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Abstract

This thesis observes the processes that occur when pupils are told to use the Internet to find information for a specific school-related task. The term Information Literacy encapsulates these processes well, and put them into two main groups: An information literate person must be able to use modern technology to find relevant information, but must also know how to evaluate this information. These two elements form the basis for the research questions. The first question examines how the pupils use the Internet to find information, which includes the search engine they use, how many searches they make, and which search engine results they click on. The second question focuses on how the pupils evaluate the information they find, including how much they trust various websites, and which strategies they use to determine the credibility of a source.

A total of 36 pupils, including 17 boys and 19 girls, took part in a quantitative study that forms the basis for this thesis. Each pupil were handed a task to complete in 45 minutes. The results are based on data from two different sources. The first source of data was collected from screen recordings of the pupils' activities when surfing the web for information, while the second source was gathered from a questionnaire that the pupils filled out after completing the task.

The results show that the pupils only used Google's search engine, and that most of them used Wikipedia articles as one of their sources. On average, the pupils made 2.91 searches, clicked on a link on most result pages (81.7%), and preferred the top result (32.8%). There was also a pattern of start-up sequences that most pupils went through. These sequences resulted in that 87% of the pupils ended up at a Google search page within the first few minutes. The pupils trusted online news, but had little trust in blogs and gossip magazines. They displayed awareness on several factors that determine credibility. The pupils also displayed a high trust in authority websites. The thesis concludes that the pupils are fairly information literate, but they may benefit from adopting different strategies and check alternative sources, and also be critical to sources that they perceive as authoritative.

Preface

The idea for this thesis came as the result of some observations I made as a teacher in a lower secondary school. The curriculum points to digital competence as one of the defining factors of an educated person. In 2010, computers have become an integrated part of a typical school day. The computer rooms at school are not meant to stand empty, so pupils are often given tasks that involve the use of the Internet as a tool for finding information for school specific tasks. In many cases, the pupils receive no additional instructions. They are marched to the computer room, told to be quiet, and generally left to their own devices.

By keeping an open eye during these computer room sessions, and by looking at the references they listed based on research done online, it became clear that Wikipedia frequently left a fingerprint on their work. There was also another pattern that was detected when looking over the pupil's shoulders in the computer rooms. Most pupils used Google to track down information.

The original idea for this thesis was to examine the implications of Wikipedia's influence in education. This idea was expanded, and I finally decided to investigate what actually went on when the pupils were doing their online research. In addition, I wanted to investigate the basis for their choice of sources. How much trust did they put in various kinds of sources, and how did they decide if they could trust a website?

Introduction

The use of the Internet has become an integrated part of a typical school day. Pupils are frequently asked to visit the computer room to find information for a school related task. In some situations, the pupils will be presented with a source by their teacher, or the textbook they use may recommend a source. However, in other situations, the teacher may instruct the pupils to use the internet without any specific instructions. Although the pupils may rely on the information they find on a website they have been told to use, they need to use their own strategies to find relevant and trustworthy information when no specific source are offered to them.

This thesis will look closer at the processes that the pupils go through when they are told to *use the internet*, but before the research questions are presented, a look at what defines the pupils in terms of their digital competence, and a brief introduction to computing and the Internet is in order.

The New Generation of Internet Users

By taking a quick glance at the passengers on a bus, chances are that some of them will be talking to a friend on the phone, listening to music on their iTouch, or updating their Facebook and Twitter profiles. These technologies are available to all age groups, but the majority of those who immerse themselves in the latest technologies are young people.

Pedró (2007) points out that the generation that these young people represent, grew up surrounded by information and computer technology (ICT), and have developed a natural affinity for these technologies (Pedró 2007:245). A fitting label for this generation is *The New Millennium Learners*, a term coined by Howe and Strauss (2000). The children that grew up at the turn of the millennium belong to this generation. These children are “the first generation to grow up surrounded by digital media, and most of their activities dealing with peer-to-peer communications and knowledge management, in the broadest sense, are mediated by these technologies” (Pedró 2007:244). They are also “adept with computers, creative with technology, and, above, all, highly skilled at multitasking in a world where ubiquitous connections are assumed” (Pedró 2007:244). These are the core elements that separates this generation from that of their parent’s generation. Although their parents are no strangers to technology, they did not grow up submerged in a world of computers and mobile phones. The

pupils that attend school today are representatives of this generation, which may provide a clearer picture of their background.

The next section will give a brief introduction to the Internet, and introduce some of the websites that have a significant influence on the information that people find online. These websites also provide one of the focus areas of this thesis.

Computer and Information Technology

A few years back, when the iPhone first arrived, hundreds of technophiles lined up outside their local Apple store in hope of securing the latest wonder from Steve Job's empire. Tensions were on the rise as the iPhone inventory shrank faster than the line outside. People are passionate about technology. Although most new releases do not result in frenzied crowds, people still show a great deal of interest. Blogs and Websites spread the latest gossip from the world of fresh technology.

The efficiency and power of technology are constantly improved. There is always a new model right around the corner, and old models soon become obsolete. In 1965, Gordon Moore, one of the co-founders of Intel, stated that the amount of computer transistors in a computer chip would double every two years, essentially making computers twice as powerful. This prediction has proven to be fairly accurate. Computers that used to fill up a small room, have been replaced with computers immensely more powerful that fits inside a small mobile phone. Beatty (2003) has calculated that the processing power of computers have multiplied by somewhere between twenty and thirty thousand times since the seventies (Beatty 2003:23).

This process of improving technology has made the widespread use of the Internet possible. In the earlier days, before most people had ever heard of the Internet, institutions such as the US military and CERN were creating the foundation of this global network. The earlier incarnations of the Internet allowed for scientists and scholars to share their research with peers across the globe. In the nineties, the Internet was opened up to the public, and innovations such as increased data transfer capacity, constant broadband connections, and mobile internet, have made it possible for the Internet to expand into new territories. Video chat, social networks, and instant messaging have become part of the way people communicate.

In 2010, being online twenty-four-seven is mandatory, at least for the young generation that grew up immersed by these new forms of communication technology. Even though the

Internet has conquered new frontiers, information sharing and distribution is still alive and well. In the next section, two of the major players in online content distribution will be introduced.

The Rise of Giants

The amount of information online has been growing exponentially since the first days of the Internet. The sheer amount of data available online has provided its own set of challenges for a web searcher looking for relevant information. Search engines were developed to allow for a way to make it possible to find this information from a central location.

In 1996, at Stanford University, two graduate students started to develop a search engine called BackRub. The following year, this search engine got a new name, and Google was born. In just a few years, this search engine managed to outclass all other search engines.

A few years after Google was well underway to take over the search engine market, another website started its rise to fame. The goal of Wikipedia was to create an encyclopedia that contained the combined knowledge of all humanity. In 2010, there are millions of articles available in all the major languages of the world, with thousands of articles added daily. Google and Wikipedia have come to dominate their own spheres of the online space, and these sites have a significant presence in this thesis.

People rely on the Internet to find information. Most questions can be answered by making a simple search online. There is no shortage of information available online, but this may lead to some problems as well. The information may be false, biased, misleading, or just irrelevant. There is a need for a skillset that can filter out poor information, and locate and recognize quality. Different people have different strategies for finding and evaluating information, which will be a recurring theme in the continuation of these pages.

Now it is time to examine the study and look at the research questions.

The Design of the Study

All the pupils that took part in this study attended the tenth grade at the same lower-secondary school, and represented all the five parallel classes. In total, 17 boys and 19 girls took part in this study. The pupils were instructed to use the Internet to find information on a topic and write a short text about it. Their computer screens were recorded, and later analyzed and tagged. After completing the task, the pupils were handed a questionnaire with a range of

questions. The balanced mix of genders opened up the possibility to examine gender differences as well, which will be looked at closer when presenting the results.

The screen recordings and questionnaires provided the data that were instrumental in answering the two main research questions: *How the pupils use the Internet to find information*, and *how they evaluate the information they find*.

The first research question, *how the pupils use the Internet to find information*, relies on the observed data that was tagged and analyzed from the screen recordings, but the questionnaire also provided additional insight. There are several related questions to this main research question. For instance, what browsers do the pupils use, how many searches do they make, how much time do they spend scanning search engine result pages (SERPs), which positions in the search engines do they click on, etc.

The second research question, *how the pupils evaluate the information they find*, contains two aspects: The reported trust ratings that they provided by filling out the questionnaire, and the strategies they used to determine if a source was usable. There are several related questions here as well. For instance, how much do the pupils trust various sources and websites, which factors contribute to choosing a source, and how often do they check additional sources to verify information.

These two questions work well within the framework of the term *Information Literacy*. Bush (2009) describes an information literate person as having the skills “necessary to locate, access, and use information in today’s society”. In addition, an information literate person needs to be able to “verify those facts and then evaluate information in a complex technological environment” (Bush 2009:446).

There are some focus areas that this thesis will pay special attention to that work in conjunction with the main research questions. The first focus area will look closely at the influence that Wikipedia and Google have over the flow of information online. The second focus area will look at ways to raise the pupil’s skills in evaluating information online.

Structure

The thesis is broken down into an introduction, a theory & background chapter, a methodology chapter, a result & discussion chapter, a conclusion, and a reflections & outlook chapter.

The first chapter is broken down into five sections. The first section presents an introduction to the Internet, and touches on topics such as how it works, who uses it, and who controls it. The next section takes a closer look at what digital media is, how it is organized, and its purpose and quality. This section also contains a closer look at Wikipedia. The third section looks at the challenges of quality control online, which skills are needed to evaluate content, and examines the elements of authority, accuracy and credibility. The fourth section looks closer at what it means to search the web, what people are searching for, and discusses the purpose, role and quality of search engines. The last section in chapter one takes a closer look at how the search engines work, including a closer look at the search engine result pages (from this point forward referred to as SERPs).

The second chapter examines the methodology of the study. This chapter is broken down into four sections. The first examines the participants and the setting in more detail, while the second section looks at the design of the task and questionnaire that were given to the pupils. The third section examines the procedure, and contains a closer look at the preparation and carrying out of the experiment. The last section looks at how the data was collected and analyzed, and also points out some limiting factors.

The third chapter presents the results of the study organized into two subchapters. The first subchapter presents and discusses the data collected from the questionnaire. The sections are structured based on common themes: Browser familiarity and use, search engine familiarity and frequency of use, reported trust in various websites, influence of webpage elements when selecting a source, influence of domain names and top-level domains (i.e. *com*, *net* and *org*), frequency of data verification, and prioritizing of results on SERPs. The last section examines the reported trust and use of sources the pupils accessed during the experiment. The second subchapter presents and discusses the data tagged and analyzed from the screen recordings. The first sections look at browser and search engine use during the experiment, distribution of searches, and start-up sequences. The next couple of sections examine how the pupils interacted with the SERPs, including which SERP positions they clicked on, how many SERPs they visited, and which websites they scanned. This section also presents and discusses the frequency of a selection of webpages in the SERPs. The last

section in this subchapter takes a closer look at various issues concerning time use such as the average time spent scanning SERPs and webpages.

The conclusion aims to draw the lines between the theory, the research questions and the results, while the final chapter, reflections & outlook, will look closer at the focus areas mentioned previously, and point to further studies that may be of interest.

1 Theory & Literary Review

This chapter will frequently mention *web searchers*. This term is representative for everyone who is looking for information online, and encompasses the pupils that took part in this study. The chapter will keep the pupils in mind, but also acknowledge that this field of study has a wider grasp.

As mentioned in the introduction, there are five sections within this chapter. These sections are meant to provide insight into various areas that the study will explore in the third chapter, but also reach across a wider area to provide a more complete view of the various topics discussed. These sections are as follows: The Internet (1.1), Digital Media (1.2), Quality Control & Online Trust Factors (1.3), Searching the Web (1.4), and Search Engine Dynamics (1.5).

1.1 The Internet

In schools and workplaces, people access the Internet to find information (i.e. reading the latest news, looking for an article on dog training), communicate (i.e. checking the inbox, posting status updates on Facebook), or sharing information (i.e. sending a document, updating a website). The introduction gave a brief overview of the history of the Internet, though what exactly is it? In order to discuss the use of Internet to find information, it is important get a clearer picture of what it is and how it works.

This section is divided into four subsections. The first subsection (1.1.1) examines Internet technology and point to some implications of this technology related to the research questions. The second subsection (1.1.2) looks at the software used to access the Internet, while the third subsection (1.1.3) takes a brief look at online demographics. The final subsection (1.1.4) takes a closer look at the powers (if any) that control this huge network.

Before moving on to the first section about the Internet, it may be useful to look at some definitions. The *Oxford Advanced Learners Dictionary* defines it as “an international computer network connecting other networks and computers from companies, universities, etc. (OALD)” while the *Merriam-Webster Online Dictionary* defines it as “an electronic communications network that connects computer networks and organizational computer facilities around the world” (MWOD). In essence, the Internet is a world-spanning computer network.

1.1.1 Internet Technology

The technology discussed in this subsection is restricted to the core functionalities of the Internet, and is not meant to be a complete overview. The aim is to provide an introduction to the technology that runs the Internet, and to point out how these technologies may be linked to the research questions. Even though some of the technological aspects mentioned here may not directly concern these questions, they were included to avoid a fractured representation of these technologies.

The Internet is built on the back of an infrastructure that makes it possible to share and receive data from all the computers connected to this network. This infrastructure is comprised of a range of data-transfer technologies; wired connections (cable networks, telephone grid, etc.) and wireless transmissions (satellite, cellular grid, wireless networks, etc.) are all connected to the same network.

The access to this network is not restricted by operation systems or computer configurations. All computers connected to the net use a set of common languages (protocols) to communicate. These protocols are collectively known as TCP/IP (Transmission Control Protocol/Internet Protocol), and they make it possible for Macs, PCs, Unix- and Linux based systems to share the same network. Each computer connected to the Internet has a unique identifier (IP address) that consists of a string of numbers that identifies its location (i.e. 134.56.78.76). This *Internet protocol* “specifies the rules that define the details of how computers communicate” (Comer 2007:128). The 2010 statistics on IP addresses state that there are more than 3.1 billion IP addresses worldwide (“Domain Counts & Internet Statistics”).

It would be impractical to use these addresses when looking up websites, as one would have to keep track of a whole range of sequences of numbers. The *domain name system* (DNS) was created in order to provide a more user-friendly alternative to using IP addresses directly. This system keeps track of the names “assigned to a computer on the internet” (Comer 2007:353). The DNS system links a domain name (i.e. *cnn.com*, *wikipedia.org*) to a specific IP address (each server on the internet is connected to a specific IP address) and folder (where the file for that domain name is located). This makes it easier for most people to use the Internet. Instead of having to type in an IP addresses and folder destinations, a web searcher may type in a domain name instead and automatically be routed to his destination.

The Internet Corporation for Assigned Names and Numbers (ICANN) is a world wide non-profit corporation that is “dedicated to keeping the Internet secure, stable and

interoperable” and further “promotes competition and develops policy on the Internet’s unique identifiers” (“ICANN:About”). This organization has the responsibility of overseeing the DNS system. In many ways, this system made the Internet accessible to the public, and also made it possible to promote online brands and build authority online. Three well-known examples are Wikipedia, Google and Facebook. These companies would have a hard time promoting themselves as a string of numbers.

There are many different types of top-level domain names (TLDs). Each of these is identified by the extension at the end of a domain name (i.e. *google.com* and *dagbladet.no*). The *com* extension is the most popular in use. There are approximately 87 million active *com* domain names, and more than 312 million deleted ones (“Domain Counts & Internet Statistics”). There are other TLDs, such as *net* and *org*, but these are in no way near the popularity of the *com* extension. The *com*, *org*, and *net* extensions (among others) are available for everyone to register, while other TLDs are restricted. Examples are the *gov* (controlled by the US government) and the *edu* (used by educational institutions in the US) TLDs. In addition, most countries have their own extensions. Norway has the *no* extension, while Great Britain has the *co.uk*, *gov.uk* and *org.uk* extensions.

The extension of a domain name contributes to the trust and authority of a website. For instance, a *com* domain may seem more legitimate and authoritative than an *info* domain (one of the more recent TLDs). This may have to do with the recognition of the domain extension. This means that a web searcher may prefer a *com* domain to an *info* domain, even though the information on the *info* domain might be of higher quality.

In order to have a common structure for sharing information, the *Hyper Text Marker Language* (HTML) was developed. HTML is a formatting language that contains the building blocks of a webpage, including functions for creating *hyperlinks* and formatting text with headers and bold text. HTML has gone through several revisions, and is currently moving towards its fifth version that is being developed to satisfy the growing demand for multimedia features and social networks. The Internet is growing as social arena, and the technology is evolving to fit the needs of its users. In addition to HTML, there are other different programming languages used to shape the appearance of a homepage, including CSS (for styling the elements on a website), Flash (for showing animations), PHP (a server-side scripting language) and Java (a client-side scripting language). A computer that does not have flash installed may be unable to view videos and other forms of multimedia content, which may limit the information that a web user can access.

The content (*hypertext*) on the Internet is woven together by *hyperlinks*. The *hypertext* is different from a printed text. Kern (2000) explains that hypertext “allows information to be organized in multi-linear strands. In hypertext, chunks of texts are linked electronically to other chunks of text in associate webs” (Kern 2000:227). There are some advantages of hypertext over standard documents as it allows for “explicit relational links between pieces of information” (Kern 2000:228). The hyperlinks can link one document with another, and contain all the elements that point the browser to where the source of the links is located on the Internet.

The technologies mentioned in this subsection allow computers to send and receive information across the Internet, but there is still one piece of the puzzle that needs to be examined. In the next section, the software technology that is used to access the internet will be looked at in more detail.

1.1.2 Browsing the Web

Before the Internet opened its doors, people were restricted to browsing in stores. Browsing is defined as the process of looking “at a lot of things in a shop/store rather than looking for one particular thing” (OALD). In the context of the Internet, this definition takes on a new meaning. Browsing the web has become an expression for going online in order to find something specific, or just to spend a few aimless hours looking around.

The software used to explore the Internet is called a web browser. There are many browsers available, although most people tend to use a limited range. The October 2009 browser usage statistics show that the various versions of Internet Explorer has a market share of 64.64%, Firefox comes second with 24.07% followed by Safari (4.42%), Chrome (3.58%) and Opera with 2.17% (Protalinski). These numbers do not take the various versions of the browsers into account (i.e. Internet Explorer version 6, 7, and 8). Although Internet Explorer is still ahead by a significant percentage, the other browsers are steadily closing the gap.

The core functionality of these browsers is to provide a graphical interface for accessing the Internet, and to convert the digital stream of binary numbers into something that a human can understand. This interface allows a user to find, view, and interact with websites.

The browser provides the user access the Internet by rendering various types of code (i.e. HTML, Flash, and Java). Although all browsers support HTML, some browsers have limited support for other programming languages, and, in some cases, certain technologies are discarded completely. In addition, some brands and companies impose restrictions to what

they will allow. For instance, Apple does not allow Flash to run on the iPhone and iPad, which means that some content may be unavailable to web users.

Even though the latest browsers share the same core functionalities, there are some differences as well. For instance, Firefox allows users to install various plug-ins that provides additional functionality. A user may also install toolbars that show up above the browser window, and usually contains additional functionalities and search fields.

Browsers also have built-in search functionalities, which is accessed through a search field for some browsers (i.e. Internet Explorer and Firefox), or directly from the URL field (i.e. Chrome) in others. Toolbars often have their own integrated search functionalities. The reason why this matters in the context of this study is that different browsers use different default search engines. For instance, Firefox and Chrome use Google by default, while the latest version of Internet Explorer uses Bing. This means that the browser may influence the use of search engines, and as a result, the information that is presented to a web searcher.

1.1.3 Demographics

The Internet continues to expand. The latest data estimates that there are more than 1.8 billion Internet users worldwide (“Internet World Stats”). In the industrialized parts of the world, most people have access to the Internet, while fewer people have access in underdeveloped areas. The Internet has encompassed most parts of the world, and it will continue to expand in the years to come.

1.1.4 The Masters at the Gate

There is not a single authority that controls the Internet, although there are institutions that regulate various aspects of it (i.e. ICANN). This does not mean that the Internet is without laws and regulations. The determining factor that controls the Internet is based on the legislation of the nation where the server is located. For instance, a server that is physically located in Norway is subject to Norwegian laws and regulations. The Internet is not directly owned by anyone. It is simply a network of computers that does not exist beyond the reach of laws and regulations.

Those who control the infrastructure also have some power of the flow of information. In China, the government restricts access to certain websites that it has determined to be unfit for its population. These filters also exist in less totalitarian nations, where sites dealing with child pornography and human trafficking are restricted.

1.2 Digital Media

Naisbitt (1982), cited in Seidensticker (2006) famously said that “we are drowning in information and starved for knowledge” (Seidensticker 2006:82). This sea of information has increased drastically since the Internet was made available to the public. Digital media has resulted in a proliferation of information unrivalled in history.

The digital information available online is referred to as digital media, and is the central topic for this section. There are four subsections: The first subsection (1.2.1) examines the Internet and digital media from a theoretical viewpoint, while the next subsection (1.2.2) looks at how the Internet and digital media is constantly changing. The third subsection (1.2.3) examines some issues that may have an influence on the quality of digital media, while the last subsection (1.2.4) provides a brief overview of Wikipedia.

1.2.1 Digital Media & Discourse Networks

Bennet (2007) defines digital media as a “convergence between interactive media (most notably gaming), online networks, and existing media forms (Bennet 2007: VII). Digital media is a term that encompasses all preceding forms of media, and mixes them with new forms of media that occasionally spring into existence. The information that web searchers gain access to during their information hunts can collectively be described as digital media. However, digital media is not limited to just articles and videos online, it includes all forms of data that has been digitalized, or exists stored on a computer (i.e. a Word document or an mp3 file).

The Internet has become saturated with interconnected digital media. Kittler (1999) points out that information networks are nothing new or exclusive to the Internet. These *discourse networks* have existed since the technology of language was developed. In tribal societies, the only way of storing information was by memory, and the transfer of this information was done by the technology of speech. Kittler suggests that the only thing that has changed with the introduction of the Internet is the technologies used to store, transfer and access data. In order to access information online, an interface technology needs to be used. Computers, browsers and LCD screens are all technologies that create an interface between the digital information and web user.

Although it can be argued that the fundamentals of information networks have not changed, there is no doubt that digital media represents a significant technological advancement. Kittler writes that the digitization of information “erases the difference between

individual media” (Kittler 1999:101), and makes the point that new forms of media (including digital media) tend to absorb previous forms of media. Harris and Taylor (2005) support Kittler’s ideas and describe digital media as "over-arching medium whose content is that of all preceding media (Harris and Taylor 2005:67)". In other words, all previous types of content have merged together into what is referred to as digital media.

In contrast, McLuhan (2001) argues that the new forms of technology have led to a drastic change that sets it apart from any other event in human history. McLuhan speculates that the new media forms have become extensions of the human body. This change puts humanity in direct contact with a kind of digital consciousness.

The impact of new technology and media is questioned by Rajagopal (2006), who points out that "when a new technological medium enters the world, we tend to think the world of it" (Rajagopal 2006:278). Since 2006, several new forms of mediums have risen to fame just within a few years (i.e. Facebook, Twitter, and YouTube). Although Rajagopal may be right, the fact remains that these new mediums have become an integrated part of many people’s lives. This is especially true for the New Millennium Learners, where a life without these new forms of media must be seen as a horrific reality.

1.2.2 The Changing Internet

The new millennium became the portal to new ways of communicating. In 2006, Time magazine awarded the person of the year to “*you*”. This was a fitting testament to the changing structure of communication, and captured the zeitgeist at a time when YouTube were becoming increasingly popular and social networking sites and blogging were on the rise.

