the network would continue to function (Banks 1997:11). The ARPANET was developed and designed in 1969 by Bolt, Beranek and Newman contracted by the Advanced Research Project Agency (ARPA) of the USA Department of Defence (Glister 1993:14). The ARPANET project linked together the computer systems of four institutions in the USA, the University of Utah, the University of California at Los Angeles, the University of California at Santa Barbara and the Stanford Research Institute. "The original ARPANET grew into the Internet. The Internet was based on the idea that there would be multiple independent networks of rather arbitrary design, beginning with the ARPANET as the pioneering packet switching network, but soon to include packet satellite networks" (Leiner *et al*. 2012:np).

As ARPANET progressed and other networks were developed, it became clear that there was a need for methods of communicating between the different networks. The way of creating such Internet work links was to find the right protocols. "A protocol is a set of conventions that determines how data will be exchanged between different programs" (Leiner et al. 2012:np) . The TCP/IP or Transmission Control Protocols were developed. It entailed a system of protocols used for wide area networking and these made the Internet possible (Glister 1993:14). By 1985 the Internet was already well established as a technology, supporting a wide community of researchers and developers, and it began to be used by others for everyday computer communications.

Electronic mail was adopted broadly across numerous communities, often using different systems (Leiner *et al.* 2012:np).

2.4.2 Emergence of the Web and development of search tools such as search engines and Web directories to find the available content

The Web is one of the services offered by the Internet. It allows one to "surf" the Internet through clickable "hypertext links" also called "hyperlinks". According to Banks (1997:34), "the Web consists of a worldwide collection of electronic documents". Each electronic document is called a webpage. The uniform resource locator (URL) is the key to navigate the Web. The searching activities on the Web are mostly conducted using search engines. However, before a search engine can tell the user where a file or a document is, it has to be found. According to Peshave and Dezhgosha (2005:2) to find information on the millions of webpages that exist, a typical search engine employs special software robots, called spiders, to build lists of words found on websites.

Peshave and Dezhgosha (2005:2) states that "When a spider is building its lists, the process is called Web crawling". The authors explain that a WebCrawler is a program that automatically passes through the Web downloading documents, following links from page to page. These pages are stored in the search engines' own databases. The search engine searches these stored pages. The primary goal of a search engine is to provide high quality search results covering a rapidly growing Web. Some of the efficient and recommended search engines are Google and Yahoo which share common features and are standardized to some extent (Peshave and Dezhgosha 2005:2). Most search engines are customizable and support the Boolean operators AND, OR and NOT. Armbruster (2002:3) highlited that "sometimes a search can be overly general (results produce too many hits) or overly specific (results equal too few hits)". To fine-tune one's search, one can use the Boolean operators mentioned above to link search words together. These operators will help to narrow or to broaden one's search, facilitating the retrieval of the exact information one needs.

In addition to the search engines, the Internet provides what is referred to as Web directories of which the directory supplied by Yahoo is a good example (Hearst 2009:np). A Web directory, according to Boswell (nd:np), usually functions under human management and organizes websites by subject. Boswell notes that these collections of links are usually much smaller than the databases of search engines, because it is human eyes that look at the sites as opposed to the mechanical management of the Web crawlers associated with search engines. Typical subject categories maintained in Web directories are: arts and humanities, business and economy, computers and Internet, education, entertainment, health sciences, social science, news and media,

society and culture, government, reference, recreation and sport (see, for example, the Yahoo directory available at http://dir.yahoo.com/).

2.5 High school education and Web information seeking

Several practices of information-seeking play a vital role in schools at different levels, from preschool to university (Limberg and Sundin 2006:np). There is an increasing reliance on the Internet for information-seeking in schools (Gunn 2003:np). Therefore it is important to briefly discuss the Web as a source of information in high school education as well as the impact of Web information on the learning and teaching process, the importance of information-literacy, the extent to which the Web has affected the information-seeking behavior of learners and the sharing and exchange of information. These aspects will be discussed below. Valenza (2006:22) points out that the Internet removes some physical barriers to information seeking. Chen (2003:29) emphasised that the search process no longer needs to involve going to the library, visiting shelves or physically browsing through indexes or tables of contents. High school students, rather than consulting books, appreciate the speed and physical advantages offered by the Web where all they need to do is "type in the word and click"

2. 5.1 Impact of Web-based information on the learning and teaching process

Technology has changed education. According to Hussain and Safdar (2008:45) it has in particular changed pedagogy and instruction by making the teaching and learning process more productive and by creating collaborative, learner-centred and interactive world-wide learning environments. Therefore, information technologies (especially the Web) are assumed to play a productive role in education leading to a more productive teaching and learning process as a result of collaboration in an information rich society. Hussain and Safdar (2008:47) state that an "information rich society promotes new practices and paradigms for education where the teacher has to play new role of mentoring, coaching and helping students in their studies rather to play the conventional role of spoon feeding in the classrooms" Learners can learn independently as a wide choice of information sources is available to them.

Learners can interact and share learning experiences with their teachers and fellow learners in the process of knowledge construction and dissemination. They receive and use information of all kinds in a constructive and productive fashion, rather than depending on the teacher (Hussain and Safdar 2008:47). Branson (1991, cited in Hussain and Safdar 2008:44), states that students learn not only from the teacher but that they also learn along with the teacher as well as by interacting with each another. Hussain and Safdar (2008:48) emphasize that learners today can learn much

more than that which the teacher teaches in a conventional learning environment. For the process of teaching and learning to be more productive, teachers and students have to use available information technologies such as the Internet to fulfil their requirements.

Hussain and Safdar (2008:48) argue that the Internet and the Web can provide learners with the latest relevant information while they are working at their own pace. Teaching organizations are adopting information and communication technologies, especially the Web, because of both easy access and effectiveness. The Web is an ocean of information required for learners, covering nearly all subjects known to man. Going through information on the Web is definitely a much faster process than identifying similar information from print-based sources such as books. Through interacting with the Web, learners can develop "self-learning habits at their own pace and time, learn with the teacher rather by the teacher", use relevant information at the right time, and exchange learning experiences and information with others (Hussain and Safdar 2008:47).

Learners can create their own resource-based learning environments by using the Internet to locate information, determine its relevance, and report their findings (Hinson 2005:27). There is evidence that students are learning more, or achieving different learning outcomes, when they have access to Web-based resources. For example, students in Schofield and Davidson's (2003) study cited in Hinson (2005:22) report that Web use allowed them to become independent learners following their own directions resulting in a greater control over content. Similar findings were reported by students participating in The Laptop Kids Project (U.S. Department of Commerce, National Telecommunications and Information Administration 2000) cited in Hinson (2005:22). Students state that, after acquiring Web access, they felt smarter, they read more and they found that their study skills had improved. "Parents commented that their children were more interested in learning and getting better grades".

Given the above, it is important to make Web content available to school learners. However, Mutula and Mutula (2007) point to the "digital divide", or the increasing imbalance as regards access to ICT's between different communities and countries, negating humankind's right to equitably enjoy quality education in an electronic age. They consider schools as very important institutions capable of bridging the digital divide in society because they represent focal points where children from different backgrounds converge for learning purposes. Linn (1999, cited in Mutula 2004:134) points out that students who do not have access to computers and the Internet are likely to make less progress in their studies than their peers to whom such technologies are available.

2.5.2 Importance of information literacy skills among learners

Information literacy is a skill that is useful in every aspect of a person's life. According to Sasikala and Dhanraju (2011:np), information-literacy skills lead to independent, student-centered learning as it lessens dependence on the teacher for the provision of answers to questions and problems students encounter. This creates in the students a greater sense of being responsible for their own learning leading them to become "dynamic learners and thinkers who are creative, analytical and efficient. In addition information-literacy goes beyond coursework in its meaning and application" (Sasikala and Dhanraju 2011:np). The authors argue that, in view of the endless amount of information that is available, individuals need to develop a better understanding of information sources and develop the ability to acquire, evaluate, use and communicate information (Sasikala and Dhanraju 2011:np).

According to them becoming information-literate will provide a student with the essential skills required for proficient learning in college and will subsequently benefit him/her in their professional and personal endeavours. Information-literacy skills enable students to select the best information to guide them in making important decisions. The world today offers abundant information choices in print, and of an electronic, visual, spatial, sound, and numeric character. Sasikala and Dhanraju (2011:np) are of the opinion that among the challenges posed to information users are the fact that there is too much information available in various formats and, besides, that not all information is of equal value. While Sasikala and Dhanraju (2011:np) focus on university students, their observations are valid for senior high school learners as well.

The information explosion as apparent in the masses of printed items and in the millions of websites and pages on the Internet complicates the access to and the retrieval of information by users. The University College London's briefing paper (UCL 2008, cited in Holm *et al.* 2010:7), stresses the information quality dimension. It points out that the Google generation born after 1993 is fast to consult the media in a society characterized by abundant information but that attention to the quality of information lags behind. For instance, many young people are not aware of Google's limitations and of the existence of academic, often library funded, information sources such as databases and electronic journals.

Holm *et al*. (2010:7) indicats that one quarter of young people in Denmark who have gained top marks, have been educated and trained to use information technology (IT) for information searching. However, a quarter of these are content to simply "Google" without any idea of the quality or even the credibility of the information. "This has consequences. The good or bad habits are maintained in the upper secondary school and follow the students into the higher educational

programmes, where the best students are those who are competent in the selection, handling, evaluation and application of information" (Holm *et al.* 2010:7). This revelation highlights the importance of introducing information literacy skills in primary and high school education because the level of their information literacy will support students in college and at university and will impact on their information-seeking and, ultimately, academic performance.

Information literacy, according to the American Library Association (2000:3), "is related to information technology skills, but has broader implications for the individual, the educational system, and for society. Information technology skills enable an individual to use computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals. Information-literate individuals necessarily develop some technology skills". Walton and Archer (2004:2), as mentioned in chapter one, point out that once students graduate from high school and enter university, "their dominant mode of learning will be self-directed and exploratory and the Web will be a key information source". The importance of students having adequate information-literacy skills is thus further re-enforced.

According to the American Library Association (2000:3) "information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning". An information-literate individual is able to:

☐ Determine the extent of information needed

☐Access the needed information effectively and efficiently

☐ Evaluate information and its sources critically

☐ Incorporate selected information into his/her knowledge base

☐ Use information effectively to accomplish a specific purpose

☐ Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally (American Library Association 2000:3).

Wu and Tsai (2005) note that "the search for and selection process of information on the Internet requires the development of certain skills in order for the individual to know where to go, how to get there in the shortest way and how to interpret the several forms in which information is presented to achieve and construct knowledge". Thus, being competent in using information presupposes being able to both acquire and process information in the best available and the most efficient ways in order to organize, present and communicate information.

2.5.3 Extent to which the Web has affected the information-seeking behavior of learners

The group of teachers interviewed in the study by Purcell *et al.* (2012) consider that the greatest impact of today's digital environment on students' research habits consists in the degree to which it has changed the very nature of research and of what it means to do research. Teachers and students alike, report that research for today's students means "Googling". "As a result, some teachers report that for their students 'doing research' has shifted from a relatively slow process of intellectual curiosity and discovery to a fast-paced, short-term exercise aimed at locating just enough information to complete an assignment". In the teachers' survey responses 94% of teachers stated that students are very likely to use Google or other online search engines in dealing with a typical research assignment, placing Google well ahead of other sources. Second and third on the list of often used sources were online encyclopaedias such as Wikipedia and social media sites such as YouTube (Purcell *et al*. 2012:3).

2.5.4 Sharing and exchange of information via Web 2.0 technologies

A powerful platform for information sharing and exchange is Web 2.0 technology. Web 2.0 technologies have made their way into the learning environment, from preschools to universities. Web 2.0 technology is a primary component of the Web that allows users to be able to connect to Web users around the world through blogs, wikis, and social networking sites such as YouTube (Sweeny 2009, cited in Jones and Cuthrell 2011:72). Jones and Cuthrell (2011:72) argue that the primary function of the social media sites is to share information, viewpoints and photographs. Users share personal and professional information, photographs, artistic creations, opinions, and videos. The most prominent video sharing website in the world today is YouTube. "YouTube was founded in February 2005 and has grown exponentially in popularity and use" (Mayora 2009). According to (SIGTE Leadership and NTLS Program Committee 2008, cited in Jones and Cuthrell 2011:76) "each day more than 100,000 videos are uploaded and shared on YouTube". These uploads include everything from home videos to music videos and full-length features, presentations and tutorials, covering every possible theme across all disciplines. Users can search for and watch videos on request. Learners can make use of YouTube to access presentations and tutorials in the area of their studies. Users also have the option to create an account and save selected videos for easy retrieval (Jones and Cuthrell 2011:76).

Emerging Web 2.0 technologies are increasingly adopted in academic settings (Saeed, Yang and Sinnappan 2009:99). These technologies include blogs, wikis, instant messaging (IM), social bookmarks and podcasts. A blog (or weblog) is a website usually maintained by an individual with regular entries of commentary, descriptions of events or other material such as graphics or video.

A wiki is "a collection of webpages that are linked to each other, and reflect the collaborative works of many authors" (Beldarrain 2006:142). Instant messaging is a form of real-time communication between two or more people based on typed texts sent via the Internet. Social bookmarking is a method for Internet users to store, organize, search, and manage bookmarks of webpages on the Internet, typically in the form of tags. "Podcasting is a method of distributing audio recordings via the Internet, allowing users to subscribe to a feed of new files" (Beldarrain 2006:142).

These emerging Web technologies have the potential to create engaging learning environments. Students can enjoy blogging and use it for community building, resource-consolidation, sharing ideas or as a personal journal. Wikis facilitate the creation of shared knowledge, dissemination of information, and group interaction. Instant messaging promotes and encourages collaborative learning and team work, as well as interaction and communication skills. Social bookmarks allow quick and easy access to online resources and provide an insider's guide to information and references (Saeed, Yang, and Sinnappan 2009:99). Podcasts provide an innovative and exciting way for people to improve communication, collaboration and social networking. Podcasts can also be used for the dissemination of knowledge, broadcasting news to students, supplementing class materials and presentations. "The above mentioned features are key learning elements and make emerging Web technologies appropriate for educational use" (Harris and Park 2008, cited in Saeed, Yang, and Sinnappan 2009:100).

The following section of the literature review addresses the literature from the perspective of the key research questions listed in chapter one.

2.6 How, where and when do learners access the Internet?

This section comprises a discussion of the three interrogatives contained in the first key research question above.

2.6.1 Access to the Internet

A study conducted by Lorenzen (2001) of high school students in the USA and their use of the Web for research, found that they usually go to the school library and, if they don't have time to do so, will use the Internet either at home or at friends' homes, or at the local public library (Lorenzen 2001:156). Nkomo (2010:5) observes that "infrastructure for Web information-seeking in educational institutions is primarily located in libraries, computer laboratories and offices, and that personal computer use is increasing". Research indicates that the majority of high school

students in the USA access the Internet through schools, public libraries and at home (Krige 2009).

Lawrence and Miller (2000:30) affirm that the "Internet has become an essential component of every library, allowing it to function as a gateway to vast reserves of dispersed information and thus transforming the way students, scholars and librarians think about collections and service". This is applicable to schools as well: the Internet is accessed in libraries and has changed how learners view the collections and where they find information. According to Chen (2003:30) Internet connectivity in recent years at schools has opened up an interesting multimedia cyberspace for children and youth. Alongside other online resources and tools, the Web has become part of school life for learners. Baffour-Awuah (2002:26) mentions that in Botswana some schools have computers in the library with full Internet access, due mostly to their dynamic headmasters. Computers are, however, available in almost all the English-medium private secondary schools in Botswana while most of these schools also have excellent libraries and Internet access.

In Namibia, according to eLearning Africa (2012), Internet access for learners is made possible through EduNet, ExNet, Telecom and the Ministry of Education (2012:np). The EduNet initiative is a public/private partnership between the Xnet Development Alliance Trust (Xnet), Telecom Namibia and the Ministry of Education. "Its core function is to provide affordable, reliable and equitable connectivity and access to information for all educational institutions".   In 2012 more than 300 schools had access to the Internet. In April 2012 the President of Namibia, announced "'free Internet access provision to schools, other educational institutions, clinics, hospitals and free use of Internet access at libraries which are key components for a pro-poor approach to provide all learners and citizens with access to electronic information and e-governance service'" (eLearning Africa, 2012:np).

During the strategic assessment of the Namibian library and information service sector carried out by the Namibia Libraries and Archive Service (2008) in the Khomas Region, it became evident that learners use, to a considerable degree, their own initiative in accessing other sources of information and study centers. The Rössing Community Library, the National Library and the Katutura Cultural Centre were cited specifically, the latter two being used in particular for Internet access. However, youngsters often have to walk fair distances to and from their homes to use these facilities and, once there, they have to queue for quite some time waiting for their turn to use the Internet (Namibia Libraries and Archive Service 2008:28).

As appears from the literature, many learners in developed countries access the Internet at home because most homes are connected. In developing countries this situation is yet to be realized. Learners in developing countries mostly access the Internet at schools and public libraries as noted by authors such as Nkomo (2009), Namibia Libraries and Archive Service (2008), and Baffour-Awuah (2002).

2.6.2 Use of mobile technology among learners

The UNISA Bureau of Market Research (2012) in their study of "Cellphone living and learning style among secondary school learners in Gauteng" reports that approximately 90% of Gauteng learners have access to the Internet on their cellphones while just over half (53.7%) have Internet access on a personal computer (PC). According to the UNISA Bureau of Market Research (2012) the prevalence of cellphone usage among Gauteng learners showcases the popularity of particular social networks, Internet access, cellphone messaging and the downloading of music.

Despite the youth's close and positive relationship with cellphones, learners seem well aware of the technological limitations of cellphones such as security risks (theft, pornography, exploitation) and distracting attention from school/homework. The UNISA Bureau of Market Research (2012:7) further reports that, when evaluating the participation rate of the youth in online educational activities, it became clear that they access the Internet via cellphones to assist them with mathematical and language-related school/homework. The youth's reliance on the Internet via cellphones is also displayed in their frequent searches for subject related information to assist them in the completion of school assignments. Analysing the possible future online education needs of learners, the study notes a clear preference among learners for receiving cellphone reminders relating to school assignments/projects and for having online tutors and blogs available to assist with such tasks (UNISA Bureau of Market Research 2012:7).

In the following section, the researcher will discuss why learners use the Web in searching for information.

2.7 Specific purposes for which learners search information on the Web

Lorenzen (2001:151) in his study conducted in the USA mentions that students use "a good variety of resources, including libraries and the Web, to find information for school assignments". According to Latrobe and Havener (1997), high school students look for academic information, general information, and information useful for future plans, relationships and current lifestyles while they are also interested in health related information. Agasto (2005:155) in his study also

indicates that school work was the teens' first and foremost reason for seeking information. Nkomo (2009:119) suggests that information needs can largely be grouped into three main categories namely: study or research, work or teaching, and communication and entertainment. The second category is arguably not applicable to high school learners although leaners might well find that information on possible future careers is useful.

Nkomo (2009:74), in his study of university students in South Africa, reports that "while most of the respondents from Unizul [University of Zululand] (39; 27%) used the Web for assignments, their counterparts at DUT [Durban University of Technology] primarily sought information for research purposes (25; 36%)".   While Nkomo's findings relate to university students, they provide a picture of how the Web is used in generally academic settings. Similarly, Latrobe and Havener (1997), writing at a time when the Internet was in its earlier stages of development, point out that high school students sought information of general nature or linked with academics, future plans, relationships, current lifestyles and health.

2.8 Searching for information on the Web

This section comprises two subsections, concerned with how learners search for information on the Web and what information-seeking steps are taken by users.

2.8.1 How learners search for information on the Web

Authors including Fidel *et al.* (1999), Lorenzen (2001) and Shenton and Dixon (2004) point out that most children have inadequate Web-searching skills. Hence, there are important educational challenges, such as the provision of effective training in the use of the Internet as well as in the proper use of information for those who teach. In this context   ICT and digital-literacy competencies are of special pedagogic relevance because of the need to prepare youngsters for the future world in which they will require skills for managing information (Albion 2007, cited in Quintana, Pujol and Romaní 2012:514). Branch (2003), in his study that   examined the information-seeking processes of junior high school students, found that all participants began by using simple search terms selected from the original question. This method was not always successful. In addition, they avoided reading long articles and therefore missed solid informative articles by preferring articles that were shorter but less relevant. His study revealed that students need more instruction and practice in order to become efficient Web users. It also demonstrated that students did little or no preparation before beginning their searches. For the majority of the group, their search was determined by what they managed to retrieve but not necessarily by what they intended to search for. In addition, the study indicated that, if students were unable to quickly

retrieve information needed for their assignments, they were inclined to change to another topic. Similarly, students recorded information of any kind at all, as long as it seemed to be in some way connected to the topic of their assignment. This practice led to some unlikely answers. Students participating in his study were quick to scan sites to determine if they were relevant and often they would not even view the complete page.

In their study of Web searching strategies of South African students, Walton, Marsden and Vukovic (2001: np) stated that the key problems for both novice and experienced Web users arose from a lack of understanding of the nature and scope of Web searching. According to the authors, novices battled significantly with Web navigation. The authors noted that spelling, typing and domain knowledge were prime causes of errors for more experienced Web users. Both new and experienced Web users encountered problems in interpreting the information they found as a result of their limited global knowledge, reading problems, lack of familiarity with the Web layout conventions, and the Web's slow responses. Interestingly, "both novices and experienced Web users often faced challenges when the goals of their searches diverged significantly from dominant paradigms or assumptions on the Web" (Walton, Marsden and Vukovic 2001: np). It seems that users tended to lose the focus of their search after which they followed whatever it was that the Web presented them with. Walton, Marsden and Vukovic (2001:np) focused specifically on university students but, once again, in the view of the researcher, their findings can be generalized to include senior high school learners a number of whom will be "university bound" in their next academic year.

2.8.2 Users' information-seeking steps

How information on the Web is accessed will for the purpose of this thesis be addressed by Wilson's theory of information searching behavior. As mentioned in section 2.2.3. Wilson (2000:263) describes information searching behavior as "a sub-set of information-seeking, particularly concerned with the interactions between information user (with or without an intermediary) and computer-based information systems, of which information retrieval systems for textual data may be seen as one type". Jansen and Rieh (2010) point out that "information searching behavior is a sub-set of information seeking, referring to the actions involved in interacting with an information search system" (Wilson's information-seeking behavior theory alluded to in this section is part of the theoretical framework that will be discussed later in this chapter).

Users' information-seeking steps are illustrated by Ellis (1989), Ellis, Cox and Hall (1993), and Ellis and Haugan (1997). They put forward a model of information-seeking behavior based on studies of the information-seeking patterns followed by social scientists. While Wilson's information-seeking model provides the broad context, Ellis discusses the more specific steps or activities comprising the interactions between the information user and computer-based information systems. The model consists of six categories of information-seeking activities: starting, chaining, browsing, differentiating, monitoring and extracting. Choo, Detlor and Turnbull (1998:np) pose that, "although the Ellis model is based on studies of academics and researchers, the categories of information-seeking behavior may be applicable to other groups of users" and in different environments as well, for example in an electronic environment. Choo, Detlor and Turnbull (1998:np) state that, "if we visualize the Web as a hyperlinked information system distributed over numerous networks, most of the information-seeking behavior categories in Ellis' model are already being supported by capabilities available in common Web browser software". They apply the model to the Web movement as follows:

Starting - Identifying websites/pages containing or pointing to information of interest.
For example, the user starts surfing the Web from one of his/her favourite starting pages or sites (these can be selected online channels of information namely, search engines and directories like Google and Yahoo, or social networking sites such as YouTube).

Chaining - Following links on starting pages to other content-related sites. For example, the user follows hypertext links to related information resources in both backward and forward linking directions.

Browsing - Scanning top-level pages: lists, headings, site maps**.** For example, the user scans the webpages of the sources selected.

Differentiating - Selecting useful pages and sites by bookmarking, printing, copying and pasting, etc. For example, the user subscribes to e-mail based services that alert the user of new information or developments.

Monitoring - Receiving site updates using, for example, push, agents, or profiles, and revisiting favourite sites for new information. For example, the user bookmarks useful sources for future reference and visits.

Extracting - Systematically searching a local site to extract information of interest available at that site. For example, the user searches a particular source or site for all the information presented on that site relating to a particular topic.

Choo, Detlor and Turnbull (1998:np) refer to the above activities as "Web moves" and compare these with the original formulations of traditional hard copy, namely:

Starting - Identifying sources of interest.

Chaining - Following up on references found in given material.