The Internet used to be a less dynamic environment where the voice of the individual used to be silent. However, this changed when blogs and social media sites challenged the idea of what a publisher was. This process can be described as *the democratization of knowledge*. Hinman (2008) defines this process as the “transference of the means of authentication from the hands of professionals into the hands of the people” (Hinman 2008:69). Although this process has been slowly gaining momentum since the invention of the printing press, it is during the last decade that a drastic acceleration has occurred with game changers such as Wikipedia, YouTube and blogging platforms (Hinman 2008:69). Although there are many admirable aspects of this process, the flipside is that it has resulted in a proliferation of unedited digital media that floods the internet.

The online service *Google Zeitgeist* gives a yearly review of the top 10 rising searches and shows which sites that has seen the most growth for that year. In 2008, the highest rising search was *Obama*, followed by *Facebook*, *Tuenti* (the Spanish equivalent to Facebook), *ATT* (Association of Taxation Technicians), *iPhone*, *YouTube*, *Fox News*, *Palin*, *Beijing 2008*, and *David Cook*. The popularity of *Facebook* and *YouTube* shows the growing significance of the Internet as a social arena.

YouTube has a larger reach than most broadcasting companies do, and the most popular videos are user generated. For instance, one of the most viewed videos of all time, the amateur video *Evolution of Dance* (where a guy demonstrates some new dance moves), has received more than 140 million views since it was published April 06, 2006 (Judson). Although this is an extreme example, users on YouTube (and other social networking and video sites) can get a decent amount of exposure provided that they actually have something interesting to share with the world.

There is also a huge network of educational videos and recordings of TV shows available on YouTube. These videos are excellent for use in educational settings. Teachers can connect their computers to projectors, and show their pupils YouTube videos on any topic imaginable. Many universities also have their own YouTube channels, where they upload lectures that may be of interest beyond the auditorium. YouTube results are also frequently showing up in the search engine results, and web searchers may listen to and watch videos in addition to reading documents when browsing the web for information.

1.2.3 Quality Issues

There are some important issues that concern the quality of the information available on the web. As a result of the democratization of knowledge, there is a lot of user-generated content online, and there is no guarantee that this content is based on facts. A web searcher may have problems separating valid information from unfounded personal opinions, and unverified information may corrupt a proper information gathering process.

Copyright laws and other restrictions are other factors that limit the availability of quality information online. For instance, most academic journals are not made publicly available online. Even though the abstracts of many papers appear in the search engines, web searches usually have to pay between twenty and fifty dollars to gain access to this content. Most of them will not pay that much to view an article.

Fitzgerald et al. (2008) make the point that “copyright laws by their very nature, fundamentally challenge this concept of a freely accessible and flowing Internet” (Fitzgerald et al. 2009:103). There are claims that the copyright laws that exists today have not managed to adjust to the technological innovations, new forms of media, and the massive growth of the Internet. Fitzgerald et al. raise several important points concerning this discrepancy. Copyright law has “failed to adequately respond to these technological developments and advances” (Fitzgerald et al. 2008:103). The copyright regulations that exists today are being “applied to the types of online activities, which were never contemplated when the original legislative provisions were drafted causing great ambiguity and uncertainty” (Fitzgerald et al. 2008:103). There is a strong sentiment here that the copyright laws are outdated.

The search engines are also subject to these laws. Even though the goal of a search engine is to provide links to content, copyright laws have been applied to restrict the content that a search engine can index. The blame is shifting from the websites that are infringing on copyright laws, to the search engines that points the way to that content.

1.2.4 The role of Wikipedia

Wikipedia is a combination of a wiki and an encyclopedia. A *wiki* is “a website that allows multiple users to create, modify and organize web page content in a collaborative manner” and “a collection of web pages that can be edited by a group” (eLearning Glossary). In other words, a wiki is a website where different people can work together to create and maintain information. An *encyclopedia* is “a reference work (often in several volumes) containing articles on various topics (often arranged in alphabetical order) dealing with the entire range of human knowledge or with some particular specialty” (WorldNet). Based on these definitions, Wikipedia can be described as a *collaborative encyclopedia*.

Wikipedia articles frequently appear at the first page of search engine results, and this website has become the first choice for many web searchers to visit when looking for information. As mentioned in the introduction, Wikipedia is available in a wide range of languages, and 2009 figures puts the article count for just the English articles to more than three million. In total, Wikipedia has at least 56 million pages indexed, and about one million incoming links from other websites (“Yahoo Site Explorer”). The website gets about 73 million monthly visitors from the US alone (“Wikipedia.org - Quantcast Audience Profile”). These statistics show how massive Wikipedia has become.

There is a high frequency of Wikipedia results in the top ten search engine results. Wikipedia is a trusted authority site, and gets good search engine rankings. There may be several reasons why Wikipedia ranks consistently well in the search engines. For many topics, it may be hard for the search engines to determine what content is reputable. It may be a better option just to list a Wikipedia article, because people know the site, how it works, and generally trust it. Search engines need to provide a good user experience, and Wikipedia may help in accomplishing that goal.

The authority of Wikipedia is well established, although the credibility of the information may be questionable. Maehre (2009) refers to studies by Chesney (2005) and Giles (2005). Chesney (2005) gave Wikipedia a 2.9 credibility rating on a scale from one (highest) to seven (lowest). Giles (2005) found that Wikipedia entries contained more errors than found in the online version of *Encyclopedia Britannica*. However, 87% of the articles studied did not contain errors (Maehre 2009:229-230). This does not mean that the remaining 13% are useless, but that they contained some sort of error (large or small). These figures are not that discouraging, and a web searcher should have no quarrels with using Wikipedia.

1.3 Quality Control and Online Trust Factors

Web searchers are exposed to a lot of information, and they need a way to filter this constant stream of data by applying various quality control skills. These skills are vital in the struggle to filter out the static and locate the quality content. Although search engines aim to deliver accurate and reliable information, the search algorithms cannot guarantee the quality of the webpages they list. Web searchers still need to apply their own strategies to evaluate the content they are presented with by Google and other search engines.

This section is broken down into four subsections: The first subsection (1.3.1) examines the concept of Information Literacy, while the next section (1.3.2) examines how authority may sway trust in a website. The third subsection (1.3.3) examines what accuracy means in the context of Information Literacy and trust factors, while the last subsection (1.3.4) looks at credibility in the same context.

1.3.1 Information Literacy

This term was briefly explained in the introduction, but the term will be expanded on in this subsection. Most people will use some sort of validation process to determine the trustworthiness of an article or another form of digital media. This process may be as simple as using the domain name as an indicator of trust, while other strategies may include checking the credentials of the author of an article.

The term *Information Literacy* is suitable in this discussion. Bush (2006) defines an information literate person as having “the skills necessary to locate, access, and use information in today’s society” (Bush 2009:446). This definition goes well with the first of the research questions of this thesis.

Bush expands on the terminology and points out that “Information Literacy means more than just finding the facts. It means being able to verify those facts and then evaluate information in a complex technological environment.” (Bush 2009:446). Web searchers may be adept with computers and information technology, but these skills do not automatically make them information literate. This skillset relies on knowledge that transcends a pure technological understanding. This second aspect of the information literate person works as a framework for the section research question.

A person that performs a web search on Google and then investigates the various results will need fine-tuned Information Literacy skills to separate quality from inferior information. Bush points out that the Information Literacy skills of evaluating authority, accuracy, and

credibility have “become necessary parts of people’s lives” (Bush 2009:446). These three skills will form the framework for the next three subsections, and will also form a basis for some of the arguments that will be brought to the surface in the conclusion.

1.3.2 Website Authority

Authority is defined as having “the power to influence people because they respect your knowledge or official position” (OALD). People tend trust in authorities in every shape and form, and a web searcher may be inclined to trust a website that they judge as authoritative.

The authority of a website will be based on the previous experience that a web searcher has with that particular site. An authoritative website has the power to sway the trust of its visitors. The important factor is the ability to be critical of these websites. Authority is not the same as quality, neither is it synonymous with credibility. Awareness of these factors is an important aspect of Information Literacy.

Website authority has become increasingly important, as more Internet users turn to these websites when looking for information. Surfing the web by clicking on links with no clear idea of where the trip would end was more in line with how people behaved online in the earlier days of the Internet. In 2010, web users check authority sites such as online newspapers and Wikipedia instead. Although Information Literacy many web searchers trust the content on authoritative sites, there is still no guarantee of the reliability of the content. As a single factor of trust, Authority does not provide a sufficient foundation to evaluate information, but people may not have the skills or the patience to use other methods of validation.

The danger with authority is that people may believe what they read without questioning it. The Internet is flooded with worthless information full of factual errors and unfounded arguments, and it may be hard to separate gold from pyrite without the necessary tools for doing so.

The authority of a website is determined by several factors. One significant factor is the exposure it gets from the search engines. A website that constantly appears in the top ten positions may increase the perceived authoritative status. This idea is supported by a study conducted by iProspect (2008). This study showed that “39% of search engine users believe that the companies whose websites are returned among the top search results are the leaders in their field” while “42% feel neutral on this question, with only 19% believing that top search engine rankings do not automatically denote an industry leader (iProspect 2008:6).

If authority can be linked to exposure, then the most visited websites may indicate which websites people trust. The most visited sites in Norway, from first to tenth place, are *Google.no*, *Facebook.com*, *Google.com*, *Youtube.com*, *vg.no*, *Finn.no*, *live.com*, *dagbladet.no*, *yahoo.com* and *wikipedia.org* (“Alexa Top Sites in Norway”). These rankings show the popularity of Google, but also include two newspapers, the *Yahoo* and *Microsoft* portals, and *Wikipedia* at tenth position. The global rankings are slightly different: *Google.com*, *Facebook.com*, *Youtube.com*, *Yahoo.com*, *Live.com*, *Wikipedia.org*, *Baidu.com*, *Blogger.com*, *Msn.com* and *qq.com* (“Alexa Top 500 Global Sites”). Both of these rankings include Google at the top, but also include its search engine competitors *Microsoft* and *Yahoo*. *Facebook* and *YouTube* are also presented in both rankings. *Wikipedia* is present in both of these lists.

1.3.3 Information Accuracy

Accuracy is defined as “the state of being exact or correct; the ability to do sth skillfully without making mistakes” (OALD). A web searcher needs to tune his accuracy skills in order to find the best possible results when using search engines. Although some of the examples listed here might just as well be included in the section on search engine dynamics (1.5), it is included here instead to provide an example on what accuracy actually means in this context. A web searcher must also be able to judge the accuracy of the information that is found online.

The mindset of the web searcher determines if the results are judged as accurate. A search engine does not know the thought processes that occur in the mind of the person making the search, but based on its search engine algorithms, the search engine will try to estimate the best results. A good web searcher use good keywords that increase accuracy in the search engines. The following paragraphs will provide an example of accuracy while searching Google.

When a web searcher types is a query such as *world of warcraft*, there is a whole range of possible sub-topics that this searcher may be thinking of. For instance, the searcher might want to buy the game, learn how to play it better, or find a guild to join. Based on the mindset of the searcher, the relevancy of this SERP will be judged differently. A skilled web searcher may add another keyword such as *guide* or *forum* to refine his search, and make the results more in line with the mindset. A less experienced web searcher may not find the right piece of information and without the skills of refining a search for accuracy, the hunt for good information becomes difficult.

The following example shows the diversity of the search term *world of warcraft*. The top ranking is the homepage of Blizzard (the creators of the game). In addition to the link to the company's homepage (the main link), there are additional site related links listed below the main link. These links point to various sub-pages such as the forum, server status and patch notes. The second position also links to the same domain, but displays information about a new game expansion. The third position links to a Wikipedia article, while the fourth position displays various news results about *world of warcraft*. In addition, the page also contains links to Blog posts, videos, images, etc. At the bottom of the page, there is a list of related searches. This list includes the core keyword *world of warcraft* with additional keywords and phrases such as *download, armory, cheats, free trial, add-ons, mods, private server* and *tips*. These are meant to help the searcher to narrow the search and find results that are more relevant.

A simple distinction can be made between broad keywords and keywords that are more precise. A broad keyword phrase may have a multitude of different aspects related to it, while a more precise one will narrow these aspects down. A user that knows exactly what he or she is searching for may enter longer search queries. In the example above, *world of warcraft* may be considered a broader search term than *world of warcraft free trial*. A web searcher can expect more relevant hits from a more precise search.

1.3.4 Information Credibility

Credibility is defined as “the quality that sb/sth has that makes people believe or trust them” (OALD). The credibility of digital media should be on the top of the mind of every web searcher. Authority and credibility are not the same. Although authority often lends to credibility, there is no automatic correlation between the two. A website may be authoritative, but the information there may still lack credibility. Wikipedia is a good example, as it is often considered an authority site, but without knowing who wrote the article, it is not possible to check their credentials.

An information literate web searcher knows how to measure the credibility of digital media, and may check the credentials of the author, check alternative sources to verify the data, or a number of other strategies. Not everyone has the same skill set when it comes to recognizing these factors. Inexperienced surfers may fall prey to online scams, lies, and propaganda. The issue of credibility is important to bring to the attention to any web searcher, and critical thinking may be a good mental tool that can be used online as well.

Microsoft provides advice on website trust on their homepage, and point to factors such as if the site is secure, certified by an Internet trust organization, or owned by a well-known company organization. Further, they provide advice on what makes a site not trustworthy: website is referred from email with unknown sender, site offers pornography or illegal material, the website seems too good to be true, has a bait and switch scheme, asks for unnecessary credit card verification, and other factors (“When to Trust a Website”).

1.4 Searching the Web

A *googol* is a very large number (1.0×100^{100}). This term shares a striking resemblance to Google, which is constantly adding more information to its huge index of webpages. According to a blog post on Google's official blog, the number of indexed pages passed one trillion in 2008 (Google). Although there is still some pages left until Google reaches a googol of indexed pages, a trillion is not considered a small number either.

This section is broken down into seven different subsections. The first subsection (1.4.1) looks at how searches can be structured into groups, while the next subsection (1.4.2) explores some trends on what people are actually searching for online. The third subsection (1.4.3) examines the purpose of search engines, while the next subsection (1.4.4) explores the social context of search engines. The quality of search engines is discussed in the fifth subsection (1.4.5), while some implications of the commercialization of search engines follow (1.4.6). The last subsection (1.4.7) will briefly discuss some ideas concerning information retrieval online.

1.4.1 Search Categorization

Each day, millions of searches are made on the various search engines. Jansen et al. (2007:1251) present a basic model structuring searches into three groups. These groups are informational-, navigational- and transactional searches.

The informational search is the most common category with more than 80% of the searches. The purpose of an informational search is to find information about a certain topic. An example of an informal search is to find information about the *Battle of the Ardennes* and the *topographic features of Africa*. A navigational search is done when a surfer knows or assumes the location of a website. The searcher will type in queries such as *google*, *ikea* and *ryan air*. Navigational searches are used when searching for a website a person already knows about. Examples include searches for various company names (*British Petroleum*, *Burger King Bagdad*, etc.). The mindset of the searcher is to find a specific website. The transactional searches are searches for software (*Super Mario Bros Wii*, *Windows 7*) and other products (*used reindeer costume*, *pixie wings for Halloween*, *cheap subwoofer for Audi 6*). The focus on this study will be on informational searches.

1.4.2 Search Trends

There may be some general trends that provide some clues about what people are looking for when going online. One way to gauge what people are searching for is by using Google trends. This service gives an overview of the most popular searches each day, and rates their rising popularity from *hot* to *volcanic*.

The following results are a snapshot from 30 October 2009. At the top is the keyword phrase *Damien Michaels* (related to a news story about a murdered porn actor), the 15th place, *pumpkin pancakes*, shows a search that relates to Halloween (as where many similar searches such as *Elvira pictures*, *Halloween sayings*, and happy Halloween comments). Based on the searches listed at Google trends, it is evident that people are looking for information on various subjects (news, recipes, and gossip), pictures, videos, and more.

People are generally searching for typical things that concern their everyday lives, their hobbies, and their interests. Most searches are *informational searches*. In addition, news stories and celebrity material is on the top of the popular searches. Most days are about ordinary things and everyday life.

1.4.3 The Purpose of Search Engines

The purpose of a search engine is to provide a web searcher with a way to input a search query, and then present a list with as relevant results as possible. These results are presented in a SERP. The searcher will then investigate these results, or refine the search query to get results that are more precise.

Millions of search queries are entered into the search engines each day, and this number continues to rise each year. The number of online searches worldwide has increased by 41% in just one year from approximately 80,554 million in July 2008 to 113,685 million in July 2009 (“comScore”). This rapid growth clearly shows the growing importance of web searching.

Most of these searches originate from Google’s search network. In addition, Google has experienced a massive growth in search queries, which went from 48,666 million in July 2008 to 76,684 million in July 2009 (“Global Search Market”). This 48% rise in search traffic outrivals the small growth of its competitor Yahoo that only saw a 2% increase (from 8,689 to 8,898 million) in the same period. Although Microsoft had a soaring 41% increase in searches throughout this period, the actual search number still only went from 2,349 to 3,317 million in

the same period. These numbers clearly show the dominance of Google, and the numbers suggest that Google will keep this position in the years to come.

Google's dominance of the search engine market is a fairly recent phenomenon. Pre-millennium Internet users used many different search engines (Exite, HotBot, AltaVista, etc.) that slowly have been phased out throughout the last decade. The 2009 statistics show that Google delivers about 67.5% of all online searches globally. Although other search engines like Yahoo (7.2%) and Microsoft (2.9%) also drive considerable volume, most people use Google to find information online ("Global Search Market").

1.4.4 The Role of Search Engines

In the previous section, the number of monthly searches was listed as more than eighty-thousand million with an increase of 48% in just one year. This suggests a trend where search engines are becoming an increasingly stronger presence in people's lives. This may be true for the educational sector as well, where pupils are told to find information online instead of using the trusted old library.

Many researchers emphasize the growing importance of the Internet in people's daily lives. According to Spink and Zimmer (2008), search engines have become more than just a tool to find information online. Web searching has "become a defining component of the human condition", and plays an important role in an individual's "everyday social, cultural, political and information-seeking activities" (Spink and Zimmer 2008:3). Google and the other search engines have become a natural part of people's lives. Search engines have replaced lexicons and libraries as the preferred way of doing research.

In the nineties, scholarly research on web searching was mainly concerned with the technological aspects of search engines, but at the turn of the century researchers started to look at the social and cultural aspects of web searching as well. Studies focusing on economics, politics, morality and ethics have widened the field even further (Spink and Zimmer 2008:3-5). This wide range of research topics into the field of web searching can help to establish a solid and diverse fundament when analyzing the data collected in this study.

Hinman (2008) points out that "search engines play a crucial role in controlling access to information, and as such they in fact contribute significantly to the social construction of knowledge" (Hinman 2008:67). Hinman makes the point that search engines play a huge role in controlling the information that people find online.

If the search engines control the information people get access to, then they have the power to influence people's opinions as well. It is not the sources that the search engines link to that has the power, this power lies entirely in the hands of the search engines and what content they decide to present to its users. From this angle, a search engine may be seen as a filter between a user and the information he seeks.

1.4.5 The Quality of Search Engines

Since search engines have become a natural part of the way people find information, the quality of the results they provide determines the quality of the information people get access to. If the search engines provide low-quality results, this will influence the quality of knowledge of the web searchers. For this reason, it is critical that search engines provide quality information.

Measuring search engine quality poses many challenges. Höchstötter and Lewandowski (2009:309) point out that there has not been done too much research into measuring the quality of search engines. Traditional retrieval measures do not transfer well into the realm of web searching. Lewandowski and Höchstötter claims that there is a crucial element missing in most efforts to rank search engines. They point out that in order to “discuss and judge the quality of search engines, it is important to focus on the user of such systems” (Höchstötter and Lewandowski 2009:309). They further point out that “better performance of ranking algorithms or providing additional services does not always lead to user's satisfaction and to better search results” (Höchstötter and Lewandowski 2009:309). The experiences web searchers have with searching for information online is the real measurement of search engine quality.

Lewandowski (2008a) observes that search engines are often seen as “providers of low-quality content from the entire web”, but also points out that “search engines use quality factors in their rankings” (Lewandowski 2008a:261). Even though search engines have become more sophisticated during the last couple of years, the algorithms still lack the ability to evaluate the academic quality of the content properly. This requires human reviewers. The content that the search engines links to may contain the right keywords, but may also be of poor academic quality. The search algorithms may bury the good content deep down in the result listings. Even so, search engines have systems in place to evaluate the quality of the content. These systems differ between search engines, although some of them may include factors such as how quickly a web searcher returns to the search engine after visiting a certain

webpage. If the search engines detect that users consistently stay less than ten seconds on a website, this may be an indicator of poor content.

Hotchkiss et al. (2005:9) argues that Google does a good job in keeping the best results in the top position. That may be the case, but web searchers may still find poor and incorrect information. Google has managed to capture a big slice of web searches by providing a good product that gives people what they want: relevant results. Because most web searchers rely on Google when doing web searches, it is worthwhile to investigate how Google compares to other search engines, and to see if Google really performs better than its main rivals do. Microsoft has rebranded their search engine, and it is important to distinguish between MSN (the old) and BING (the new, improved version). Studies frequently look at MSN, but these results do not directly apply to BING.

Another challenge that must be taken into consideration is the constant updates to search algorithms. For instance, Yahoo aggregates search results from Google, but used to incorporate results from MSN. The search engines are in constant flux, so any comparative studies may be relevant one year, but irrelevant the following year. An important point for this section is to discuss the influence of the Google search engine, and look at a few studies that compare it to other search engines. Does it really provide better results, or are web searchers better off using Yahoo or Bing?

The quality of the results was investigated in more detail in a study by Höchstötter and Lewandowski (2009). Four areas contribute to measuring search engine quality. These are index quality, quality of the results, quality of search features, and search engine usability. The results of this study showed that Yahoo (48.5%) and Google (47.9%) had almost the same percentage of relevant searches, while MSN (33.9%) get a considerable lower score. Since this study, Microsoft has released the BING search engine replacing MSN. Although this study does not include this new search engine, there seems to be a general agreement that it is an improvement over its predecessor. Even so, these numbers suggest that Yahoo and Google both deliver relevant results.

Google provides significantly better descriptions on the SERPs, with a score of 60.2% vs. Yahoo's 52.8% and MSN 45.1%. The study also concluded that Google and Yahoo were able to provide at least one relevant result for each query in the study, while MSN failed to provide an accurate result for three out of 40 queries; Not a big problem, but significant when compared to the other search engines.

Lewandowski (2008a:262) points to relevance as the major problem in web searching, and argues that even though there has been improvements, search engine results are far from perfect. He further points out that the lack of relevance is a major problem with search engines. Even though there have been improvements, the search results are far from perfect.

1.4.6 Commercial Interests

The search engines have become monetization engines. Hinman (2008) points out that “search engines themselves are driven in part by the voice of the people, in part by the voice of advertisers” (Hinman 2008:69). There is no point in starting a business if there is no intent of creating a steady flow of revenue. The leading search engines all have their advertisement programs that allow advertisers to bid on certain keywords and get their ad listed on the SERPs. The most popular advertising networks are Google Adwords, Microsoft Ad Center and Yahoo Search Marketing. Selling advertising space online is a huge revenue generation business. For instance, Google generated \$16.59 billion in total revenue in 2007 with 99% from selling ads placed on Google search results and other Google products (Chen and Kraemer 2008:54).

The advertising networks must balance between generating revenue and providing valuable information to its users. A typical search will display ads on both the top of the screen and in the column to the right depending on how many advertisers are bidding on a search term. Informational searches are the most popular kind of searches, and many web searchers often search for information that has low commercial value, which results in few or no ads. Even so, ads may appear in the search result and may have an influence on how they find relevant information online, because some web searchers may click on these ads.

1.4.7 Information Retrieval for Internet Purposes

A search engine may be regarded as an Information Retrieval (IR) system, which deals with the processes of finding information. This field has mainly been concerned with library related searching, and it is only during the past couple of years that IR models for the Internet have been developed. Most of these models build upon older models tailored for library use. Langville (2006) defines information retrieval as “the process of searching within a document collection for a particular information need (called a query)” (Langville 2006:2). This definition is also a good way to explain a search engine search.