Browsing - Scanning tables of content or headings.

Differentiating - Assessing or restricting information according to its usefulness.

Monitoring - Receiving regular reports or summaries from selected sources.

Extracting - Systematically working through a source to identify material of interest.

In the present study respondents were presented with the "Web moves" listed above and asked how often they followed or used such steps (see question 18, Appendix 2).

2.9 Web information searching skills of learners

This section will discuss in three subsections, learners' perceived abilities to search for information on the Web, the provision of relevant training to learners, and how to equip them with Web information searching skills.

2.9.1 Abilities to search for information on the Web

With regard to learners' abilities to search for information on the Web, Purcell *et al.* (2012:6) state: "Indeed, in our focus groups, many teachers suggest that despite being raised in the 'digital age' today's students are surprisingly lacking in their online search skills." Adams (2009) adds that, although there is consensus across the world that universities need to adapt to the needs of Generation Y brought up with high-level information technology, the Internet and social networking, this does not mean that today's students are information-literate.

2.9.2 Provision of training and equipping learners with Web information-seeking skills

Information searching skills are essential for achieving searching goals. As Wu and Tsai (2005) point out (see 2.5.2) , "The search and selection process of information on the Internet requires the development of certain skills in order for the individual to know where to go, how to get there in the shortest way and how to interpret the several forms in which information is presented to achieve and construct knowledge." Nkomo (2009:xiii) poses that results from his study "shed light on the general information retrieval difficulties students face and most of these difficulties appeared to stem from poor training or lack of skills". Gunn (2003:np) in her study examining the searching for Internet information at schools found that grade 12 learners "were more dependent on friends and classmates to teach them how to search for information on the Internet". It appears

that academic institutions, at both school and tertiary level, do not always provide effective training in information searching skills.

In Nkomo's (2009) study, a number of suggestions are made with respect to what the surveyed institutions can do in order to equip students with better Web information-seeking skills. These include a call for more lecturers, "increasing the number of computers to expand Web access", extended opening times of computer laboratories, and Web training to be offered as part of each academic programme or included in the general curricula of all students. "Students requested that they be given more online assignments to help them practice. Information literacy was identified as an important course that would equip users with more web-related skills" (Nkomo, 2009:89).

2.10 Sources of information on the Web used by learners

In their study Purcell *et al*. (2012:4) report that in a typical research assignment students are "very likely" to use the following sources (in descending order of frequency of use): Google or other online search engines, Wikipedia or other online encyclopaedias, YouTube or other social media sites, print or electronic textbooks, online databases such as EBSCO, JSTOR or Grolier, and student-oriented search engines such as Sweet Search. This section will discuss learners' use of search engines as well as their use of other Web information sources.

2.10.1 Learners' search engine use

While Web search engines are essential tools in the quest for online information they are, in spite of their popularity, just one of a number of channels available to users of the Web. One thinks, for example, of subject directories described under 2.4.2 above. However, the search engine, particularly Google, has invariably become the first step in accessing information resources on the Web. According to Bilal (2000:646), search engines facilitate seeking information on the Web. Apart from Google, there are many others such as Ask, Bing, Yahoo, Dogpile, Webodia, Duck Duck Go and WebCrawler (Gil 2013). Search engines come and go; they change; and the top-rated search engine of a few years ago may not be at the top today (Vidmar 1999). Thus learners can use several search engines when searching for information. However, in Gunn's study conducted in Canada (2003) on seeking information for school-related purposes on the Internet, it was found that, although most students knew of the existence of a number of search engines, they were often unaware of the top-rated ones. They tended to use one search engine frequently. "The search engine of choice for just over 66% of the students participated in the study was Google" (Gunn 2003:np).

Bilal (2000:646) highlights that there are over 500 engines, but only a few are designed for children such as Yahooligans! and Ask Jeeves for Kids. The former's interface is captured in Figure 1 below.

Figure 1: Yahooligans! Search engine interface, adopted from Yahooligans Inc, 2013

Yahooligans! began in 1994 as a search engine and directory, designed for children between the ages of seven and twelve. Ask Jeeves for Kids was developed in 1996 as an engine and meta-engine with the age-group target not being specified. But like Yahooligans! it is especially aimed at young people. "It allows for both keyword searching and browsing by subject categories or headings". Retrieval from Yahooligans! includes the number of categories and the number of sites within each category. "Yahooligans! does not employ advanced search syntax, such as Boolean logic, proximity, nesting, or natural language" (Bilal 2000:647). [Note: Yahooligans! has been discontinued as from the end of April 2013 (Wikipedia 2014:np).]

2.10.2 Learners' use of other Web information sources

This section will discuss learners' use of licensed databases, Web-based curriculum resources and Wikipedia.

2.10.2.1 Learners' licensed databases

In addition to the search engines discussed above school libraries can subscribe to licensed reference databases and make these available to library patrons. Krige (2009:30) points out that the databases provide the content that is most relevant for high schools. Examples of such databases include GALILEO and several Gale databases, among others Wilson Biography, LitFinder and NetLibrary (CCCPLS 2008, cited in Krige 2009:30). These databases are according to Krige (2009:31) "licensed by metadata aggregators such as EBSCO and Cengage Gale mainly since the licensed databases are the intellectual property of the owners of digital information services". Given this, the databases are licensed and a fee has to be paid to access them. Some of these resources are briefly outlined below.
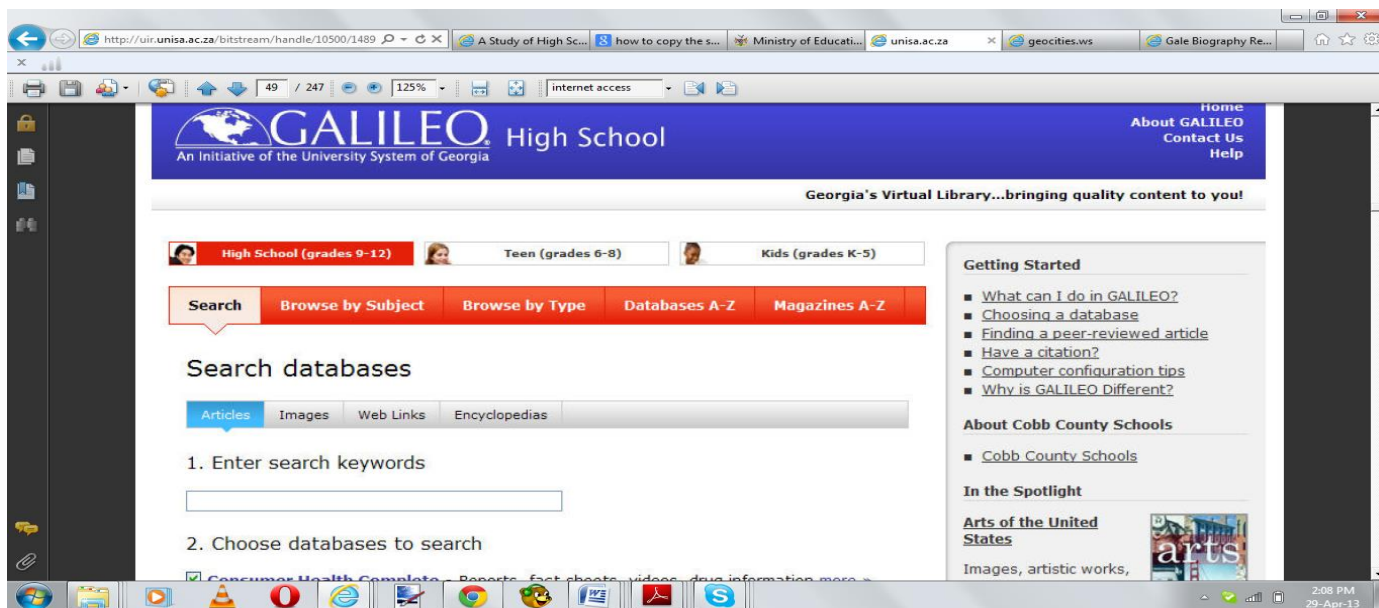
Figure 2 : GALILEO database interface, adopted from Krige (2009:37).

The GALILEO high school interface provides search options for high school students such as a federated search feature that searches across multiple databases as well as the possibility to browse by subject, material type, database or journals (Krige 2009:37). A second database is NetLibrary (see Figure 3 below).

Figure 3: NetLibrary Interface, as shows in Krige (2009:50)

NetLibrary is an electronic database which provides full-text eBooks, audiobooks and eJournals. NetLibrary's relevance to high school students is due to the fact that it offers a growing range of full-text eBooks, assisting high school students in meeting their information needs for school-related projects. NetLibrary database's covers hundreds of subject areas with full-text eBooks and access to bestselling titles from the world's leading publishers (Krige 2009:50). The final database briefly examined is the Biography Resource Center (BRC) (see Figure 4 below).
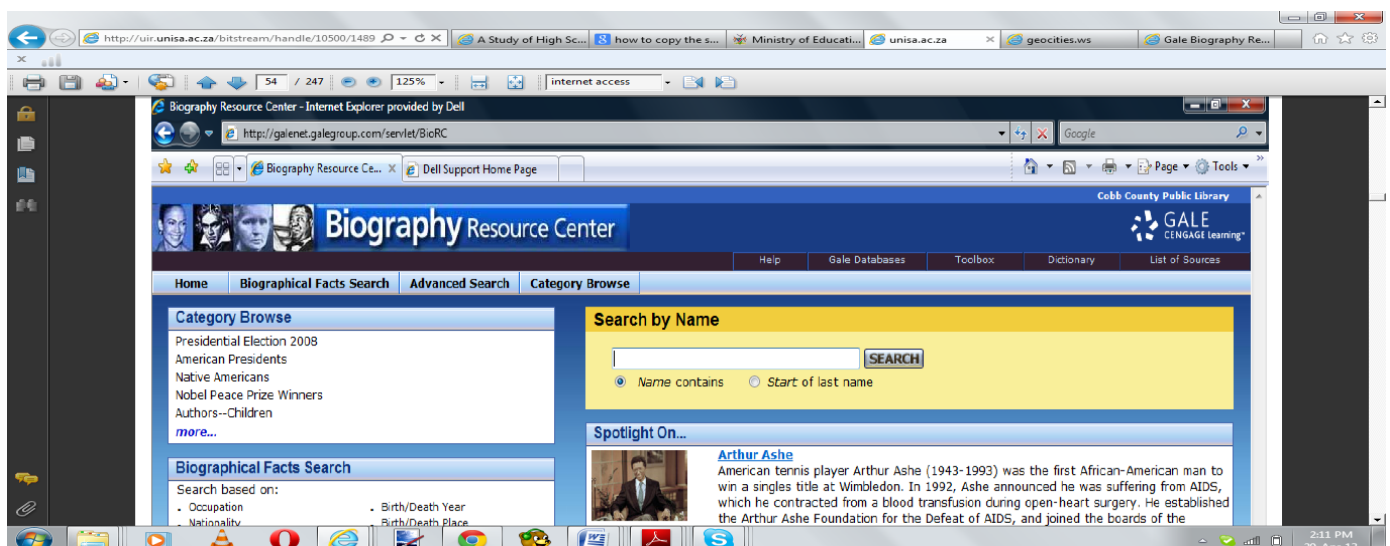
Figure 4: Biography Resource Center, adopted from Krige (2009:30)

The objective of the BRC is to offer an online biographical reference database that assists school, academic, and public library users in need of information about people active in the fields of literature, science, multicultural studies, business, entertainment, politics, sport, government, history, arts and news making. According to Krige (2009:30) the BRC website is described as a comprehensive database that provides up to date biographical information.

2.10.2.2 Web-based curriculum resources

According to the University of California (2009:np) the Web is "doomed" to be an ocean of information. There are sites that offer more specialized information for particular career fields and academic subjects for school students. Table 1 below lists just a few Web-based resources which help one to avoid having to comb the Internet/Web and which facilitate the focusing on specialised websites for school related information.

Table 1: Web-based curriculum resources

Career and Subject Resources	Description	Comments
The Consortium for Mathematics and its Applications (COMAP) www.comap.com	COMAP develops curriculum materials and teacher training programs that are multidisciplinary, academically rigorous, and fun, using mathematical tools to explore real-world problems.	Products are in print, video, and multi-media formats. Provides links to resources in **mathematics** and **science** for educators and students. Grades 9-12.
Eisenhower National Clearinghouse http://www.goENC.com/	Math and Science Electronics Bioscience and Health Environmental Science Agriculture	A huge amount of curriculum related information that is easily searchable
Awesome Library www.awesomelibrary.org	Catalogues the top 5% of all education resources, from more than 20,000 sources. Database for teachers, kids, teens, parents, librarians, and college. Searchable by the Arts, English, Math, Social Studies, Science, Health, Technology, Languages and Geography	

2.10.2.3 Wikipedia

Wikipedia is a free online encyclopaedia that learners can consult if they have no access to subscribed databases. In line with the above, Lipczynska (2005:7) makes the point that "Wikipedia is not claiming absolute authority on any given subject: what it does offer is considered information and the necessary tools to stimulate further research". The author states that the site unquestionably has great reference value and should be treated similarly to other reference sites that is, as a starting point for, or as a valuable part of, wider research (Lipczynska 2005:7). Howard (2009:np) is of the opinion that teachers should master how to use Wikipedia as a source rather than banning it. He adds that, even if it is forbidden to use Wikipedia as a source, many students consult it as it provides a starting point for research on unfamiliar topics (Howard 2009:np).

2.11 Learners evaluation and use of information found on the Web

According to Brown (2002:np), the Internet by its very nature encourages an unlimited exchange of information. No rules or standards govern the type or the quality of information that an author can put on the Internet. He emphasizes that websites may contain factual information, opinions, data, ideas, propaganda, self-promotion and/or commercialism. Anyone who can create his/her own webpage, or pay someone to create a webpage, can present information on the Internet. There is evidence that much information on the Web is not valid and therefore it is essential that users are able to evaluate how accurate and trustworthy specific information is. This section of the study will consider how learners judge and use Web-based information. Evaluation criteria applied by students are discussed below.

The most troubling finding of Lorenzen's study was that the high school students were using search engines to screen information for quality. According to Lorenzen (2001:161), "The student mistakenly puts too much trust in the information found on an indexed webpage". Many students felt that, if a website was indexed by Yahoo!, the information found on that website was reliable whereas Lorenzen (2001:161) states this is untrue as very few search engines screen content for any level of quality. According to him websites are never checked for accuracy or quality by search engines. While Yahoo! in particular was trusted by the students, it does not evaluate sites for quality (Lorenzen 2001:161). With regards websites used by students to find facts, Lorenzen (2001:158) found that some students used the website address extension (for example .com and .org) as a way of judging the relevance and the quality of the factual information provided by the

site. According to these students, the availability of the extensions .org, .com or .edu indicate that the website has been produced by an organization or a company and that it was therefore reliable.

Lorenzen (2001:160) emphasizes that whereas this evaluation method may certainly give an idea of what type of organization, institution, or company has authored a website, it does little to help verify the validity of the information on the site. The .com and .org and .edu extensions cause problems for students because it is easy to acquire the right to use them. Lorenzen found that students mostly trusted the government and educational sites. Several students believed that, if a website had .edu as an extension, it was produced by a university and therefore be of a scholarly quality providing solid information (Lorenzen 2001:161). Lorenzen (2001:161) concludes that students used weak and unhelpful methods of evaluation. He recommends that students be taught not to take a website at face value.

Head and Eisenberg (2010:10) suggest that traditional evaluation criteria – such as timeliness and authority - ought to be applied to Web information. They emphasise timeliness as the basis for determining the currency of research material (the publication date is for example of importance) and authority as the basis for judging the reliability of the authorship of a site (such as the identity and credentials of the author). These criteria are derived from the scholarly print world and librarianship but they are suitable as well for information on the Web. Head and Eisenberg (2010:10), state that standards for Web resource evaluation are referred to as Domain-specific standards. Domain-specific standards are often used for judging the reliability and authority of Web content. In their analysis, the authors include criteria for deciphering the origins of a URL, determining the presence of external links to other sites on the Internet, and the presence of footer details (such as information on when a site was last updated).

Mandalios (2013:4) reminds us that the 21st century has been called the Information Age. We are surrounded by so much information, in so many forms, that it may feel as if we we are drowning in it. This is especially true for the Internet. Therefore Mondalios (2013) suggests the RADAR information evaluation approach for students. RADAR stands for

R - Relevance

A - Authority

D - Date

A – Appearance

R - Reason for writing.

Mondalios (2013:4) notes that students can safely navigate through a sea of information by following the RADAR method which can be used for evaluating any information source, for example books, the Internet and periodical databases. RADAR is briefly elaborated on below, considering the questions that need to be asked when evaluating information.

Relevance:

In which respects is the information you found relevant to your assignment?

Authority:

Who is the author? (this may be a person or an organization)

What are the author's credentials?

Does the author have relevant qualifications and experience in the area?

Does the URL of the site give you clues as regards its authority?

If you have doubts about the authority of the site, does it contain links to other authoritative or helpful sources?

Date:

When was the information published? Is the publication date important to you?

Appearance:

What clues does the appearance of the source provide you with?

Does the information look serious and professional? Does it contain citations and references?

Is it written in formal, academic language? Or does it appear to be written by a non-professional?

Does it look as if it was published for children?

Or to sell something?

Reason for writing:

Why did the writer publish the information?

To produce a balanced, well-researched, professional piece of work to add to an existing body of knowledge?

Or for fun? (Mondalios 2013:5).

The following section will discuss the accuracy and trustworthiness of information found on the Web and, following this, the issue of learners' information use will be examined.

2.11.1 Accuracy and trustworthiness of information found on the Web

Rowlands *et al*. (2008:302) writes that one area of current interest and, indeed concern, is the evaluation by young people of information from electronic sources. Internet research indicates that the speed with which young people search the Web means that little time is spent in evaluating information for its relevance, accuracy or authority. Schacter *et al.* (1998) found that young people took little time for judging the quality of information found on the Web and Chen (2003) agrees. Authors such as Fidel *et al*. (1999) and Lorenzen (2001) point out that most children lack the necessary skills to process and critically evaluate Web information. This reality underscores the importance of preparing youngsters for the future world by training them in skills not only for the managing of information but also for assessing the reliability and relevance of what they find on the Web (Albion 2007 cited in Quintana, Pujol and Romaní, 2012:514).

Lorenzen (2001), in his study of high school students and their use of the Web for research in the USA, found that students have the greatest difficulty to explain how they knew the information on a website was "good". Many students hesitated to respond to the question and ended up saying they did not know (Lorenzen 2001:161). Some students answered that they checked the source or the author to determine whether the information was reliable, or they based their trust in the source on the presence of a bibliography and the evidence of a publisher. Other students pointed out that the absence of an acknowledgement of who wrote the article, suggested the information was unreliable. Concerning the question how pupils interpret websites the findings of McFarlane and Roche (2003:154) indicate that learners use a range of strategies to interrogate a website. They rely heavily on visual information (88%) while 50% claim that they read the complete text, 54% compare the information to other things they happen to know and more than 60% consider how their website findings match what they already know and discuss this with family or friends.

In Lorenzen's study students were asked which websites they avoided. The most common response was personal webpages. The students did not trust personal pages because anyone can put them up. Pornographic sites were also commonly avoided since viewing them would violate school policy. Students mentioned sites that contained errors and others that were "outrageous". They disapproved of sites that lacked a bibliography or that appeared to not have a copyright (Lorenzen 2001:159).

2.11.2. Learners information use

Information use consists of the physical and mental acts involved in incorporating new information into a person's existing knowledge base (Wilson 2000:50). As stated by the American Association of School Libraries, the mission of the school library program is "to ensure that students and staff are effective users of ideas and information" (American Association of School Librarians 1988:1). To achieve this mission, school librarians have to do a significant amount of teaching. School libraries, then, are sites of classroom activity involving information seeking. McGregor and Williamson (2005:498) highlight that, in the past, both teachers and teacher librarians have emphasized instruction that provides learners with location skills. However, less attention was given to ways in which information, once found, was used (For example how students incorporate new found ideas in their work).

Quintana, Pujol and Romaní (2012:513) write that the ability to extract relevant information from a source is a vital one. Although there are clear differences between the methods of the presentation and even the characterizing of content in books and on websites, it would seem that pupils lack the skills to use information from either source effectively. According to Shenton and Dixon (2004), research by Pitts (1994) and Hirsh (1999), found that high school students had difficulty with processes of information use. These ranged from the inability to locate information to a lack of ability to effectively synthesize the information found.

Kuhlthau (1993), cited in McGregor and Williamson (2005:498), identified the Information Search Process (ISP) showing the importance of including a pre-focus stage during which the student explores the available information and considers its potential use in order to establish a focus. McGregor, cited in McGregor and Williamson (2005: 499) inter alia examined, based on an extended version of Kuhlthau's ISP, the issue of plagiarism among students.

2.11.3.1 Plagiarism and referencing (acknowledgements)

As a starting point for evaluating students' understanding of plagiarism, McGregor and Williamson (2005:512) asked students what they thought plagiarism is. Three of the four students in the case-study, including the one who was most guilty of plagiarism, gave appropriate definitions of what constitutes plagiarism. Responses were: "basically taking someone else's writing or whatever and just claiming it as your own", "copying someone without crediting them" and "basically just copying someone else's work and trying to pass it off as your own, without stating where you got it from" (McGregor and Williamson 2005:512).

McGregor and Williamson (2005: 503) mention that even students who plagiarize copiously were aware of what plagiarism is, although they did not necessarily recognize it as such when plagiarizing. The students who committed plagiarism were however vaguer in their understanding of protocols for acknowledging sources than those who plagiarized least. McGregor and Williamson (2005:504) found that students tended to consider processes of learning, seeking meaning or gaining true understanding as not of prime importance. The way in which quotations were used by the four students in the case-study adds another dimension to these comparisons. The two students who plagiarized least, chose a minimal amount of quotations and used them effectively. They capably synthesized their information and ideas (which poses a challenge when a task primarily requires the reporting of information). The two who plagiarized the most directly quoted greater portions of other people's writing and produced papers that contained very minimal amounts of original writing. McGregor and Williamson (2005) emphasize that most learners participating in their study did not plagiarize and that those who did, knew what plagiarism is but plagiarized unconsciously. The researchers however consider these findings as inapplicable to learners in developing countries where most learners start university without knowledge of information ethics and plagiarism.

Rowlands *et al.* (2008:299) underscore this by highlighting that the Google Generation is a "cut-and-paste" generation. There is a lot of anecdotal evidence to pinpoint plagiarism as a serious issue. Plagiarism has in fact become a major issue in universities worldwide, whereby the Internet's contribution to the problem is particularly emphasized, for example by McCabe (2004, cited in McGregor and Williamson 2005:547). Rowlands *et al*. (2008:300) recommend that, if this is the situation at university level, it implies that issues of plagiarism and effective information use need to be addressed more adequately at secondary school level.

2.12 Challenges faced in Web-based information seeking

Challenges faced in Web-based information-seeking at schools are, among others, the following:

2.12.1 Time

Valenza (2006:np) highlights time as one of the constraints which prevents students from using the Internet effectively, especially if they use their school's computers. In addition, looking from the teachers' perspective, Purcell *et al.* (2012) note that the main problem encountered by teachers is lack of time. One teacher reported: "'we don't actually have the time in the courses that we run in school to put students onto the Internet, although we do use it for one of our projects. There is an issue about time to search for and to prepare learning with, online resources'" (Purcell *et al.*

2012:55). Teachers also complained that lack of time does not allow them to develop the effective teaching of information literacy skills in class. Teachers repeatedly noted the difficulty of covering these skills in class in addition to all the other subjects they have to teach. Teachers pointed out that time spent on research was for many students restricted by a lack of Internet access at home and by limited library opening hours (Purcell *et al.* 2012:55).

Viseu (2005:64), in her study of "The use of Internet by students in Portuguese schools", also presents the rules for Internet access as problematic. Students complain that they can't use the Internet for more than 30 minutes which is not enough to "'search, read the information, and select the information…'". This situation produced in fact a perverse effect because some students confessed that the time available was so short that they rather spend it on searching information for purely personal purposes. As one respondent put it "'I'm not going to use the limited time I have for school work! I'll use it for finding what I want, for my personal interests'".

2.12.2 Controlled source of information

Teachers interviewed by Purcell *et al.* (2012) stressed that the best, most credible resources on the Internet are often available only by subscription, so many schools and students have no access to the best quality information in a particular field.

2.12.3 Information literacy skills

Lorenzen (2001:154) stresses that the insufficiency of skills to use, access, and evaluate Internet information effectively remains a challenge. He states that it is essential to teach all students how to use the Internet meaningfully. McFarlane and Roche (2003:156) in their study on elementary learners and their use of the Internet, emphasize that "it is too late to wait until secondary school to teach these skills". The same applies obviously to secondary school pupils; to leave it to universities to teach them information literacy skills, is leaving it too late.

Chen (2003:29) sees difficulties with spelling, typing, the phrasing of search terms, extracting key concepts, formulating search strategies and evaluating search results as exacerbating the problems experienced by school children when searching on the Web. Todd (2003:27) believes that to eliminate such problems, there is a need to develop the "learners' information and critical literacies." Nkomo (2009:98) has noted that students in South Africa are handicapped by an inability to evaluate information and a lack of searching skills, an inability to reference Internet sources, and by information overload. The obtaining of relevant skills is crucial for the development of information literacy.

2.12.4 Curriculum structure

The curriculum structure could pose a challenge in that the way it is structured does not encourage learners to seek Web-based information.   Teachers interviewed by Madden *et al*. (2003:np) point out that "Another factor affecting Web usage appears to be the prescriptive nature of the National Curriculum." While the National Curriculum referred to here is that of the UK, it is possible that the curriculum structure in schools in Namibia is such that it doesn't facilitate use of the Web for information searching.

2.12.5 Access but no accessibility

Other concerns mentioned by teachers were sites that disappear with time so that content that was once accessed cannot be found again, and the existence of firewalls making some sites inaccessible (Madden *et al*. 2003). As one teacher participating in the study remarked "'We have problems with continuity of sites where we direct the kids to a site one day, go to the same site the following day and somebody's upgraded it or something, It's unavailable. I'm reaching a point where I reach a firewall and I can't get onto bits that are supposed to extend out of the site, and that is very frustrating'" (Madden *et al.* 2003:np).

Accessibility is further hampered by network filters. Purcell *et al*. (2012:56) indicate that the school environment itself may hinder the teaching of effective online research. Their survey points to a variety of challenges faced by teachers in effectively incorporating online content into their lessons. Virtually all teachers interviewed were working in schools that employ Internet filters, have formal policies for cellphone use and acceptable use policies. The teachers felt that these policies did impact on their teaching to varying degrees, but that Internet filters had a major impact on both teaching and research. Network filters block access to certain websites or online content. Filters that prevent learners from accessing specific Internet content, were also considered as barriers by Valenza (2006:np).

2.12.6 Institutional policies

The Namibia Libraries and Archive Services Baseline Report (2008:30) reports that some schools offer computer science as a subject. These schools have computer laboratories with Internet connections. With a few notable exceptions however, the report found that learners were not able to use the computers at school to access the Internet for research purposes and that few have computers of their own to do so. Learners were required to pay for computer science lessons, something which has the divisive effect of excluding a large number from participating. However,

the two schools which participated in the current study were exceptions in that senior learners have access to the Internet during school hours. Valenza (2006:22) in her study conducted in the USA mentions that high school students are frustrated with institutional barriers, for example school schedules, preventing them from using Web resources.

2.12.7. Teachers' views and perceptions of Web information seeking

The Namibia Libraries and Archive Services Baseline Report (2008:31) states that, besides security issues, a cogent reason given by principals for restricting access to the Internet was that learners, if unsupervised, are likely to abuse the resource for entertainment purposes or to get their hands on undesirable material (Namibia Libraries and Archive Service 2008:31). Madden *et al.* (2003:np) report concerns of teachers about learners freely accessing the Internet, some of them referring to unsuitable, unsavoury and undesirable sites, and others explicitly mentioning pornography. Two interviewees were worried about the risk of picking up computer viruses. In answer to the question how teens do research in the digital world, the teachers interviewed by Purcell *et al.* were of the opinion that learners tend to spend most of their time on social networking sites and spending any time left over on their schoolwork. As one of the teachers put it: "they just surf the Internet and mess around with Facebook and every other thing, they'll do it until 11:00 or 12:00 or 1:00, and then they'll think they can do their project in one hour. I think that's the biggest problem; while the Internet can be a strength, it's also a huge problem, even in the classroom. Unless you got it set up to monitor every screen, they're going to be looking at pictures of their latest film star, music star or anything else. They will do anything to not do work; and it's a real problem'" (Purcell *et al.* 2012:68). In order to address these concerns, the schools need to closely supervise the learners and ensure that the Internet at school is used for school work only. In this context McFarlane and Roche (2003:155) suggest that the number and variety of sites available for use in schools should be limited and Internet use supervised and filtered.

2.12.8 Connectivity and infrastructure

Valenza (2006:np) considers limited computers as a barrier to Web content access among learners in the USA. In Africa both connectivity and limited infrastructure are among the challenges. In South Africa there are, according to Brandt *et al.* (2004:1), a number of factors that prevent schools from joining the information age. Notably, a large number of schools have no electricity or telephone lines. There are also an alarming number of schools without a proper building infrastructure so that children are studying in shacks or even outside. Nkomo (2009:98) lists slow or poor Internet connections, access restrictions, Web filtering and censoring, and inadequate

facilities (computers and computer laboratories) as limiting Web information-seeking among pupils in schools in South Africa.

In Namibia, according to eLearning Africa (2012:nd), over 300 schools which have electricity were, along with other educational institutions, provided with PCs and Internet connectivity. The Ministry of Education supports and provides technology programs and resources in order to create effective learning environments. However, the 2008 study carried out by Namibian Library and Archive Services, showed that ICT is still effectively absent in the large majority (more than 80%) of schools in Namibia, both as a subject on the curriculum and as a tool for accessing and processing information. This can be explained by the simple fact that many schools do not have electricity (Namibia Libraries and Archive Service 2008:30). eLearning Africa (2012:np) reports that circa 700 Namibian schools in rural areas have no electricity.

2.13 Models and theories of information behavior

In this final section of chapter two, the principal theories on which the present study is based will be discussed. Models of information behavior, according to Wilson (1999:263) do not all describe the same set of phenomena or activities: some are concerned with behavioral patterns in the actual search activity while others present stages of activity within which the behavioral patterns may occur. At a broad level Wilson's nested model of information behaviour, as indicated in Figure 5 below, was adopted for this study.
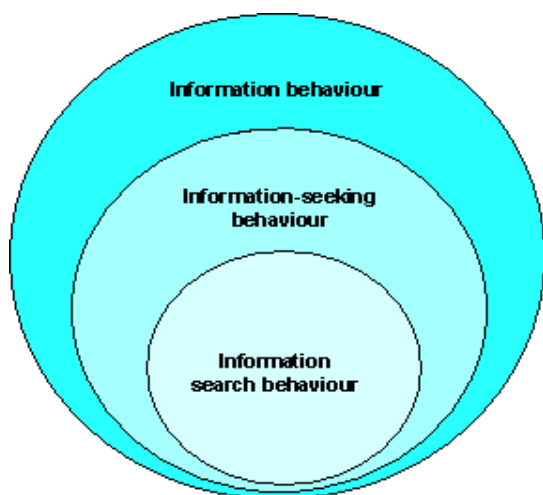
Figure 5: A nested model - from information behavior to information searching (Wilson, 1999)

Wilson (1999) has developed a nested model of conceptual areas which describe the interrelated concepts of information behavior. The model presented here is that of problem solving as the overall framework for the activity of information-seeking. It is Wilson's 1996 model of

information behavior in general (Wilson 1999:263). Wilson (1999:263) states that information behavior may be defined as the more general field of investigation (as shown in Figure 5), with information-seeking behavior being a sub-set of the field, particularly concerned with the variety of methods people employ to find and gain access to information resources. Thus, information searching behavior is defined as a sub-set of information seeking, particularly concerned with the interactions between information user and computer-based information systems.

However, more specifically, the present study is guided by Wilson's (1999) model of information behavior (presented in Figure 6). This is a well-established model that has been successfully adopted by other information behavior studies including Du Preez's (2008) study of information needs and information-seeking behavior of consulting engineers, and Guðmundsson's (2011) study entitled: "Swimming coaches' information-seeking behavior using the World Wide Web." According to Wilson (1999:251), the model attempts to describe an information-seeking activity and suggests the relationships among stages in information-seeking behavior. The scope of the model is broad in that it attempts to cover most of what is considered as belonging to information behavior (Wilson 1999:251).

The model suggests that information-seeking behavior is a consequence of a need perceived by an information user who, in order to satisfy that need, makes demands upon formal (for example, in the context of this study, Web-based academic resources) or informal information sources or services (for example information which is recorded and reported outside the formal publishing process and generally available on the Web). A Web user can either find or fail to find relevant information. If successful, he or she will use the information found and thereby, fully or partially, satisfy his/her perceived need. Failure to find relevant information necessitates a reiteration of the search process (Wilson 1999:251). The model shows that the information-seeking behavior may involve other people through information exchange while information considered useful may be passed on to others as well as being used (or instead of being used) by the person him- or herself (Wilson 1999:251).
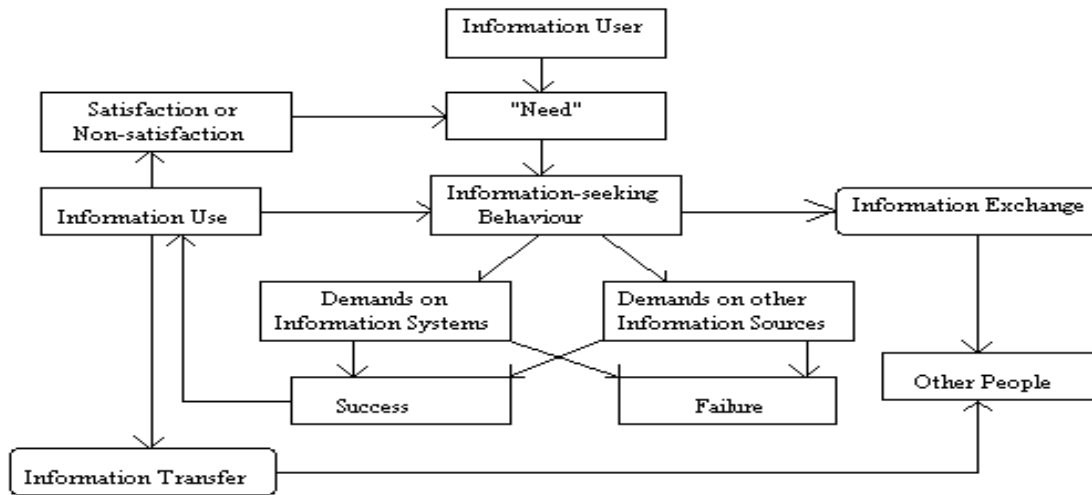
Figure 6: Wilson's information behavior model, 1999

2.14 Summary

Information-seeking is a basic activity, indulged in by all humankind and manifested in a particular behavior (Kakai, Ikoja-Odongo, and Kigongo-Bukenya, 2004:np). Different authors have pointed out that most children have inadequate Web searching skills. This underscores the need to ensure they receive effective training in using the Internet and its information searching systems. Research indicates that most high school students access the Internet in schools, public libraries, or at home, and through the use of mobile technology - cellphones in particular. It has also become clear that a number of learners have difficulty in judging the quality of online information and that time constraints have a negative influence on their information-seeking.

Few studies have been conducted on the Web-based information behavior among students and learners in developing counties where they are faced with problems such as low or poor connectivity, high costs and lack of technological facilities and communication infrastructure. This highlights the different situations of youths from developed and developing countries. Obstacles met by students from developed countries deal mainly with the use of the resources and not to access.

This chapter also addressed the theoretical framework applied. The study broadly adopted Wilson's nested model of information behavior and was guided by Wilson's (1999) model of information behavior which comprises 12 components (Figure 6). While Wilson's information-seeking behaviour (one of the components) provides the broad context, Ellis provides more specific steps or activities comprising the interactions between the information user and computer-

based information systems. This model consists of six categories of information-seeking activities: starting, chaining, browsing, differentiating, monitoring, and extracting.

In chapter three the research methodology, used to address the research questions, will be outlined.

<div align="center">

CHAPTER THREE

RESEARCH METHODOLOGY

</div>

3.1 Introduction

In this chapter, the research methodology used in investigating the Web-based information behavior of grade 12 learners, is described. The research paradigm, research design, research approach, population concerned, sampling procedures and data collection procedures are outlined. To begin with, the term "research methodology" is defined.

3.2 Research methodology

Babbie (2011:647) defines research methodology as "the methods, techniques and procedures that are employed in the process of implementing the research design or research plan as well as the underlying principles and assumptions that underline their use". Sarantakos (1997:34) describes the research methodology as the science of methods, including the standards and principles employed to guide the choice, structure, process and use of methods, as directed by the underlying paradigm". It is to the term "paradigm" that the discussion now turns.

3.3 Research paradigm

A paradigm is a term frequently used in the social sciences but one that can lead to confusion because it tends to be given multiple meanings. According to Saunders *et al*. (2009:118), a paradigm "is a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted". Pickard (2007:7) classifies research paradigms into three philosophically distinct categories, namely positivism, interpretivism and post-positivism. Terreblanche, Durrheim and Painter (2006:47), observes that the research paradigm has many implications for the design, sampling, data collection instruments, and analysis of a study, because these aspects differ depending on which research paradigm is selected. Below the paradigm classifications are briefly discussed.

3.3.1 Interpretivism

Interpretive researchers believe that reality consists of people's subjective experiences of the external world. Unlike positivists, interpretive researchers use meaning and relevance, but no measurements orientated methodologies. They mainly use data generation techniques such as interviews or participants' observations that rely on subjective relationships between the

researcher and his/her subjects (Saunders *et al*. (2009:116). Interpretivism advocates the necessity for the researcher to understand differences between humans in their roles as social actors. This emphasises the difference between conducting research relating to people rather than to objects such as computers. Crucial to the interpretivist philosophy is that the researcher has to adopt an imagined stance. The challenge here is to enter the social world of the research subjects and to understand it from their point of view (Saunders *et al*.2009:117).

3.3.2 Positivism

Positivist researchers assume that reality is an objective given and that it is measurable, using properties which are independent of the researcher and his or her instruments. In other words, knowledge is objective and quantifiable. Positivism works in the tradition of natural science and, if the research reflects the philosophy of positivism, it will probably follow the philosophical stance of the natural scientist. Positivists prefer "working with an observable social reality and that the end product of such research can be law-like generalisations, similar to those produced by the physical and natural scientists" (Remenyi *et al.* 1998 cited in Saunders *et al.* 2009:113).

The positivist researcher would claim to be external to the process of data collection in the sense that there is little that can be done to change the substance of the data collected. The assumption is that "the researcher is independent of and neither affects nor is affected by the subject of the research" (Remenyi *et al.* 1998:33). According to Gill and Johnson (2002), the emphasis is on quantifiable observations that lend themselves to statistical analysis. The aim is for the researcher to "observe from a distance" and to interfere with as little disturbance as possible with the field or the subject being studied, thus ensuring his/her objectivity (Denzin and Lincoln 2000:1-2). The current study adopted the positivist paradigm given that, in the main, it was measurement oriented.

3.4 Research approach

Research methodology revolves around two major approaches: qualitative and quantitative research (Powell 1999:3). The difference between the two is that, essentially, qualitative research involves methods that collect verbal or textual data, while quantitative research uses numerical data that can be counted (School of Education Training and Development 2003:59). The quantitative approach is, among other things, preoccupied with measurement, categorization and statistical data (Denzin and Lincoln 2000:1). Shenton and Dixon (2003:2) state that research can profit from the use of both the qualitative and quantitative methods. A study that uses exclusively one or the other is likely to miss out on the rich interpretation made possible by an integrated approach, particularly when social phenomena such as behavior are investigated.

3.4.1 Qualitative research

By definition qualitative research "is a method of inquiry employed in many different academic disciplines, traditionally in the social science but also in the market research and further contexts" (Denzin and Lincoln 2005). Best and Kahn (2006:246) emphasize that all qualitative research involves a design that allows for flexibility and purposeful sampling, and most use realistic enquiry. Qualitative researchers typically rely on the following methods for gathering information: participant observation, non-participant observation, field notes, reflexive journals, structured interviews, semi-structured interviews, unstructured interviews and analysis of documents and materials (Boas 1943).

Qualitative research may generally be understood as research that is conducted in a natural setting. Sarantakos (1997:6) states that qualitative research employs methods of data collection and analysis that are non-quantitative. Such research aims to explore sociological elements and describe reality as experienced by the respondents. Other than that, qualitative research methods, according to Durrheim (in Terreblanche, Durrheim and Painter 2006:46), allow researchers to study selected issues in depth. As noted above, the qualitative method, as far as employed in the present study, is evident in the structured (open-ended) questions in the questionnaire.

3.4.2 Quantitative research

Quantitative research refers to "the systematic empirical investigation of social phenomena via statistical, mathematical or computational techniques" (Given 2008). Quantitative research refers to a study that is numerically oriented, requires that significant attention is paid to the measurement of phenomena, and often it involves statistical analysis. There are various quantitative research methods today. Myers (1997:np) identifies the following quantitative methods, all of them generally accepted in the social sciences: Surveys, laboratory experiments, formal methods (for example, econometrics) and numerical methods such as mathematical modelling. According to McCarthy (2006:np), quantitative methods are useful for getting answers to the questions of what, where and when.

With regard to Web information-seeking behavior, the quantitative research method was applied to determine who is doing what, how many learners are doing what, how many are aware of something, or believe something, or are in some way motivated to behave in a certain way towards the Web in their learning environments.

The approach was chosen to ensure that Web information behavior activity associated with people's characteristics, opinions, views, attitudes or experiences, would be sufficiently addressed while allowing the researcher to reach a large - and thus more representative - population allowing for a better generalisation of the findings (Kellar, Watters and Shepherd 2006:7). Quantitative researchers seek causal determination, prediction, and the generalization of findings, while qualitative researchers seek illumination, understanding, and extrapolation to similar situations (Best and Kahn 2006:246).

In the case of the current research both research approaches were used. The qualitative method was partly used in this study through open-ended questions. However, the quantitative approach was the dominant one adopted. Such an integrated approach was achieved through the use of a questionnaire comprising open questions that generated qualitative data and closed questions which provided quantitative data. Open questions invited the expression of feelings and views, perceptions and opinions of the respondents with regard to Web information seeking. Although the researcher selected a largely quantitative research approach and more specifically a descriptive design, the answers to the open questions which were subsequently quantified, introduced a qualitative element to the study.

3.5 Research design

The use of surveys is one of several research designs (others include content analysis, experiments, observation and the historical method), employed by researchers to gather information for a study. It is among the most prevalent techniques used. Surveys involve the systematic collecting of data, whether by interview, questionnaire or through observation methods. Precise samples are selected for surveying and attempts are made to standardize and eliminate errors from the survey data gathering tools. They are aimed at identifying something specific about a population, resulting in a set of objects about which we wish to make generalizations (Gray 2004:99).

Best and Kahn (2006:271) see the survey as a research instrument that uses both quantitative and qualitative research methodologies. The most frequently cited reasons for using surveys is that they tend to be relatively cheap, easy to carry out, with the ability to generate huge amounts of data in a relatively short period of time which can be easily quantified, and they can collect original data for describing a population that is too large to observe (McNeill 1990:19). For these very reasons the present study chose the survey within, as mentioned above, a quantitative approach.

Generally, surveys are employed to gather information on the background, behavior, beliefs or attitudes of a large number of people (Neumann 2006:43). According to Babbie and Mouton (2001:232), survey research involves collecting data through asking questions, either by using self-administered questionnaires or through interviews. Surveys are used for descriptive, explanatory and exploratory purposes. Descriptive surveys are designed to measure the characteristics of a particular population. They are designed to discover what, rather than why something occurred (Gray 2004:100). In keeping with the quantitative approach the present researcher used a structured self-administered questionnaire as the date collection technique. This is further discussed under 3.6 below.

3.6 Data Collection tools / techniques

In the most general sense, Detmar *et al.* (2004:np) describe techniques as the specific procedures that determine how a researcher gathers data. The most commonly used data collection tools in a survey consist of self-administered questionnaires, personal interviews and/or the use of focus groups. As noted earlier, this study employed the self-administered questionnaire.

3.6.1 Questionnaires

According to Loose and Worley (1994:144) the use of questionnaires to collect data is very popular in much of information behavior research. A questionnaire can either be used on its own or in conjunction with other methods of data collection. The written questionnaire, whether administered through the mail or as part of a personal interview process, can be highly effective as a means of obtaining data. The authors mention the questionnaire's ability to elicit both qualitative and quantitative data on unobservable behavior such as feelings, attitudes, ideas, opinions, and viewpoints. This made it the instrument of choice for the present study. Furthermore, questionnaires give respondents time and the freedom to independently respond to questions and responses may be well thought out. The researcher has little influence on the responses and the respondents enjoy greater anonymity, possibly resulting in less bias.

According to Cockburn and Mackenzie (2000:2), "The main attraction of questionnaires is the relative ease of gathering a large set of responses. Their primary limitations however, are their narrow scope and their separation from the user's task: They report on the user's perceived, rather than actual, interaction." Dawson (2002:86) makes it clear that, "If you're sure that a questionnaire is the most appropriate method for your research, you need to decide whether you intend to construct a closed-ended, open-ended or combination questionnaire". The questionnaire used in this study comprised of both open and closed questions.

a) Open questions

Dawson (2002:86) poses that open questions allow the respondent to answer in his/ her own words. They give the respondent an opportunity to express an opinion without being influenced by the researcher (Foddy 1993:127). The advantages of open questions include the possibility of totally spontaneous answers and the avoidance of any bias that could result from the researcher suggesting a certain position to respondents which could occur in the case of closed questions. However, open questions have also disadvantages such as the need for extensive coding and extensive non-response (Reja *et al.* 2003:161).   Open questions in this study were used when elaboration and explanation of online (Web) behaviour of learners was required.

b) Closed questions

In closed questions pre-written response categories are provided and respondents are asked to choose answers from these (Dawson 2002:86). Thus, "Close-ended questions limit the respondent to the set of alternatives being offered" (Reja *et al.* 2003:161). The advantages of closed questions include that the questionnaire can be quicker administered, it is often easier and quicker for the researcher to record responses and easier to code. A disadvantage is obviously that respondents can only answer in pre-defined terms and new issues cannot always be raised. Respondents may have to answer in a way that does not match their actual opinion and become frustrated. However, as closed questions do not take much time to answer, respondents may be more likely to answer all the questions (Dawson 2002: 87).

A further decision concerning the questionnaire is whether it is to be self-administered, whereby the respondent fills it in alone, away from the researcher, or whether it is to be administered by the interviewer. Dawson (2002:87) points out that the self-administered questionnaire can be sent through the post, delivered in person or distributed via email. For the present study the questionnaires were distributed by the researcher herself as described in 3.10 below. An advantage of using questionnaires is that information can be collected relatively quickly from a large sample size and is cost effective in comparison with face-to-face interviews,   easy to analyze once the data is collected, lacking the interviewer's bias and promoting a feeling of anonymity on the part of respondents (Babbie and Mouton 2001:162).

Self-administered questionnaires also have disadvantages: respondents may, for example, take their time to return the questionnaire, or even abandon it and not return it at all. In addition, probing is not possible which could be problematic in the case of questions with multiple response formats and for open questions. Because the process of data collection remains unobserved, it is not known whether respondents understand and follow the given instructions. To overcome this in the present study, questionnaires were administered and collected in person, directly after completion. The researcher being present, she could immediately respond to any queries (the procedure is described under 3.10 below).

3.7 Population

In discussing population it is important to distinguish between the target population and the study population. Kazerooni (2001:np) states that the target population is the whole group of individuals to whom we would like to apply our conclusions. The study population, on the other hand, is the group of individuals to whom we can legitimately apply our conclusions. Unfortunately the target population is not always readily accessible and we can only study that part of it that is available. Babbie (2011:175) notes that the study population is the aggregation of elements from which the sample is selected. The target population for this study were grade 12 learners and the study population consisted of 201 grade 12 learners from Mweshipandeka High School and 400 grade 12 learners from Gabriel Taapopi Senior Secondary School. The total population of grade 12 learners in the two schools was 601 (as determined through school databases) and it was from this study population that the sample was drawn.

3.8 Sampling

Sampling is the process of selecting units (for example persons or organizations) from a population of interest in such a way that, after studying the sample, we may feel justified in generalizing our results and applying them to the population from which the sample was chosen (Trochim 2002:np). Sampling can be divided into two types, namely probability and non-probability sampling (Neuman 2006). Some scholars describe the two types as random and non-random methods (Australian Bureau of Statistics 2004, cited in Nkomo 2009). According to Trochim (2002: np) the difference between non-probability and probability sampling is that non-probability sampling does not involve random selection whereas probability sampling does. With a probability sample one is on more secure grounds in terms of knowing that the sample represents the population well (Trochim 2002:np).