Knight and Spink (2008) lay out many processes that occur when conducting a web search, which include “cognitive processes, motivation issues, information needs, technology

attitude and adoption” (Knight and Spink 2008:209). A young woman looking to buy a new espresso machine will most likely engage the search engine differently than her grandmother who is searching for distant relatives in a far-away country. The generation that grew up at the turn of the millennium may have an intuitive understanding on how to find the information they are looking for, while their parents may have a slower, but more analytic approach. There are other differences between individual web searchers as well, including prior experience, Internet perceptions, gender, and age (Knight et al. 2009:226). In short, there are many variables to consider when investigating web searching.

There are other systems at work when retrieving information using search engines. These include “search engine algorithms and interface design” (Knight and Spink 2008:209). Web searchers need to adjust their search strategy based on these factors. Google changes its SERP design frequently and add new features, and the results that are shown also changes.

There are other important factors to consider when discussing IR on the web. Knight and Spink (2008) points to one such factor as relating to “how users navigate (called browsing) the hypertext links of a Web page (including the dynamic page/results of a search engine query) in order to meet their information need” (Knight and Spink 2008:209). These factors will be important in the discussion of the results from the study.

1.5 Search Engine Dynamics

The previous section established the context of search engines in society, discussed the quality of search results, and provided a condensed theoretical overview of what web searching is. In contrast, this section will look at the practicalities of a search engine.

This section is broken down into four subsections. The first subsection (1.5.1) examines the search page in more detail, while the following subsection (1.5.2) examines the layout and features of a SERP. The third subsection (1.5.3) briefly discusses eye-tracking studies relevant to this thesis, while the last subsection (1.5.4) looks at some studies that may predict how a web searcher will behave when interacting with search engines.

1.5.1 The Search Page

The first page that most web searchers will see in their quest for knowledge is the search page. Each search engine has a different search page, but there are some core features that are shared between them. For instance, the Google and BING search pages both contain a field for inputting a search query and a button to start the search as shown in the images below.



Image 1: Bing Search Field.



Image 2: Google Search Field.

There are other choices as well (depending on the search engine) but the core feature of a search engine is meant to cause as little confusion as possible about what to do. However, not

all search engines use simple approach. The main difference between these two search engines, and MSN and Yahoo, is that the latter two are not pure search engines. In addition to providing search results, MSN and Yahoo are portal sites. Although Yahoo also contains a simple search field on the top, the rest of the homepage is cluttered with links to news, commercials, other related sites, and so on.

1.5.2 Search Engine Result Pages

The SERP is a gateway to information that the search engine algorithms determine are relevant to the search query. The core element of a SERP is usually a lists of ten results. Each of these results has a title that contains a hyperlink, a description, and a display URL. In addition, search engines may supplement these results with thumbnails of images and videos (*blended results*).

Most SERPs provide *vertical search* options as well. These searches allow “search engine users to limit the results of their search (prior to conducting a search) to a specialized category, such as news, images, or videos” (iProspect:5). Vertical links are often located above blended results as a text link. By clicking on the vertical search link, a new list of results limited to that particular category is displayed.

The Google search engine contains other vertical search functions as well, although Google tend to change these functionalities frequently. The latest version of the Google SERP (May 13 2010) is shown on the screenshot on the next page, where these vertical functions can be directly accessed from the left column. These buttons can filter the results based on the category that the searcher is looking for (video, blog, news, maps, books, etc.). There are other functions available as well such as recency (last hour, day, week, year, etc.).



Image 3: Google SERP.

This screenshot shows the latest incarnation of the Google SERP, with *vertical search* functionality to the right, the search field and results in the centre, and advertisements on the right. Even though SERPs have some common elements, there are no exact patterns.

The SERP above shows the results for the query *metallica album covers*, and displays thumbnails at the top position, as well as a link to more image results above these thumbnails. This comes as no surprise considering the search engine's focus on relevancy. People looking for the covers of Metallica albums are most likely searching for images. Other searches result in different SERP elements. For instance, the search query *the cuban missile crisis* displays pictures between the third and fourth position and video results at the end of the results.

Links to digital media such as videos and images may be helpful but may also distract searchers. For instance, pupils doing research for a school related task may be distracted from finding relevant information and start to look at videos or images instead and click themselves away from the task at hand.

1.5.3 Eye-tracking and SERPs

Eye tracking technology has provided detailed insight into how a web searcher behaves in pursuit of knowledge. Joachims et al. (2005) points to eye fixations as “the most relevant metric for evaluating information processing in online search” (Joachims et al. 2005). This study showed a figure that is included below.

This image shows the distribution of fixations on a Google SERP. The red areas show the areas that was fixated on the most, while the orange, yellow, green, and blue show less and less fixation. As expected, the top position got the most attention, while the second and third positions getting some attention. The top ads on the right also got a few views.

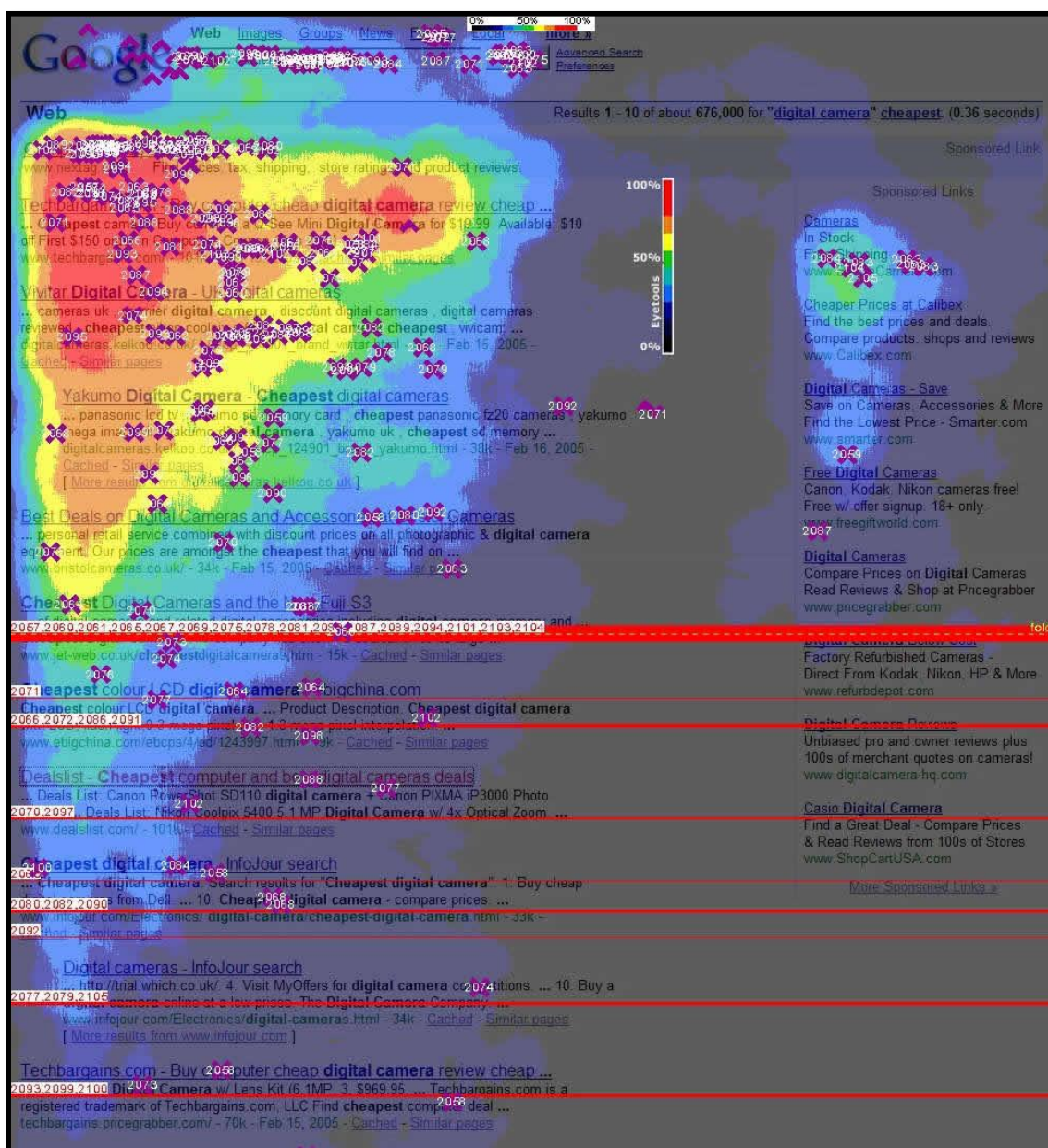


Image 4: Google SERP heatmap (Eyetoools, Inc.).

The area above the thick red line that cuts across the screen below the header of search position six indicate the area where the browser window ends, and the web searcher must scroll down to see more results. This area is referred to as above the fold.

1.5.4 How People Interact with Search Engines

In the context of online search, a session length refers to the length of time it takes for a web searcher to initiate the first search, checking out a few websites, and to finish the process. Research has shown that the average session length is about fifteen minutes. This means that the average web searcher will spend about fifteen minutes checking out some of the pages that are typically found in the top ten position of the search engine they use (Lewandowski 2008:262). The session lengths differ from context to context. For instance, in schools, the pupils often get a full lesson at their disposal, and the session length may be longer than the average that is suggested here. In addition, the pupils are not just searching for information, they are also told to create a product based on the information they find.

Not all web searches will find what they are looking for at the first attempt, in fact, “49% of search engine users who continue their search process when not initially finding what they see, change their search term and /or search engine after reviewing just the first page of search results” (iProspect 2008:6). This means that about half of every web searcher will make a new search (or try another search engine) if they do not find what they were looking for in the top 10 results. They will typically not click on the next button to explore additional results.

Lewandowski (2008a) points out that web searchers “tend to consider only the results of the first page” and that they “focus on just the first few hits, the ones that they can see without scrolling to the bottom of the page” (Lewandowski 2008a:262). A small computer screen, or a web browser with lots of toolbars, will show less of the SERP above the fold. This suggests that the hardware may also influence the sources and information that a web searcher will consider.

There are certain habits that many web searchers seem to share when searching for information online. One such habit is that most prefer to click on the first SERP positions. A study shows that the top position got 50.86% of the clicks, while the second place got 21.71% (“CTRvsRanking.jpg”). The first position carries most authority with the web searchers, and it appears that this position is fortifying itself and growing stronger for each year.

Keane et al. (2008) carried out a study that concluded that users generally prefer the top positions even when the natural order of the search results was changed. This shows the status

that the first position is based on its position, and not on its title and description. Joachims et al. (2005) refer to the same phenomenon as trust bias. This study used eye-tracking technology and showed that the first position received a higher frequency of clicks when compared to the second position, even though both positions have a similar fixation period. Joachims et al. (2005) suggest two reasons for this. Firstly, the first position is the most relevant to the searcher, and, secondly, users prefer to click on the top position. These studies clearly show the importance of the top position in the search engines.

The level of exposure that each position in the SERP gets declines drastically from third place and down. Jerkovic (2010:4) shows an overview of the percentage of people who will view each SERP ranking. Although the first three top positions will be viewed 100% of web searchers, the number quickly descends from 85% for the fourth place, down to 20% for the tenth place in the SERP. There can be many reasons for this. For instance, some web users may have tool bars and other browser add-ons that make the size of the main browser window smaller.

2 Methodology

2.1 Participants & Setting

A total of 36 boys and girls took part in the study. The sample contains a balanced group of boys (N=17) and girls (N=19) with a slight majority of girls. The participants were selected randomly from a pool of pupils that has agreed to take part in the study. More than forty pupils handed in the permission slip.

The pupils attended the tenth grade at the same lower secondary school in Stavanger, and represented all the five parallel classes at that level. All the pupils at this school were used to work with computers as a part of their school day. They were all used to working in the computer room that was designated for the experiment.

2.2 Design

2.2.1 The Task

The pupils were given a task to work with during the experiment (Appendix 2). This task was formulated in a way that was intended to avoid any obvious search queries that the pupils could extract from the text and punch into the search engines. The pupils had not received any tutoring in the topic (the Soviet invasion of Afghanistan during the Cold War).

In addition to the description of the task, the handout contained some basic instructions. They were asked to use the Internet to find information, write their answer in Word, and type in the references under the Word document. These points were added to answer any typical questions that the pupils often ask when given a task. The last point about noting down the sources were also included to make sure that the pupils remembered the sources they had used during the experiment when they were asked to rate them based on trust level on the questionnaire.

2.2.2 Questionnaire

The questionnaire (Appendix 3) was handed to the pupils following the completion of the task. In total, the questionnaire contained 17 questions. The pupils were first asked to tell their gender. This data was important to collect, because one of the ideas was to look if there were any gender differences. The next question contained a table where they could fill in the list of sources they had used and rank these sources based on a trust scale.

The questionnaire also contained questions about which browsers and search engines they knew about and preferred to use, how much they trusted in various websites and sources, etc. As the last part of the questionnaire, the pupils were asked to mark down if various webpage elements had an influence on their decision to use this page as a source.

2.3 Procedure

2.3.1 Preparation

The computer room at the school was prepared the day before the experiment. Screen recording software (Camstudio), a video encoder (H.264), and a media player (VLC) were installed on each computer. The internet connections were checked for all machines.

A few configurations were made. The Windows menu bar was hidden on a few of the machines, so the settings were altered to display this bar. This change was made to give each machine the same basic setup, and to avoid any confusion for pupils who did not see the menu bar. This could affect the experiment and make it harder to compare the data collected. The screen resolution was set to 1280x1024 on a few machines with other settings. This was done so avoid any issues conserving the SERPs and the fold. The desktop icons and images were left alone.

After the machines were set-up, a few test runs were performed to check the screen recording software. These tests ran for 40 minutes, were completed to verify that the screen recording software worked properly, and that it did not have a problem with rendering and storing large video files.

2.3.2 Experiment

The teachers that had the class in the first lesson were given a list of names of the pupils that had been selected for each of the two groups. The first group arrived a few minutes after the first lesson had started, and each pupil got the task and a participant number linked to a specific machine in the computer room. The screen recordings were started as the pupils sat down by the computer. They were told to follow the instructions on the task, and were given 40 minutes to complete it. They were also reminded that their screens were recorded. The pupils focused on the task and few spoke together or visited irrelevant webpages. The reason might be the setting and the fact that they knew their screen was recorded. Initial observations showed that many pupils used Google to find information, and several were Wikipedia

articles. The pupils got the questionnaire after finishing the task, and left after completing it. Afterwards, the video files and the documents were copied over to a portable hard disk.

The second group arrived in a more dispersed manner. A couple of participants arrived in the break before the lesson began, and were told to wait until the lesson started. The rest of the pupils arrived within the next minutes. The instructions were repeated. This group was more talkative. There was some initial noise, but the pupils settled down and eventually worked quietly with their task. Several pupils in this group finished the task in less than 25 minutes. This did not happen in the first group, where everyone worked on the task until the end of the allotted time. The same procedure was completed after this group had left the computer room.

2.4 Analysis

2.4.1 Data Collecting

All the pupils did the task and handed in the survey, while 34 of the pupils were recorded using screen capture software. Because of a problem with corrupted video files, the screen recordings were reduced from 34 to 23 videos that had sufficient data to be included for full analysis. There valid recordings were divided between 13 boys (54.2%) and 11 girls (45.8%). Although the loss of video material will not make the questionnaire invalid, this loss limits the possibilities to cross-reference between the answers the pupils provided and the observation data based on their recordings.

2.4.2 Limitations

The sample of 34 pupils is fairly limited and best suited for a descriptive analysis. The difference between boys and girls will be looked at when the data supports it based on the amount of data available. Because of the loss of video material, the data collected based on observation also lacks in the sample size.

There are several considerations that need to be taken into account when working on these two questions. Firstly, the task the pupils were given contained no recommended sources. The pupils may have used an entirely different strategy if they had a source at their disposal. Secondly, the topic were restricted to a specific historical event which meant that the information available online was limited. This may affect the outcome of this study, because the data collected may be influenced by the lack of alternative sources. Thirdly, the setting itself may influence the way the pupils act. During a standard computer session, they may

behave differently. They knew they were recorded, so this may also have an impact on their behavior.

2.4.3 Organization of Data

The data collected were structured into two collections. The first collection comprised of a statistical database generated using SPSS, and contained most of the data collected from the questionnaire. In addition, selected data collected through the tagging process discussed below were also included in the statistical database. Much of the data gathered from the tagging process were also incorporated into this database.

A spreadsheet was created as a tool to be used in the tagging process. This spreadsheet consisted of approximately 3,000 lines of data. This data contained detailed information on how the participants completed their task. This includes data on what they searched for, how long they spent on each website, which positions they clicked on in the SERPs, the title of the website they visited, the name of the search and the SERP, etc.

3 Presentation & Discussion of Results

The chapter is segmented into two subchapters. The results presented in subchapter I is based on the questionnaire, while the results presented in subchapter II is based on the observed data from the screen recordings. This selection was done in order to provide a clear structure, and to separate what the pupils reported from the observed data.

The first subchapter is divided into eight sections. The aim for both subchapters was to create sections that had a common theme. The first two sections (3.1, 3.2) take a closer look at the reported familiarity and use of various browsers and search engines, while the next section (3.3) examines the trust that the pupils reported in various websites and sources. The following section (3.4) looks closer at the influence of various webpage elements on the pupils' decision to use a webpage as a source or not. The fifth section (3.5) examines the influence of domain names and Top-Level domains (TLDs), while the sixth section (3.6) investigates how often the pupils verify information they find on the Internet. The next section (3.7) explores the influence of SERP positions when prioritizing which websites to visit, while the last section (3.8) under this subchapter presents the reported trust in the sources that the pupils listed they used during the experiment.

The second subchapter is also divided into eight sections. The first of these sections (3.9) looks at which browsers and search engines that were used during the experiment, while the second section (3.10) examines the searches that were made. The third section (3.11) looks at how the pupils started their search for information, while the fourth section (3.12) provides an overview of various SERP statistics. The fifth section (3.13) looks at the frequency that a selection of websites appeared in the SERPs, The next section (3.14) looks at the distribution of click-throughs on the first page of Google, while the following section (3.15) looks closer at which webpages were clicked on. The eight section (3.16) provide a brief overview of the time used to scan SERPs and complete the task, and looks at how much time was spent scanning individual webpages visited during the experiment.

Each of the sections listed above is followed by a discussion. This was done to make the discussions easier to follow, as they are linked to the data presented in each section. The threads will be picked up in the conclusion, and a broader discussion based on the focus areas mentioned in the introduction will be included in a final chapter following the conclusion.

A huge amount of data was collected throughout the process of analyzing the videos and entering the data from the questionnaire into SPSS. The challenge was to find the relevant and

interesting data and present them in manageable sections. Elements that contained sparse data were omitted in situations where these elements were put side by side and compared to each other. For instance, it would be problematic to compare a website that was listed by just one pupil with a website listed by seven pupils, because the mean scores would not be reliable for the elements with very few numbers.

The questionnaire will also be referred where applicable during the next sections. These references appear between brackets, which correspond to the question in the questionnaire. For instance, (Q11) will refer to question one, while (T2) refers to task two.

I Reported Data

3.1 Browser Familiarity and Use

The browser that a web searcher uses may have an influence on the information they find. The pupils were provided with a question (Q8) about which browsers they knew about, if they used this browser, and where they used it (at school, at home, or both). Four of the most popular browsers were included: Chrome, Firefox, Internet Explorer (IE) and Opera. There was also an empty field where the pupils could fill in other browsers. The only additional browser listed was Apple’s Safari. All pupils gave valid responses (N=36).

3.1.1 Reported Browser Familiarity

The figure below shows the percentage of the pupils that were familiar with the various browsers. Figure 1 shows the percentages from the full sample (N=36), as well as individual percentages for the boys (N=17) and the girls (N=19). The figure also contains a data table.

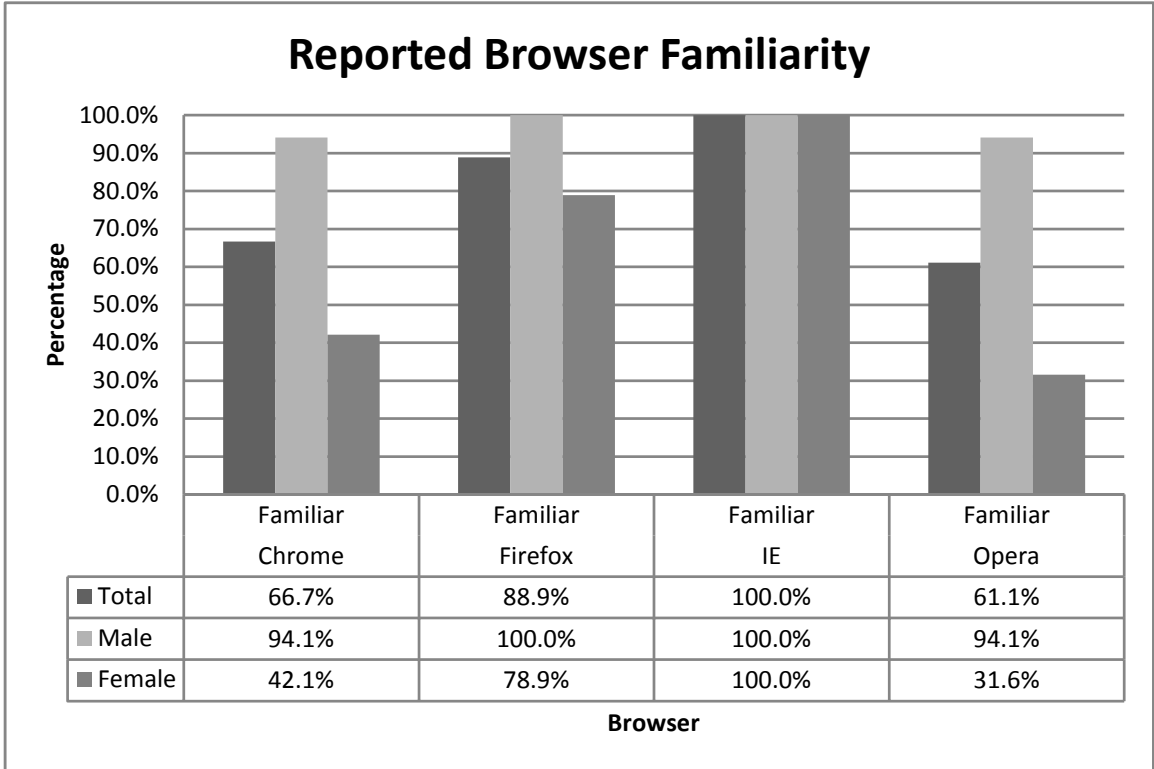


Figure 1: Reported browser familiarity divided into gender groups.

Everyone recognized Internet explorer, 88.9% recognized Firefox, 66.7% recognized Chrome, and 61.1% recognized Opera. As a group, most of the pupils were familiar with these browsers, but there were some differences based on gender. All the boys recognized both Internet Explorer and Firefox, and nearly all (94.1%) recognized both Chrome and Opera. The

percentages for the girls were significantly lower. Although all the girls recognized Internet Explorer, the rest of the browsers were recognized by a significantly lower percentage: 78.9% of the girls recognized Firefox, and only 42.1% recognized Chrome. Opera was only recognized by 31.6% of the girls.

There were some statistically significant correlations between gender and browser familiarity. The following correlations are based on Spearman's rho: Chrome (N=36, $r_s = -.334$, sig=.000), Firefox (N=36, $r_s = -.334$, sig=.046) and Opera (N=36, $r_s = -.640$, sig=.000). The correlation between gender and browser familiarity is supported at a 0.01 level (1% chance of not being relevant) for Chrome and Opera, and at a 0.05 level (5% chance of not being relevant) for Firefox.