3.8.1 Sampling methods

The decision whether to use random or non-random sampling techniques or quantitative or qualitative approaches is influenced by the research methodology adopted. In a quantitative study, the intention is often to select samples randomly to achieve representative results. By contrast, qualitative studies often select samples for their usefulness as opposed to their randomness (Best and Kahn 2006:249). As earlier mentioned, the present study used the quantitative methodology. Probability sampling, using both stratified and systematic sampling techniques, was used to ensure that certain characteristics of the population were captured in the results without sacrificing representation. Trochim (2002:np) states that in stratified sampling, elements are chosen randomly according to some fixed strata, and Neuman (2006:221) confirms, more specifically, that in stratified sampling the researcher identifies categories into which cases or people will be selected and the selection aims to reach a predetermined number in each category. In the present study, the survey population was categorized according to fields (or strata) of study using stratified sampling. A systematic random sample was drawn from each of the strata.

This study did not necessarily aim to examine behavior as linked to a specific area of study; instead, the intention was to have all the fields of study represented. However, it needs to be noted that a field of study may have implications for access to technology. For example, those learners doing Science and Technology have ICT integrated into their study field and, consequently, might find it easier to access ICT facilities (such as computers) than learners in other study fields.

3.8.2 Sample size and response rate

To determine the appropriate size of the sample for the present study, the sampling table in Saunders *et al*. (2009:219) was used. It indicates that, with a population of 601 (as is the case in this study), a sample of 217 should be adequate. The sample was selected using, as mentioned above, a stratified, systematic random sampling method. Table 2 below demonstrates the population stratified according to study fields as well as the sample size achieved. The questionnaires were randomly distributed to the sample population at each of the two high schools. The last column in the table reflects the number of respondents and the percentage of answers achieved in each of the strata. The overall response rate was 74%.

Table 2: Population and sample size

Strata	Population	Sample size	Response rate
Mweshipandeka High School			
Science	64	23	21 (9.6 %)
Agriculture	106	38	22(10.1%)
Home economics	11	5	3(1.4%)
Design and technology	20	7	4(1.8%)
Total	**201**	**73**	**50(22.9%)**
Gabriel Taapopi Senior Secondary School			
Commerce	122	44	29(13.4%)
Science	278	100	81(37.3%)
Total	**400**	**144**	**110 (50.7%)**
Overall	**601**	**217**	**160(74.0%)**

3.9 Reliability and validity of instruments

Reliability refers to consistency, even though consistency does not guarantee truthfulness (Henerson, Morris, and Fitz-Gibbon 1987:134). When one conducts a survey, using a questionnaire, and the results are the same on different occasions, the instrument is considered reliable. According to Joppe (2000 cited in Golafshani 2003:598), reliability is "the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable". In addition to reliability, validity needs to be evaluated, namely, "whether the research truly measures that which it was intended to measure or how truthful the research results are" (Golafshani 2003:598).

The securing of validity and reliability can be facilitated in a number of ways but one of the most important methods to ensure the validity of an instrument is to do a pre-test. Fraenkel (2000:169) states that, when a researcher is aware of potential errors (exposed through, for example, a pre-test) remedial action can be taken quickly before resources are wasted on collecting data whose reliability and validity might later be questioned. Concerning the validity of the questionnaire used in the present study, a pre-test was done on eight grade 12 learners in one of the schools. Respondents were asked to be mindful of any question which they found difficult to answer. Respondents in the pre-test were generally able to complete the questionnaire without much difficulty. However, there were instances where problems were experienced. For example, learners' reactions to the questionnaire showed that most did not understand words like "acknowledgement" and "equip".

Through the pre-test the researcher discovered that there were some fields of study at both schools that she was unaware of. These were added to the questionnaire. Words that respondents did not understand were clarified in the final version of the questionnaire. Feedback obtained from the pre-test thus helped improve the quality of the instrument in areas such as the precision of questions, how they captured content, and their suitability for the respondents. In addition to the pre-test, validity was also ensured through content validation. Content validation was achieved by making sure that the items in the questionnaire were related to the questions which the present study set out to answer. Content validity is a systematic examination of content to determine whether it adequately represents that which is to be measured (Anastasi and Urbina 1997:114).

3.10 Data collection procedure

As noted, data for this study was collected using a self-administered questionnaire. The questionnaire was distributed to grade 12 learners in the two selected schools. This distribution took place while the learners were gathered in the hall of each school and grouped according to their fields of study. The school halls were chosen because they are convenient places where learners can all gather. The following approach was adopted:

A questionnaire was randomly given to the required number of learners in each group. Thus, for example, of the 64 science students at the Meshipandeka High School, 23 were given a questionnaire. This helped ensure that the fields of study were proportionally represented. All the questionnaires were distributed and collected by the researcher herself. This approach helped to minimize the possibility of faulty data being produced, because she took time to explain everything to the respondents before they completed the questionnaire. The researcher could also respond directly to any queries. This approach gave the researcher control over the data collection procedure and assisted in increasing the overall response rate.

3.11 Data analysis

The methods used to analyse the data depend on whether the research approach is qualitative or quantitative (Dawson 2002:110). Edwards and Talbot (1994:98) point out that data carries little information until it is compiled, analysed and interpreted. According to Saunders *et al.* (2009:415), data analysis is the process of obtaining meaning from raw data and of discovering their implications. They pose that the data analysis methods, associated with survey research design, are content analysis, descriptive statistical analysis, and statistical testing. Two types of data analysis are:

a)   Qualitative data analysis

McMillan and Schumacher (1997) argue that "qualitative researchers integrate the operations of organising, analysing, and interpreting data and call the entire process data analysis." Qualitative data basically means textual data. The qualitative data derived from the open questions was analysed using content analysis. Courtney (2005:51) defines content analysis as a "systematic, replicable technique for compressing many words for text into fewer content categories based on explicit rules of coding". Adopting this approach, the researcher was able to identify major themes/threads in the responses. The frequency of words or phrases was coded and entered into SPSS.

b)   Quantitative data analysis

Dawson (2002:110) states that quantitative data analysis is done at the end of the data collection process. If it concerns a large survey, it is easiest and most efficient to use statistical software. Quantitative data is sometimes referred to as numerical data and involves data measured or identified on a numerical scale. Quantitative data is essentially analysed using statistical methods and results can be displayed using tables, charts, histograms, and graphs (Muhambe 2012:42). In the present study quantitative analysis techniques were used to analyse the data. The programme of Statistical Programme for Social Sciences (SPSS) was used to analyse the quantitative data. Thus, in the present study, the variables in the questionnaire were given codes before entering the data into SPSS. Babbie and Mouton (2001:583) state that SPSS can be very helpful when it comes to the manipulation of large amounts of data. With the help of SPSS, frequency tables, graphs, and pie charts were created and used for quantitative analysis and subsequent presentation (see chapter four).

3.12 Summary

In this chapter the research methodology and methods used to address the research problem were discussed. Important issues such as research design, population, sampling and data collection instruments, pre-test of the questionnaire, validity and reliability, were discussed. Included is a detailed discussion of the questionnaire as the data collection method used in the study.
In the following chapter the finding of the study are presented.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Introduction

Chapter four presents the research findings (data presentation). The results were drawn from the self-administered questionnaire given to the grade 12 learners at Mweshipandeka High School and Grabriel Taapopi Senior Secondary School. There are seven (7) sections with results, corresponding to the key research questions as outlined in chapter one. Prior to listing the results relating to a particular question, an overview of the question is given.

4.2 Response rate

Of the 217 copies of questionnaires distributed to grade 12 learners, 160 were returned, yielding a response rate of 74%. Considering the sample size of 217 grade 12 learners from two selected schools, this is a good response rate, due in part to the various measures taken by the researcher and aimed at ensuring participation as mentioned in chapter three.

In the following section, the symbol N indicates the possible total of respondents that could have answered a particular question.

4.3 BACKGROUND INFORMATION

4.3.1 Gender

The respondents were asked to specify their gender (question 1). The results are illustrated in Figure 7. There were 94 (58.8%) female and 66 (41.3%) male respondents.

N=160
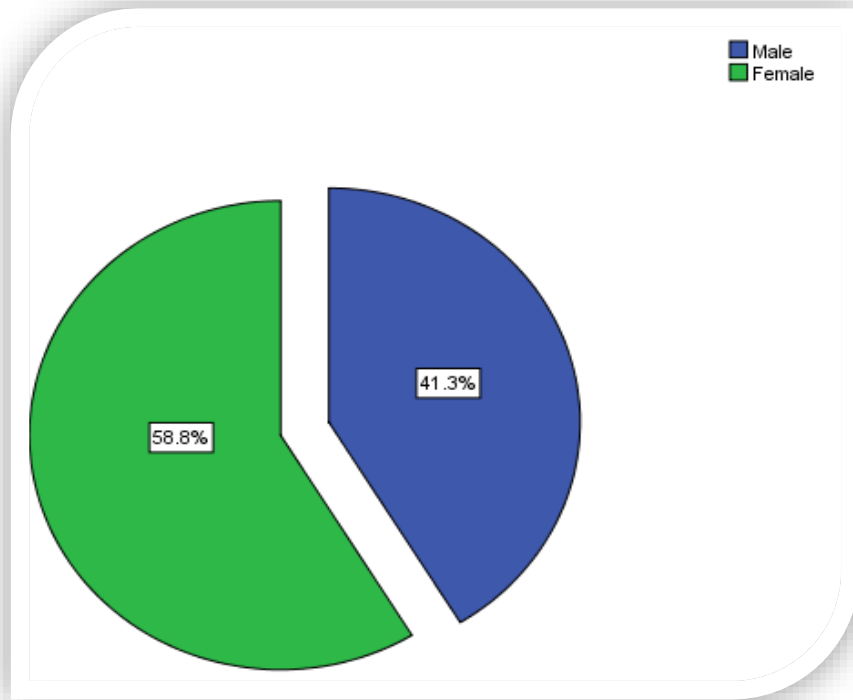
Figure 7: Gender

4.3.2 Age

The information in this section deals with the age range of participants. In question 2 respondents were asked to specify their age. Table 3 shows that the highest number of respondents (71 or 44.4%) were 18 years old. The lowest number of respondents were 21 (2.5%) and 20 (3.8%) years of age. Hence, the most common age group was 17-18 (69.4%) and the least common was 20-21 (6.3%).

Table 3: Age distribution

N=160

Age	Frequency	Percent
16	14	8.8
17	40	25.0
18	71	44.4
19	25	15.6
20	6	3.8
21	4	2.5
Total	**160**	**100.0**

4.3.3 Field of study

The respondents were asked to specify their field of study (question 3). The results, illustrated in Table 4, show that 102 (63.8%) respondents, or the majority, studied Science followed by Commerce with 29 (17.1%) respondents. The lowest numbers were four (2.5%) learners who were doing Design and Technology, followed by three (1.9%) respondents studying Home Economics. The findings reveal that the biggest group of respondents were from Science and the smallest group from the Home Economics field of study.

Table 4: Field of study

N=160

Field of study	Frequency	Percent
Science	102	63.8
Commerce	29	18.1
Agriculture	22	13.8
Design and Technology	4	2.5
Home Economics	3	1.9
Total	**160**	**100.0**

4.3.4 Accessing the Internet

Respondents were asked if they access the Internet (Question 4). The results in Figure 8 below show that 141 (86.3%) respondents access the Internet and 22 (13.8%) do not access the Internet.

N=160
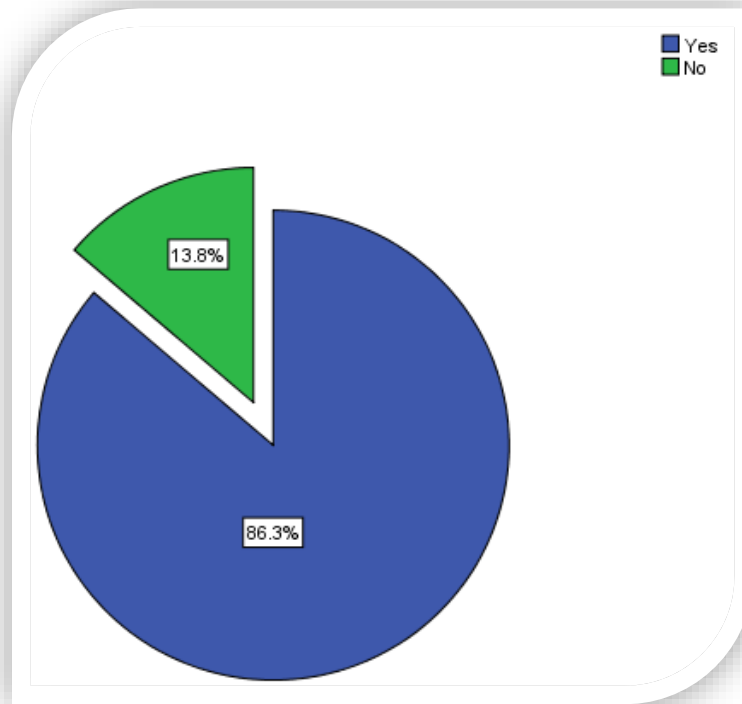
Figure 8: Accessing the Internet

4.3.5 Why not accessing the Internet

The 22 respondents who stated that they did not access the Internet were asked why. The results in Table 5 below show that the highest number of respondents, seven or 31.8%, have no access to the Internet due to malfunctioning computers, while six (27.2%) have no computer and hence no access to the net. Four (18.1%) said their cell phones were unable to access the Internet and three (13.6%) said they did not have the skills to do so.

Table 5: Reason/s for not accessing the Internet

N=22

Reasons for accessing Internet	Frequency	Percent
Malfunctioning computers	**7**	31.8
Lack of Computers	6	27.2
No Internet access on cell phone	4	18.1
Lack of skills	3	13.6
School restriction to computer/Internet	2	9.0
Total	**22**	**100.0**

4.4. HOW, WHERE AND WHEN IS THE INTERNET ACCESSED?

4.4.1 Gaining access to the Internet

The 138 respondents who indicated that they use the Internet were asked how they gain access (question 5). The results are presented in Table 6. The Table shows that, 114 (82.6%) respondents, or the majority, access the Internet using cell phones, followed by 64 (46.3%) respondents who use school laboratory computers. The lowest number of respondents, namely two (1.4%), use tablets while nine (6.5%) respondents use computers in the public library.

Table 6: Internet access modes
N=138

Internet access mode	Frequency	Percent
Cell phone	114	82.6
School laboratory computer	64	46.3
School library computer	56	45.1
Home computer	44	31.8
Friend's home computer	16	11.5
Public library computer	9	6.5
Tablet	2	1.4
iPad	1	0.7
Total*	**306**	**221.7**

*Multiple responses received

4.4.2 Most used Internet mode

Out of 138 respondents, 109 who ticked more than one mode were asked to identify the Internet mode they use the most. The results in the graph in Figure 9 show that 78 (71.6%), or the majority of respondents use cell phones followed by 13 (11.9%) respondents who use home computers.
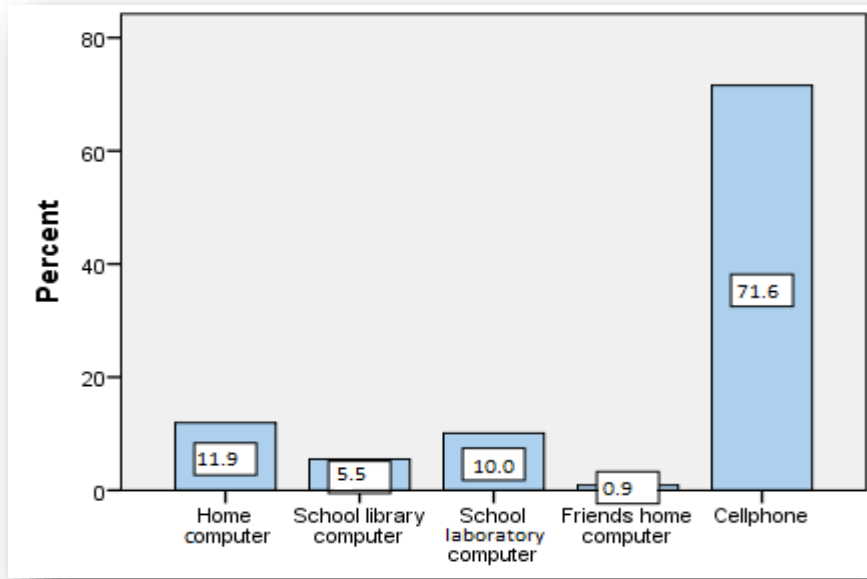
Figure 9: Most used Internet mode

4.4.3 When Internet is accessed

Respondents were asked to indicate when they access the Internet (question 6). Figure 10 below shows that 64 (46.4%) respondents access the Internet during weekends, followed by 41 (29.7%) who access the net after school and 33 (23.9%) during school hours.

N=138
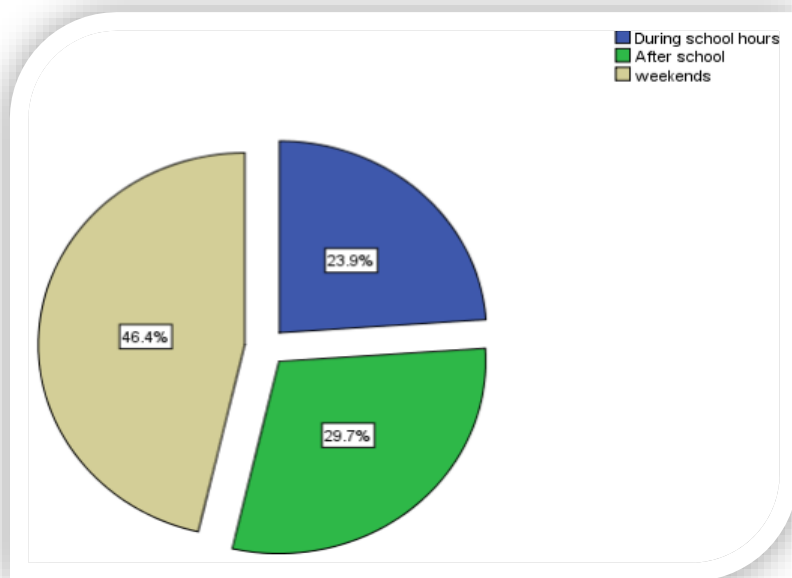
Figure 10: When Internet is accessed

4.4.4 Time learners spend on the Internet

The 138 respondents were asked how much time they spend weekly on the Internet (question 7). Table 7 below indicates that a high number of respondents (59 or 42.8%), spend less than one hour per week on the net followed by 47 (34.1%) respondents with between one and three hours per week. Hence, the majority of respondents (76.9%) reports spending three hours or less per week on the Internet. By contrast, 32 (23.1%) respondents spend three or more hours per week on the net.

Table 7: Average time spent on the Internet

N=138

Average time spent on Internet	Frequency	Percent
Less than one hour	59	42.8
Between one and three hours	47	34.1
Between three and five hours	17	12.3
Between five and seven hours	11	7.9
Seven or more hours	4	2.9
Total	**138**	**100.0**

4.5 PURPOSES FOR WHICH INFORMATION IS SOUGHT ON THE WEB

5.1 What the Internet is used for.

Respondents were asked what they use the Internet for (question 8). The results in Table 8 below indicate that a sizable majority of respondents (103 or 74.6%) use the Internet for searching for information, followed by social networking which was mentioned by 81 (58.6%) respondents. The smallest number of respondents, 44 or 31.8%, use the Internet for email.

Table 8: What the Internet is used for

N=138

Reasons for using Internet	Frequency	Percent
Searching for information using the Web	103	74.6
Social networking	81	58.6
Email	44	31.8
Total*	**228**	**165.2**

* Multiple responses received

4.5.2 Purpose of seeking information on the Web

Respondents were asked the purpose for which they seek information on the Web (question 9). The results in Table 9 below indicate that the highest number of respondents at 102 (73.9%) use the Web for school related work, followed by entertainment with 83 (60.1%) respondents, while the lowest number of 36 or 26.0% use the Web for topics of general awareness.

Table 9: Purpose of Web information use

N=138

Purpose of Web information use	Frequency	Percent
School related work	102	73.9
Entertainment	83	60.1
Communication/Social networking	61	44.2
General Awareness	36	26.0
Total*	**282**	**204.3**

*Multiple responses received

4.5.3 Aspects of school related work

The 102 respondents who indicated that they seek information on the Web for school related work were asked in an open question for which particular aspects of school related work they use Web information (question 10). The results in Table 10 below indicate that a majority of respondents (72 or 70.5%) use the Internet for homework, study notes for exams, followed by assignments and projects which were mentioned by 51 (50.0%) respondents. The smallest number of participants, nine (8.8%), use the Internet for general subject information. The results show an unavoidable overlap (lack of mutual exclusiveness) in these categories. They are presented so as to reflect the respondents' statements.

Table 10: Aspects of school related work

N=102

Aspects of school related work	Frequency	Percent
Homework	42	41.1
Exam Study Notes	30	29.4
Assignments	27	26.4
Projects	24	23.5
Experiments	12	11.8
General study information (further study information)	9	8.8
Total*	**144**	**141.1**

***Multiple responses received**

4.5.4 Why not using the Internet for school work

The 36 respondents who did not use the Web to get information for school related work were asked in an open question to give their reasons (question 11). The results in Table 11 below indicate that the highest number of respondents, namely ten (27.7%) who indicated they avoid the Internet for school related work because the school does not allow them enough time to use the resource, followed by five (13.8%) who use books for school related work.

Table 11: Why not using Internet for school work

N=36

Reasons for not using Internet for school work	Frequency	Percent
School restricts access to computers and time to surf Internet	10	27.7
Use of books for information	8	22.2
Shortage of computers at school	5	13.8
Using information from teachers only	4	11.1
Lack of awareness about school information on Internet	4	11.1
Confusing information	3	8.3
Using Internet for entertainment only	3	8.3
Malfunctioning computers/Internet	3	8.3
Total*	**40**	**111.1**

***Multiple responses received**

4.6. HOW IS INFORMATION SEARCHED FOR ON THE WEB (STEPS INVOLVED)

4.6.1 Steps taken in searching for information from the Web

The 102 respondents who used the Web to get information for school related work were asked in an open question to indicate the steps they took to obtain relevant information (question 12). The results in Table 12 below indicate that the smallest number of respondents (seven or 6.8%) use key words to search. The findings show that the most common "move" mentioned by 74 (72.5%) respondents was to, Go to Web browser (Internet Explorer and Opera Mini), Find search engine (Google and Yahoo) and Search. However, various sequences (or moves) were followed. Respondents generally did not give a detailed outline of the steps they took and many students mentioned simply opening the browser and entering what they thought were appropriate terms into a search engine.

Table 12: Steps taken in searching for information from the Web

N=102

Steps taken in searching	Frequency	Percent
Go to Web browser (Internet explorer and opera mini), find search engine (Google and yahoo search) and search	74	72.5
Enter the question or enter keywords	20	19.6
Select the wanted information among results	13	12.7
Copy or save	32	31.3
Total*	**139**	**136.2**

*Multiple responses received

4.6.2 Information found or not found

The learners were asked whether or not they could find the information they were looking for (question 13). The responses are presented in Table 13 below. The results show that the vast majority of 93 (91.1%) respondents considered their searches successful as opposed to four (3.9%) who didn't.

Table 13: Finding information on the Internet

N=102

Finding information on Internet	Frequency	Percent
Yes	93	91.1
No	4	3.9
No response	5	4.9
Total	**102**	**100.0**

The four respondents whose searches had been fruitless were asked in an open question to describe any further steps they took to obtain the desired information and whether they had been successful. Only two participants responded to this question. One (50.0%) said he/she subsequently went to the library and the other (50.0%) had undertaken "research". Neither indicated whether success had followed or not.

4.6.3 How often users perform information-seeking steps

The respondents were asked to list the steps they followed when searching for information on the Web and to indicate how often they used these steps (question 18). The results are presented in Table 14 below. They show that the majority of respondents (55 or 53.9%) identify websites/pages followed by 41 (40.2%) who often select useful pages and sites by bookmarking, printing, copying and pasting. Forty-two respondents (41.1%) never receive site updates using, for example, push, agents, or profiles, and/or revisit favourite sites for new information and 39 (38.2%) respondents tend to systematically search a local site to extract information. The findings show that identifying websites/pages, scanning top-level pages, selecting useful pages and sites by bookmarking, printing, copying and pasting, are the common steps performed by learners when seeking information.

Table 14: Web information-seeking steps

N=102

Web information-seeking steps	Frequency and percentage				
	Always	**Often**	**Occasionally**	**Never**	**Total**
Identify websites/pages	55 (53.9%)	37 (36.2%)	8 (7.8%)	2 (1.9%)	**102 (100.0%)**
Follow links on starting pages	30 (29.4%)	37 (36.2%)	21 (20.5%)	14 (13.7%)	**102 (100.0%)**
Scan top-level pages: lists, headings, site maps	39 (38.2%)	40 (39.2%)	18 (17.6%)	5 (4.9%)	**102 (100.0%)**
Select useful pages and sites by bookmarking, printing, copying and pasting	33 (32.3%)	41 (40.2%)	18 (17.6%)	10 (9.8%)	**102 (100.0%)**
Receive site updates using e.g. push, agents, or profiles and/or Revisit favourite sites for new information	11 (10.7%)	18 (17.6%)	31 (30.3%)	42 (41.1%)	**102 (100.0%)**
Systematically search a local site to extract information	24 (23.5%)	39 (38.2%)	17 (16.6%)	22 (21.5%)	**102 (100.0%)**

4.7. WEB INFORMATION SEARCHING SKILLS

4.7.1 Web abilities

The respondents were asked to rate their abilities with regard to various aspects of searching for information on the Internet/Web (question 14). The results are presented in Table 15 below. In all but one instance the majority of respondents rated themselves as good, very good or excellent. The one case in which more than half (58 or 56.9%) of respondents rated themselves as fair or poor, concerned their ability to combine and use appropriate effective keywords applying the Boolean operators. Another aspect, in which 34 or 33.3% of respondents rated their performance as fair to poor, was related to assessing the quality and the accuracy of information found online.

Table 15: Overall abilities

N=102

Abilities	Frequency and percentage					
	Excellent	**Very good**	**Good**	**Fair**	**Poor**	**Total**
Ability to understand how online search results are generated	19 (18.6%)	30 (29.4%)	41 (40.1%)	11 (10.7%)	1 (0.9%)	**102 (100%)**
Ability to identify appropriate effective search terms	10 (9.8%)	31 (30.3%)	39 (38.2%)	18 (17.6%)	4 (3.9%)	**102 (100%)**
Ability to combine and use these terms/keywords using the Boolean operators	2 (1.9%)	11 (10.7%)	31 (30.3%)	44 (43.1%)	14 (13.7%)	**102 (100%)**
Ability to assess the quality and accuracy of information found online	12 (11.7)	18 (17.6)	38 (37.2)	26 (25.4)	8 (7.8)	**102 (100%)**

4.7.2 Learners' perception of their abilities with regard to searching for information on the Web

Question 15 asked respondents to consider whether they possessed the necessary skills to use the Internet/Web when searching for information. Table 16 below shows that a slight majority of 52 (50.9%) thought that they had the necessary skills whereas 38 (37.2%) admitted that they do ''not really'' have the required skills, and six (5.8%) felt that they had no relevant skills at all.

Table 16: Possession of necessary Web skills

N=102

Possessing necessary Web skills	Frequency	Percent
Yes	52	50.9
Not really	38	37.2
Not at all	6	5.8
No response	6	5.8
Total	**102**	**100.0**

4.7.3 Received formal training

Question 16 asked from the learners whether they had ever received any formal training or orientation courses on how to use the Web in terms of searching for information. The responses are presented in Table 17 below. Sixty (58.8%) respondents said they had received formal training; 36 (35.2%) had not.

Table 17: Receiving formal training

N=102

Receiving training	Frequency	Percent
Yes	60	58.8
No	36	35.2
No response	6	5.8
Total	**102**	**100.0**

4.7.4 Usefulness of the training received

The 60 respondents who had received training were asked if the training had been useful. The answers are set out in Table 18 below: 44 (73.3%) found the training was useful as opposed to 16 (26.6%) who felt the training had not been beneficial to them.

Table 18: Usefulness of the training

N=60

Usefulness of training	Frequency	Percent
Yes	44	73.3
No	16	26.6
Total	**60**	**100**

4.7.4.1 Why students did not receive training

The 36 respondents who had not received any formal training were asked why not. Their reactions are reflected in Table 19 below. Eight (22.2%) indicated they already had the skills. Twenty-five (69.4%) stated they missed out on training because ICT is only integrated in some of the study fields at their school. Four (11.1%) said that they could not afford such training.

Table 19: Reasons for not receiving training

N=36

Why not trained	Frequency	Percent
ICT is integrated in some study fields only	25	69.4
Have got skills already	8	22.2
No money for personal training	4	11.1
Total*	**37**	**102.7**

*Multiple responses received

4.7.5 Suggestions on how to equip more people with Web information-seeking skills

Respondents were asked in an open question to suggest what, in their view, their schools could do to equip learners like themselves with Web information-seeking skills (question 17). Out of 102 respondents to whom this question was directed, only 85 reacted and gave 137 answers. The results are calculated as percentages on basis of a total of 85 respondents. Table 20 shows that the highest number of participants (33 or 32.3%) suggested that the school should provide learners with sufficient time to search the Internet. Twenty-six (25.4%) suggested the school should make enough ICT teachers available while 11 (10.7%) of the respondents proposed that the school should provide more computers.

Table 20: Suggestions to equip learners with Web information searching skills

N=102

Equip learners for Web information searching	Frequency	Percent
School should give enough time to use Internet	33	32.3
Provide enough ICT teachers	26	25.4
Provide enough training in ICT and Internet use	25	24.5
ICT should be integrated in all fields of study	18	17.6
ICT training should start from lower grades	18	17.6
School should provide enough computers	11	10.7
Internet lessons should be practical	6	5.8
Total	**137**	**161.1**

*Multiple responses received

4.8. WEB SOURCE/S OF INFORMATION USED

4.8.1 Learners' search engine use

Learners were asked what search engines they use (question 19). Table 21 below shows the responses. The majority (90 or 88.2%) use Google, followed by 48 (47.0%) users of Yahoo. The lowest number of respondents, namely three (2.9%) use WebCrawler, followed by with two (1.9%), using AOL.

Table 21: Search engine use

N= 102

Search engine	Frequency	Percent
Google	90	88.2
Yahoo search	48	47.0
Bing	23	22.5
MyWebSearch	16	15.6
Ask	7	6.8
Yahooligans	5	4.9
WebCrawler	3	2.9
AOL	2	1.9
Total*	**194**	**190.1**

*Multiple responses received

4.8.2 Most used search engine

The respondents who indicated that they used more than one search engine were further asked to indicate which search engine they use most often. The results in Figure 11show that of the 68 respondents who used more than one search engine, the vast majority 58 (85.3%) used Google and the lowest number of respondents use MyWebsearch and Bing both with one (1.5%) respondent each.
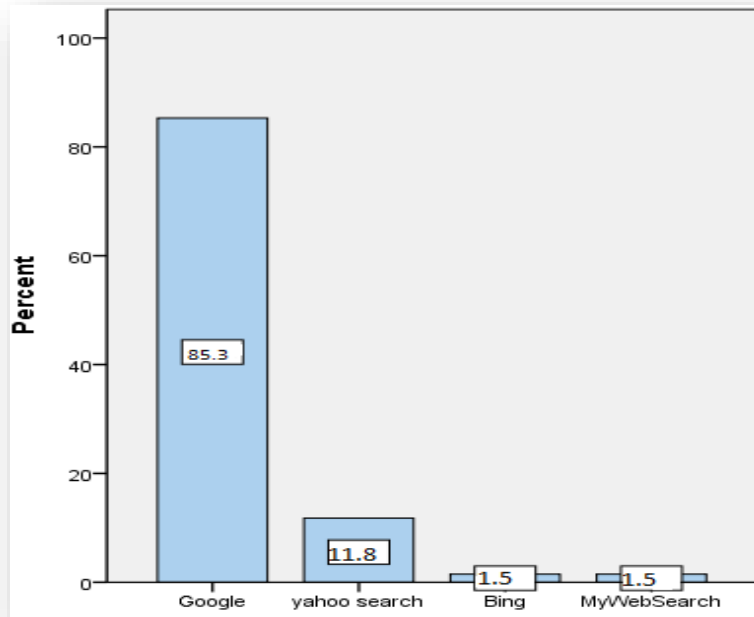
Figure 7: Most used search engine

4.8.3 Learners' reliance on Web information source

The respondents were presented with various education-related sources of information on the Web and asked which ones they use, and how often, when seeking information for their school work (question 20). Table 22 below shows that the highest number of respondents, namely 64 (62.74%) never use online databases such as Wilson Biography. Forty four (43.14%) always use Wikipedia, followed by 42 (41.18%) who often use YouTube. It is evident that Wikipedia is the most used source with just over 90% of respondents making use of it. A number of respondents (60 or 48.3%) also never use learner-orientated search engines such as Yahooligans!

Table 22: Information source

N=102

Information source	Frequency and percentage				
	Always	**Often**	**Not often**	**Never**	**Total**
Online databases such as Wilson Biography. Litfinder and NetLibrary	2 (1.9%)	19 (18.6%)	17 (16.6%)	64 (62.7%)	**102 (100.0%)**
Wikipedia or online encyclopaedia	44 (43.1%)	30 (29.4%)	18 (17.6%)	10 (9.8%)	**102 (100.0%)**
You Tube or other social media sites	27 (26.4%)	42 (41.1%)	16 (15.6%)	17 (16.6%)	**102 (100.0%)**
SparkNotes, ClifNotes or other study guides	11 (10.7%)	27 (26.4%)	23 (22.5%)	41 (40.2%)	**102 (100.0%)**
Student-oriented search engines such as Yahooligans!	8 (7.8%)	26 (25.4%)	16 (15.6%)	52 (50.9%)	**102 (100. %)**

4.9. EVALUATION AND USE OF INFORMATION

4.9.1 Accuracy and trustworthiness of information found on the Web

The respondents were asked how much of the information they find through search engines on the Web is in their opinion accurate/trustworthy (question 21). Figure 12 shows the results: a high number of respondents 47 (46.0%) reckon that most of the Web information found via search engines is accurate and trustworthy, followed by 27 (26.4%) who thought that only some of the information is accurate and 21 (20.5%) who consider all the information accurate and trustworthy.
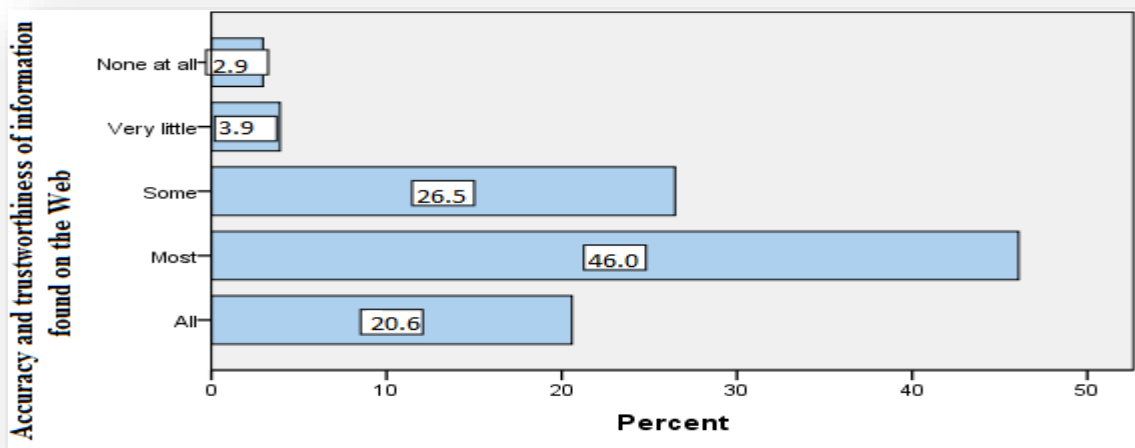
Figure 8: Accuracy and trustworthiness of information found on the Web

4.9.2 Reason/s for answer given regarding the accuracy/trustworthiness of information on Web

In an open question participants were asked to give a reason for their views on accuracy and trustworthiness of information accessed via search engines. The results are reflected in Table 23 below. Most respondents 53 (51.9 %) were of the opinion that Google is always right. Thirty one (30.3%) stated that Web information is correct and reliable because they get good marks applying it in their schoolwork. Those respondents who were to some degree mistrustful of information on the Web mentioned the fact that anybody can put anything on the Web (12 or 11.7%) and that some information found on the Web is outdated (8 or 7.8%).

Table 23: Reason/s for answers dealing with accuracy/trustworthiness of information on Web

N=102

Reason/s	Frequency	Percent
Google is always right and most of the information found using it is correct	53	51.9
I get good marks applying the information found	31	30.3
I find helpful information for my school work every time	22	21.5
Not accurate because anybody can enter anything	12	11.7
Not accurate because some information is outdated	8	7.8
Total*	**126**	**123.5**

*Multiple responses received

4.9.3 Information evaluation criteria

In an open question respondents were asked what qualities of a website make them decide that the information provided by the site is, or is not, accurate/trustworthy (question 22). Table 24 shows that 55 (53.9%) respondents stated that they compared the Web information with information found elsewhere to decide on its reliability. Nineteen (18.6%) respondents said they examine the headline and only 13 (12.7%) check the identities of author and publisher and the date of publication. There were 15 (14.7%) respondents who do not apply any criteria at all but who simply copy whatever they want.

Table 24: Information evaluation criteria

N=102

Criteria used to evaluate Web information	Frequency	Percent
Comparing information	55	53.9
Examine the headline	19	18.6
Check the pictures	16	15.6
I don't use any criteria; I just copy what I want	15	14.7
Check author, publisher and date	13	12.7
As long as it is school related	12	11.7
Total*	**130**	**104.8**

*Multiple responses received

4.9.4 Plagiarism

In an open question respondents were invited to explain their understanding of the term plagiarism (question 23). Table 25 below shows that a high number of respondents (50 or 49.0%) had no idea what plagiarism is. One may assume that the 51 (50%) who gave no response also had no idea. Only one (0.9%) respondent was close to understanding the meaning of plagiarism.

Table 25: Plagiarism

N=102

What is plagiarism	Frequency	Percent
I don't know/First time I hear it	50	49.0
Copy and paste	1	0.9
No response	51	50.0
Total	**102**	**100.0**

4.9.5 Referencing and acknowledgements

Respondents were asked whether in assignments and projects they acknowledge (provide references) where they got their information from (question 24). Given their lack of understanding of plagiarism it is not surprising that, as seen in Table 26, more than half of the respondents or 57 persons (55.8%) did not acknowledge the origin of their information. Only 21 (20.5%) indicated that they do acknowledge their source of information.

Table 26: Referencing
N=102

Referencing	Frequency	percent
Yes	21	20.5
No	57	55.8
No response	24	23.5
Total	**102**	**100.0**

4.9.6 How to acknowledge

The 21 respondents who stated that they add references to assignments and projects were in an open question asked to briefly explain how they go about acknowledging or referencing. Table 27 shows that of the nine respondents who answered the question only 5 (23.8%) mention publisher, writer and date. Four (19.0%) respondents stated that they conclude their work with a list of sources of information.

Table 27: Acknowledgement and referencing

N=21

Acknowledgement and referencing	Frequency	Percent
Indicate publisher, writer and date	5	23.8
Indicate and list source of information at the end	4	19.0
No response	12	57.1
Total	**21**	**100.0**

4.9.7 Evaluation of information steps

Respondents were provided with a list of steps used in evaluating information on the Web and asked how often they use the steps (the underlying assumption, shown to be false, being that all learners do evaluate information) (question 25). It is interesting that, as apparent from Table 28 below, with one exception, more than 50% of respondents either occasionally or never use the steps listed. For example, just on three quarters (75%) of respondents either never (51%) or only occasionally (22.5%) look for the reason why specific information was written.

Table 28: Web information evaluation steps

N=102

Web information evaluation steps	Frequency and percentage				
	Always	**Often**	**Occasionally**	**Never**	**Total**
Check the relevance	32 (31.3%)	23 (22.5%)	20 (19.6%)	27 (26.4%)	**102 (100.0%)**
Check the authority (e.g. who is the author and what are his/her credentials)	18 (17.6%)	21 (20.5%)	22 (21.5%)	41 (40.2%)	**102 (100.0%)**
Check the date	21 (20.5%)	16 (15.6%)	30 (29.4%)	35 (34.3%)	**102 (100.0%)**
Check the appearance (e.g. whether information appears to be of academic standing with citations and references)	13 (12.7%)	12 (11.7%)	25 (24.5%)	44 (43.1%)	**102 (100.0%)**
Find out the reason why information was written	18 (17.6%)	11 (10.7%)	23 (22.5%)	53 (51.9%)	**102 (100.0%)**

4.10. WHAT ARE THE CHALLENGES FACED BY GRADE 12 LEARNERS WHEN SEARCHING THE WEB FOR INFORMATION?

4.10.1 Challenges of searching the Web for information

Respondents were asked to identify the challenges they face when searching the Web for information (question 27). Table 29 shows that the majority of respondents, namely 79 (77.4%), saw time as their greatest challenge, followed by Internet slow speed (55 or 53.9%) and inadequate resources (computers) (39 or 38.2%). Lack of skills and knowledge in terms of using ICT and searching information on the Web was also mentioned by 31.3% and 35.2% of respondents respectively. Only two respondents (1.9%) mentioned limited access to the school computer laboratory as a drawback while 28 (22.5%) identified filtered network as a challenge. Hence, the most common challenges were the limited time available to use the Internet, the slow speed and inadequate resources, with filtered network and limited access to the lab named as the least common challenges.

Table 29: Challenges faced when seeking for Web information

N=102

Challenges faced	Frequency	Percent
Not enough time to use the Internet at school	79	77.4
Internet slow speed	55	53.9
Inadequate resources	39	38.2
Lack of skills and knowledge facilitating searching the Web	36	35.2
Poor quality of facilities	32	31.3
Lack of skills and knowledge in using ICT	32	31.3
Filtered network	28	27.4
Limited access to the school lab	2	1.9
Total*	**303**	**297.0**

*Multiple responses received

4.10.2 Suggestions for addressing identified challenges

In an open question participants were asked what could be done to address the challenges they identified (question 27). Out of a total of 102 to whom the question was posed, only 76 responded with a total of 126 suggestions which were divided into 12 categories. Percentages are thus

calculated on the basis of 76 (100%). Table 30 shows that most respondents (33 or 32.3%) proposed that the school should allow sufficient time for using the Internet, followed by 31 (30.3%) who suggested the school should be provided with enough computers. Twenty (19.6%) respondents thought that the school should give adequate training in ICT and online use and 10 (9.8%) mentioned the need for a sufficient number of ICT teachers.

Table 30: Suggestions for addressing challenges

N=102

Suggestions for addressing challenges	Frequency	Percent
The school should allow enough time to use Internet	33	32.3
The school should be provided with enough computers	31	30.3
Provide adequate training in ICT and online searching	20	19.6
Provide sufficient qualified ICT teachers	10	9.8
Upgrade computers, software and Internet	8	7.8
Unblock school related contents	7	6.8
Increase Internet speed	5	4.9
ICT training should start from lower grades	4	3.9
Internet lessons should be practical	3	2.9
ICT should be integrated in all fields of study	3	2.9
The school should opt for wireless Internet	1	0.9
Learners should be permitted to bring cell phones and personal devices to school	1	0.9
Total*	**126**	**123.5**

*Multiple responses received

4.10.3 Additional comments

Question 29 asked the participants for additional comments in relation to searching for information on the Web. Three persons responded. One stated that searching for information on the Web is easier than getting it from other people. A second respondent suggested that learners should be taught how to find Internet information because it will be helpful when they go to universities. The final respondent added that Internet use should be highly valued as it plays a very important role in studying.

4.11 Summary

Chapter four presented the results from the questionnaires distributed among high school learners at Mweshipandeka High School and Gabriel Taapopi Senior Secondary School. The findings are, in the main, presented in the form of tables and graphs.

In the next chapter the findings are discussed.

CHAPTER FIVE

DISSCUSSION OF RESULTS

5.1 Introduction

The study's main objective was to investigate the Web information behavior of high school learners in Oshana region, Namibia. Chapter five discusses the findings, reported in chapter four, in relation to the research questions listed in chapter one.

5.2 Background information

In this first section the demographics of the respondents are discussed.

1.   Demographic profile of respondents

The present study focuses on high school learners at Mweshipandeka HS and Gabriel Taapopi SSS. In terms of gender, there were 94 (58.75%) female and 66 (41.25%) male respondents. In terms of age, the majority fell in the age group of 17-18 years (69.4%) and a minority of 6.3% was 20 or 21 years old. The ages of learners participating in the study imply that they are Generation Y learners. According to Partridge and Hallam (2006:406), Generation Y students are born between 1980 and 2000. This generation is also known as the Millennial, or the Digital Generation (or Google Generation) (William and Rowlands 2007). As mentioned in chapter two, Generation Y students are brought up with high-level information technology, the Internet and social networking. Technology is part of their life.

As far as fields of study are concerned, 102 (63.8%) respondents, or the majority, studied Science, followed by 29 (17.1%) respondents who studied Commerce. Only four (2.5%) did Design and Technology and three (1.9%) studied Home Economics. One's field of study has obvious implications for one's access to technology. Those learners doing Science and Technology have ICT integrated into their curricula and have better access to ICT facilities (such as computers) than learners in the other fields.

2.   Access the Internet

This study found that the vast majority of learners 141 or 86.25% access the Internet whereas only 22 (13.75%) indicated that they do not. Most of the learners who stated they do not use the Internet gave either malfunctioning computers, or not having access to computers at all, as their reasons. The fact that a high percentage of respondents do use the Internet reflects the

pervasiveness of the technology and underscores the importance of studies such as the present one. Mutula and Mutula (2007:137), points out that students who do not have access to computers and the Internet (among other technologies), are likely to fall behind in comparison to their peers who do have such access. In a country like Namibia, with a vision for transformation of the nation into an information society by 2030, infrastructure and practical policies that would facilitate physical and intellectual access to Web information are thus urgently needed. The major objective of Namibia's vision is to: "accomplish the transformation of Namibia into a knowledge-based and highly competitive, industrialized and eco-friendly nation with sustainable economic growth and high quality of life" (National Planning Commission 2004:41). Widespread access to the Internet at school level would undoubtedly facilitate the realisation of this objective.

5. 3 Discussion of findings in relation to research questions

As noted above, the key research questions provided the basis for the survey.

5.3.1 How, where and when do Grade 12 learners access the Internet?

In relation to this research question there are two subsections, namely: on the one hand the gaining of access to the Internet and the Internet mode most used by learners and, on the other hand, when the Internet is accessed and the time learners spend on the net.

5.3.1.1 Gaining access to the Internet and the Internet mode most used by learners

The respondents who indicated that they access the Internet were asked how they do so. The results show that 114 (82.6%), or the majority, use their cellphones, followed by 64 (46.3%) who use school laboratory computers. The lowest number of respondents (two or 1.4%) use tablets and nine (6.5%) get on the Internet in the public library. Concerning the usage of computers in the library, Lawrence and Miller (2000:30) confirm that the "Internet has become an essential component of every library, allowing it to function as a gateway to vast reserves of dispersed information and thus transforming the way students, scholars and librarians think about collections and service". Both schools featuring in this study provide learners with physical access to the Internet. While learners access the Internet/Web via their school facilities (computer laboratories and libraries), it is interesting that cellphones emerged as the most used mode of access among high school learners (see Figure 9).

Of the 109 respondents who indicated using more than one way of getting on the Internet/Web, 78 (71.6%), or the majority, declared that they used cell phones, followed by 13 (11.93%) who used home computers. These findings concur with those of the UNISA Bureau of Market Research

(2012:7) which reports that approximately 90.0% of Gauteng learners have access to the Internet via cell phones while just more than half (53.7%) access the net via a personal computer. The report states that the "youths' reliance on the Internet via cell phones is also displayed in their frequent searches for subject related information to assist with the completion of school assignments". Learners encounter problems in accessing Web information at schools and it seems that cell phones are, amongst Grade 12 learners, the most popular way to access the net. This finding contrasts with that of Nkomo (2010:5) who observed that "infrastructure for Web information-seeking in educational institutions is primarily located in libraries, computer laboratories and offices and that personal computer use is also increasing".