3.1.2 Patterns of Browser Use

The pupils were also asked to provide details on where they use the various browsers (Q8). The purpose was to map if the pupils used the browsers at home, at school, or both. The pupils also had the option to select that they never used a browser even though they recognized it. Figure 2 shows the percentages of pupils that listed each of the four options.

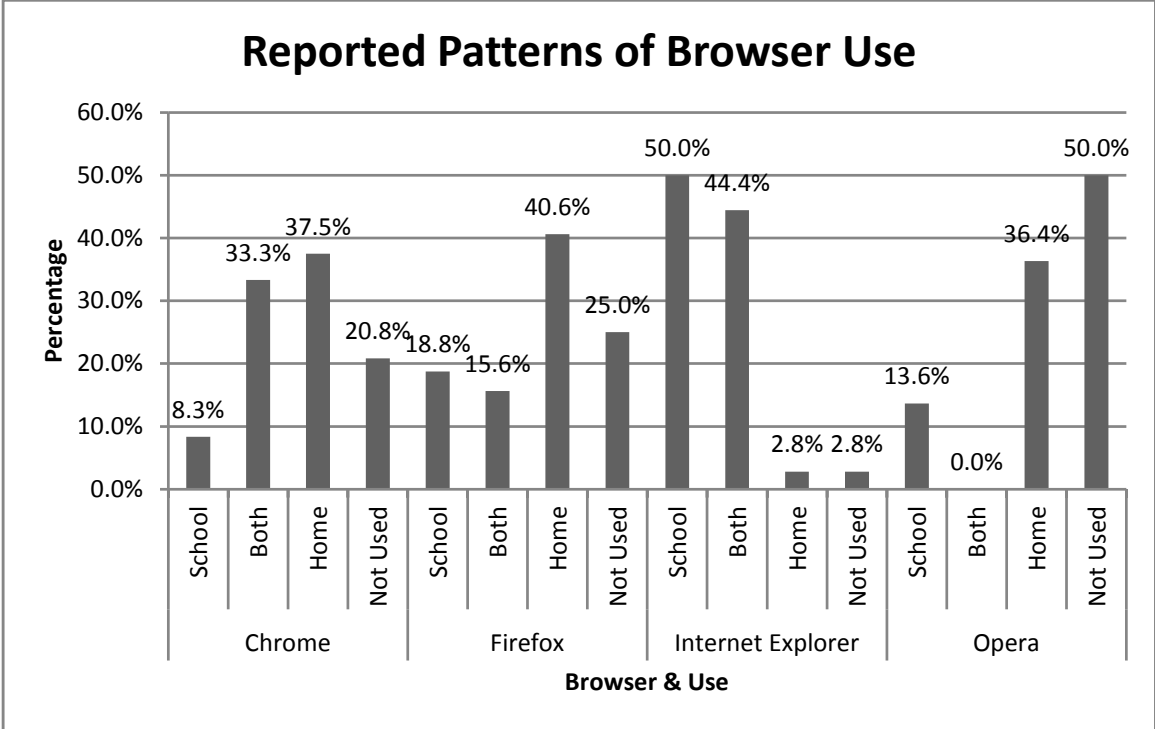


Figure 2: The percentages of pupils reporting patterns of browser use.

8.3% of the pupils reported that they only use Chrome at school, 33.3% reported that they use this browser both at home and at school, while 37.5% of the pupils reported that they only use this browser at home. 20.8% reported that that they never use Chrome.

18.8% reported that they only use Firefox at school, 15.6% reported that they use it both at home and at school, while 40.6% of the pupils reported that they only use Firefox at home. 25.0% reported that they do not use this browser.

50.0% reported that they only use Internet Explorer at school, 44.4% reported that they use it both at home and at school, while just one pupil (2.8%) reported that this browser was only used at home. One pupil (2.8%) reported that this browser was never used.

Finally, 13.6% reported that they only use Opera at school. No one reported using this browser at both home and at school, while 36.4% of the pupils reported that they only use this browser at home. In total, 50.0% of these pupils reported that they never use this browser.

3.1.3 Browser Overlap

The purpose of this subsection is to provide a clearer picture of the difference in browser use. Figure 3 shows the overlap between home and school use for the various browsers. The circles with dotted lines represent use at school, while the circles with solid lines represent use at home. The overlap between use at school and at home is illustrated by the proximity of the circles and the number between the circles. The size of the circles illustrates where this browser is most frequently used.

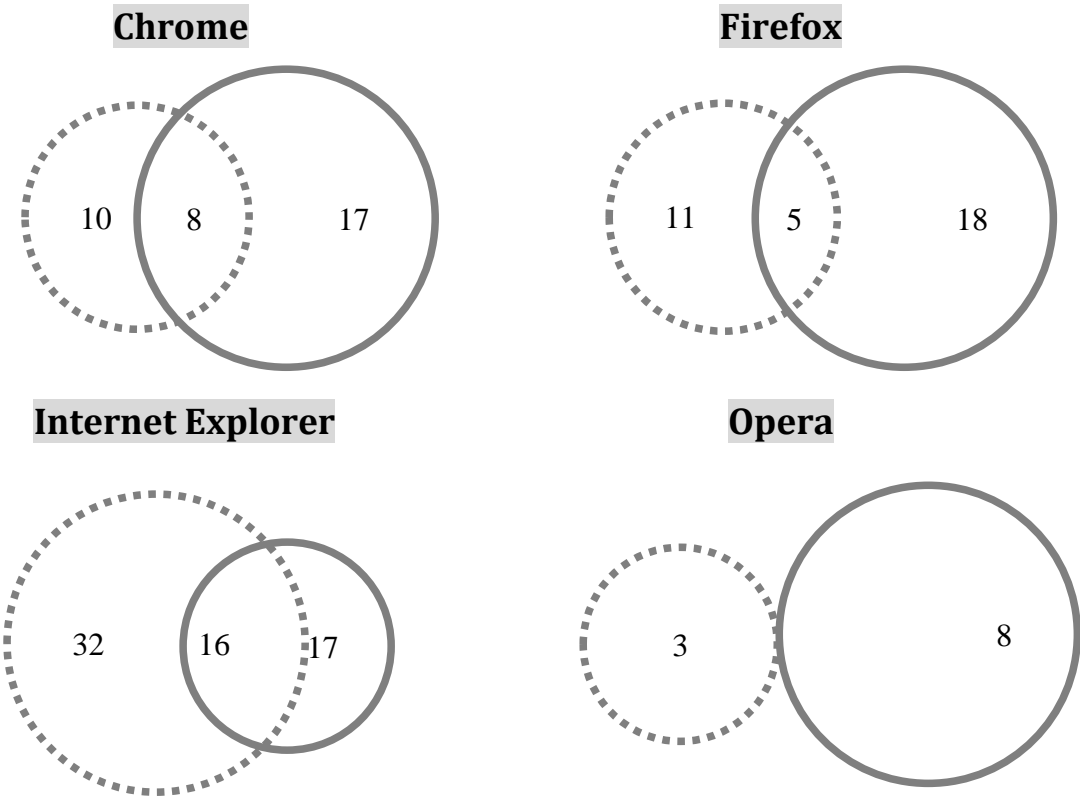


Figure 3: Number of pupils using the browser at home (dotted line), school (solid lines) and both (overlap)

This figure shows that Chrome, Firefox and Opera are most frequently used at home, while Internet Explorer is frequently used at school. Chrome, Firefox, and Internet explorer share a similar frequency of use at home. In school, Internet Explorer outclasses the other browsers in terms of use.

3.1.4 Discussion

The choice of which browsers the pupils use may have an influence on the information they get access to online. The browsers listed here have various built-in search functionalities that link to different search engines. Since each search engine provides different results, the choice of browser may lead the searcher to different content.

It appears to be a difference between genders in their recognition of the various browsers. These correlations suggest that the boys in this study know more about browsers than girls do. Firefox has been on the market since 2004, and it controls a significant portion of the browser market. Even so, one in five girls does not recognize it. The difference is even more drastic with less known browsers. Nearly all the boys recognized Opera and Chrome, while just one in three girls recognized Opera, and less than half of them recognized Chrome. The only browser that all girls recognized was Internet Explorer. This suggests that the girls are more likely to use this browser.

Internet Explorer is by far the most popular browser at school. Half of the pupils reported that they only use this browser at school, while 44.0% reported that they use it at school and at home. 94.4% of the pupils reported that they use Internet Explorer at school. Few reported that Internet Explorer was not used, or just used at home. The other browsers were more frequently used at home, Chrome and Firefox, were used by approximately twice as many pupils at home as in school. Internet Explorer seems to be the browser of choice for the pupils, although they tend to use other browsers at home.

There may be many reasons why Internet Explorer is the preferred school browser. One reason is that this browser is an integrated part of Windows, which is the preferred operating system in Norwegian schools. Another reason may be that the pupils do not have the proper credentials to install additional software on the machines, so they are stuck with Internet Explorer.

3.2 Search Engine Familiarity and Frequency of Use

This section examines the reported familiarity and frequency of use of various search engines. The questionnaire (Q6) focused on six search engines: Four major international ones (Google, Yahoo, MSN and Bing) and two Norwegian search engines (Sesam and Kvasir). All pupils provided valid answers to this question (N=36).

3.2.1 Reported Search Engine Familiarity

Figure 4 displays the percentages of pupils who were familiar with the various search engines. The figure also displays individual columns for the boys and girls, and features a data table with the percentages listed.

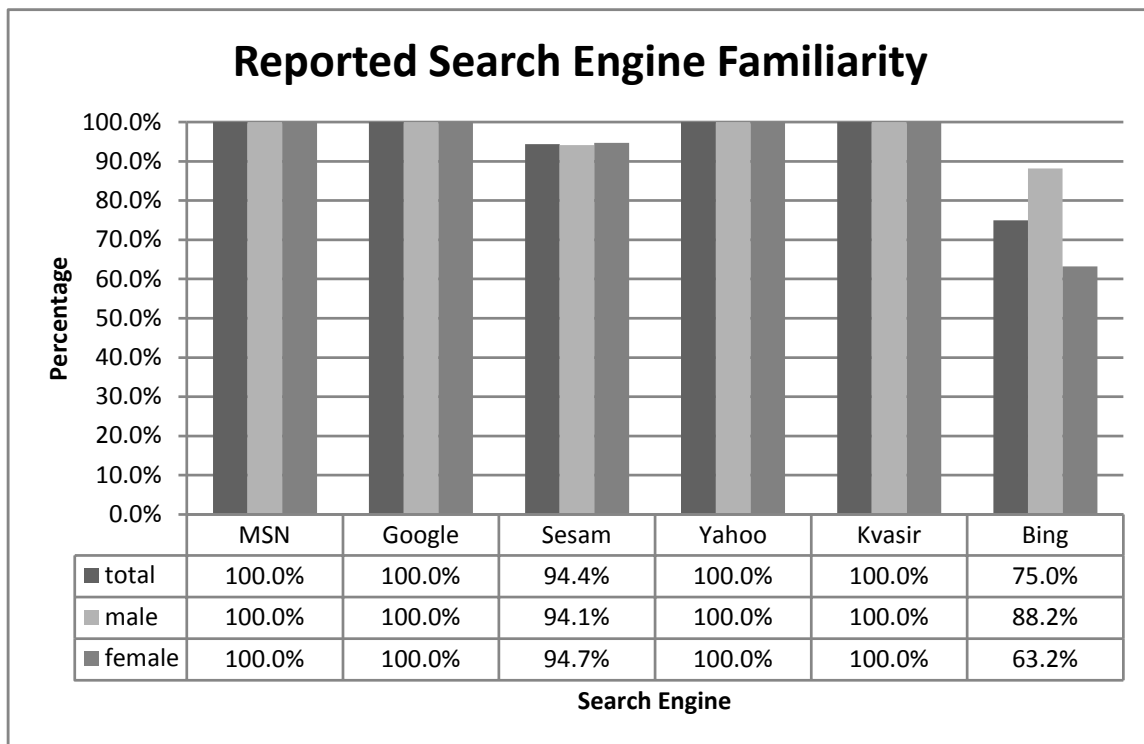


Figure 4: Reported search engine familiarity divided into gender groups.

Everyone recognized MSN, Google, Kvasir and Yahoo, while Sesam was familiar to 94.4 % of the pupils (94.1% of the boys and 94.7% of the girls). Microsoft's new search engine Bing scored lowest. It was recognized by 75% of the pupils (88.2% of the boys and 63.2% of the girls).

There were no significant correlations in reported search engine familiarity between boys and girls, although the correlation between gender and familiarity with Bing (N=36, $r_s = -.289$, sig=.087) hints at a tendency that boys may be more familiar with this search engine than girls are.

3.2.2 Reported Search Engine Use

Although most pupils displayed a high degree of search engine familiarity, this does not mean that they actually used these search engines. Figure 5 shows the means of reported frequency of search engine use for all the pupils (N=36), but also for the boys (N=17) and the girls (N=19). The range of use was set on intervals between zero and three, with zero being *not used*, and three being *frequently used*. The figure also contains the mode for each search engine.

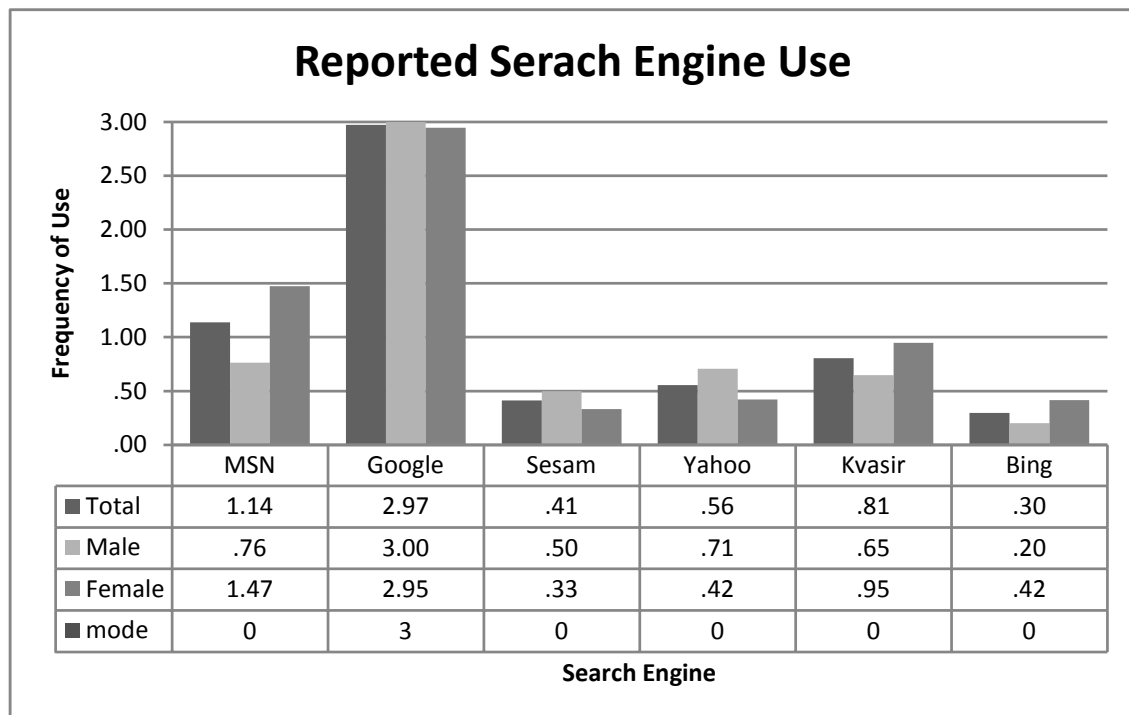


Figure 5: Reported search engine use broken down into gender groups.

The average use for the various search engines show that Google is ranked with a high frequency of use by nearly all the pupils (mean=2.97, mode=3). There is a huge gap down to the rest of the search engines. MSN is rarely or never used (mean=1.14, mode=0), followed by Kvasir (mean=0.81, mode=0). Yahoo is also rarely or never used (mean=0.56, mode=0), neither is Sesam, and few uses Bing at all (mean=0.30, mode=0).

There were no significant correlations between gender and browser use, although there were a noticeable difference between the use of MSN as a search engine (N=36, $r_s=.310$, sig=.066). The girls reported that they used MSN more than the boys did.

3.2.3 Discussion

Most pupils were familiar with the six search engines they were asked to identify. The only search engine that some pupils were unfamiliar with was Microsoft's new search engine Bing. However, three quarters of the pupils knew about this browser as well. Most pupils also knew about the Norwegian search engines Kvasir and Sesam. Overall, the pupils had no problems identifying the various search engines. However, this did not mean that the pupils used the other browsers.

Figure 5 shows that Google is used far more than any other search engines. Google did not just beat the other search engines. It outclassed them. This indicates that most pupils rely solely on Google when looking for relevant information online. This may limit the data they get access to, since the pupils will only consider the results that google provides.

The girls did use MSN more frequently than the boys did. This may be linked to the girls' preference for Internet Explorer. Although the new version of this Browser uses Bing as the default search engine, the older version may be set to use MSN search instead. In addition, the default welcome page is set to MSN, so the first page that they see is this webpage. This may be a reason to explain that MSN were a bit above the rest of the search engines.

3.3 Reported Trust in Various Websites and Different Sources

The pupils were asked to grade how much they trusted various websites and sources (Q5, Q11) by using a trust factor in three incremental steps. The steps were *little trust* (1), *some trust* (2) and *much trust* (3). A checkbox for those pupils who did not recognize a particular website (Q5) were also included. In addition, a question that specifically focused on the trust in Wikipedia (Q10) was included. This question asked them if they trusted the information they found on Wikipedia. Four answers were possible: *yes*, *partly*, *no*, and *uncertain*.

3.3.1 Reported Trust in Different Websites

Figure 6 shows how much the pupils trusted in various websites, ranging from online news sites to celebrity blogs. The mean was calculated from the number of pupils who recognized each website and rated it based on how much they trusted that site. The figure also contains a data table with the precise means broken down into gender groups in addition to showing the total average.

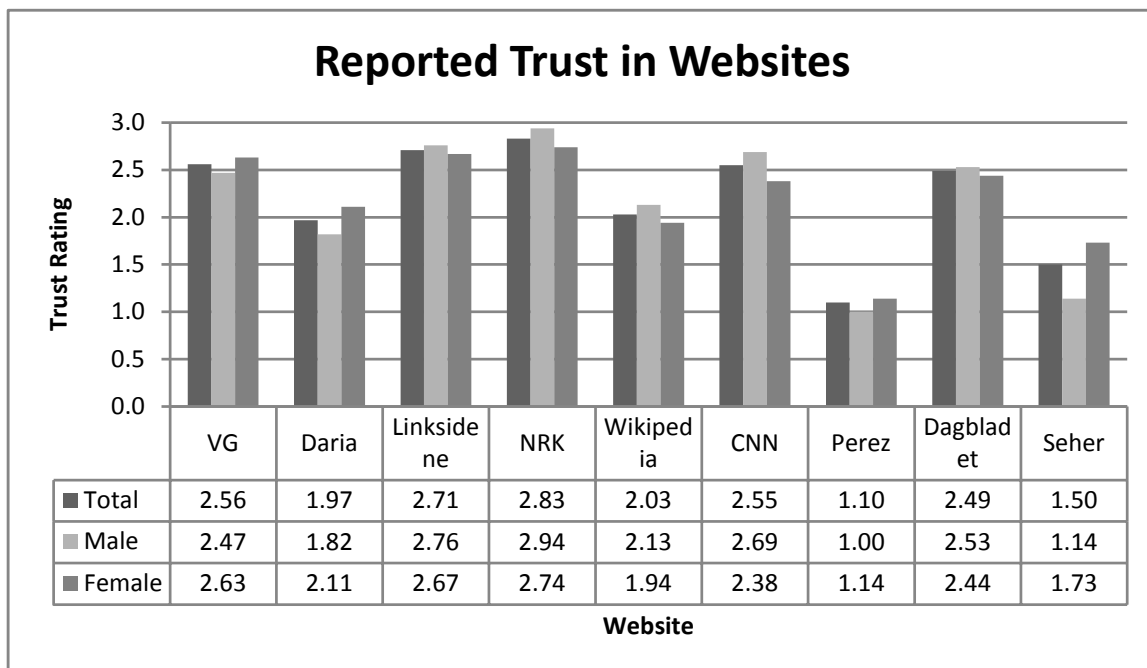


Figure 6: Reported trust in various websites broken down into gender groups.

The Norwegian Broadcast Network (NRK), was given the highest trust rating (mean=2.83, boys: 2.94, girls: 2.74) followed by *Linksidene* (mean=2.71, boys=2.76, girls=2.67). The next three websites are all online news sites, and were rated roughly the same: *VG* (mean=2.56, boys=2.47, girls=2.63), *CNN* (mean=2.55, boys=2.69, girls=2.38) and *Dagbladet*

(mean=2.49, boys=2.53, girls=2.44). *Wikipedia* follows after these three newspapers (mean=2.03, boys=2.13, girls=1.94). The websites that scored lowest on the trust factor was the celebrity magazine *Seher* (mean=1.50, boys=1.14, girls=1.73) and the celebrity blog *Perez Hilton* (mean=1.10, boys=1.00, girls=1.14).

The reported trust varied slightly between genders. There was one significant correlation between gender and the trust in the website *Seher* based on Spearman’s rho (N=36, $r_s = .488$, sig=.040) that were significant on a 0.05 level.

3.3.2 Reported Trust in Different Sources

Even though computers and the Internet are commonplace at schools, there are still sources that are unavailable online. The pupils were asked to determine how much they trusted in a variety of different sources, both digital and analogue. The same scale as mentioned in the subsection above was used.

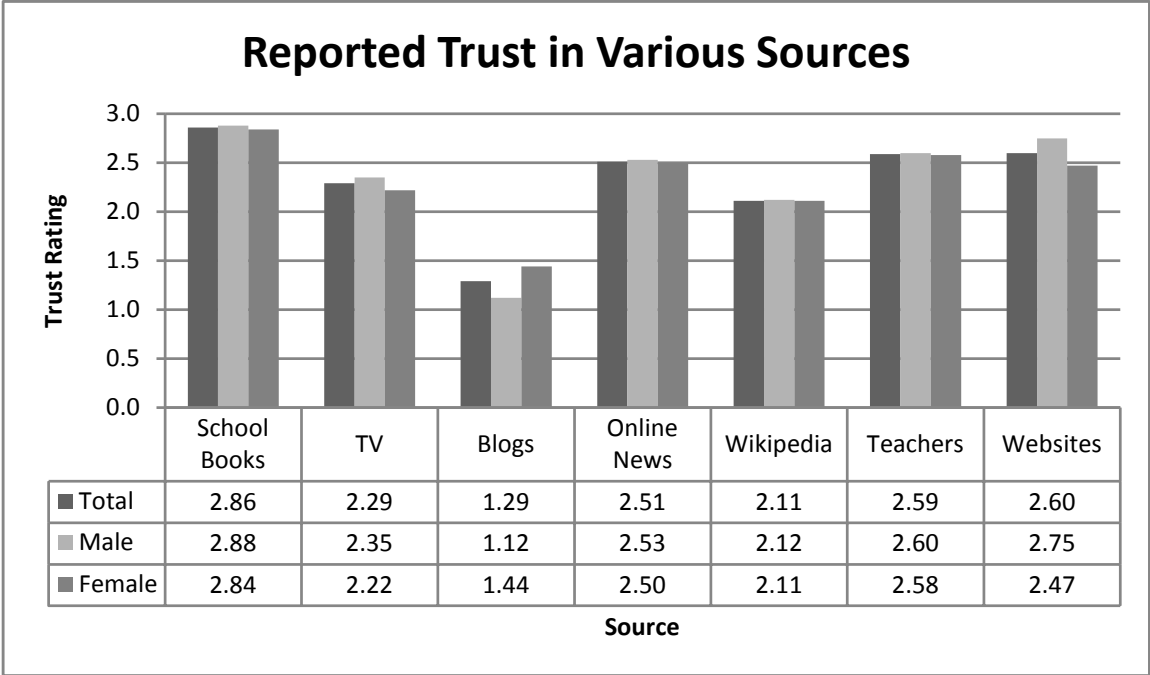


Figure 7: Reported trust in various sources broken down into gender groups.