5.3.1.2 When is the Internet accessed and how much time do learners spend on the Internet

It appears that many learners access the Internet at home. Asked to indicate when they access the Internet, 64 (46.4%) respondents said they do so during weekends, followed by 41 (29.7%) who access the net after school and 33 (23.9%) who do so during school hours. These results suggest that a fairly large proportion of learners access the Internet outside the school context. Concerning the amount of time they spend on the Internet per week, a high number of respondents (59 or 42.8%), stated less than one hour, followed by 47 (34.1%) respondents who spend between one and three hours per week. Hence, the majority of respondents (76.9%) spend three hours or less per week on the Internet. This appears to be a short time which could be explained by the fact that those respondents who use school computers can do so only for limited periods and cannot spend as much time on the net as they might like. For others, using cellphones and home computers, the cost of surfing the Web is presumably a factor.

Learners did in fact complain that, due to restricted opening hours of the computer labs, they could not spend enough time on the Internet. Valenza (2006) in her study conducted in the USA also found that teens were unhappy about the limited time they get to spend on the Web. She adds that high school students are frustrated by institutional barriers preventing them from using Web resources freely, for example school schedules, limited equipment and filters. She stresses that time constraints influence information-seeking (Valenza 2009:22). Similarly, teachers interviewed in a survey conducted in the USA point out that "for many of their students research time is restricted by a lack of Internet access at home and/or limited library hours" (Purcell *et al*. 2012:55).

5.3.2 What are specific purposes for which Grade 12 learners search for information on the Web?

Discussing the above question involves the consideration of two subsections: what is the Internet used for and the purpose of seeking information on the Web, and reasons for not using the Internet for school work.

5.3.2.1 What the Internet is used for; the purpose of seeking information on the Web

When asked what they use the Internet for, just on three quarters (74.6%) of respondents answered that they use it to search for Web information whereas 58.6% accessed the Internet for the purpose of social networking and 31.8% for email. When focusing specifically on the Web, the main aim was to find material for school-related work as stated by almost three quarters of the respondents (73.9%). Other reasons for Web use were entertainment (60.1%), communication/social networking (44.2%), and increasing general awareness (26%). In relation to school, most respondents (67.5%) use the Web for homework and assignments. These findings correlate with those reported by Nkomo (2009:74) who in his study of university students found that "while most of the respondents from Unizul (39; 27%) used the Web for assignments, their counterparts at DUT primarily sought information for research purposes (25; 36%)". Nkomo's findings, while related to university students, provide a picture of Web use in academic settings.

The results from the present study certainly indicate that the Web is a tool used for diverse purposes. This is confirmed by Huang *et al.* (2007:np), who write: "The Web can act as an instrument of communication, education, business, entertainment, finance, staying informed, passing time, relaxing, escape, socialization, work, surveillance, etc." Similarly, Latrobe and Havener (1997), writing when the Internet was still in its early stage of development, point out that high school students seek academic information, general information, information helpful for future plans and relationships, as well as current lifestyles and health related information. Nkomo (2010:3) notes that information needs can largely be grouped into three main categories namely: study or research, work or teaching, and communication and entertainment. The second category is arguably not applicable to high school learners although information on careers might well be useful for learners. Although learners are using the Web for several needs, information for school related work was listed by the largest number of respondents listed as their greatest need. This result concurs with Agosto's (2005:155) finding that school work was the youth's first and foremost reason for seeking information.

5.3.2.2 Reasons for not using the Internet for school work

Replying to an open question, 10 respondents (27.7%) who do not use the Web to collect information for school related work referred to the school restricting access to computers and the limited time allowed for surfing the Internet. Eight (22.2%) respondents used library books for school related work and three (8.3%) indicated malfunctioning computers/Internet as a reason for not consulting the Internet for school work. That most of these learners do not use the Internet for school work because the school gives them only limited use of the resource is confirmed by Viseu (2005:64) who, in her study of "The use of Internet by students in Portuguese schools" points out that the rules for Internet access at schools can be a problem. Students said they could only use the Internet for 30 minutes which is not enough time to "search, read the information, and select the information…" The effect of this restriction is somewhat perverse as some students confessed that the short time available ends up inspiring them to rather use their time on the net for purely personal purposes. As one respondent put it: "'I'm not going to use the limited time I have for school work! I'll use it for finding what I want, for my personal interests'".

5.3.3 How do Grade 12 learners search for information on the Web?

The discussion of the above question can be divided into three subsections, namely the steps taken in searching for information on the Web, success in finding information, and how often users perform information-seeking steps:

5.3.3.1 Steps taken in searching for information on the Web

Respondents who used the Web for school related tasks were, in an open question, asked to list the steps they took in searching for Web information. The common steps listed by 72.5% of respondents were to go to the Web browser (Internet Explorer or Opera Mini in the case of cell phones), open a search engine (Google or Yahoo), enter the terms and press search. Respondents generally did not outline their steps in any detail. For many of them it was simply a case of opening the browser and entering what they thought were appropriate terms into a search engine. Thus, even though learners showed some awareness of ICT Web information searching skills when listing their steps, the responses showed no clear pattern that would have assisted in a successful search. The general impression is that the online searching behavior of learners is neither targeted nor directed. Information-seeking steps are supposed to incorporate whatever strategy users formulate to search the Web. But it is clear that learners' Web searching skills are inadequate. Similar findings have been reported by various authors including Fidel *et al*. (1999),

Lorenzen (2001), and Shenton and Dixon (2004). All have come to the conclusion that most children and teenagers are lacking effective Web searching skills.

5.3.3.2 Success in finding information

The results indicate that the vast majority (91.1%) of respondents were of the opinion that their Web searches were successful. Nkomo (2009:113) also stated that "in the questionnaire responses to the question 'Do you find what you are looking for on the Web?' most of the respondents indicated that they usually found what they were looking for". On the basis of these findings one could argue that the Web is an unfailing tool for finding information. Underscoring this view, Dalgleish and Hall (2000) pose that the Web is now established as the medium for widely disseminating information across the Internet. They go on to say that, within the academic context, learners throughout the world have the ability to retrieve seemingly endless volumes of information across all disciplines from all over the globe. That most respondents considered their searches for Web information successful is of course based on no more than self-assessment and there is the distinct possibility that their expectations were low.

5.3.3.3 How often users perform information-seeking steps

In a related question, respondents were provided with a list of steps and asked to indicate which steps they followed when searching for Web information. They were also asked to indicate how often they used these steps. It turned out that the majority of respondents, namely 55 (53.9%), always identify websites/pages, followed by 41 (40.20%) who often select useful pages and sites by bookmarking, printing, copying and pasting. Forty-two respondents (41.18%) never receive site updates, using for example push, agents, or profiles and/or revisit favourite sites for new information. Hence, the common steps users often perform when seeking information are identifying websites/pages, scanning top-level pages: lists, headings, site maps, and selecting useful pages and sites by bookmarking, printing, copying and pasting.

Numerous attempts have been made in the relevant literature to model what steps information seekers take when gathering information from an information system. In the present study, as mentioned in the literature review, the model of Ellis (1998: np) has been used to provide respondents with steps involved in Web information-seeking. The results are reported in the above paragraph. The results suggest that a majority of respondents, either always or often, follow the steps outlined by Ellis with the exception of the step that is concerned with receiving site updates (as mentioned above). While these findings are in contrast with the self-reported steps discussed

in 5.3.3.1, they do suggest a certain systematic approach to searching for information on the Web on the part of the respondents.

5.3.4 What are the Web information searching skills of Grade 12 learners?

The Internet and the Web are relatively new technologies in the field of information-seeking. Users generally have to overcome several skills-related challenges before they can confidently carry out an effective information search by using these new technologies in their everyday activities. With this in mind learners were asked questions regarding their searching skills. The discussion in relation to this question is divided into three subsections, namely, learners' perception of their abilities with regard to searching for Web information, received formal training or orientation, and suggestions concerning how to better equip learners with Web information-seeking skills:

5.3.4.1 Learners' perception of their abilities with regard to searching for information on the Web

Respondents, when asked to rate their abilities with regard to various aspects related to searching for information on the Internet/Web, judged them, in all but one instance, as 'good', 'very good' or 'excellent'. Only where their expertise in combining and employing terms/keywords using Boolean operators was concerned, did more than half (58 or 56.9%) of the respondents rate their ability as 'fair' or 'poor'. In addition, 34 (33.3%) of respondents stated that their ability to assess the quality and accuracy of information found online 'fair' or 'poor'.

In a subsequent but related question respondents were asked if they thought that they possessed the necessary skills to use the Internet/Web when searching for information. A slight majority of 52 (50.9%) answered in the affirmative followed by 38 (37.2%) who indicated that they did "not really" have the skills. Six (5.8%) felt that they were totally lacking in necessary skills.

On the basis of these findings it would seem that learners' online skills are limited. Purcell *et al.* (2012:6) came to the same conclusion and state that: "Indeed, in our focus groups, many teachers suggest that despite being raised in the 'digital age', today's students are surprisingly lacking in their online search skills". There is also the suggestion put forward by Adams (2009) that there is consensus across the world that universities need to adapt to the needs of Generation Y students who are brought up with high-level information technology, the Internet and social networking, which does however not mean that they are information literate. Given the above results the same is applicable to the grade 12 learners who took part in the present study. Findings also show that most high school learners did have general technology skills.

5.3.4.2 Received formal training or orientation

The learners were asked whether they received any formal training on, or were familiarised with, how to search for Web information. Sixty (58.8%) respondents had received training as opposed to 36 (35.2%) who had not. Of those who were trained, 73.3% found the training useful. Given the findings of this study as regards learners' Web information searching skills, one could possibly argue that the training they received, even when it was considered useful by them, was not necessarily effective. Nkomo (2009:xiii) points out that results from his study "shed light on the general information retrieval difficulties students face and most of these difficulties appeared to stem from poor training or lack of skills". One could conclude that, as far as skills for Web information searching are concerned, the significant number of 36 (35.2%) learners who had not received any training at all, would certainly have been at a disadvantage compared to their peers.

However, when 36 respondents were asked why they hadn't been trained, eight (22.3%) of them stated that they already had the skills and 25 (69.4%) explained that ICT is only integrated in some study fields at their school. This last point is confirmed by the earlier finding that the vast majority of participants were studying in fields where ICT training was not part of the curriculum. Madden *et al.* (2003:np) also remark on the issue of curriculum structure. Teachers who were interviewed pointed out that: "Another factor affecting Web usage appears to be the prescriptive nature of the National Curriculum." While the National Curriculum referred to is that of the United Kingdom, the same applies, as noted above, to the curriculum structure in schools in Namibia where the development of ICT skills, including the use of the Web for information searching, is not always facilitated.

One of the eight respondents who indicated that they already had sufficient Web searching skills stated that there was "no need to [undergo training] because I started using computers when I was 6 years old". A second respondent said: "I learned [about computers] from friends and [on] my own". These two respondents are arguably "true" members of Generation Y, exposed to computers in their daily lives and learning to use them through self-teaching or from friends. Interestingly, Gunn (2003:np) in her study of information seeking for school purposes on the Internet found that grade 12 learners "were more dependent on friends and classmates to teach them how to search for information on the Internet".

The literature has highlighted the importance of training of learners regarding online information use. Walton and Archer (2004:2) indicate that, once students graduate and leave high school to enter university; their dominant mode of learning will be self-directed and exploratory whereby

the Web will be a key information source. It is clear in the contemporary world that even at school, the Web functions as a key information source for students. It is therefore essential that all students are taught at school how to use the Internet in a meaningful way.

According to McFarlane and Roche (2003:156), numerous studies which focus on elementary school learners show that teaching computer skills in secondary school is leaving it too late. The current study which concentrates specially on senior high school learners proposes that leaving training in the necessary skills until learners enter university is leaving it too late. Once at university they will frequently have to interact with Web-based information systems. It is therefore imperative to familiarize learners with information literacy skills, ideally at primary school level, and if not, at least at high school level. One would like to believe, given the extent to which the Web has penetrated into the educational landscape of the high school that information-seeking on the Web would be treated as a core competency. The urgent need for these skills should be increasingly reflected by the integration of computer training into school curricula.

5.3.4.3 Suggestions on how to equip learners with Web information-seeking skills

Respondents, when asked in an open question what they think their schools could do to equip learners like themselves with Web information-seeking skills,   the most commonly made suggestion (by 33 or 38.8%), was that schools should allow sufficient time to use the Internet, followed by 26 (30.5%) who wanted the school to provide enough ICT teachers. Twenty five (29.4%) learners stated simply that enough training in ICT and Internet searching should be provided.   Fourteen (16.4%) suggested that ICT should be integrated in all fields of study, and the same amount of participants made a similar point by suggesting that ICT training should start in the lower grades. Finally, 11 (12.9%) respondents pointed to the need for a sufficient number of computers at their school. In summary, the most common ideas involved the allowing of enough time to use the Internet, the provision of enough ICT teachers, of ICT and Internet use, and the integration of ICT in all fields of study.

In answer to a similar question posed by Nkomo (2009), students suggested that their "surveyed institutions should equip more people with Web information-seeking skills" by increasing their number of computers in order to improve access. They also thought that computer laboratories' opening times needed to be extended and that Web training should be offered in each study program or be included as an important course in the general curricula of all students.

5.3.5 What sources of information on the Web do Grade 12 learners use?

The discussion in relation to this question is divided into two subsections, namely learners' search engine use and the search engine they use most, and learners' reliance on Web information.

5.3.5.1 Learners' search engine use and the search engine most used

The preferences for particular types of information sources and their form of delivery as well as the reasons for these preferences by various user groups are well articulated in the literature on information-seeking. With regard to this, learners were first asked which search engines they use. The vast majority of 90 respondents (88.2%) use Google, followed by Yahoo with 48 (47.0%) respondents. In the question concerning preferences, respondents were presented with various education-related sources of information on the Web and asked which they choose when seeking information for school work and how often they do so. Wikipedia was the most used source with 74 (72.5%) of respondents who stipulated that they use the source always or often. Wikipedia was closely followed by YouTube with 69 (68%) users. The least used were online databases such as Wilson Biography with 64 (62.74%) respondents indicating that they never use it.

Overall, there was clearly a high level of familiarity with various Web information sources and search engines although their use remained mainly concentrated on a few sources. From the findings one could conclude that among learners the most popular search engine by a long way is Google followed by Yahoo. The implications of this are pointed out by the University College London's briefing paper (UCL 2008 cited in Holm *et al.* 2010:7) which stresses the importance of information quality. It points out that the Google Generation (born after 1993) is quick to use the media in a society characterized by abundant information, but that its attention to the quality of information tends to flag. For instance, young people are not aware of Google's limitations and the existence of academic, often library funded, information sources such as databases and electronic journals. Gunn (2003) found that, although most students knew of the existence of many search engines, they were often unaware of some of the top-rated ones. They tended to use one single search engine regularly. And the search engine of choice for just over 66% of the students in Gunn's study was Google (2003:np).

Purcell *et al.* (2012) states that for today students' research means Googling. As a result, some teachers report that doing research for their students has shifted from a relatively slow process of intellectual curiosity and discovery to a fast-paced, short-term exercise aimed at locating just enough information to complete an assignment. Ninety four percent of the teachers surveyed in their study said that their students were very likely to use Google or other online search engines in

a typical research assignment, placing these well ahead of other sources. Second and third on the list of frequently used sources are online encyclopaedias such as Wikipedia, and social media sites such as YouTube (Purcell *et al.* 2012:3) (see reports on Wikipedia and YouTube in the next section).

5.3.5.2 Learners' reliance on a specific Web information source

The most popular source of information by a long way was the online encyclopaedia Wikipedia with, as mentioned above, over 70% of respondents indicating they always or often use the source. The debate concerning the use of Wikipedia and its credibility as a source of information is an on-going one, but the view of Lipczynska (2005:7) in this regard is instructive. He states that the site has unquestionably great reference value and should be treated similarly to other reference sites, namely as the starting point for, or as a valuable part of, wider research. The problem arises when Wikipedia is used as the only source of information as appeared to be what many learners did in the present study. There is an undeniable need for students to be exposed to other sources, purposely designed for them and containing content appropriate to their level of study. There is also a need, as pointed out by Howard (2009:np), for teachers to address ways in which to use Wikipedia as a source rather than banning it (as is sometimes done). Even if it is prohibited as a source, numerous students will still access Wikipedia because it provides them with an introduction to what may be an unfamiliar topic and a starting point for further research.

The current study showed a high level of familiarity with the Web, indicative of the growing use of Internet and Web services in the educational environment. Online information searching is flourishing in extraordinary ways with most of the learners supposedly having encountered all or most of the eight search engines. Low use was however recorded for sources that have to be paid for or for specialized services (for example, online databases such as Wilson Biography' Litfinder and NetLibrary). The same was found by Purcell *et al.* (2012) who were told by teachers that students rely mainly on search engines to conduct research, neglecting other resources such as online databases.

5.3.6 How do Grade 12 learners evaluate and use information found on the Web?

The above question will be discussed in two subsections, namely information evaluation and information use.

5.3.6.1 Information evaluation

The section concerning information evaluation will be considered in two subsections: accuracy and trustworthiness of information found on the Web, and information evaluation criteria and the frequency of steps used when evaluating information on the Web

1. **Accuracy and trustworthiness of information found on the Web**

Asked how much of the information they find on the Web through using search engines they think is accurate and trustworthy, less than half of respondents (47 or 46.0%) answered that they judged most of the information to be above board. One respondent stated that "All information on Internet and Google is trustworthy and accurate" and another: "I trust Google because when I apply information I get from there I pass with good marks".

The respondents were asked in an open question to justify their trust in Web information.   The majority at 53 (51.9 %) thought the information is accurate and trustworthy because Google is always right and 31 respondents (30.3 %)   have full confidence in Web information because they get good marks applying it. However, other respondents were less or not at all convinced that information found on the Web was reliable. They mentioned the fact that anybody can enter whatever he wants on the Web (12 or 11.7%). However, the number of respondents who are uncritical of Web information obtained via Google is still high.   Agee and Antrim (2003:474) report that: "Many students assume that the Internet satisfies all their information needs, as confirmed by The Pew Internet and American Life Study (2001)". The over-reliance of students on Web information involving little or no critical evaluation has been highlighted in previous chapters of this study.

2. **Information evaluation criteria**

Learners were asked which characteristics of a website make them decide whether the information provided by the website is accurate and trustworthy or not. The majority at 55 (55.9%) compared the information obtained with information from other sources and with their own general knowledge to decide on the value of the information obtained.   There were 19 (18.6%) respondents who based their judgment on the headline and 16 (15.6%) who looked for pictures related to the information they needed while 15 (14.7%) did not apply any criteria but simply copy what they wanted.   Comparing information was also commonly used by learners as criteria for deciding on the reliability of the information. Adams (2009) notes that, although universities need to adapt to the high-tech needs of Generation Y students, these are not necessarily

information literate. Students showed high-tech skills but often did not know how to analyse information needs or, in terms of the present discussion, how to discriminate between information sources.

In this research the researcher has found that comparing information has become a trend of information evaluation among learners. These findings are supported by McFarlane and Roche (2003:22) who also found that students compare Web information to what they already know in order to see whether the new information matches what they know. They use this as an evaluation method. As one learner pointed out: "I compare the information with the other information from other sources and to what know already, than I know the information is trustworthy".

A learner who examined headlines and pictures as a means of evaluating information said: "I check headlines on top of the pages as I search and as I go through the information provided at the time to see if it is relevant. Sometimes they provide photographs on what you are looking for and you will obviously tell it is what you are looking for". Echoing the views of the group of learners who do not evaluate information at all, was the respondent who stated categorically: "I don't evaluate information from the Internet. I copy whatever I information I get".

It is evident that some of the criteria used by learners to evaluate information found on the Web leave a lot to be desired and one of the standard procedures for evaluation, namely checking author, publisher and date was only mentioned by 13 (12.7%) respondents. Arguably though, comparing information as reported by just over half the respondents is a valid approach in terms of ensuring accuracy/trustworthiness of the information. In his study Lorenzen (2001) found that high school students were using search engines to screen for quality: "The student mistakenly puts too much trust in the information found on an indexed webpage".

Many students felt that, if a website was indexed by Yahoo!, its information was sure to be reliable. This, as Lorenzen (2001) emphasizes is not true because very few search engines screen for any level of quality at all. He adds that Yahoo! in particular was trusted by students despite the fact that it does not necessarily evaluate sites for quality (Lorenzen, 2001:161). It is evident from the findings of the present study that there are a number of learners who, like those surveyed in Purcell *et al.* (2012), have difficulty in judging the quality of online information. This difficulty is further elaborated on in the section which follows.

3. Frequency of steps used when evaluating information on the Web

Respondents were provided with a list of steps used in evaluating information on the Web and asked how often they use these steps when doing so (the underlying assumption that all learners do evaluate information turned out to be false). The results, interestingly, make clear that, with one exception, more than 50% of respondents either occasionally or else never use the steps listed. For example, just on three quarters (75%) of respondents either never (51%), `or only occasionally (22.5%), take the trouble to find out why the information was written in the first place.

This creates the strong impression that grade 12 learners lack information evaluation skills. The findings are not exceptional. Authors, including Fidel *et al*. (1999) and Shenton and Dixon (2004), point out that most children lack adequate skills to process and critically evaluate information. Lorenzen (2001) found, in his study on the use of the Web for assignments by high school students in the USA, that their ability to evaluate the information they find on the Web is weak.

Albion (2007, cited in Quintana, Pujol and Romaní 2012:513) points out that this reality poses important educational challenges, including the need for effective training in a proper use of Internet information searching systems for those who teach. In this complex scene, he states, ICT and digital literacy competences acquire special pedagogic relevance. Youngsters have to be prepared for the future world in which they will need skills for managing information as well as the capacity to assess the reliability and relevance of, for example, Web information.

5.3.6.2 Information use

The discussion related to this question is broken into two sections – one on plagiarism and the second on information use:

1. Plagiarism

To determine whether learners understood what plagiarism is, they were asked to define the term. A high number of learners (50 or 49.0%) had no idea what plagiarism is. Of all those who answered the question, only one (0.8%) was close to understanding the meaning. Fifty-one (50.0%) respondents left the question unanswered which suggests that they did not know the answer. It was evident that many of the respondents heard the term for the first time. These findings do contrast with those of McGregor and Williamson (2005:512) who found in their study that "three of the four case-study students, including the student who plagiarized most, were able to provide appropriate definitions of plagiarism".

2. **References, acknowledgements, and how to acknowledge**

The learners were asked whether they acknowledge sources or add references to their assignments and projects. More than half of the learners (56 or 55.8%) did not do so. Of all the learners who answered the question, only 21 (20.5%) indicated that they do acknowledge where they get their information from. These respondents were further asked in an open question to briefly explain how they go about acknowledging or referencing. Of the nine respondents who answered the question, only five (55.5%) said that they indicate publisher, writer and date. The other four (44.4%) stated that they list the source of information at the end.

Hence, only a few grade 12 learners add references to their work and acknowledge where they get their information from. Rowlands *et al.* (2008:299) refer to the Google Generation as a "cut-and-paste" generation, and mentions that there is a lot of anecdotal evidence suggesting that plagiarism is a serious issue. The findings in the present study are troublesome, owing to the fact that these concern grade 12 learners many of whom will soon be embarking on tertiary studies and have to start from scratch in terms of understanding and avoiding plagiarism. It is no surprise that McGregor and Williamson (2005:512) argue that "plagiarism has become a major issue in universities worldwide".

5.3.7 What are the challenges faced by Grade 12 learners when searching the Web for information?

Asked to identify the challenges they face when searching the Web for information, the majority of learners (79 or 77.4%) indicated time as the greatest challenge, followed by slow Internet speeds (55 or 53.9%), and inadequate resources (39 or 38.2%). The most common challenges are thus insufficient time to use the Internet and slow speed of the net and inadequate resources while the least common challenges are filtered network and limited access to the lab.

Similar challenges have been mentioned by Nkomo (2009:98), including slow Internet or poor Internet connections, access restrictions, Web filtering and censoring, inadequate facilities (computers and computer laboratories), inability to evaluate information and lack of searching skills, inability to reference Internet sources and information overload. While these challenges were identified in tertiary institutions they are similar to those identified in high school settings. For example, Valenza (2006:22) notes that high school students are frustrated with institutional barriers such as school schedules, limited equipment and filters that prevent them from using Web resources. She further stresses that time constraints influence information seeking.

Kebede (2002:160) notes that "there is a need for the physical presence of computing facilities and access to electronic information sources". The physical presence of computing facilities would be

computer hardware and software and other electronic information-related facilities, devices and equipments, as well as opportunities to access electronic information sources and content through such ICT infrastructure. The issue of accessibility needs to be strongly emphasized, as schools may have access to the electronic information infrastructure but not to the information or content, due to school rules and policies.

5.3.7.1 Suggestions to address challenges

Learners were asked to make suggestions for addressing the challenges they face when seeking information on the Web. Most respondents, namely 33 (32.2%), indicated that the school should allow enough time for Internet use. Thirty one respondents (40.8%) suggested that the school should be provided with enough computers. Twenty (19.6) advised that the school should give sufficient training in ICT and online search, and 10 (9.8%) wanted more ICT teachers.

Verbatim responses from learners include the following. "Is best if we could be provided with enough computers at school and we must also be provided with ICT literacy teacher. It is also good for ICT to be part of our promotional subjects at our school". "Learners should be provided with enough time to concentrate on computers and learn more about them. Majority of people are lacking skills on how to find information on the Web, such people need some training to gain knowledge about computers and use them excellently."

One (0.9%) respondent suggested that learners should be allowed to bring cell phones and personal devices to school. As noted earlier, the vast majority of learners access the Internet via their cell phones. The suggestion of this one learner is supported by Nkomo (2009) who states that "institutions should be proactive and desist from sticking to traditional service methods/models while ignoring trends that have proliferated throughout all spheres of life and changed how people search for, and handle, information". He adds that more progressing educational institutions have started using mobile supported learning, having observed the increased use of mobile technologies by students.

5.3.8 Additional comments

Participants were asked for additional comments on searching for information on the Web. Three participants responded to this question. One said that "Searching information on the Web is easier then asking people." The second suggested that "Learners should be taught how to search information from Internet because it will help them when they go to universities." And the last one stated that: "The use of Internet should be highly considered because it plays a very important

role in our studies." The importance of the Web as a source of information and the need for training in this regard was underscored in the responses given.

5.3.9 High school learner's information behaviour

In Section 2.12 of the literature review, Wilson (1999: 25) describes information-seeking behavior as a consequence of a need perceived by an information user, who, in order to satisfy that need, makes demands upon formal (for example, in terms of this study, Web-based academic resources) or informal information sources or services (for example, information which is recorded and reported outside the formal publishing process, and is generally available on the Web). A user can either find or fail to find relevant information. If the user succeeds, he or she makes use of the information found and may either fully or partially satisfy the perceived need. Failure to find relevant information necessitates a reiteration of the search process. In this respect, the current study found a low use for sources that have to be paid for or for specialized services (for example, online databases that mostly contain scholarly or academic resources) or for informal information sources or services (for example information which is recorded and reported outside the formal publishing process, and is generally available on the Web).

It has been noted that learners for a typical research assignment are likely to use Google, or another search engine, placing these well ahead of all other sources that were listed. Second and third on the list of frequently used sources are online encyclopaedias such as Wikipedia, and social media sites such as YouTube. A user can either find or fail to find relevant information but 91.1% of the respondents indicated that they, when using this system, they were successful in finding information. Only four (2.9%) indicated failure. If the user succeeds in his/her search, he/she applies the information found thus fully or partially satisfying his/her perceived needs. However, the way in which learners use information is worrisome as they do not acknowledge sources nor do they know how to do so. In addition, an understanding of plagiarism is lacking. Failure to find relevant information necessitates a reiteration of the search process. Those respondents, who were not successful in their search, started again from the beginning or consulted other information sources such as the library. However, it did not become clear if they ultimately succeeded in their quest for information. It appears that high school learners' information behavior echoes Wilson's theory of information behavior. However, when it comes to information searching skills and information use (including evaluation and plagiarism), serious shortcomings are evident in learners' information behavior.

5.3.10 Summary

This chapter discussed the findings of a survey conducted on the Web-based information behavior of high school learners in Oshana region, in Namibia. Generally, the status of learners' access to the Internet is good. Both schools provide learners with physical access to the Internet. Learners access the Internet/Web through their school's facilities, namely, computer laboratories and libraries. The findings of the present study indicate that the Web is a tool used for diverse purposes. From the findings one might argue that the Web is an unfailing tool for finding information. Overall, a high level of familiarity with various Web information sources such as search engines was evident, although usage was mainly concentrated on a few sources such as the search engines Google and Yahoo and the online encyclopedia, Wikipedia. The findings indicate that learners Web searching skills are inadequate. Young people are not aware of Google's limitations and the existence of academic (often library funded) information sources such as databases and electronic journals. The findings give a strong impression that grade 12 learners lack information evaluation skills.

The next chapter provides the summary and conclusions of the study, recommendations for improvement at the two institutions, and suggestions for future research.

CHAPTER SIX

SUMMARY, CONCLUSIONS ANDRECOMMENDATIONS

6.1 Introduction

Chapter six summarizes the findings of the study, provides the conclusions and recommendations, and suggests directions for further research. The study set out to examine the Web information behavior of high school learners at Mweshipandeka High School and Gabriel Taapopi Senior Secondary School. The study attempted to answer the following seven questions:

1. How, where and when do Grade 12 learners access the Internet?

2. What are specific purposes for which Grade 12 learners search information on the Web?

3. How do Grade 12 learners search for information on the Web?

4. What are the Web information searching skills of Grade 12 learners?

5. What sources of information on the Web do Grade 12 learners use?

6. How do Grade 12 learners evaluate and use information found on the Web?

7. What are the challenges faced by Grade 12 learners when searching the Web for information?

A brief overview of the study follows.

6.2 Summary of the study

Chapter one presents the background and outline of the research problem, statement of the research problem and key questions to be asked, significance of the study, theoretical framework and research methodology, background of the two high schools used in the study, and an outline of the remainder of the dissertation and summary.

Chapter two contains the literature review. It includes an overview of the information behavior model underpinning the study. The literature review addresses key research questions. Other issues addressed in the literature review (but not necessarily explicitly tackled in the research questions) are: high school education and Web information-seeking, the impact of Web-based information on the learning and teaching process, importance of ICT literacy skills among learners, the extent to which the Web affects the information-seeking behavior of learners and the

sharing and exchange of information. A brief history and explanation of the Internet are provided and the conceptual framework on which the study is based is presented.

The research methodology is described in chapter three. A survey using self-administered questionnaire as the technique of data collection represents the research design adopted to gain an insight into the Web-based information behavior of high school learners in the Oshana Region, Namibia. Also the review of related literature contributed to the gathering of information.

The findings of the study are presented in chapter four. The presentation is done via tables and figures.

Chapter five consists of a discussion of the findings as presented in the previous chapter. The findings are related to the key research questions which structure the content of this chapter.

The present chapter, chapter six, presents the main findings of the study, together with the conclusions and recommendations that emerge from these. The chapter ends with suggested topics for further research.

6.3 Main findings and conclusions

This section summarises the main findings of the study as per research questions.

6.3.1 How, where and when do Grade 12 learners access the Internet?

The study found that the many learner's generally access the Internet/Web through their school's facilities, such as computer laboratories and school libraries as well as through public libraries and home computers. However, the cell phone emerged as the most used mode of access among high school learners. Learners encounter various problems in accessing Web information at schools; hence it seems that Grade 12 learners prefer to get on the Internet via their cell phones. Answering the question concerning where they access the net it appeared that they do so at home rather than at school.

The highest number of respondents use the Internet during weekends, followed by those who access the net after school and those who do so during school hours. The majority of respondents spend three hours or less per week surfing the Web. This limited time could be explained by the fact that those who use school computers are subjected to time restrictions and simply cannot be as long on the Internet as they might like to. In addition, those who use their cell phones to access the Internet are timewise limited by the costs of spending much time on the network. It appears

that the curriculum structure does not encourage learners or provide them with sufficient opportunities to seek Web-based information to the extent that it ought to.

6.3.2 What are specific purposes for which Grade 12 learners search information on the Web?

Close to three quarters of the respondents indicated that they use the Internet to search for information with social networking and emails mentioned by 58.6% and 31.8% respectively. When focussing on the Web specifically, respondents' main purpose was to find information for school-related work (mentioned by just under three quarters of the respondents), followed by minorities who looked for entertainment, communication/social networking and general awareness. Most learners use the Web to get information for homework and assignments. The findings indicate that the Web is doubtlessly a tool used for diverse purposes. Among these, needs connected to school related work are in the majority. There are, however, a few learners who refrain from using the Internet for school work due to challenges experienced during searches for information. These challenges include malfunctioning computers, a shortage of computers at school, not owning a cell phone with Internet access and not having sufficient skills to use the Internet for school related work.

6.3.3 How do Grade 12 learners search for information on the Web

The general impression is that the learners' online searching behavior is neither targeted nor directed. Respondents generally did not give a detailed outline of the steps they take and for many of the students it was simply a matter of opening the browser and entering whatever they thought were appropriate terms into a search engine. The findings reveal that there is no systematic process in place during their search. It is interesting that they did think their search was usually successful. However, a closer examination might have revealed otherwise. Only the smallest number of respondents (7 or 6.8%) indicated that they use key words to search.

6.3.4 What are the Web information searching skills of Grade 12 learners?

It is evident, given what has been said in 6.3.3 above, that learners' Web information searching skills are limited. Respondents rated themselves as fair or as poor when asked to evaluate their ability to combine and use /keywords applying the Boolean operators. Asked to judge their ability to assess the quality of information found online, 34 respondents (33.3%) stated fair to poor. Most respondents however considered themselves as possessing the necessary skills. However, the present research suggests otherwise.

Given the findings of this study concerning learners and their Web information searching skills, one could argue that the training they received, while considered useful by them, was not necessarily effective. Even so, the quite significant number of learners who had not received any training or orientation at all were at a disadvantage in terms of Web information searching skills. The vast majority of learners were studying in fields where ICT training was not offered. The national curriculum structure in schools in Namibia does not always promote ICT skills, including those enabling learners to use the Web for information searching. It appears that Grade 12 learners depend more on friends and classmates to teach them how to search for information on the Internet. However ICT skills are ones which could be provided through the teaching of BIS since the respondents have gone through this subject in their early grades.

6.3.5 What sources of information on the Web do Grade 12 learners use?

The results of the present study show that the vast majority of respondents use Google, followed by Yahoo search. Overall, a high level of familiarity with various Web information sources and search engines was indicated, although actual usage was primarily concentrated on a few sources: the highly popular Google and the less popular Yahoo search. The most popular source of information among learners by a long stretch was the online encyclopaedia Wikipedia with, as mentioned above, 74 of 102 respondents indicating that they use the source always or often.

There is also a need for teachers to deal with how to handle Wikipedia as a source, rather than banning it (as is sometimes done). Even at schools where it is a forbidden source, many students will still consult Wikipedia because it provides a starting point for doing research on a topic that may be unfamiliar. The familiarity shown with the Web is a consequence of the increasing use of Internet and Web services in the educational environment. Online information searching is flourishing in extraordinary ways as most of the learners stated to have encountered most of the eight search engines. However, low use was recorded for those sources that have to be paid for, or for specialized services. Learners rely mostly on search engines to conduct research, in lieu of other resources such as online databases.

6.3.6 How do Grade 12 learners evaluate and use information found on the Web?

Respondents were provided with a list of steps used in evaluating information on the Web and asked how often they use those steps (the underlying assumption that all learners do evaluate information, turned out to be false). With one exception, more than 50% of respondents never used the listed steps or did so only occasionally. For example, three quarters of respondents either

never (51%), or occasionally (22.5%), find out why specific information was written. The findings strengthen the impression that grade 12 learners lack information evaluation skills.

Concerning the question dealing with plagiarism, it is evident from most reactions (and from the many who refrained from responding) that respondents only learnt of the term for the first time when completing the questionnaire. Similarly, it became clear that learners do not add references to assignments or acknowledge where they get their information from, thus violating intellectual property rights. In this respect the findings of the present study are worrisome as they concern grade 12 learners many of whom will soon embark on tertiary studies where they will start from scratch in terms of understanding and avoiding plagiarism.

6.3.7 What are the challenges faced by Grade 12 learners when searching the Web for information?

Although facilities for Web access are available, they do not appear to adequately cater for the enormous student populations at the two schools. Some sites are blocked or filtered and schools do not allow enough time to seek information on the Web. In addition, the filtered network and slow speed of the Internet, the poor quality of facilities, lack of skills and limited knowledge as regards finding information on the Web, lack of skills and knowledge as regards the use of ICT and limited access to the school computer laboratories were listed as challenges. These challenges made it difficult, if not impossible, for learners to satisfy their information needs. In this context it is important to study Web-based information behavior of young people. The challenges participants mentioned appear to be peculiar to developing countries such as Namibia.

6.4 Recommendations

From the main findings and conclusions of the present study various recommendations emerge that are listed below. It is acknowledged that many, if not all, these recommendations come with financial implications and, in some instances, have consequences for educational policy as well. Neither can be avoided. On the whole, schools should provide inclusive training programs that address skills shortages apparent in learners. There is doubtlessly a broad need for training that imparts Web information searching skills. Other recommendations are the following:

- **Information literacy/Web literacy training**

Web information searching should be treated as a core competency and should as such be integrated more completely into school curricula. Training to impart high end information searching skills must be given to learners from lower grades to high grades. The training should

address   how and where to find information, patterns such as the use of Boolean operators, evaluation of information sources and the issue of respecting   intellectual property rights through correct referencing procedures. Thus, learners will grasp at an early stage how to become good users of information and they will be prepared for being good researchers in the future. There should be a more emphasis on information literacy to help students to become responsible information users with concern for the value of information. The teaching of ICT skills within BIS should be a priority as such skills are the foundation of effective Web information searching. Computer courses need to be included in all aspects of curricula development and should possibly be offered in every field of study. The curriculum structure ought to be designed in such a way as to support ICT training for all learners. Teachers with a solid knowledge of Web information literacy should be employed by schools and provide learners with relevant skills.

- **Connectivity, access and accessibility**

There is an obvious need to invest in ICT infrastructure (for example, increase the availability of computer laboratories, computers and software) to improve the present situation. Connectivity that offers greater mobility and ease of access, such as wireless technology should be provided and bandwidths increased for greater Internet speed. More knowledge of the various Web information sources should be provided. Instead of disapproving of, and filtering or blocking sites that in the eyes of school authorities appear to be irrelevant to learners, supervising the school network should be encouraged and students' access to the Internet should remain unhindered. The curriculum structure ought to be designed in such a way that it encourages Web-based information searching, for example by allowing students enough time.

- **Funding**

It is acknowledged that the surveyed schools are government institutions whose budget is required to sustain facilities and equipment that can support effective Internet access. It is therefore recommended that schools, government and potential sponsors, give urgent attention to the funding of necessary equipment, including teacher training, more computers, increased bandwidth and the latest connections such as wireless connection.

6.5 Recommendations for further research

- This study focused on schools with access to the Internet. A comparative study should be carried out to compare schools with access to supplementary Internet resources with those

who do not, in order to evaluate the impact of the Web-based information resources on schools.

- Further studies could adopt a mixed method research approach (including interviews and observations) to widen the study and to get further indications by observing the actual behavior of learners in accessing the Web information.

- Further studies should investigate the appropriate use of information among learners, including their understanding of information, plagiarism and the crucial issue of evaluation of information.

6.6 Summary

This chapter provided an overview of the entire study. Conclusions about the findings were discussed. Recommendations to improve learner's Web-based information searching skills together with recommendations for further research were provided.

REFERENCES

Adams, L. E. 2009. *Information-seeking behavior of Generation Y Students at the Stellenbosch University Library and Information Service,* PhD diss. University of the Western Cape: Western Cape.

Agee, J. and Antrim, P. 2003. Stone buildings, cyberspace, and the library user. *New Library World*, 104 (11/12): 474-480.

Agosto, D. E. 2005. People, places and questions: An investigation of the everyday life Information-seeking behaviors of Urban young adults. *Library and Information Science Research,* 27 (2): 141-163.

Alavi, M. and D. E. Leidner. 2001. Knowledge management and knowledge management systems: Conceptual foundations and research issues (Review). *MIS Quarterly,* 25 (1): 107-137.

American Association of School Librarians. 1988. *Information power: Guidelines for school library media programs.* Chicago: American Llibrary Association.

American Library Association. 2000. The information literacy competency standards for Higher Education. Available at: http://www.ala.org/acrl/standards/informationliteracycompetency<12/04/2013>

Anastasi, A. and Urbina, 1997. *Psychological testing.* 7th ed. London: Prentice Hall International (UK) Ltd.

Armbruster, B. 2002. How to use ERIC on Ebsco Host. Available at: http://www.asbury.edu/cms.files/media/document/library/Howto4-Ericebsc.pdf.

Babbie, E. and Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press.

Babbie. E. 2011. *The practice of social research.* Belmont: Wadsworth.

Baird, D. E., and Fisher, M. 2005. Neomillennial user experience design strategies: Utilizing social networking media to support "always on" learning styles. *Journal of Educational Technology Systems,* 34 (1): 5-32.

Banks, A.M. 1997. *The Internet unplugged: utilities and techniques for Internet productivity... Online and off.* Wilton CT: Online Inc.

Bartlett, J. C., and Toms, E. G. 2005. How is information used? Applying task analysis to understanding information use. In Proceedings of the 35th annual conference of the Canadian Association for Information Science. Available at:http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.120.130&rep=rep1&type=pdf< 12/04/2013>.

Beldarrain, Y. 2006. Distance education trends: Integrating new technologies to foster student interaction and collaboration. *Distance Education,* 27 (2): 139-153.

Best, J.W. and Kahn, J.V. 2006. *Research in education*. Boston: Pearson Education Inc.

Biddiscombe, R and Upton, I.1996. *Getting started: An information professional's guide to the Internet*. USA: AAL (Association of Assistant Librarians).

Bilal, D. 2000. Children's use of the Yahooligans! Web search engine: I. Cognitive, physical, and affective behaviors on fact-based search tasks. *Journal of the American Society for Information Science,* 51 (7): 646-665.

Bilal, D. 2001. Children's use of Yahooligans! Web search engine: II. Cognitive and physical behaviors on research tasks. *Journal of the American Society for Information Science and Technology*, 52 (2): 118-136.

Blair, D.C. 2002. Knowledge management: Hype, hope or help? *Journal of the American Society for Information Science and Technology,* 53 (12): 1019-1028.

Boas, F. 1943. Recent anthropology. *Science,* 98 (2545): 311.

Bouthillier, F. and K. Shearer. 2002. Understanding knowledge management and information management: The need for an empirical perspective. *Information Research,* 8 (1) Available at: http://www.informationr.net/ir/8-1/paper141.html<09/08/2013>.

Boyd, A. 2004. Multi-channel information seeking: A fuzzy conceptual model. *Aslib Proceedings*, 56 (2):81-88.

Branch, J. L. 2000. Investigating the information-seeking processes of adolescents: The value of using think alouds and think afters. *Library of Information Science Research, 22* (4): 371-392.

Brandt, I. G. (2006). *Models of Internet connectivity for secondary schools in the Grahamstown Circuit.* PhD thesis. Grahamstown: Rhodes University.

Brown, J.2002. Why evaluate Web information. Available at: http://education.illinois.edu/wp/credibility/page2.html<12/07/2013>.

Case, D. 2002. *Looking for information: A survey of information seeking behaviour*. London: Academic Press.

Chen, S. H. 1993. A Study of high school students' online catalog searching behavior. *School Library Media Quarterly*, 22 (1): 33-39.

Choo, Chun Wei. 2002. *Information management for the intelligent organization*: *The art of scanning the environment*. Medford, NJ: Information Today.

Choo, Chun Wei, Brian Detlor, and Don Turnbull. 1998. A behavioral model of information seeking on the Web: Preliminary results of a study of how managers and IT specialists use the Web. In proceedings of 61st ASIS annual meeting held in Pittsburgh, PA, Cecilia M. Preston (ed.), 35: 290-302. Information Today Inc.

Cockburn, A., and McKenzie, B. 2001. What do Web users do? An empirical analysis of Web use. *International Journal of human-computer studies,* 54 (6): 903-922. than a machine: Qualitative findings from the girls and ICT survey. Available at:http://www.cit.gu.edu.au/conferences/QualIT2006/proceedings/PDFPapers/Proce edings.pdf<17/04/2013>.

Dalgleish A, and Hall R. 2000. Uses and perceptions of the World Wide Web in an information-seeking environment. *Journal of Librianship and Information Science*, 32 (3): 104–16.

Dawson, C. 2002. *Practical research methods: A user-friendly guide to mastering research techniques and projects*. How To Books: Oxford.

Denzin, K. and Lincoln, Y. S. (Eds.). 2005. *The Sage handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Detmar, S., Gefen, D, and Boudreau, M. 2004. The information systems world quantitative, positivist research methods website. Available at: http://www.dstraub.cis.gsu.edu:88/quant<02/12/2013>

Duffy, P. 2008. Engaging the YouTube Google-Eyed generation: Strategies for using Web 2.0 in teaching and learning. *The Electronic Journal of e-Learning,* 6 (2): 119 – 130.

Du Preez, M. 2008. Information needs and information-seeking behaviour of consulting engineers: a qualitative investigation.MIS thesis, Pretoria: UNISA

eLearning Africa.2012. Namibia country profile. Available at: http://www.elearning-africa.com/eLA_Newsportal/namibia-country-profile/<12/07/2013>.

Edwards, A and Talbot, R. 1994. *The hard pressed researcher: A research handbook for the caring professions*. New York: Longman.

Ellis, D. 1989. A behavioral approach to information retrieval system design. *Journal of Documentation,* 45 (3): 171–212.

Ellis, D. and K. Hall. 1993. A comparison of the information-seeking patterns of researchers in the Physical and Social Sciences. *Journal of Documentation,* 49 (4): 356-369.

Ellis, D and Haugan, M. 1997. Modelling the information-seeking patterns of engineers and research Scientists in an Industrial Environment. *Journal of Documentation,* 53 (4): 384-403.

Fidel, R., Davies, R. K. , Douglas, M. H., and Holder, J. K. 1999. A visit to the information mall: Web searching behavior of high school students. *Journal of the American Society for Information Science,* 50 (1): 501-521.

Fisher, K.E., Erdelez, S. and McKechnie, L. (Eds.). 2005. *Theories of information behavior.* Medford, NJ: Information Today.

Foddy, W. 1993. *Constructing questions for interviews and questionnaires: Theory and practice in Social Research.* Cambridge: Cambridge University Press.

Fraenkel, J.R. and Wallen, N.E. 2000. *How to design and evaluate research in education.* New York: McGraw-Hill.

Gandhi, S. 2004. Knowledge management and reference services. *The Journal of Academic Librarianship,* 30 (5): 368-381.

Gil, P. 2013. The 10 best search engines of 2013. Available at: http://netforbeginners.about.com/od/navigatingthenet/tp/top_10_search_engines_for_beginn ers.htm<11/05/2013>.

Gilbert, H. 1995. *Introduction TCP/IP.* Available at: http://www.yale.edu/pclt/COMM/TCPIP.HTM<10/03/ 2013>.

Given, L. M. 2008.*The Sage encyclopaedia of qualitative research methods.* Los Angeles, Calif: Sage Publications.

Glister, P. 1993. *The Internet navigator: The essential guide to network exploration for the individual dial-up user.* Canada: John Wiley and Sons inc.

Golafshani, N. 2003. Understanding reliability and validity in qualitative research. *The qualitative report*, 8 (4): 597-607.

Goodman, J. 2007. Click first, ask questions later: Understanding teen online behavior. *Aplis,* 20 (2): 84-86.

Gray, D. E. 2009. *Doing research in the real world*. Califonia: Sage Publications.

Guðmundsson, H. B. 2011. Swimming coaches' information seeking behaviour using the World Wide Web. Masters thesis. University of Iceland: Reykjavík.

Gunn, H., and Hepburn, G. 2003. Seeking information for school purposes on the Internet. *Canadian Journal of Learning and Technology/La revue canadienne de l'apprentissage et de la technologie*, 29 (1). Available at:http://cjlt.csj.ualberta.ca/index.php/cjlt/article/view/35/32<01/03/2013>.

Head, A. J., and Eisenberg, M. 2010. *Truth be told: How college students evaluate and use information in the digital age*. Information School: University of Washington.

Hearts, M. 2009. *Search user interfaces*. England: Campridge University Press.

Henerson, M. E., Morris, L. L., and Fitz-Gibbon, C. T. 1978. *How to measure attitudes.* Beverly Hills, Califonia: Sage Publications.

Hennessy, S., Ruthven, K., and Brindley, S. 2005. Teacher perspectives on integrating ICT into subject teaching: commitment, constraints, caution, and change. *Journal of curriculum studies*, 37 (2): 155-192.

Hirsh, S. G. 1999. Children's relevance criteria and information-seekingon electronic resources. *Journal of the American Society for Information Science,* 50 (14): 1265–1283.