Most pupils reported *schoolbooks* as the most trusted source (mean=2.86, boys=2.88, girls=2.84), followed by *topic specific websites* (mean=2.60, boys=2.75, girls=2.47) and *teachers* (mean=2.59, boys=2.60, girls=2.58). *Online news sites* closely follows on third place (mean=2.51, boys=2.53, girls=2.50). There is a small gap down to *television programs* (mean=2.29, boys=2.35, girls=2.22), and *Wikipedia* (mean=2.11, boys=2.12, girls=2.11). There is a drastic decline to *blogs* (mean=1.29, boys=1.12, girls=1.44). *Wikipedia* is placed

clearly in between what is considered trusted sources (teachers and schoolbooks) and the low-trust sources (blogs).

There were no statistically significant differences between boys and girls, although blogs ($N=35$, $r_s= .316$, $\text{sig}=.064$) appeared to be more trusted by the girls.

3.3.3 Reported Trust in Wikipedia

In addition to gauging how Wikipedia stacked up against other sources in the previous two subsections, a question that focused solely on Wikipedia. Figure 8 shows the percentages of the pupils that replied to the question if they trust the information they find on Wikipedia. As mentioned, the choices were *yes*, *no*, *partly*, and *uncertain*.

The majority of the pupils reported that they only partly trusted Wikipedia, 22.2% were sure they could trust the information, while 2.8% did not trust Wikipedia. 5.6% were uncertain

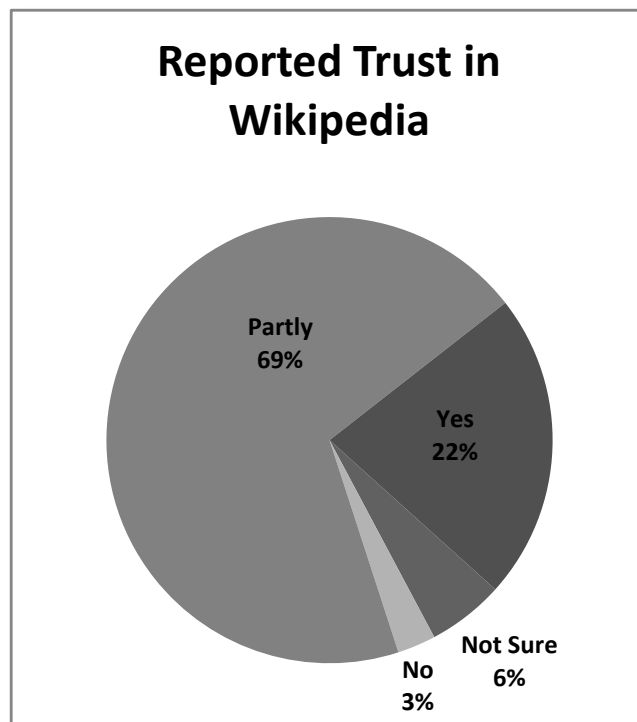


Figure 8: Reported trust in Wikipedia.

3.3.4 Discussion

A look at the trust rankings in Figure 6 shows that most pupils graded online newspapers with a similar trust rating, although NRK was a cut above the rest. This may reflect the perceived authority this broadcasting network has. The pupils may view NRK as more serious news organization than the commercially run VG, Dagbladet and CNN. These results show that pupils trust online newspapers, and that they recognize the difference between a newspaper and a gossip/celebrity magazine such as Seher (the web presence of the magazine Se & Hør). There is a significant difference in trust between these sources. Seher scored a low 1.50 on the trust scale, which was a full rank behind the online news outlets. Even less trust was put in blog Perez Hilton's blog, which got the lowest trust factor of all the websites and sources (1.10).

Figure 7 shows that school books are the most trusted source. Schoolbooks play a large role in the education in Norwegian schools, and the pupil actually reported that schoolbooks

are more trustworthy than teachers and educational websites. In contrast to the main sources of school education (teachers and schoolbooks), user-generated content from blogs are not trusted much at all (trust rating: 1.29). This corresponds with the low trust that was given to similar websites as shown in figure 5. It appears as if the pupils have a sense about what they can trust, or at least what they think they should trust. Again, Wikipedia was placed in a comfortable middle position.

There are not any statistically significant gender differences here, though a few elements may be worthy of note. It appears that the girls in this experiment trust more in blogs and gossip based content (although still very low trust). The reason can be that girls spend more time on these sites, and therefore perceive them with a higher authority ranking. However, this may be coincidental as well.

Figure 8 shows that most pupils only partly trust in Wikipedia. This direct question shows that most of the pupils show caution when trusting Wikipedia. This fits well with the impression that was given in this section. There seems to be an agreement that Wikipedia lies somewhere between the credible and untrustworthy sources. Wikipedia is generally a good source for content, so the trust the pupils put in it may be less than it may deserve. Even so, most pupils use Wikipedia as a source.

3.4 Influence of Webpage Elements

The pupils were given the assignment to rate various website elements marked on two different webpage screenshots (T1, T2). The pupils had two options: The element had *little influence* (0) or *some influence* (1) over their decision to use this website as a source. They were also confronted with a decision if they would have used this website as a source or not.

The following figures show the means (ranging from zero to one) of the evaluated elements for the two websites used: *Store Norske Leksikon (SNL)* and *Daria*. Based on their answer, the table also is broken down into two groups: Group A, who answered that they would have used it as a source, and group B, who disagreed.

3.4.1 Website 1: Store Norske Leksikon

SNL is an online encyclopedia that was listed as a source by five pupils in the questionnaire (Q2). The website got an average trust rating of three, which means that all those who listed it as a source, gave it the highest score (3.0) on the trust scale. Most pupils (89.0%) reported that they would use this website as a source. Figure 9 shows the mean scores of the various elements ranked from zero (little influence) to one (some influence).

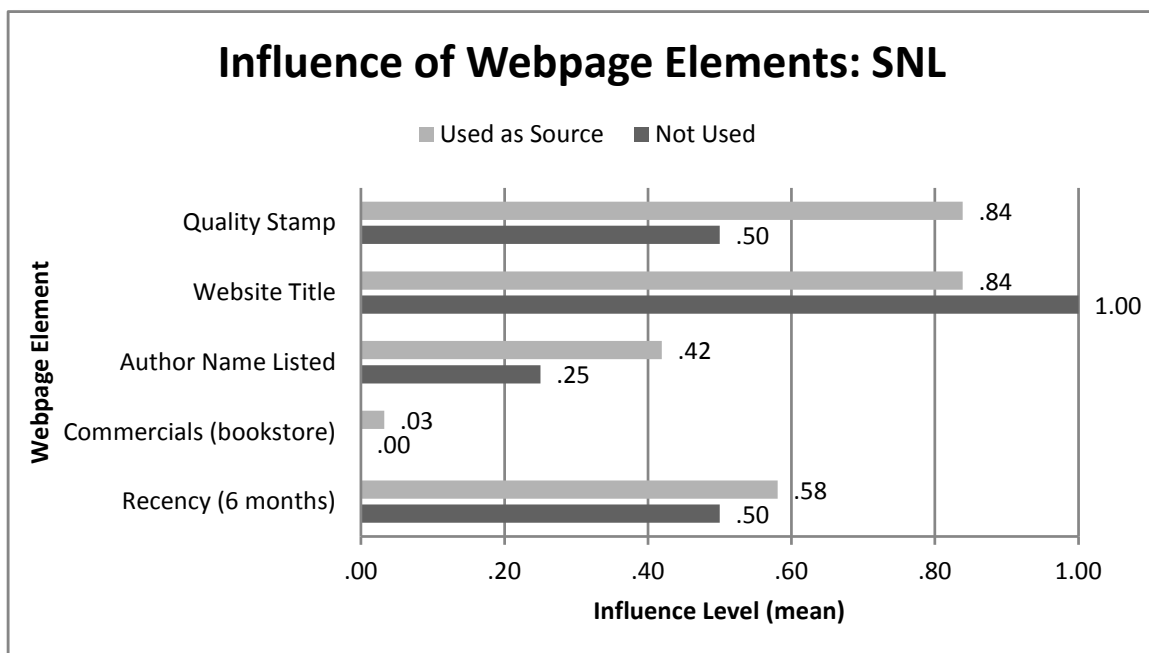


Figure 9: Significance of various website elements (SNL)

The quality stamp were highly significant (mean=0.84) for the pupils who reported that they would have used the website as a source (group 1A), while its significance was rated lower (mean=0.50) for those who would not use SNL as a source (group 1B). The website title had a high influence for group 1A (mean=0.84) and even higher for group 1B (mean=1.00). The

listed author name had some significance for group 1A (mean=0.42), but less for group 1B (mean=0.25). The bookstore commercials had little significance for group 1A (mean=0.03) and group 1B (mean=0.00). The recency of the article was fairly influential for both group 1A (mean=0.58) and group 1B (mean=0.50).

3.4.2 Website 2: Daria

Daria is a website containing many articles and essays uploaded by other pupils. This website was also listed in the questionnaire by six pupils, and it got an average trust rating of 2.17. About half of the pupils (53.0%) reported that they would have used this website as a source. Figure 10 shows the mean scores of the various elements.

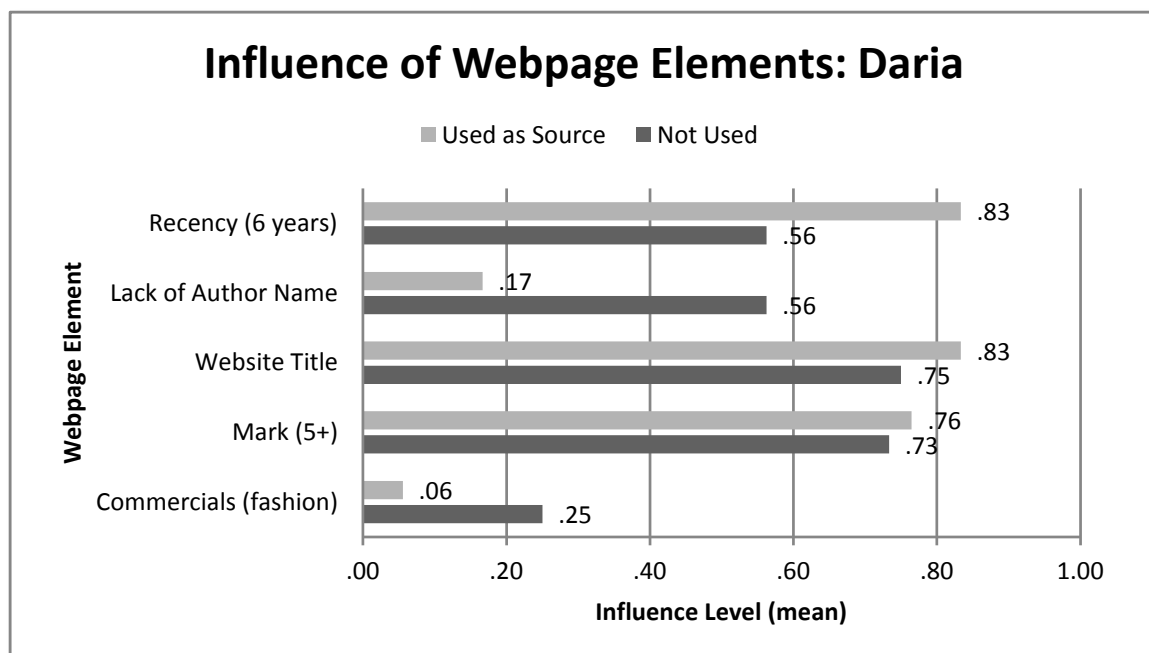


Figure 10: Significance of various website elements (Daria)

The recency of the article were influential (mean=0.83) to the pupils who reported that they would have used the website as a source (group 2A), but the significance was rated much lower (mean=0.56) for those who decided against it (group 2B). The lack of an author name had little significance for group 2A (mean=0.17), but it meant more to group 2B (mean=0.56). The website title had a high influence for both group 2A (mean=0.83) and group 2B (mean=0.75). The good mark that this article had received also had a high influence for both group 2A (mean=0.76) and group 2B (mean=0.73). The fashion commercials had little influence, although group 2A (mean=0.06) rated this element lower than group 2B (mean=0.25).

3.4.3 Discussion

Most pupils (89.0%) listed that they would have used SNL as a source, which makes it difficult to use that website as a basis for comparing the two groups. The low number of pupils who rejected this site does not provide the same reliability. The *Daria* data is more reliable as a comparison between the two groups, since the vote was split on using this website or not.

Most pupils reported that the website title had a strong influence on their choice. This suggests that the pupils used their personal opinion of that webpage as one of the contributing factors. There was a big difference in the reported trust between these websites, where SNL got a trust rating of 3.0 and *Daria* got a 2.17 rating. The significance may be connected to that rating, as the pupils may have an idea on the trust of the website just by looking at the title.

As expected, commercials had little influence on the pupil's decision to use a source or not. The Internet is saturated with commercials, and this seems to be ignored in terms of choosing a source. Even so, there seem to be a slight difference between the two sites. The book commercial at the *SNL* site was rated by nearly all the pupils as having little influence, while the fashion commercial displayed at *Daria* had a higher degree of influence, especially for Group 2B who chose not to use *Daria* as a source. Group 2A, who gave *Daria* thumbs up, cared significantly less about this commercial. Perhaps the pupils regarded a book commercial as more credible than a fashion commercial, at least when choosing a source for a school related task. Books are connected to school and education, while fashion is linked to lifestyle. Blogs and celebrity sites were given low trust ratings, and for some pupils, these commercials may remind them of these kinds of sites.

Credibility and trustworthiness of a website is increased if the author of the article is listed. The pupils shared this thought, at least when rejecting a website as a source. Those who chose to use *Daria* as a source (group 2A) did not pay too much attention to the lack of an author (mean=0.17), while those who rejected the site (group 2B) reported a higher significance level (mean=0.56). This large difference indicates that many pupils thought that the lack of an author was an important element in rejecting this website as a source.

Quality stamps and high marks are also viewed favorably, and these quality seals seemed to play a role in the pupil's decision. Group 1A reported that the quality stamp at the *SNL* site had a strong influence (mean=0.84), while those who rejected the site did not credit this stamp with the same influence level (mean=0.50). For the *Daria* site, both groups 2A and 2B credited the high grade as influential. Since a quality stamp usually have a favorable

influence, it may be assumed that both groups believed that this had a positive influence. However, it was not sufficient for group 2B that rejected *Daria* as a source.

Fresh content may be viewed favorably compared to what may be perceived as outdated content. However, when writing about historical events, there may be no good arguments for crediting fresh content above older content. The recency of SNL and Daria were very different. The *SNL* article was six months old, while the *Daria* article where six years old. For *SNL*, both group 1A (mean=0.58) and group 1B (mean=0.50) rated this element as fairly influential. It makes little sense that a fairly new article should be considered a good reason for rejecting a website. As with the quality marks mentioned previously, a recent article will most likely have a positive influence, or no influence at all. For *Daria*, Group 2A, who approved of the site, actually rated this as having a higher influence level than the other group (mean=0.83 vs. mean=0.56). This may indicate that a date has a positive influence, even though the article is a few years old.

3.5 Influence of Domains & TLDs

The domain name of a website may influence the process of determining the authority of a website, and the various top-level domains (TLDs) may also sway the trust of a web searcher. The following figures look at two different aspects of a domain name collected from the questionnaire (Q13, Q15). All pupils gave valid responses (N=36).

Figure 11 shows the percentages of pupils that reported their choice between three websites that all contained the same topic in the URL (*answers.com/topic/cold-war*, *historylearningsite.co.uk/coldwar* and *wikipedia.org/wiki/cold_war*). Figure 12 shows the percentages of the pupils who preferred a website with a certain TLD extension, even though the domain names were the same (i.e. *coldwarfacts.com* vs. *coldwarfacts.info*). The purpose was to check if there were any differences in the choice of TLD extensions.

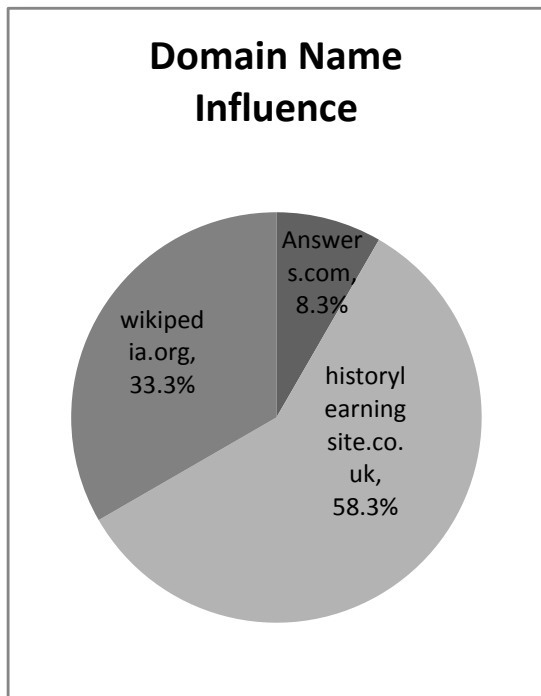


Figure 11: Domain Name Influence

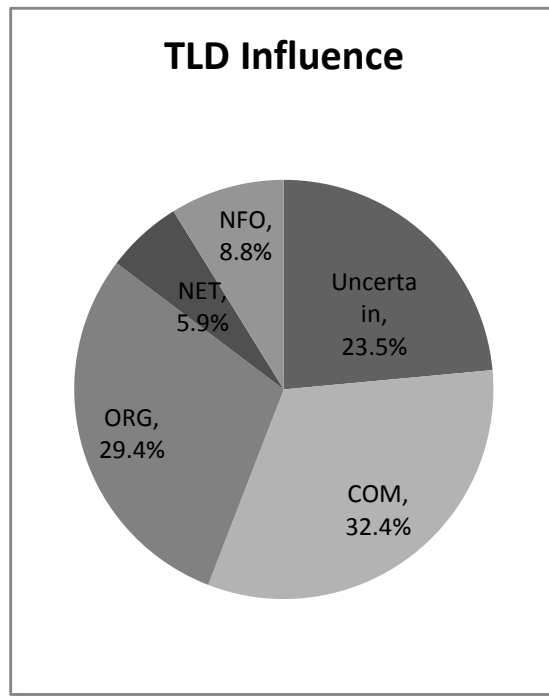


Figure 12: TLD Influence

Figure 11 shows that the most pupils (58.3%) believed that the domain *historylearningsite.co.uk* would contain the best information, while 33.3% believed *wikipedia.org* would provide better information. Just 8.3% thought that *answers.com* would provide the best results.

Figure 12 shows that most pupils (32.4%) preferred the domain name with the *com* extension, while the *org* extension follows slightly behind (29.4%). The *info* extension was also preferred by a few (8.8%), while *net* was the least preferred extension (5.9%). About a quarter (23.5%) of the pupils reported that they were uncertain.

3.5.1 Discussion

Domain names carry their own authority. Wikipedia is a name that most pupils recognize, while the domain *historylearningsite.co.uk* may be unknown to most. Even so, more pupils listed this website as their preferred choice without having the option to visit any of the sites. It may be that the keywords embedded in the domain name (history learning) provide an increase in perceived authority and accuracy for that site. As expected, few believed that *answers.com* would be the best choice for picking up information on the cold war.

The various top-level domains also seem to carry some authority. As expected, the *com* extension was the preferred choice. However, there was no clear victory over the *org* extension. Pupils may connect this extension to *wikipedia.org* as well. Since the pupils are frequently exposed to this extension, this may account for its high preference percentage. In contrast, the *net* extension was preferred by just 5.9% of the pupils, and was ranked lower than the *info* extension. This is surprising considering the status of *net* domains is generally judged as higher than *info*.

3.6 Frequency of Data Verification

An information literate person knows that it is necessary to check additional sources to verify a piece of information. The questionnaire (Q3) contained a question that asked how often the pupils verified the information they found online. All pupils gave a valid reply to this question (N=36).

Figure 13 shows that 27.8% of the pupils (boys: 29.4%, girls: 26.3%) reported that they frequently verify information by visiting other websites, while 50.0% (boys: 52.9%, girls: 47.4%) reported that they sometimes check additional websites. A low percentage (16.7%) reported that they rarely verify information (boys: 11.8%, girls: 21.1%), and only a few (5.6%) reported that they never check additional sources.

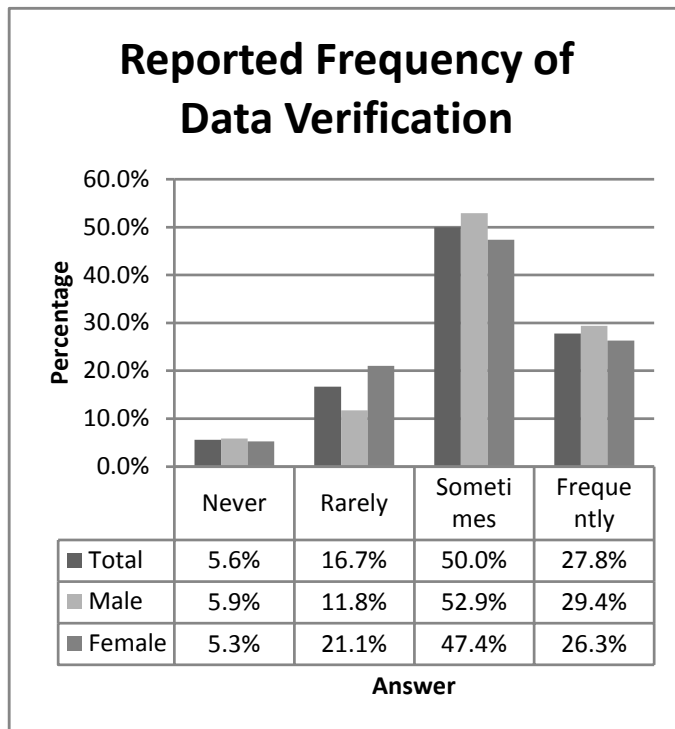


Figure 13: Reported frequency of data verification broken down into gender groups.

3.6.1 Discussion

Checking additional sources to verify information is a strategy that an information literate person would apply. The pupils reported that most of them tend to verify the information they find online. Subsection 3.8.1 shows that the pupils on average listed 2.58 sources. Based on the topic they worked with, it can be assumed that most of these sources contained similar and overlapping information, which suggests that the pupils actually do check more than one source to verify that the information they have found is reliable.

3.7 Prioritizing of SERP results

The pupils were shown screenshots of two Google SERPs. The pupils were told to prioritize the top five positions based on which website they would visit first, second, third, fourth, and fifth. The purpose was to get an indication of how influential Wikipedia results are in the search engines. Table 1 lists the SERP position and the website as they appeared on the questionnaire (Q12, Q14). The mean reflects the average rank in which that the pupils would visit this site. Based on these averages, the final column shows the prioritized order.

Table 1: Overview of SERP prioritizing based on website name and position.

SERP 1				SERP 2			
SERP position	Site	Mean	Priority	SERP position	Site	Mean	Priority
1	Daria	2.61	2	1	Wikipedia	1.69	1
2	Marxisme	3.03	3	2	Wikipedia (ind.)	3.47	4
3	Wikipedia	2.17	1	3	Daria	3.39	3
4	Wikipedia (ind.)	3.94	5	4	Daria (ind.)	4.22	5
5	Skoleweb	3.25	4	5	SNL	2.22	2

The first SERP shows that *Wikipedia* (mean=2.17, third SERP position) was the first website that most of the pupils reported that they would visit first, followed by *Daria* (mean=2.61, first SERP position), *Marxisme* (mean=3.03, SERP position 2), and *Skoleweb* (mean=3.25, SERP position 5). The Indented *Wikipedia* listing (mean=3.94, SERP position 4) had the lowest priority.

The second SERP shows that *Wikipedia* (mean=1.69, SERP position 1) had a clear lead as the most prioritized website, followed by *SNL* (mean=2.22, SERP position 5), *Daria* (mean=3.39, SERP position 3), and the Indented *Wikipedia* listing (mean=3.47, SERP position 2). The Indented *Daria* listing (mean=4.22, SERP position 4) had the lowest priority.

3.7.1 Discussion

The main purpose of this section was to look at how influential Wikipedia was in the SERP engines, even when it was ranked lower than the first position. Wikipedia was the first website that the pupils reported that they would have visited on both SERPs. However, the average priority rating was lower when Wikipedia was listed at SERP position three than on top.

Even though Wikipedia scored highest in both SERPS, the indented listing that followed the main listing was prioritized much lower. In the first SERP, the indented listing got the last priority, while in the second SERP it is rated with the second last priority. The indented listings seem to have little interest.

3.8 Reported Trust and Use of Sources during the Experiment

The pupils were asked to list the sources they had used on the questionnaire (Q3), and grade them based on how much they trusted each of these sources. Nearly all the pupils listed the domain name for the website instead of writing down the individual pages they had visited. This means that the reported data is best suited to measure the trust of websites/domains instead of webpages.

3.8.1 Average Number of Sources Listed

The number of sources that the pupils listed was divided into two categories. The reason was that several pupils listed Google as a source. Although this gives credit to Google’s authority, the fact is that Google is a search engine, not a source.

The average number of sources listed with Google included was close to three (mean=2.94). There was a noticeable difference between the boys (mean=2.29) and the girls (mean=2.84). The correlation between the use of sources and gender shows a strong significance (N=36, $r_s=.253$, sig=.069), but it was not strong enough to be counted as significant. The average number of sources was 2.58 when Google was excluded.

3.8.2 Distribution of Sources (Excluding Google)

The table in the questionnaire only contained room for five sources, which may have influenced the number of sources listed. Table 2 shows how the frequency of pupils from the total sample (N=36) that listed between one and five sources (excluding google).

Table 2: Distribution of number of sources listed.

sources	N	%
1	6	16.7%
2	13	36.1%
3	8	22.2%
4	8	22.2%
5	1	2.8%
Total:	36	

The table shows that six pupils listed one source (16.7%), while 13 pupils listed two sources (36.1%). Eight pupils listed three sources (22.2%), and the same number of pupils listed four

sources (22.2%). Only one pupil listed five sources (2.8%). A large majority (83.3%) listed at least two sources.

3.8.3 Frequency of Source Use

Figure 14 shows the websites that were listed as sources by three or more pupils. The table containing the full list of sources is included in appendix A1. The first bar above each listed source shows the total percentages of pupils who used this source, while the two other bars shows the percentages based on gender. The figure also contains a data chart that shows the precise numbers.

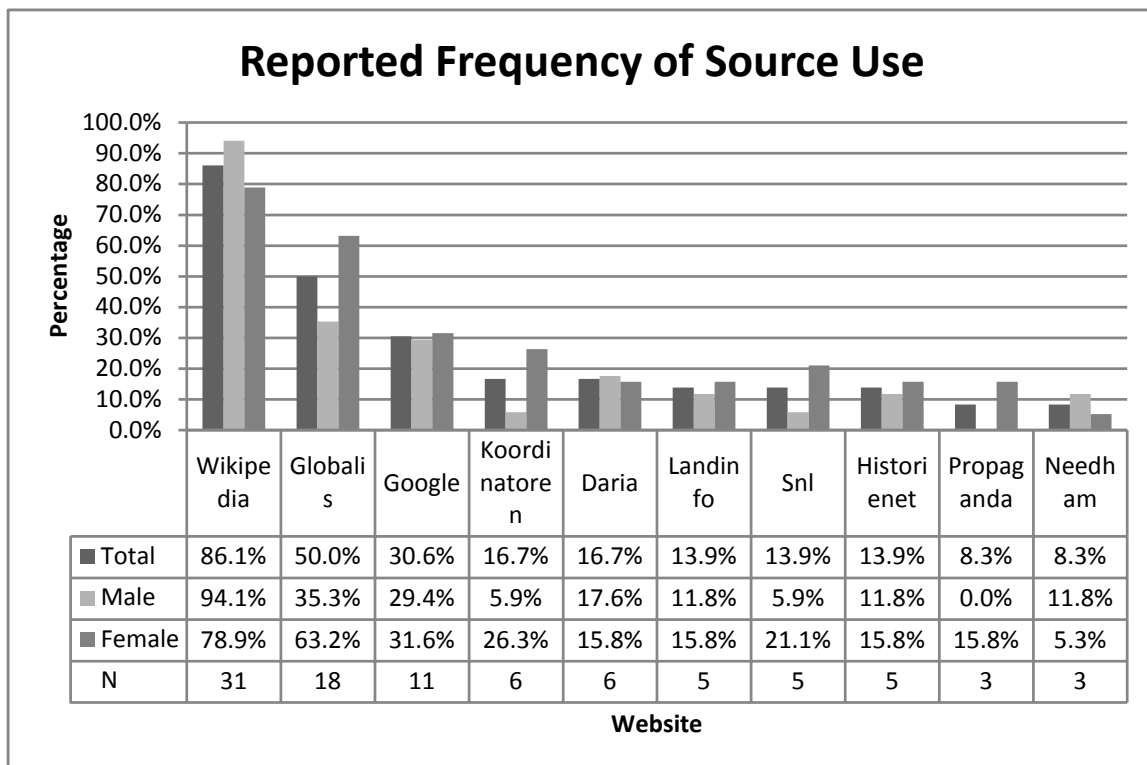


Figure 14: Reported frequency of source use broken down into gender groups.

Wikipedia was listed by 86.1% of the pupils (N=31). *Globalis*, the second most listed source, was listed by 50.0% of the pupils (N=18), followed by *Google* listed by 30.6% (N=11). *Daria* and *Koordinatoren* were both listed by 16.7% of the pupils (N=6), while *Landinfo* was listed by 13.9% (N=5). *Needham* and *Propaganda* were both listed by 8.3% of the pupils (N=3). Further, the complete table in Appendix A1 shows that *Forsvaret* and *Aftenposten* were listed by two pupils each, while *Skoleforum*, *Dagsavisen*, *Redd Barna*, *Mil*, *Infoplease*, *Kamerat*, *Guide to Russia*, and *leksikon* were listed by one pupil. In total, 20 different sources were listed by the pupils.

There was a slight gender difference, but no statistically relevant correlations. *Wikipedia* was listed by 94.1% of the boys (N=17) and 78.9% of the girls (N=19), *Globalis* by 16.7% of the boys and 33.3% of the girls, and *Google* by 13.9% of the boys and 16.7% of the girls. Further, *Daria* was listed by 17.6% of the boys and 15.8% of the girls, *Koordinatorer* by 5.9% of the boys and 26.3% of the girls, while *Landinfo* was listed by 11.8% of the boys and 15.8% of the girls. The rest of the sites have a too small sample to have any relevance when looking at gender differences.

3.8.4 Reported Trust in Sources Used During the Experiment

Next to each source listed, the pupils were asked to rate the trust of each source (Q2). This trust scale was the same as discussed earlier (between one and three). The figure below shows the average trust rating for each source. For reference, the figure also contains the number of pupils that listed this website. The complete list of trust rankings are listed in appendix A2.

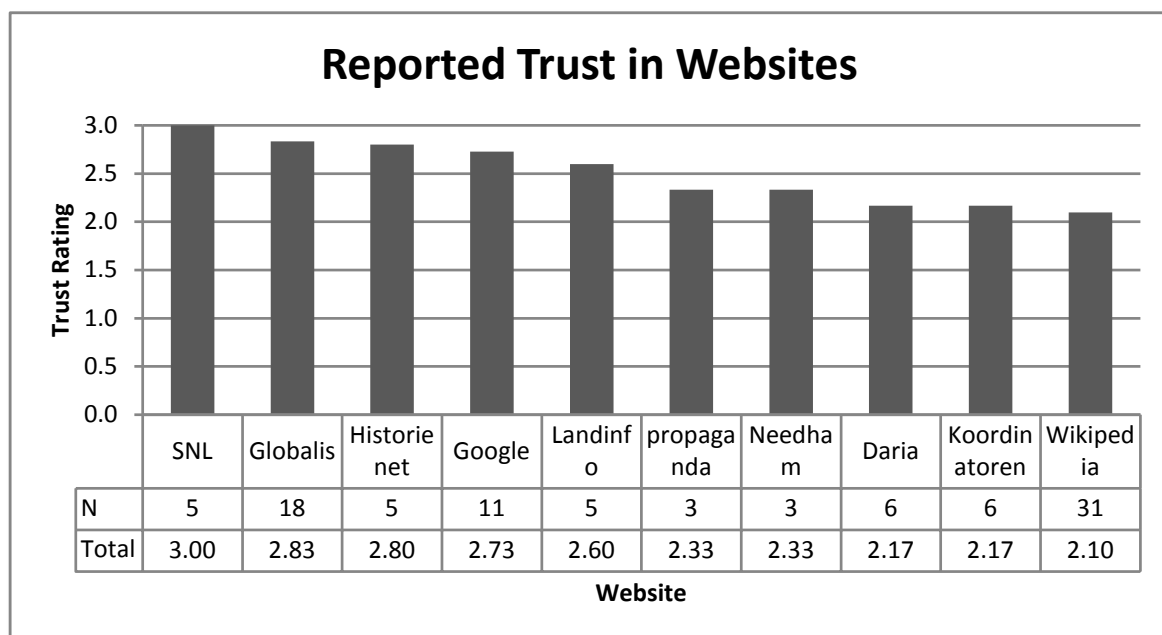


Figure 15: This figure shows the average trust rating and the number of pupils that used that source.

The most trusted website was *SNL* (N=5, mean=3.00). This website scored a top rating from all pupils who used it. Following *SNL* was *Globalis* (N=18, mean=2.83), *Historienet* (N=5, mean=2.80), *Google* (N=11, mean=2.73), *Landinfo* (N=5, mean=2.60), *Propaganda* (N=3, mean=2.33), *Needham* (N=3, mean=2.33), *Daria* (N=6, mean=2.17) and *Koordinatorer* (N=6, mean=2.17). For websites listed by at least three pupils, *Wikipedia* received the lowest trust rating (N=31, mean=2.10).

The complete table in Appendix A2 further shows the following trust ratings: *Forsvaret* (N=2, mean=2.33) and *Aftenposten* (N=2, mean=2.50). The rest were listed by one pupil:

Skoleforum (2), *Dagsavisen* (3), *Redd Barna* (3), *Mil* (2), *Infoplease* (2), *Kamerat* (3), *Guide to Russia* (3), and *leksikon* (1).

3.8.5 Discussion

Wikipedia was listed by a large majority of the pupils (N=31). However, it is important to note that the pupils accessed several different articles from Wikipedia, Globalis and SNL, while the other sites only included one webpage.

Wikipedia was given the lowest trust rating of all the websites that was listed by at least three pupils. They have probably run into a few of the other websites before (i.e. Globalis, Daria and SNL), but the reminding websites may be unfamiliar to them. Despite the fact that they may not have heard of these websites before, they were still rated as more trustworthy than Wikipedia. Although the number of pupils that listed these websites was considerably lower, there is room to make the proposition that Wikipedia has some trust issues. This became apparent in section 3.3 as well, where Wikipedia consistently scored lower than other sources and websites. This may be a reaction to being overexposed to the website, which may lead the pupils to regard Wikipedia as a common phenomenon, and, consequently, it gets a common rating.

Approximately one-third of the pupils (30.6%) listed Google as a source. One explanation may be that some pupils are not aware that there is a distinction between a search engine and a source. Google was also rated with a fairly high trust rating (mean=2.73). This number can be looked at as an indicator of how much the pupils trust Google's results. Google was also the most used search engine by far, where nearly all the pupils reported that they used it often. They might be so accustomed with using Google that they do not consider that there are quality issues with Google as well.

Websites such as SNL and Globalis received a high trust rating from the pupils. Globalis is a website that is part of a United Nation project, so that website will probably continue to be a part of the pupils list of high quality sources. However, Store Norske Leksikon will soon be discontinued in use. This will be a loss for the pupils who need to find reliable sources online, at least as an alternative to Wikipedia.

II. Observed Data

3.9 Browser and Search Engine Use during the Experiment

This section gives a brief overview on which browsers and search engines that was used during the experiment.

3.9.1 *Browsers Used*

Although many of the recordings were corrupted, it was still possible to view the first minute and two from most of them (N=33). During the experiment, most pupils used Internet Explorer. In total, 29 pupils used this browser, while the remaining four pupils used Chrome. No other browsers were used. The reported use of browsers showed that Internet Explorer is the browser of choice at school. The pupils also reported that they used Chrome and Firefox as much at home as in school, but this was not shown during the experiment.

3.9.2 *Search Engines Used*

Google was the only search engine that was used. This supports the reported data from section 3.2.2. Searches were also made using Conduit which were the result of a search through a toolbar. However, this is not a proper search engine, and the results were filled with commercials. This was not a search engine, but a tool to generate revenue for the company that created it.

3.9.3 *Discussion*

Even though the pupils knew about a wide range of search engines, they only used Google during the experiment. This observed use is reflected in the pupil's reported use of the various search engines. Google was used frequently by all the pupils, while the second most search engine used (MSN) was rated with a far less frequency of use.

A few interesting observations were made during the analysis of the screen recordings. Even though Internet Explorer uses Bing as the default search engine for its built-in search functionality, Google was set as the default search engine on all observed browsers. There are several reasons why this may have occurred. For instance, pupils that have previously used the machine may have changed the default search engine from Bing to Google. Another explanation may be that the Google toolbar for Internet Explorer was installed. This toolbar

changes the default search engine to Google. However, it is doubtful that the pupils have installed this toolbar on all the machines used during this experiment. The probable explanation is that the Macromedia Flash extension was installed. This piece of software is requirement for the national tests to run on a computer, so most computers in Norwegian schools will have Flash installed. The second part to this story is that Flash is bundled with the Google toolbar. When installing flash, Google toolbar is also installed unless this option was unchecked during the install process.

There are also differences in regional preferences between the various browsers. In this experiment, some of the pupils who used Chrome and searched using the URL field were redirected to the UK version of Google. Each regional version of Google may produce different results, and by comparing these SERPS, there were slight differences between the results presented by the UK and Norwegian SERPs. Even so, the top five positions did not alter in any of these comparisons.

3.10 Distribution of Searches

This section looks closer at the searches the pupils committed during the experiment. The first subsection looks at the dispersion of the total amount of searches, while the second subsection takes a closer look at the searches that originated from Google. The last subsection will provide an overview of the distribution of google searches.

3.10.1 Total Number of Searches

The only searches that were considered to be from a search engine were those that originated from Google. All the other searches were considered to internal on-site searches (results just from one particular website).

Table 3 shows the three main websites that the searches were divided between (Google, Wikipedia and SNL). For each of these websites, the number of pupils out of the total (N=23) that made a search on this site is listed. The minimum and maximum number of searches is also listed, along with the number of searches, the percentages from the total number of searches, and the average searches made for each of these three websites.

Table 3: Total number of searches using Google, Wikipedia, SNL, and other.

Source	Pupils		Searches				Mean
	N	%	Min Searches	Max Searches	Total Searches	%	
Google	22	95.6	1	7	64	72.7	2.91
Wikipedia	5	21.7	1	3	8	9.1	1.60
SNL	4	17.4	1	4	9	10.2	2.25
Other	2	8.7	-	-	7	8.0	3.50
<i>Total</i>	<i>23</i>				<i>88</i>		<i>3.83</i>

23 pupils made a total of 88 searches. Only one pupil did not use Google at all to make a search, while the remaining 22 pupils (95.6%) made between one and seven searches (mean=2.91) using this search engine.

Google accounted for 72.7% (64) of the total searches. Five pupils (21.7%) made between one and three searches (mean=1.60) using Wikipedia’s built-in search engine. This website accounted for 9.1% (8) of the total searches. Four pupils (27.4%) made between one and four searches (mean=2.25) using SNL’s integrated search functionality. These searches accounted for 10.2% (9) of the total searches made during the experiment. The remaining

8.0% of the searches were divided between one pupil who used the online translation service TriTrans, and another pupil who used a commercial toolbar (Conduit).

Spearman’s rho revealed a correlation between gender and the total amount of searches (N=23, $r_s = -.445$, sig=.033). The boys made 59 searches (mean=4.92), while to girls only made 29 searches (mean=3.83)

3.10.2 Distribution of Google Searches

Google accounted for the majority of the searches made. Each individual search on google was analyzed and categorized into several groups based on the origin of each of the searches. Distinctions were made between

intentional and *circumstantial* searches. Intentional searches was made by searches who knew which search engine they would use (i.e. Google) that they would use, while circumstantial searches lead the searcher to a search engine (i.e. Google) but the search may have ended up at a different search engine under other circumstances.

The figure to the left shows the distribution of Google searches. As the figure shows, about one half (48.4%) of the searches were performed directly from the Google homepage, while one in four (25.0%) were done at a SERP page. These searches can be considered intentional, and accounted for a total of 73.4% of all searches.

Further, the figure shows that 12.5% of the searches were made using the Chrome URL field, while 9.4% were made by using the Internet Explorer Search bar. These searches can be considered circumstantial. The remaining 4.7% of the searches were divided between one search using Internet Explorer’s URL search, one search using the Google Toolbar, and one using the integrated Google image search functionality that can be accessed directly from a SERP.

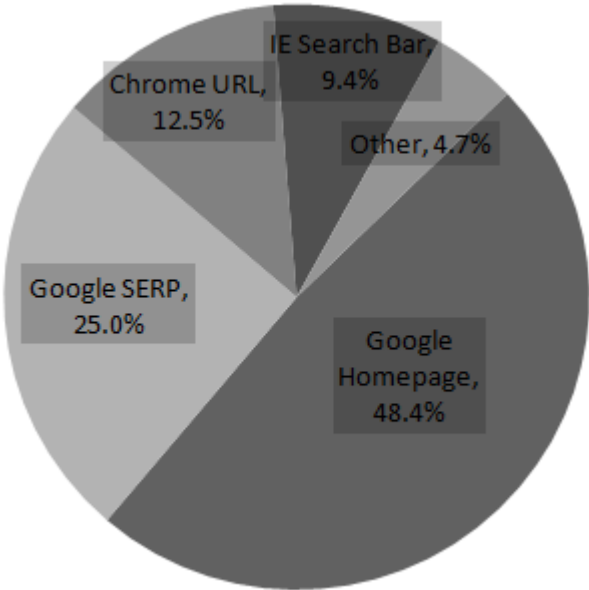


Figure 16: Distribution of Google searches.

3.10.3 Frequency of Google Searches

Table 3 showed that the pupils on average made 2.91 searches each, although this does not provide an accurate representation of how these searches were spread out. The number of searches made by each pupil varied substantially. Table 4 shows how many searches each of the pupils made, and also includes the percentages of the total sample of pupils who used Google (N=22).

Table 4: Frequency of Google searches.

Searches	N	%
1	7	31.8
2	4	18.2
3	4	18.2
4	3	13.6
6	3	13.6
7	1	4.5
	22	

Seven pupils (31.8%) made just one search on Google during the experiment. Four pupils (18.2%) made two searches in total, and another four pupils (18.2%) made three searches. Three pupils (13.6%) made four searches, three pupils (13.6%) made six searches, and one pupil made a total of seven searches using the Google search engine. About two-thirds of the pupils (68.2%) made three searches or less.

3.10.4 Discussion

Google was the only real search engine used during the experiment, and accounted for a significant percentage of all searches (77.2%). Even so, many pupils used other ways of searching as well. The websites Wikipedia and SNL accounted for about one-fifth of all searches (20.3%). The searches made on-site had a different quality to them, since the pupils knew that the results would be limited to that website.

Even though the average number of Google searches were close to three (mean=2.91), most pupils just made a single search. This can imply that they found the information they were looking for, and had no reason to make another search. This may indicate that Google did produce relevant results, that the pupil made an accurate search, or a combination of both. However, there may also be another reason. The pupils may have been in a lazy mood, and were perfectly happy with the Wikipedia link that Google offered to them.

It came as a surprise that no searches were performed using other search engines than Google, even though many pupils used Internet Explorer. Reasons why the default search functionality of Internet Explorer was changed from Bing to Google were discussed in subsection 3.9.3.

Most searches originated directly from the Google homepage. These searches were done after the user entered Google's webpage address in the URL field. These searches were intentional, because the searcher knew that the search would produce a Google SERP. Although the searches that originated from Google SERPs may have originally been circumstantial, any search directly at a SERP is counted as intentional. It can be argued if the searches done using the Chrome URL field or Internet Explorer's search bar should be counted as intentional searches instead of circumstantial. The argument of intent is stronger with those who used the Chrome URL field, since this browser uses Google as the default search engine. However, those who used the Internet Explorer search field could have ended up at Bing instead if the default settings had not been changed.

3.11 Start-Up Action Sequences

During the tagging of the videos, it became apparent that there were certain action sequences that many pupils shared. These paths were categorized into six steps: 1) Opening a browser, 2) entering an URL or making a search using an integrated search feature, 3) visiting a Google homepage, 4) making a search at Google, 5) scanning a SERP, and 6) interacting with a SERP. These steps are shown in figure 17, and each action are marked with the number of pupils from the total sample (N=23) that performed that action.

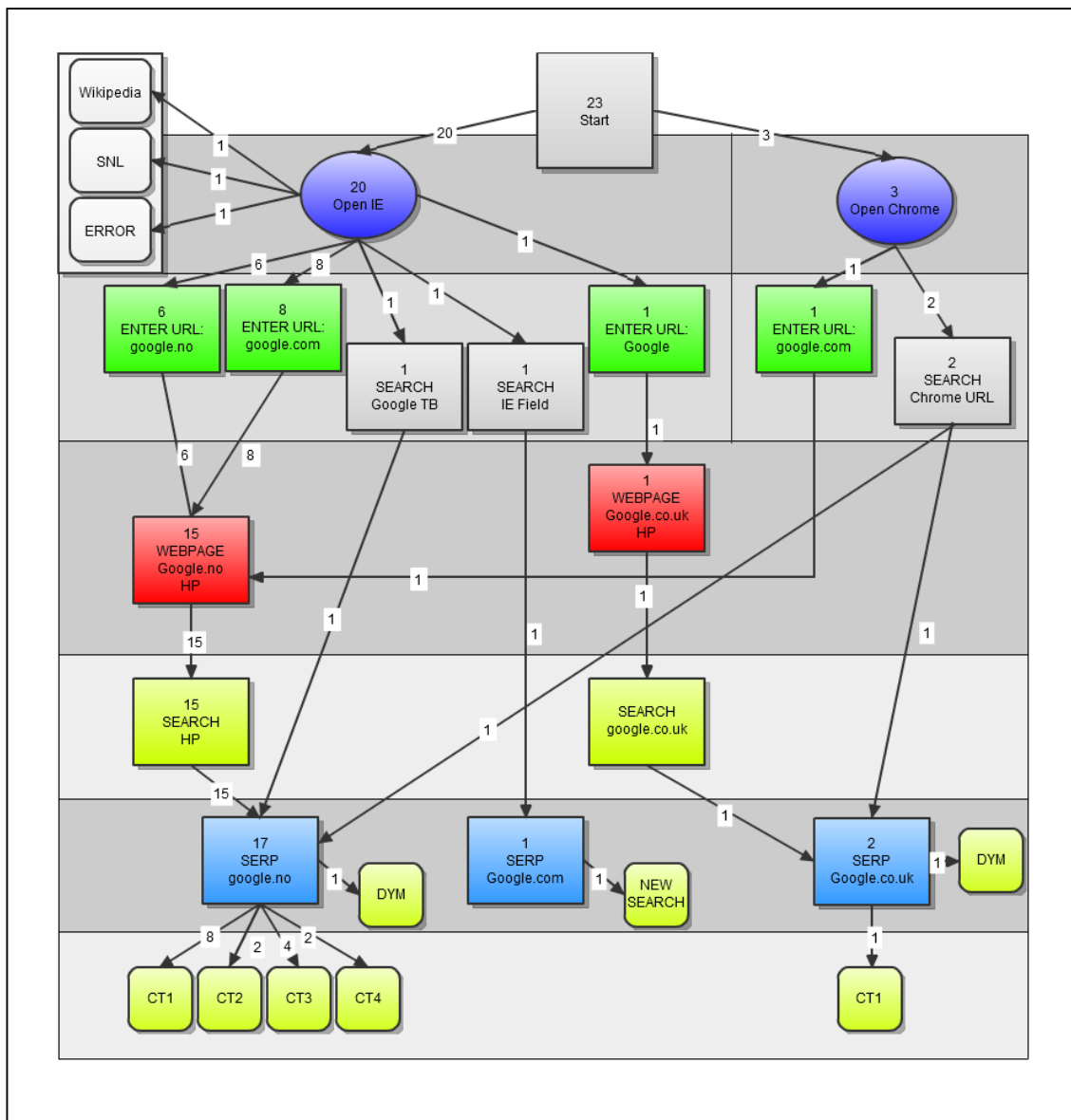


Figure 17: six-step model on start-up sequences.