Holm, C., Schreiber, T., Tønnesen, P. H., and Friedrichsen, A. 2010. *Information literacy in the upper secondary School: A discussion paper*. Danmarks: Aarhus Universitet.

Howard, R. M., and Davies, L. J. 2009. Plagiarism in the Internet age. *Educational Leadership*, 66 (6): 64-67.

Huang, C. Y., Shen, Y. C., Chiang, I. P., and Lin, C. S. 2007. Concentration of Web users' online information behavior. *Information Research*, *12* (4): 12-4.

Hussain, I and Safdar, M .2008. Role of information technologies in teaching learning process: perception of the faculty. *Turkish Online Journal of Distance Education*, 9 (2): 46-56.

Jansen, B. J., and Rieh, S. Y. 2010. The seventeen theoretical constructs of information searching and information retrieval. *Journal of the American Society for Information Science and Technology*, 61 (8): 1517-1534.

Jones, T., and Cuthrell, K. 2011. YouTube: Educational potentials and pitfalls. *Computers in the Schools*, *28* (1): 75-85.

Kadli, Jayadev and Kumbar, B. D.2011. Faculty information-seeking behavior in the changing ICT environment: A study of commerce colleges in Mumbai. *Library Philosophy and Practice (e-journal).* 53 (1).Available at: http://dialnet.unirioja.es/servlet/articulo?codigo=3711420<10/07/2013>.

Kafai, Y., and Bates, M. J. 1997. InternetWeb-searching instruction in the elementary classroom: Building a foundation for information literacy. *School Library Media Quarterly,* 25 (2): 103–111.

Kahveci, A., Şahin, N., and Genç, Ş. 2011. Computer perceptions of secondary school teachers and impacting demographics: A Turkish perspective. *The Turkish Online Journal of Educational Technology,* 10 (1):71-80.

Kakai, M., Ikoja-Odongo, R., and Kigongo-Bukenya, I. M. N. 2004. A study of the information-seeking behavior of undergraduate students of Makerere University, Uganda. *World libraries*, 14 (1). Available at: http://www.worlib.org/vol14no1/kakai_v14n1.shtml<14/6/2013>.

Kellar, M., Watters, C. and Mutula, S. 2006. Field study characterizing Web-based information seeking tasks. Available at: http://www.cs.dal.ca/research/techreports/2005/CS-2005-20.pdf<25/04/2013>.

Krige, N. A. 2009. High school students' use of licensed databases and digital resources via the public library in the East Cobb area of Atlanta, Georgia, USA. Master Thesis. Pretoria: University of South Africa.

Kuhlthau, C. C. 1991. Inside the search process: Information-seekingfrom the user's perspective. *Journal of the American Society for Information Science,* 42 (5): 361-71

Kuhlthau, C. C. 1993. A principle of uncertainty for information seeking. *Journal of Documentation,* 49 (4): 339-355.

Kuhn, T. S. 1990. *The Structure of scientific revolutions*, 3rd ed. Chicago: University of Chicago Press.

Latrobe, K. and Havener, W. M. 1997. The Information-seeking behavior of high hchool honors Students: An exploratory study. *Journal of Youth Services in Libraries,* 10 (2): 188-200.

Lawrence, H & Miller, W. 2000. *Academic research on the Internet: options for scholars and libraries*. New York: Haworth Press.

Leedy, P. D and Ormrod, J. E. 2005. *Practical research: planning and design*. 8thed: Upper Saddle River, NJ: Pearson Education Inc.

Leiner, B.M. et al. 2012. *A brief history of the Internet.* Available at: http://www.isoc.org/Internet/history/brief.shtml<16/03/ 2013>.

Lipczynska, S. 2005. Power to the people: the case for Wikipedia. *Reference Reviews*, 19 (2): 6-7.

Loose, R.M. Jr. & Worley, K.A. 1994. *Research and evaluation for information professionals.* London: Academic Press Inc.

Lorenzen, M. 2001. The land of confusion? High school students and their use of the World Wide Web for research. *Research strategies*, *18* (2): 151-163.

Madden, A.D., Ford, N., Miller, D. and Levy, P. 2003. *Schoolchildren searching the Internet - teachers' perceptions.* In: Martin, A., and Rader, H. B. (Eds.). 2003. *Information and IT literacy: Enabling learning in the 21st century,* London: Facet.

Mandalios, J. 2013. RADAR: An approach for helping students evaluate Internet sources. *Journal of Information Science*. 1-9.Available at: http://jis.sagepub.com/content/early/2013/03/12/0165551513478889<11/09/2013>.

Mayora, C. 2009. Using YouTube to encourage authentic writing in the English as Second or Foreign Language class-rooms. *TESL Reporter*, 42 (1): 1–12.

McFarlane, A. and Roche, E. 2003. Kids and the Net: Constructing a view of the world. *Education, Communication and Information,* 3 (1): 151-157.

McGarry, K. J. 1981. *The changing context of information*. London: Clive Bingley

McGregor, J.H. andWilliamson, K. 2005. Appropriate use of information at the secondary school level: Understanding and avoiding plagiarism. *Library and Information Science Research*, 27 (4): 496-512.

McMillan, J.H. and Schumacher, S. 1997. *Research in education: a conceptual introduction*. 4thed. Michigan: Longman.

McNeill, P. 1990. *Research methods*. London: Routledge.

Muhambe, B. H. 2012.Technology initiatives in academic libraries: Status of Library 2.0 within the Libraries of the University of KwaZulu-Natal. Master thesis. Pietermaritzburg: University of KwaZulu-Natal.

Mutual, S.M. and Mutula, D.L. 2007. ICT Information in Botswana Secondary schools: Digital divide factor and implications for information literacy. *African Journal of Library Archives and Information Science*, 17 (2): 126-12.

Namibia Library and Archives Service. 2008. Namibian Library and Information Service Sector strategic assessment study. Windhoek: National library.

National Planning Commission. 2004. Namibia vision 2030: Chapter 3. Available at:(http://www.npc.gov.na/vision/pdfs/Chapter_3.pdf <08/04/2013>.

Neuman, L. W. 2006. *Social research methods: qualitative and quantitative approaches* (6th Ed.). Boston: Pearson.

Nkomo, N. 2009. *A comparative analysis of the Web information-seeking behavior of students and staff at the University of Zululand and the Durban University of Technology*. PhD diss. Zululand: University of Zululand.

Partridge, H. and Hallam, G. 2006. Educating the Millennial Generation for evidence based information practice*. Library Hi Tech,* 24 (3): 400-419.

Payne, G and J. Payne. 2004. *Key concepts in social research*. London: SAGE Publications.

Peshave, M., and Dezhgosha, K. 2005. *How search engines work*. Springfield USA: University of Illinois.

Pickard, A.J. 2007. *Research methods in information*. London: Facet Publishing.

Pitts, J. M. 1994. Personal understandings and mental models of information: A qualitative study of factors associated with the information-seeking and use of adolescents. PhD diss. Florida: Florida State University.

Purcell, K., Rainie, L., Heaps, A., Buchanan, J., Friedrich, L., Jacklin, A., and Zickuhr, K. 2012. How teens do research in the digital world. *Pew Research Center's Internetand American Life Project*.Available at:http://pewInternet.org/~/media//Files/Reports/2012/PIP_TeacherSurveyR<01/04/2013>.

Quintana, M. B., Pujol, M. C., and Romaní, J. R. 2012. Internet navigation and information search strategies: How do children influenced by their participation in an intensive Information Communication Technology project. *International Journal of Technology and Design Education*, 22 (4): 513-529.

Rafiq, M. 2009. Information-seeking behavior and user satisfaction of university instructors: A case study. Available at: http://digitalcommons.unl.edu/libphilprac/240/<28/03/2013>.

Reja, U., Manfreda, K. L., Hlebec, V., and Vehovar, V. 2003. Open-ended vs. close-ended questions in Web questionnaires. *Advances in Methodology and Statistics (Metodološki zvezki)*, 19: 159-77. Available at: http://www.Websm.org/db/12/1326/Bibliography/Open-ended%20vs.%20Closeended%20Questions%20in%20Web%20Questionnaires/<11/3/2013>.

Rowlands, I., Nicholas, D., Williams, P., Huntington, P., Fieldhouse,M., Gunter, B., Withey, R., Jamali,H., Dobrowolski, T, and Tenopir, C. 2008. The Google generation: The information behavior of the researcher of the future. *Aslib Proceedings,* 60 (4): 290-310.

Saeed, N., Yang, Y., and Sinnappan, S. 2009. Emerging Web technologies in higher education: A case of incorporating blogs, podcasts and social bookmarks in a Web programming course based on students' learning styles and technology preferences. *Educational Technology and Society*, 12 (4): 98-109.

Sangrà, A., and González-Sanmamed, M. 2011. The role of information and communication technologies in improving teaching and learning processes in primary and secondary schools. *Journal of Asynchronous Learning Network (JALN),* 15 (4): 207-220.

Sarantakos, S. 1997. *Social research*. (2nd Ed.). New York: Palgrave.

Sasikala, C., and Dhanraju, V. 2011. Assessment of information literacy skills among science students of Andhra University.Available at: http://digitalcommons.unl.edu/libphilprac/626/<20/07/2013>.

Saunders, M., Lewis, P. and Thornhill, A. 2000. Research methods for business students.

Upper Saddle River, NJ: Prentice-Hall.

Savolainen, R. 2007. Information behavior and information practice: Reviewing the 'umbrella concepts' of information-seeking studies. *The Library Quarterly,* **77** (2): 109-27.

Schacter, J., Chung, G. K. W. K., and Dorr, A. 1998. Children's Internet searching on complex problems: Performance and process analyses. *Journal of the American Society for Information Science,* 49 (9): 840–849.

School of Education Training and Development. 2003. *Understanding research: Learning guide and research.* 2nd ed. Pietermaritzburg: Univesity of KwaZulu-Natal.

Shelly, G.B. and Vermaat, M. E. 2007. *Discovering computers 2007: a gateway to information.* Boston: Thomson Place.

Shenton, A. K., and Dixon, P. 2004. Issues arising from youngsters' information-seeking behavior. *Library and Information Science Research*, 26 (2): 177-200.

Singh, K. P., and Satija, M. P. 2006. A review of research on information-seeking behavior of agricultural scientists: International perspectives. *DESIDOC Journal of Library and Information Technology*, 26 (2) 25-36.

Stilwell, C. 2010. Research into information behavior in the South African context: A preliminary exploration and bibliography: 1980 to date. *Innovation,* 40: 1- 33.

Tahir, M., Mahmood, K., and Shafique, F. 2008. Information needs and information-seeking behavior of arts and humanities teachers: a survey of the University of the Punjab, Lahore, Pakistan. *Library Philosophy and Practice (e-journal)*, 227: 1-11. Available at: Paper 227. http://digitalcommons.unl.edu/libphilprac/227<21/08/2013>.

Taylor, R. S. 1968. Question negotiation and information-seekingin libraries. *Journal of College and Research Libraries*, 29 (3): 178-94.

Terre, B. M. Durrheim, K. and Painter, D. (Eds.). 2006. *Research in practice: Applied methods for social sciences.* Cape Town: University of Cape Town Press.

Todd, R. J. 2003. Adolescents of the Information Age: Patterns of information-seeking and use, and implications for information professionals. *School Libraries World Wide,* 9 (2): 27-46.

Trochim, W. M. 2002. What is the research methods knowledge base? Available at: http://csi.ufs.ac.za/resres/files/Trochim.pdf<11/05/2013>.

Troy, J., and Kristen, C,. 2011. YouTube: Educational potentials and pitfalls, *Computers in the Schools*, 28 (1): 75-85.

UNISA Bureau of Market Research. 2012. Cellphone living and learning style among secondary school learners in Gauteng. Pretoria: University of South Africa.

University of Califonia. 2009. Web-based curriculum resources for career academi. Available at: http://casn.berkeley.edu/resources.php?r=77<10/05/2013>.

Urquhart, C., and Rowley, J. 2007. Understanding student information behavior in relation to electronic information services: Lessons from longitudinal monitoring and evaluation, Part 2. *Journal of the American Society for information Science and Technology*, 58 (8): 1188-1197.

Vidmar, D.J. 1999. Darwin on the Web. *Computers in Libraries*, 19 (5): 22 -27.

Valenza, J. K. 2006. They might be gurus. *Teacher Librarian,* 34 (1): 18-27.

Viseu, S. 2010. The use of Internet by students in Portuguese schools. *Digital Education Review*, 11: 60-66. Available at: http://greav.ub.edu/Der/index.php/der/article/viewFile/100/187<13/309/2013>.

Walker, S. 2006. Academic library services for the Millennial Generation. *Georgia Library Quarterly,* 43 (2): 8-12.

Walton, M., and Archer, A. 2004. The Web and information literacy: Scaffolding the use of Web sources in a project-based curriculum. *British EducationalCommunications and Technology Agency,* 35 (2): 1-14.

Walton, M. Marsden, G. and Vukovic, V. 2001. Key challenges for project-based learning: A study of South African student Web searching strategies. Available at: http://www.chi-sa.org.za/CHI-SA2001/visualLiteracy.PDF<20/05/2013>.

Wikipedia, 2012. Mweshipandka High School. Available at: http://en.wikipedia.org/wiki/Mweshipandeka_High_School<11/08/2013>.

Wikipedia, 2012. Gabriel Taapopi Senior Secondary School. Available at: http://en.wikipedia.org/wiki/Gabriel_Taapopi_SSS <11/08/2013>.

Wikipedia, 2014. Yahoo! Kids. Available at: http://en.wikipedia.org/wiki/Yahooligans <04/01/13>

Wilson, T.D. 1999. Models in information behavior research. *Journal of Documentation*, 55 (3): 249-270.

Wilson, T. D. 2000. Human information behavior. *Informing Science*, 3 (2): 49-56.

Wu, Y., and Tsai, C. 2005. Information commitments: Evaluative standards and information searching strategies in Web-based learning environments. *Journal of Computer Assisted Learning*, 21(5):374–385.

Appendix 1: LETTER OF CONSENT

Dear Respondent,

I am Tertu Shiweda a Master in Information Studies candidate at the University of KwaZulu-Natal, Pietermaritzburg Campus, South Africa. I am conducting this study as part of the requirements for the Masters Degree. This survey aims at finding out how Grade 12 learners in the Oshana region are using the World Wide Web (or Internet) to find information

The results of the study will be distributed within the Ministry of Education and to education stakeholders. It is hoped that the study will add to existing knowledge on how learners currently make use of the Web to help them in their learning and research.

Please note that you are not required to provide your name. This means that you name will not be used in the study and that the information you provide will not be linked to your name in any way.

 Please note that this is NOT a test and there are no right or wrong answers. You are kindly asked to answer all questions to the best of your ability and as truthfully as possible.

Finally, your participation in answering the questions is completely voluntary. You have the right to withdraw at any time during the study.

I really do appreciate your participation in the study. Thank you

Yours sincerely
Teru Shiweda
Email: ter2haixwa@yahoo.com

Please complete this form
Web-based information behavior of high school learners in Oshana region, Namibia

I, …………………………………………………….., hereby consent to participate in the study as outlined in the document about the study/ as explained to me by the researcher.

I acknowledge that I have been informed about why the questionnaire/interview is being administered to me. I am aware that participation in the study is voluntary and I may refuse to participate or withdraw from the study at any stage and for any reason without any form of disadvantage.

I, …………………………………………., acknowledge that I understand the contents of this form and freely consent to participating in the study.

Participant
>   Signed: …………………………………………………
>   Date:…………………………………………………

Researcher
>   Signed: ………………………………………………….

>   Date: ……………………………………

Appendix 2: QUESTIONNAIRE

WEB-BASED INFORMATION BEHAVIOR OF LEARNERS IN OSHANA REGION, NAMIBIA

Please answer the questions below to the best of your ability. Please be truthful. Remember, this is NOT a test and there are NO right or wrong answers.

SECTION A
BACKGROUND INFORMATION

Please tick the box next to the answer which applies.

1. Gender
    1. Male ⌗
    2. Female ⌗

2. What is your age?
    1. 16 ⌗
    2. 17 ⌗
    3. 18 ⌗
    4. 19 ⌗
    5. 20 ⌗
    6. 21 ⌗
    7. Older than 21 ⌗

3. In which field of study are you?
    1. Commerce ⌗
    2. Design and technology ⌗
    3. Science ⌗
    4. Agriculture ⌗
    5. Home economics ⌗
    6. Fashion and fabrics ⌗
    7. Design and technology ⌗

4. Do you access the Internet?
YES ⌗ NO ⌗

If your answer to above is NO, explain why and thereafter do not proceed.
………
………

SECTION B
HOW, WHERE AND WHEN IS THE INTERNET ACCESSED?

If YES TO QUESTION 4,

5. How do you gain access to the Internet? (You may tick more than one).
   1. Home computer ⊞
   2. School Library computer ⊞
   3. School Laboratory computer ⊞
   4. Public library computer ⊞
   5. Friend's home computer ⊞
   6. Tablet ⊞
   7. Cellphone ⊞

Other (please
specify)……………………………………………………………………………………
If you ticked more than one response above, please state which one you use the most often.

…………………………………………………………………………………………………

6. When do you access the Internet?
   1. During school hours ⊞
   2. After school ⊞
   3. Weekends ⊞

7. On average, how much time do you spend on the Internet PER WEEK.
   1. Seven or more hours ⊞
   2. Between five and seven hours ⊞
   3. Between three and five hours ⊞
   4. Between one and three hours ⊞
   5. Less than one hour ⊞

SECTION C

PURPOSES FOR WHICH INFORMATION IS SOUGHT ON THE WEB

8. What do you use the Internet for? (You may tick more than one).
   1. Email ⊞
   2. Searching for information using the World Wide Web (WWW or Web) ⊞
   3. Social networking (e.g Facebook and Twitter) ⊞
   4. Other (please
      specify)……………………………………………………………………..

      …………………………………………………………………………………………

I would now like to focus on your use of the Web in searching for information:

9. For what purpose/s do you seek information on the Web? (You may tick more than one).
   1. School related work ⊞
   2. Entertainment (e.g. downloading music/ playing online games) ⊞
   3. Communication/Social Networking (e.g. email, net meeting, chatting) ⊞
   4. General awareness/keeping up-to-date with the news ⊞

5. Other (please specify)

    …………………………………………………………………………………

    ………………………………………………………………………………………………

10. If you ticked 1. above, what aspect/s of your school related work do you use the Web to get information for?

………………………………………………………………………………………………

………………………………………………………………………………………………
………………………………………………………………………………………………

11. If you do not use the Web to get information for school related work, please indicate why you do not do
so.………………………………………………………………………………………………

………………………………………………………………………………………………
………………………………………………………………………………………………

Please do not continue. Thank you for taking the time to answer the questions above.

SECTION D
HOW INFORMATION SEARCHED FOR ON THE WEB (STEPS INVOLVED)
If you use the Web to get information for school related work, please think about the last time you needed to get information from the Web (e.g for an assignment that you had to write).

12. Please describe how you went about getting the information from the Web, what steps that you took from start to the end.

………………………………………………………………………………………………

………………………………………………………………………………………………..

13. During your search, did you find information that you were looking for?
YES ⊞   NO ⊞

If NO, what further step/s did you take to get the information that you were looking for and were you successful?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………
18. When you are searching for information on the Web the steps or moves that one uses can be quite similar to the moves or steps you might use when searching for information in hardcopy

literature e.g. sources such as books and journals. How often, when searching the Web, do you use or follow the six steps listed below (To assist you in answering this, I have provided, in brackets, the similar steps you would follow when searching the literature.)

Identify Websites/pages containing or pointing to information of interest. (Identify sources of interest.)
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Follow links on starting pages to other content-related sites. (Follow up references found in given material).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Scan top-level pages: lists, headings, site maps. (Scan tables of contents or headings.)
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Select useful pages and sites by bookmarking, printing, copying and pasting, etc. (Assess or restrict information according to their usefulness.)
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Receive site updates using e.g. push, agents, or profiles and/orRevisit favourite sites for new information. (Receive regular reports or summaries from selected sources)
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Systematically search a local site to extract information of interest at that site. (Systematically work through a source to identify material of interest.)
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

SECTION E – WEB INFORMATION SEARCHING SKILLS
14. Overall, how would you rate yourself on each of the following?

Ability to understand how online search results are generated
EXCELLENT ⊞ VERY GOOD ⊞ GOOD ⊞ FAIR ⊞ POOR

Ability to identify appropriate and effective search terms/key words relating to your information need
EXCELLENT ⊞ VERY GOOD ⊞ GOOD ⊞ FAIR ⊞ POOR

Ability to combine and use these terms/keywords using the Bolean operators AND, OR, NOT
EXCELLENT ⊞ VERY GOOD ⊞ GOOD ⊞ FAIR ⊞ POOR

Ability to assess the quality and accuracy of information found online,
EXCELLENT ⊞ VERY GOOD ⊞ GOOD ⊞ FAIR ⊞ POOR

15. Do you think you possess the necessary skills to use the Internet/ the Web when searching for information?

YES ☐ NOT REALLY ☐ NOT AT ALL ☐

16. Have you ever received any formal training or orientation on how to use the Web in terms of searching for information?
YES ☐ NO ☐

If "YES", do you think that such training was useful?
YES ☐ NO ☐

If "NO", please explain why not.
………
………
………

17. Please suggest what you think can be done to equip or prepare learners like yourself with Webinformation-seeking skills at your school?
………
………
………

SECTION F
WEB SOURCE/S OF INFORMATION USED

19 .Which search engines do you USE? (You may tick more than one).
1. Google   ☐
2. Yahoo search ☐
3. Bing   ☐
4. Ask   ☐
5. AOL   ☐
6. MyWebSearch ☐
7. Dogpile   ☐
8. WebCrawler ☐
9. Yahooligans   ☐
10. Other (please specify)……………………………………………………………………………………
………

If you ticked more than one search engine, please indicate which search engine you use most often.

………
20. Which of the following sources of information on the Web do you use when seeking information for your school work and how often do you use them? (Please tick all that apply to you).

Online databases such as Wilson Biography, LitFinder and NetLibrary
Always ⌗ Often ⌗ Not often ⌗ Never ⌗

Wikipedia or other online encyclopaedias
Always ⌗ Often ⌗ Not often ⌗ Never ⌗

YouTube or other social media sites
Always ⌗ Often ⌗ Not often ⌗ Never ⌗

SparkNotes, CliffNotes, or other study guides
Always ⌗ Often ⌗ Not often ⌗ Never ⌗

Student-oriented search engines such as Yahooligans, Ask
Always ⌗ Often ⌗ Not often ⌗ Never ⌗

Other (please specify)………………………………………………………………….....................

……

SECTION G
EVALUATION AND USE OF INFORMATION

21. In general, how much of the information you find on the Web using search engines (e.g. Google) do you think is accurate/trustworthy? Would you say…

All   ⌗
Most   ⌗
Some   ⌗
Very little   ⌗
None at all   ⌗

Please give a reason for your answer.
……

……

22. What are the things (criteria or factors) in a Website which you think will help you decide if the information that the Website contains is accurate/trustworthy or not?
……

……

23. What do you understand by the term "plagiarism"?
……

123

………

24. In your assignments/projects do you acknowledge or reference where you get your information from?
YES ⊞NO ⊞

If 'YES' please briefly explain how you go about doing so
………

………

25. When you are evaluating information on the Web how often do you use the steps listed below?

Check the relevance (e.g how is the information that you have found relevant to your assignment).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Check the authority (e.g who is the author and what are their credentials).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Check the date (e.g when was the information published).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Check the appearance (e.g. if information looks academic - has citations and references).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

Find out the reason/s for writing (e.g why did the writer publish it).
Always ⊞ Often ⊞ Occasionally ⊞ Never ⊞

SECTION H

CHALLENGES FACED WHEN SEARCHING THE WEB FOR INFORMATION?

26. What challenges, if any, do you face when searching for information on the Web at school?
(You may tick more than one).
1. Filtered network   ⊞
2. Not enough time to use the Internet at school   ⊞
3. Speed (slow Internet)   ⊞
4. Poor quality of facilities (hardware)   ⊞
5. Inadequate resources(e.g lack of computers)   ⊞
6. Lack of skills and knowledge in finding information on the Web ⊞
7. Lack of skills and knowledge in using ICT (e.g. computers) ⊞
8. Other (please
    specify……………………………………………………………………………………

    ....

……

27. Please suggest what can be done to address the challenges you have stated above.

……

……

If you have anything else to say concerning searching for information on the Web please do so below

……

……

Thank you very much for completing this questionnaire. It is very much appreciated.