The first step in the sequence involved opening a browser (IE or Chrome). Most pupils started by opening Internet Explorer (20), while three pupils opened Chrome instead.

The second step involved two different actions: Entering a URL or making a search using a built-in search feature. Most pupils that used Internet Explorer typed in a Google specific URL. Six of them entered *google.no* into the URL field and was taken to *google.no*. However, eight pupils typed in *google.com* instead. This resulted in a redirect to *google.no*, so they ended up at the same website. One pupil just typed in *google*. This resulted in a redirect to *google.co.uk*.

Out of the twenty pupils who used Internet Explorer, one searched using the google toolbar and was taken to a *google.no* SERP, while another who used the integrated search field was taken to a *google.com* SERP. In addition, one pupil visited Wikipedia directly, one SNL, and one pupil made a search that produced errors, and was not included in the figure.

The third step shows how many pupils who landed on the Google homepage: The vast majority of the pupils (15) ended up at the *google.no* homepage, while one pupil ended up at *google.co.uk* homepage. After landing at the *google.no* or *google.co.uk* homepage, during step four, all of these pupils (16) made a Google search.

During step five, 17 pupils ended up at a *google.no* SERP, one at a *google.com* SERP and two on a *google.co.uk* SERP. In total, 20 pupils ended up at a Google SERP. During step six, all of these pupils interacted with the SERPs. Most of these pupils clicked on the first SERP position (nine pupils). Two pupils clicked on the second position, four clicked on the third position, and two on the fourth position. In total, there were 17 click-throughs. In addition, two pupils clicked on the “*did you mean*” button, and one pupil made a new search.

3.11.1 Discussion

The paths from opening the browser to clicking on a link varies, though as the pupil progress through the process. The figure show that the actions conjoin towards the same destination and most pupils (17) ended up at the *google.no* SERP. The figure also gives an indication of typical start-up behavior. The pupil starts the process by opening up Internet Explorer, enters either *google.no* or *google.com* into the URL field (which are both directed to *google.no*). From here, the typical pupil makes a search, scans the resulting SERP, and in most cases clicks on a result.

The flow clearly shows that most of the pupils end up at a Google SERP. Even though the SERPs were divided based on which version of google was accessed (*no*, *com*, *co.uk*), for all sense and purposes, they are all Google SERPs. The actions the pupils take in the first steps are varied, but towards the last step, they tend to converge at the same destination.

Nearly all the pupils (21) ended up at a Google SERP, and 15 of these pupils clicked on one of the top four positions in the SERP, while a few made a new search or clicked on the “*did you mean*” button.

Although this is discussed on more detail in section 3.14, the click-throughs illustrated in this figure clearly show the influence of the first position in the SERPS. The first SERP that the pupils visit, get 40% of the clicks. Since each click represents one searcher, these numbers can be compared to the click-through calculations in subsection 3.14.1 that showed an average individual CTR of 32.8%. This comparison may indicate that pupils more frequently click on the first SERP position on the first SERP they visit.

The systematic structure of the first steps that the pupils took, suggests that they have a clear plan on how to get hold of information as soon as possible. These actions were all tailored to produce results without any detours on the way. This sequence hint at a pattern that they, in most cases, will use when doing searches that are not school related as well.

3.12 SERP Usage Statistics

The next four sections look closer how the pupils interacted with the SERPs. This section contains an overview of various observations that may help to explain how the pupils interact with the search engines (in order to find information online). The first subsection looks at how many SERPs that were visited, while following subsection examines how many SERPs resulted in click-through, and also present the average number of click-throughs each of these SERPS got. The last subsection looks at how many of the total SERPs were listings beyond the top ten results.

3.12.1 Frequency of SERPs Visited

Figure 18 shows how many pupils (y-axis) who visited a certain number of SERPs (x-axis), while table 5 shows a statistical overview of the number of SERPs visited.

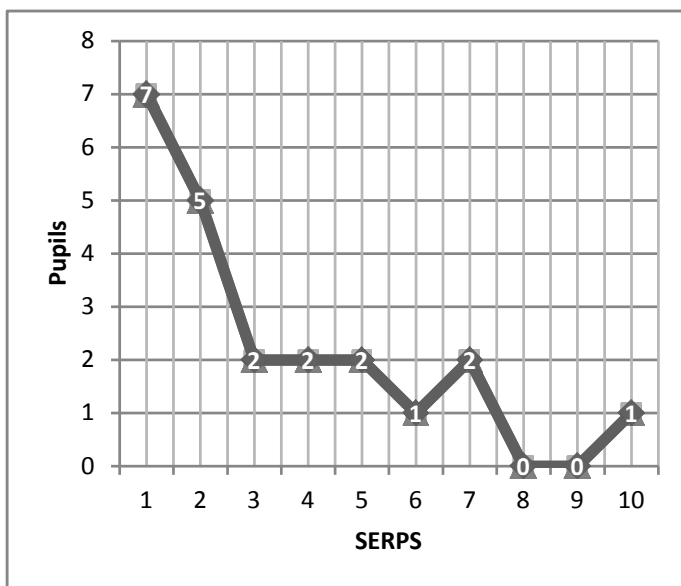


Table 5: Descriptive statistics for number of SERPS used.

Mean	3.23
Median	2.00
Mode	1
Std. Deviation	2.506
Variance	6.279
Minimum	1
Maximum	10
Sum	71

Figure 18: Number of pupils vs. number of SERPS visited.

The full sample of pupils (N=23) accessed 71 SERPs. Seven pupils visited one SERP during the experiment, while five pupils visited two SERPs each. Two pupils each visited three, four and five SERPs. One pupil visited six SERPs, while two pupils visited seven SERPs each. No one visited eight or nine SERPs, and one pupil visited ten SERPs. Table 5 shows that the pupils on average visited 3.23 SERPs each.

3.12.2 Active vs. Passive SERPs

This section examines how many SERPs resulted in a click through. SERPs where the pupils made use vertical search functionality, made new searches, or did a refined search (by clicking on the *did you mean* button were not counted. Only SERPs that resulted in a click-through to another site were counted as active.

Figure 19 shows the percentages of the total SERPs that got a click-through. This was calculated using two different methods. The first method explored the number of active SERPs from the total number of SERPs accessed during the experiment. Based on this strategy, 58 out of 71 SERPs got a click-through (81.7%).

Only 13 SERPs did not get any click-throughs (18.3%). The second method explores the averages on an individual level. This method shows a higher percentage of active SERPs. On average, the pupils used 89.1% of the SERPs they accessed.

A more detailed look at further showed that most of the pupils (68.2%) used all the SERPS they accessed. No pupil used less than half of the SERPs, while the majority (81.8%) used more than 70% of the SERPs they visited.

3.12.3 Average Number of Clicks on Active SERPs

Most pupils clicked on between two and three links on each active SERP page (mean=2.4). The average clicks on each SERP were 2.4. This number was calculated by taking the individual averages of the number of active SERPs a user visited divided by the total number of click-throughs.

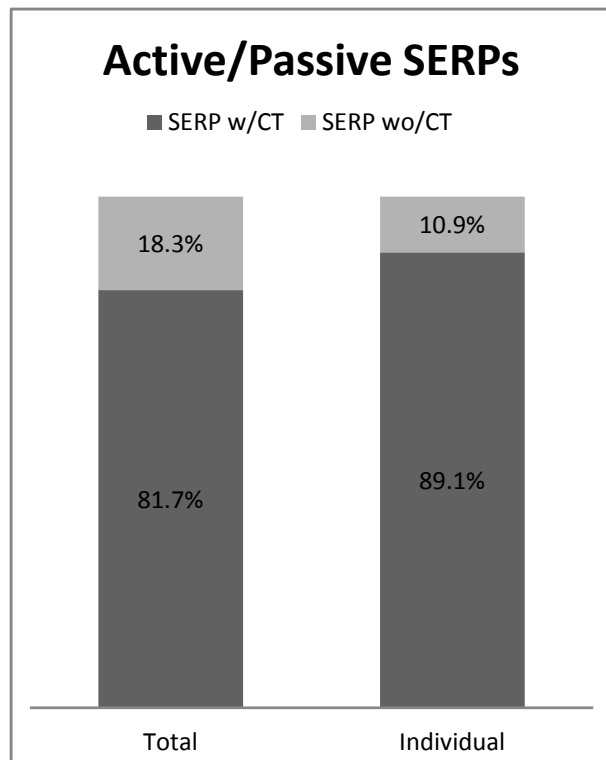


Figure 19: Active/Passive SERPs

3.12.4 Beyond the Top 10 Rankings

Most web searcher rely on the first page of the search engines, but a few ventures into deeper rankings as well. Table 6 shows the distribution of SERPs visited categorized based on how deep into the search results that SERP was.

Table 6: Distribution of SERPs on first, second, and third page on Google.

SERP Depth	SERPS	%
Page 1 (1-10)	67	94.4%
Page 2 (11-20)	3	4.2%
Page 3 (21-30)	1	1.4%

Most of the SERPs visited were from the first ten positions (94.4%). Most pupils did not venture beyond the top 10 results. In total, only three SERPs were visited that dug deeper into the results (4.2%), while just one SERP displayed results beyond the first and second page. No one dug deeper than the third page.

3.12.5 Discussion

Figure 18 shows that the highest frequency of pupils just visited one SERP, even though the average number were 3.23 searches per active SERP. Although many pupils only visited one SERP, this does not mean that they did poor research. Some pupils may be satisfied with the result they find on the first SERP they visit, and there is nothing that stops a web searcher to check on several different results. The pupils may visit several sites on a SERP.

The pupils used most of the SERPs (89.1%) they visited when looking for information. Many pupils actually used every SERP they visited. This may be an indication of the pupil's Information Literacy skills, and that they know how to pull out relevant keywords from a task, and make a search. However, it may also be a sign of a search engine that tries it best to guess the mindset of the searcher and succeeds. It can also be a combination of the above. Each SERP is also frequently used to visit more than one website (mean=2.4), which strengthen the idea that Google does a good job at providing relevant SERPs.

Few pupils visited rankings beyond the top 10 results, and made new searches instead. This might be one reason why so many pupils listed the same sources. The variation lies deeper into the search results, while the top hits for commonly themed search queries usually centers on a limited number of domains. The pupils may miss some quality information by disregarding SERP depth.

3.13 SERP Domain Rankings

The following figure displays the appearances of various websites in a selection of 49 SERPs. The figure shows the number of SERPs where these websites were listed, the average position, and the percentages of the total SERPs that these website were listed. The websites that were tracked in these SERPs were Wikipedia, Globalis, SNL, and Daria. Because Wikipedia often featured indented listings just below the regular listing, these were included as a separate entity, as where the SERP where a third Wikipedia article were listed. Daria is also listed with an indented result.

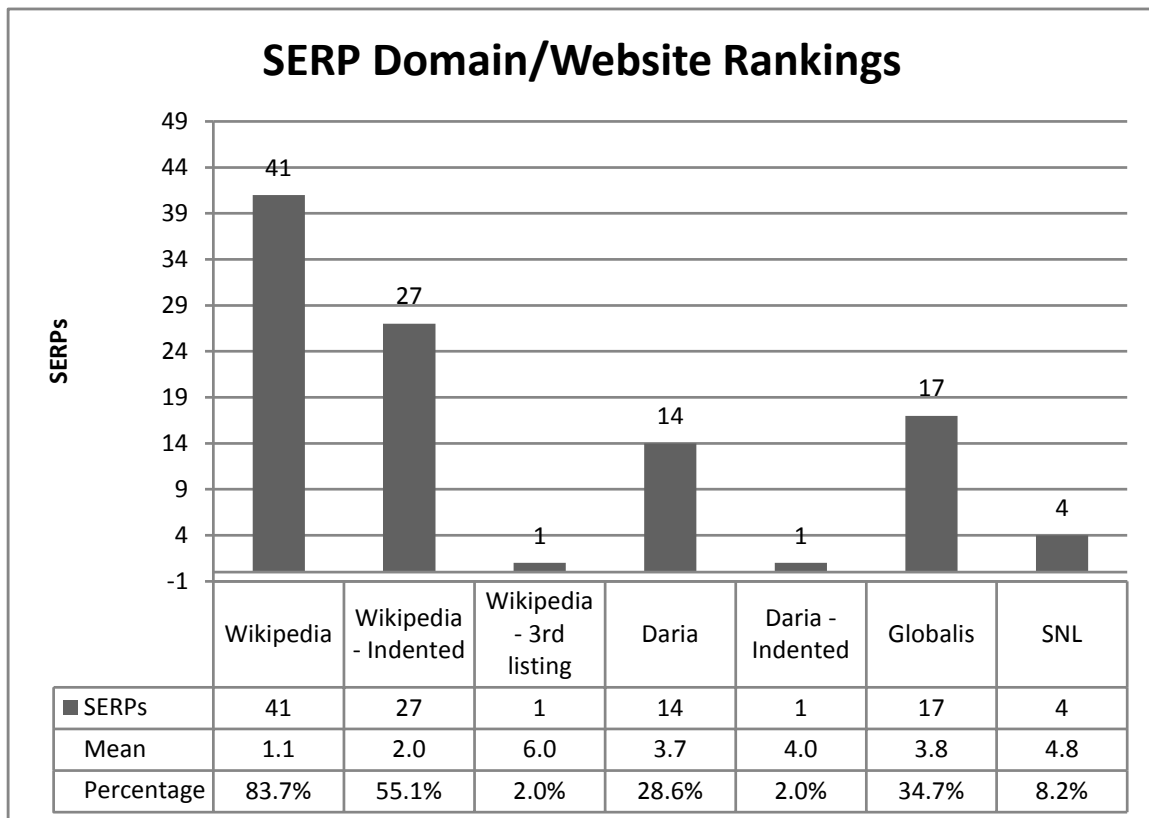


Figure 21: SERP Domain/Website Rankings

This figure shows that *Wikipedia* was present in 83.7% of all the SERPS (N=49), and had an average SERP rank of 1.12. Indented *Wikipedia* results appeared in a total of 55.1% of the SERPS. This means that 65.8% of all SERPs that contained a *Wikipedia* listing, also contained an indented listing. *Daria* was present in 28.6% of the SERPs, and had an average rank of 3.7. Just one of the SERPs where *Daria* was listed, included an indented listing. *Globalis* was present in 34.7% of the SERPS, with an average rank of 3.8 (no indented listings), while *SNL* was present in 8.2% of the SERPS with an average rank of 4.8 (no indented listings).

3.13.1 Discussion

There is one significant conclusion to draw from this section. Wikipedia had an exceptionally high exposure rate. They were listed in most SERPs (83.7%) and ranked at the first SERP position for most of these (mean=1.1). In addition, the indented listing followed the first ranking, and claiming even more SERP real estate. Even though the indented link appears to be less prioritized (see section 3.7), the fact remains that a majority of what the pupils see will be links to Wikipedia. Websites such as Globalis and SNL received a much higher trust rating than Wikipedia got, but these websites were still ranked considerably lower in the SERPs.

Section 3.11 discussed the option that the first SERP visited gets more clicks on the top position than the next ones. This may be tied to the fact that Wikipedia frequently appears in the top SERP positions. If a pupil clicked on the Wikipedia result on the first SERP, the same pupil may not feel the urge to click on the same result if it appears in another SERP, and instead look further down the list.

3.14 SERP Click-Through Ratings

Most pupils only accessed the first page on Google. The following section looks closer at how the pupils interacted with this SERP.

3.14.1 CTR on the First Page of Google (Top 10 Results)

Figure 22 shows the average click-through rating for each of the top ten positions in Google (disregarding any vertical searches or deeper scans) the figure contains two different columns. The first column shows the percentage of the total 116 clicks that each position received (CTR). Another way to calculate the CTR was to first calculate the CTR for each position for each participant, and then take the average from that score. Instead of looking at the total number of clicks, this column looks at the average CTR for each participant in the experiment (disregarding the total number of individual clicks for each individual).

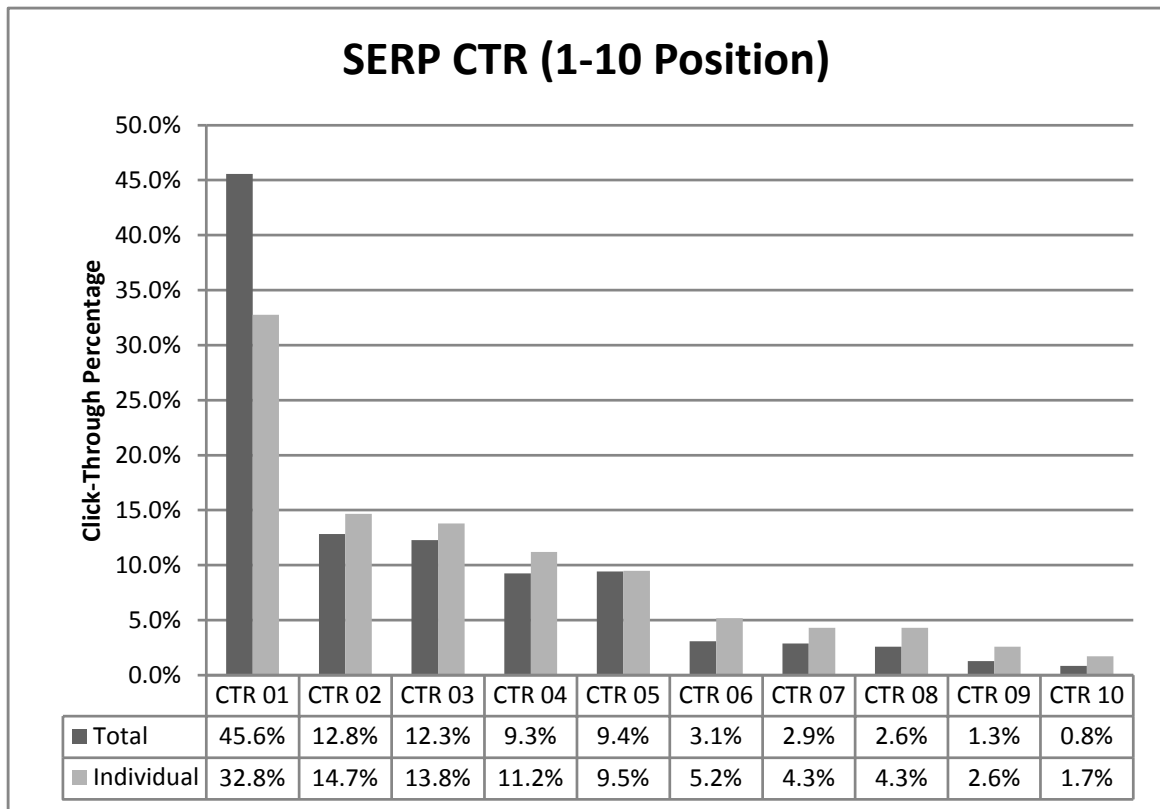


Figure 22: CTR for top ten SERP positions in Google based on total clicks and individual averages.

Based on the total scores, the first position got almost half of the total clicks, with a CTR of 45.6%. There is a large gap down to second position with a CTR of 12.8% and third position with a CTR of 12.3%. There is a slight gap down to the fourth (CTR 9.3%) and fifth positions (CTR 9.4%) before the graph slightly descends throughout the last five positions: Sixth

position (3.1%), seventh position (2.9%), eighth position (2.6%), ninth position (1.3%) and tenth position: (0.8%).

The individual average is significantly different for the first position. The first position was preferred by about two-thirds of the pupils with a CTR of 32.8%. This is about twice the amount of clicks than the second position got (14.7%). The third position (13.8%), fourth position (11.2%) and fifth position (9.5%) follows close behind. There is a gap down to the last five positions on this figure as well: Sixth position (5.2%), seventh position (4.3%), eighth position (4.3%), ninth position (2.6%) and tenth position: (1.7%).

3.14.2 Discussion

The first position gets much more click-throughs than the lower positions, but the decline in clicks does not vary much between the positions that follow after the first position. The first five positions will usually be above the fold, without any need to scroll down to see the rest. This significant difference in clicks clearly point to the habits of the pupils. The pupils prefer to click on the first position. Based on an individual average, 81.9% of the pupils clicked on one of the top 5 positions.

An interesting observation is to examine the slight fall from the second to the fifth spot, while there is a drastic drop to the sixth spot. This may be a result of the monitor resolution that was too low to show the last five positions. Another contributing factor may have been the appearance of vertical search elements such as *news* and *image* results (usually somewhere between the fourth to sixth positions). These vertical search functions may have influenced the CTR of the regular links by pushing the lower positions beneath the fold.

3.15 SERP Webpage Click-Through Details (Top 10)

This section explores the webpages that the pupils visited after clicking on a result in the top 10 results. Table 7 shows the webpage, the number of clicks that each of these sites got, the percentages of the total clicks (N=116), and the average SERP rank that generated these clicks. Each of the webpages listed here correspond to a certain URL that is listed in Appendix A3. The data presented here is based on the combined clicks of the 22 pupils that used Google during the experiment.

Table 7: The websites that received click-throughs at the first page of Google.

Webpage	Clicks (N=116)	%	Mean / CT RANK
no.wikipedia.org [AfgSovKrig]	16	13.8	1.7
globalis.no [Konflikter/Afghanistan]	14	12.1	3.2
no.wikipedia.org [DenKaldeKrigen]	11	9.5	1.5
koordinatoren.com	8	6.9	4.0
landinfo.no	7	6.0	3.1
daria.no	7	6.0	4.7
vgd.no [forum]	7	6.0	8.1
no.wikipedia.org [AfgHistorie]	6	5.2	2.2
historienet.no	6	5.2	6.0
needham.k12.ma.us	5	4.3	2.4
en.wikipedia.org [SovietWar]	3	2.6	1.0
no.wikipedia.org [AfgSovKrig]	2	1.7	1.0
no.wikipedia.org [Mujahedin]	2	1.7	1.0
no.wikipedia.org [AfgDemRep]	2	1.7	2.0
snl.no [Mujahedin]	2	1.7	2.0
caplex.no	1	0.9	1.0
csc.umich.edu	1	0.9	1.0
en.wikipedia.org [Afghanistan]	1	0.9	1.0
en.wikipedia.org [leaders]	1	0.9	1.0
google.com	1	0.9	1.0
leksikon.org	1	0.9	1.0
maps.google.com	1	0.9	1.0
tritrans.net	1	0.9	1.0
guidetorussia.com	1	0.9	3.0
prio.no	1	0.9	4.0
propaganda.net	1	0.9	4.0
britannica.com	1	0.9	5.0
infoplease.com	1	0.9	5.0
aftenposten.no [Afghanistan]	1	0.9	7.0
bip.no	1	0.9	7.0
globalsecurity.org	1	0.9	8.0
mil.no	1	0.9	10.0
reddbarna.no	1	0.9	10.0

The webpage *no.wikipedia.org* [AfgSovKrig] was the most visited page. It got 16 clicks (13.8%) with an average SERP rank of 1.7. The next webpage was *globalis.no* [Konflikter/Afghanistan] with 14 clicks (12.1%) and an average SERP rank of 3.2, followed by *no.wikipedia.org* [DenKaldeKrigen] with 11 clicks (9.5%) and an average rank of 1.5. There was a slight gap to *kordinatoren.com* with eight clicks (6.9%) and an average rank of 4.0. The next three pages got seven clicks (6.0%) each: *Landinfo.no* with an average SERP rank of 3.1, *daria.no* with an average SERP rank of 4.7, and *vgd.no* [Forum] with an average SERP rank of 8.1. These pages were followed by *no.wikipedia.org* [AfghanistansHistorie] with six clicks (5.2%) and an average rank of 2.2, and *historienet.no*, also with six clicks (5.2%), but with an average rank of 6.0. The next page was *needham.k12.ma.us* with five clicks (4.3%) and an average SERP rank of 2.4, followed by *en.wikipedia.org* [SovietWar] with three clicks and an average SERP rank of 1.0. The following website each got two clicks: *No.wikipedia.org* [AfgSovKrig] with an average SERP rank of 1.0, *no.wikipedia.org* [Mujahedin] with an average SERP rank of 1.0, *no.wikipedia.org* [AfgDemRep] with an average SERP rank of 2.0, and *snl.no* [Mujahedin] with an average SERP rank of 2.0. The rest of the webpages only got a single click.

Wikipedia was the only website that had more than one webpage that got a click-through from the first page of Google. Even though there are additional websites listed with differencing brackets, these websites were accessed through other channels than the first page of Google. In total, seven different pages were listed from Wikipedia, and together they captured 44 clicks (37.0%).

3.15.1 Discussion

There is no doubt that Wikipedia gets the most click-throughs from the SERPs. About one in three clicks went to a Wikipedia article. These numbers are in agreement with the fact that *Wikipedia* ranks consistently high in the SERPs. This also explains why so many pupils ended up scanning through a *Wikipedia* article.

The top webpages are worth a closer look. Table 7 showed that only two clicks separated *no.wikipedia.org* [AfgSovKrig] and *globalis.no* [Konflikter/Afghanistan], but the difference in average SERP ranking (1.7 vs. 3.2) was larger than the slight difference in clicks should suggest. Even though the *globalis.no* result on average ranked about 1.5 spots lower, it received just a few clicks less than the most popular *Wikipedia* article. This may indicate that the authority and trust the pupils credit to *globalis.no*. In section 3.8, *Globalis* got a trust rating of 2.83, while Wikipedia got a rating of 2.10 on the same scale. *Globalis* is also a

website that the pupils frequently use at school, so it is possible that they would prefer it to Wikipedia results, even though the ranking power of Globalis is lower.

3.16 Time Spent Scanning SERPS and Source Material

This section looks closer at how much time the pupils used on various aspects of the work process, lists the time that each individual website was accessed, and

3.16.1 Time Factors

Each relevant action that the pupil took during the experiment was tagged and categorized. This included the time spent scanning webpages and SERPs, and writing the answer to the task in word. The following table examines the average time that the pupils spent on these activities. The table also contains the minimum and maximum scores.

The total time shows a total sample of N=23. This includes all pupils that provided valid recordings. However, since a section of video was erased for one pupil towards the end of the experiment, this video was not taken into account when calculating average times. The reason is that it is uncertain which actions that pupil did in these minutes. To avoid any misrepresentation of these numbers, this recording was omitted from calculating SERP time, time spent scanning websites, and time spent working with Word.

The pupils had two main strategies for referencing a source when they had started to write their texts. The first strategy was to switch between the source and the text processor, while the other strategy was to keep the source in the background while writing. Most pupils worked using the first strategy (N=18), while a few (N=4) used the other strategy.

Table 8: Total Time, SERP time & Work Time

Time Factor	N	Minimum	Maximum	Mean
Total Time	23	0:15:26	0:45:24	0:30:39
Total SERP time	21	0:00:07	0:02:49	0:00:51
Average SERP time	21	0:00:05	0:01:26	0:00:21
Work Strategy 1: Write	18	0:06:22	0:23:40	0:13:41
Work Strategy 1: Scan	18	0:03:34	0:21:18	0:10:58
Work Strategy 2: Write	4	0:00:00	0:13:07	0:06:36
Work Strategy 2: SIB	4	0:07:38	0:25:27	0:15:18
Work Strategy 2: Scan	4	0:00:16	0:17:27	0:07:23

The average pupil spent about half an hour (30:39) from start to finish, with a minimum of 15:26 and a maximum of 45:24. The pupils that visited Google spent a total of 51 seconds SERPs on average. The average time spent on each individual SERP was 21 seconds.

The pupils that used the first work strategy (N=18), spent on average 13:41 working with their answer, and 10:58 scanning sources. The pupils who used the second work strategy (N=4), spent on average 6 minutes and 36 seconds just writing, 15 minutes and 19 seconds with the source in the background (writing and scanning), and 7 minutes and 23 seconds just scanning websites.

3.16.2 Time Spent Scanning Source Material

This section looks at the various sources a group of pupils visited. As mentioned in the previous section, the pupils had two main work strategies for referencing a source when they had started to write their texts. This section focuses on those who used the first strategy (N=18). The reason is that it was easier to calculate the exact time spent scanning a website when they switched between Word and the browser, instead of leaving the source in the background.

The average time spent on each website gives an indicator if it was used as a source. Websites that on average were scanned less than ten sections indicated that the pupils quickly determined that the websites was irrelevant, Any exact time spent to establish if the pupils considered it as a source is hard to estimate, but any website that was scanned for more than 30 seconds, but less than one minute may indicate that they needed more time to determine that it was relevant or not. A website scanned for more than one minute indicates that the pupil evaluated it more carefully, and may be considered as a source.

Table 9 on the next page shows the number of pupils that visited each webpage during the experiment, the percentages of them that visited that page, the minimum and maximum time spent on the page, and the total amount. The domain trust is listed based on the average reported trust levels for the 19 pupils that were included here. These trust ratings differ slightly from those found in section 3.8 since they do not include the full sample of pupils. The lack of a trust rating also means that this webpage was not listed as a source.

Table 9: Websites visited during experiment from sample of N=18.

Websites	N	%	Mean / Avg. Time	Domain Trust
no.wikipedia.org [AfgSovKrig]	14	77.8%	0:03:49	2.06
globalis.no [KonflikterAfghanistan]	11	61.1%	0:02:16	3.00
no.wikipedia.org [DenKaldeKrigen]	8	44.4%	0:01:34	2.06
daria.no	7	38.9%	0:01:02	2.00
koordinatoren.com	6	33.3%	0:02:17	2.00
landinfo.no	5	27.8%	0:02:35	2.67
historienet.no	5	27.8%	0:01:33	2.67
Needham	4	22.2%	0:05:30	2.33
vgd.no [forum]	4	22.2%	0:00:05	-
no.wikipedia.org [AfgHistorie]	3	16.7%	0:01:55	2.06
no.wikipedia.org [Mujahedin]	3	16.7%	0:00:55	2.06
no.wikipedia.org [AfgDemRep]	2	11.1%	0:04:46	2.06
en.wikipedia.org [SovietWar]	2	11.1%	0:04:32	2.06
aftenposten	2	11.1%	0:00:26	2.00
en.wikipedia.org [Afghanistan]	1	5.6%	0:04:04	2.06
no.wikipedia.org [KrigAfg2001]	1	5.6%	0:03:55	2.06
leksikon.org	1	5.6%	0:03:50	1.00
guidetorusia.com	1	5.6%	0:03:29	3.00
propaganda.net	1	5.6%	0:02:17	2.33
csc.umich.edu	1	5.6%	0:01:28	-
snl.no [AfghanistanHistorie]	1	5.6%	0:01:11	3.00
mil.no	1	5.6%	0:00:55	-
no.wikipedia.org [Hafzulla]	1	5.6%	0:00:42	2.06
vgb.no [blog]	1	5.6%	0:00:42	-
snl.no [Historie]	1	5.6%	0:00:39	3.00
iranbulletin.org	1	5.6%	0:00:37	-
en.wikipedia.org [Leaders]	1	5.6%	0:00:30	2.06
snl.no [AfgStatsoverhoder]	1	5.6%	0:00:08	3.00
answers.com	1	5.6%	0:00:07	-
commons.wikimedia.org	1	5.6%	0:00:07	-
globalis.no [Konflikter]	1	5.6%	0:00:06	3.00
prio.no	1	5.6%	0:00:06	-
globalsecurity.org	1	5.6%	0:00:05	-
snl.no [mujahedin]	1	5.6%	0:00:05	3.00
no.wikipedia.org [BarakKamal]	1	5.6%	0:00:02	2.06

The pupils that used the switch strategy (N=18) visited a total of 35 webpages. The most frequently used webpage was *no.wikipedia.org* [AfgSovKrig] that was visited by 14 pupils (73.7%), scanned for 2:49 on average. The average trust rating for the Wikipedia sites was 2.06. *Globalis.no* was visited by 11 pupils (57.9%), scanned for 2:16 on average, and was rated with a 3.0 trust rating. *No.wikipedia.org* [DenKaldeKrigen] was visited by eight pupils (42.1%) and was scanned for 1:34 on average. *Daria.no* was visited by seven pupils (36.81%), scanned for 1:02 on average, and was rated with a 2.0 trust rating. *Koordinatoreren.com* was visited by six pupils (31.6%), scanned for 2:17 on average, and was rated with a 2.0 trust rating. *Landinfo.no* was visited by five pupils (26.3%), scanned for 2:35 on average, and was rated with a 2.67 trust rating. *Historienet.no* was also visited by five pupils (26.3%), scanned for 1:33 on average, and was rated with a 2.67 trust rating. *Needham.com* was visited by four pupils (21.1%), scanned for 5:30 on average, and was rated with a 2.33 trust rating. *Vgd.no* [Forum] was also visited by four pupils (21.1%), was scanned for 0:05 on average, and was not listed as a source

The next four webpages were all Wikipedia links: *no.wikipedia.org* [AfgHistorie] was visited by three pupils (15.8%) and scanned for 1:55 on average, *no.wikipedia.org* [Mujahedin] was also visited by three pupils and scanned for 0:55 on average, *no.wikipedia.org* [AfgDemRep] was visited by two pupils (10.5%) and scanned for 4:46 on average, and *en.wikipedia.org* [SovietWar] was also visited by two pupils and scanned for 4:32 on average. The rest of the websites had only one visitor.

The table shows that nine webpages was not listed as a source. These webpages had relatively low average scanning times: *vgd.no* [forum] (0:05), *csc.uminch.edu* (1:28), *mil.no* (0:55), *vgd.no* [blog] (0:42), *iranbulletin.org* (0:37), *answers.com* (0:07), *prio.no* (0:06), *globalsecurity.org* (0:05).

3.16.3 Average Time Spent Scanning Sources versus Domain Trust

Table 9 listed the various webpages used during the experiment, while this figure shows a graphical representation of the average time spent scanning a selection of different sources, and puts this up against the reported trust in that source. The aim was to check if there was a correlation between trust and time scanned. Only one Wikipedia article was used in order to make the comparison based on individual websites.

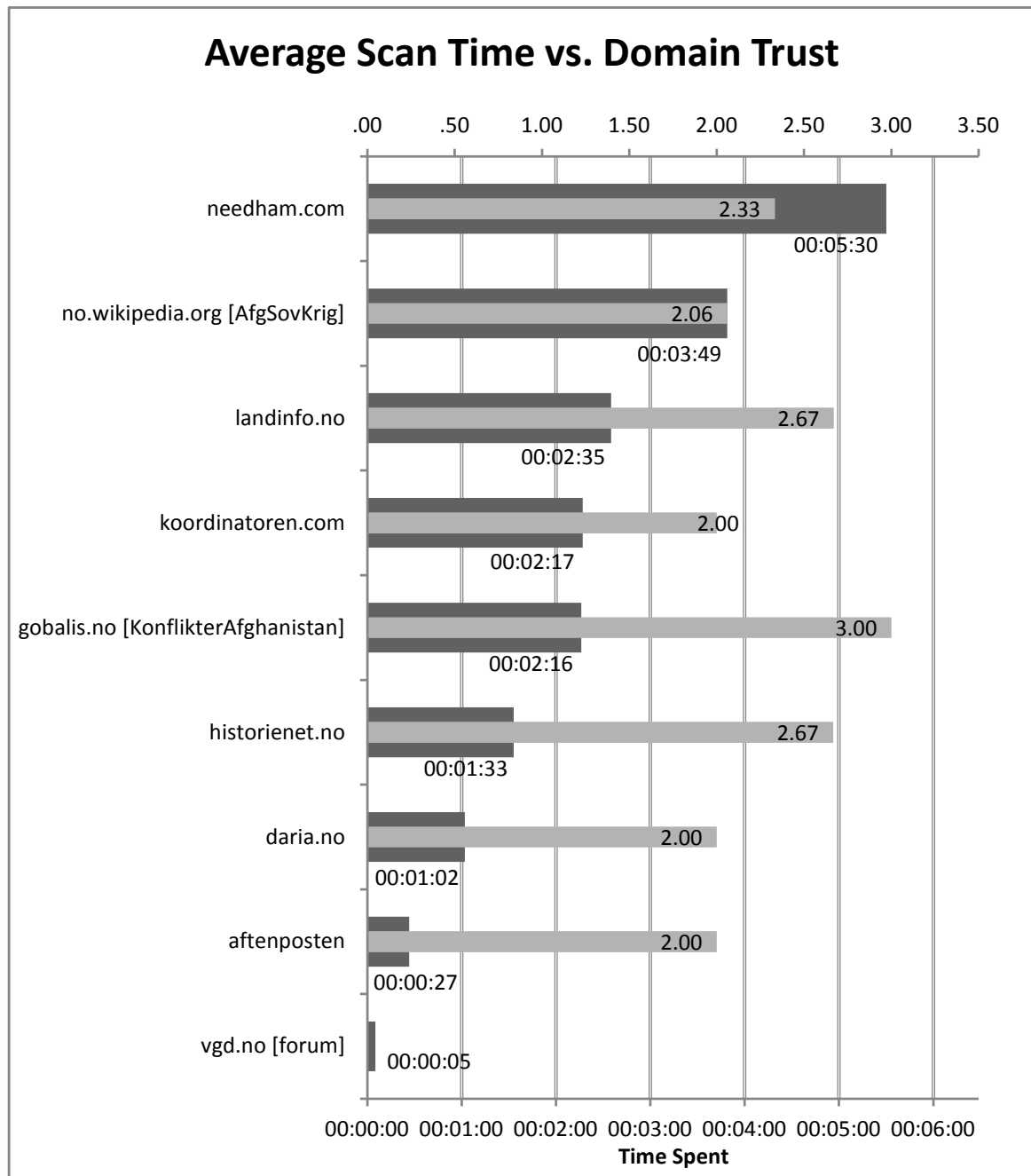


Figure 23: Average time spent scanning sources vs. reported trust in domain.

The table shows that the average time spent on needham.com was 5:32 with a trust rating of 2.33. Various Wikipedia articles that got a shared trust rating of 2.06 take the text spots. The average time spent on *no.wikipedia.org* [AfgDemRep] was 4:46, while the average for *en.wikipedia.org* [SovietWar] was 4:46. The webpage *no.wikipedia.org* [AfgSovKrig] was scanned for 3:49 on average. The webpage *landinfo.no* was scanned for 2:35 on average with a trust rating of 2.67, while *koordinatoren.com* was scanned for 2:17 on average with a trust rating of 2.00. *Globalis.no* [KonflikterAfghanistan] follows, and was scanned for 2:16 on average with a trust rating of 3.00. The next two spots are Wikipedia articles. *No.wikipedia.org* [AfgHistorie] was scanned for 1:55 on average, while *no.wikipedia.org* [DenKaldeKrigen] was scanned for 1:34 on average. *Historienet.no* follows, and was scanned for 1:33 on average with a trust rating of 2.67. The webpage *daria.no* was scanned for 1:02 on average with a trust rating of 2.00, *no.wikipedia.org* [Mujahedin] was scanned for 0:55 on average, and *aftenposten.no* was scanned for 0:26 on average with a trust rating of 2.00. The least scanned webpage was *vgd.no* with an average scan time of 0:05 and no listed trust rating.

3.16.4 Discussion

The time spent scanning websites suggests that the pupils take their time when doing research. The average pupil spent about eleven minutes (10:58) scanning through various websites, while the total time used writing was close to fourteen minutes (13:41). In total, the pupil spent, on average, 24 minutes and 39 seconds reading and writing. In comparison, the average pupil used less than a minute searching the SERPs for this information. The strategies used to find content were efficient, which resulted in the pupil getting more time to scan sources and create decent work.

Table 9 showed that most pupils on average spent a few minutes scanning through various Wikipedia articles. The webpage that topped this ranking, *no.wikipedia.org* [AfgSovKrig] ended up with an average scan time close to four minutes (3:49), while *no.wikipedia.org* [DenKaldeKrigen] had a lower average scan time (1:34). This suggests that the most prioritized article was more relevant, which is a plausible conclusion to draw based on the topic the pupils got. The first article mentioned here was highly relevant, while the other one were less accurate. The time spent scanning a website that had a lower accuracy rate is worth looking closer at, because it may tell something about how long pupils need to determine if a website is irrelevant, or not relevant enough for the purpose of the task at hand.

There were nine sources listed that were not mentioned in the source list that the pupils provided on the questionnaire. Most of these websites were scanned for less than a minute, and some were scanned for less than ten sections. These sites were singled out as irrelevant, and in most cases, the pupils made this decision in less than a minute. The website *vgd.no* [forum] was a good example of how quickly the pupils determined relevancy. This website only contained a threaded discussion list, and the pupils figured out that it was relevant to what they were after. Even so, a fair share the pupils visited this site. Table 7 shows that this webpage got 7 clicks in total from an average SERP rank of 8.1. No other website got this high level of Click-Through from such a low SERP position. The reason may be that the pupils credited authority to it, and the SERPs in general contained few sites they recognized save Wikipedia, Daria and SNL. The issue of authority seems to be an important factor in the pupils filter to validate which units of information they are going to use.

Figure 23 shows the relationship between trust rating and scan time. If there was a clear correlation, the average trust rating would descend in correspondence with the time spent scanning the website. However, this does not happen. This indicates that pupils still spend a lot of time on a source they think is relevant, even though they rate it as less trustworthy than sites they spent less time on.

4 Conclusion

The results have been presented and discussed, and it is time to collect some threads and address the research questions. During the experiment, the pupils were stationed in front of a computer with an Internet connection, a task to solve, and 45 minutes at their disposal. This framework mirrors the typical *use the internet* task that is a frequent occurrence in schools. Even though these tasks may seem easily manageable, the actual processes that are needed to complete such a task rely on a conglomerate of varied skills.

The pupils displayed well-toned computing and information retrieval skills during the experiment. From the start, they progressed through a chain of actions that each demanded unique abilities from a complex skill set: Accessing a computer, using browser software, navigating the web, synthesizing an accurate search query, scanning a SERP for relevant information, making a decision on choice of content, and, finally, scanning and verifying a content source. The pupils managed to balance the skills that worked in union to find and evaluate content. These skills each represented a small part of the complete story that each of the research questions represent. The next two sections look closer at each of the research questions.

The next two sections will examine each of the two research questions from a viewpoint of information literacy.

4.1.1 How the Pupils used the Internet to find information

The Internet is a computer network that connects all kinds of digital media into a huge information network that is saturated with information. The first aspect of Information Literacy relies on skills to navigate this network to look for accurate information. This challenge was the first the pupils had to face. Within a framework of 45 minutes, they had to find this information, decide if it was credible, and write a few hundred words on the topic.

The primary tools used to find formation online are the browser and the search engine. Although the results have already been discussed in the previous chapter, some of the findings will need to be revisited in order to provide an adequate answer the first research question. The pupils recognized most browsers that were brought to their attention, although the girls seemed to know less about alternatives to Internet Explorer. The pupils reported that Microsoft's browser was most frequently used at school, but they were just as likely to use

other browsers at home. During the experiment, most of the pupils used Internet Explorer, although a few used Chrome instead.

After selecting a browser, it was time for them start searching for information. The rest of the initial actions played out as a well-rehearsed script. There pupils knew where they were going, how to get there, and what to do when they arrived at their destination. Most started by typing in the URL to Google, and then making a search, before ending up at a Google SERP. Some pupils used the browser's built-in search functionality, which brought them directly to a Google SERP. In total, 78.2% of all pupils ended up on a Google SERP within the initial stages of their information hunt. After scanning the SERP, most pupils clicked on one of the top four SERP positions, and arrived at their first destination seconds later. The only exceptions were two defiant pupils who entered the URL to *Wikipedia* and *Store Norske Leksikon* instead.

In the questionnaire, the pupils reported that Google was the search engine of choice, which was easy to verify during the experiment. It turned out that Google was the only search engine used. Most Google searches originated from the Google homepage or a Google SERP. On average, each pupil made 2.91 searches, although the boys made significantly more searches than the girls did. The rest of the Google searches originated from the built-in search functionality of the two browsers used (Chrome and Internet Explorer).

The pupils appeared to be pleased with the SERPs they visited. A vast majority of the SERPS (81.7%) resulted in at least one click-through. Some pupils were so pleased with the first SERP that they did not see the need to visit another one. The highest frequency of pupils used just one SERP, although the average was 3.23 for each pupil. Further, they spent about 20 seconds scanning each SERP they visited. Although the SERPs were instrumental in their search for information, this was not a place to waste time. The SERPs were about finding relevant content as quickly as possible.

The pupils preferred the top SERP position (32.75%), and most clicked on one of the top five positions (81.9%). The pupils preferred the listings that were above the fold. Wikipedia dominated the SERPs and was a constant presence in the top positions. The preference of the first SERP position combined with the frequency of Wikipedia listings, explains the extensive use of Wikipedia articles.

The pupils were competent at navigating the web, and they applied an advanced skillset to find relevant information. They satisfied the first aspect of Information Literacy with excellence. Now it is time to tell the other side of the story.

4.1.2 How the pupils evaluated the information they found on the Internet

The pupils showed they were proficient in information retrieval. However, there is more to Information Literacy than finding information. The ability to evaluate this information and determine if it is a credible source represents an entirely new skillset. The first step of evaluating a source is to verify that the content is accurate in terms of what the pupil where looking for. This is a fairly straightforward routine. The challenge is to determine the credibility of the content once it has been judged as accurate.

The pupils rated a lot of websites and sources based on a trust scale. These ratings show the credibility that the pupils put into the various sources, but they do not provide the underlying reasons for these ratings. Even though these ratings have their limitations, they are a good measurement to identify trust patterns. The pupils reported the highest trust in online newspapers and broadcasting companies, and put little trust in celebrity websites and blogs. These scores indicate that the pupils are aware of certain conventions about which websites are reliable when looking for credible information. In addition, authority is another element that needs to be taken into consideration. The trust in online newspapers may be connected to the perceived authority of these websites.

The trust credited to the websites used during the experiment provided the data for some notable observations. Websites that the pupils in all likelihood had never visited before received higher trust ratings than Wikipedia. The reason for this does not lie in the authority of these sites, but may rather reflect a higher degree of perceived credibility. In addition, Wikipedia scored lowest on the trust rating of all the listed sources used by at least three pupils. The highest-ranking websites (*SNL* and *Globalis*) may be considered authority sites for most pupils. While Wikipedia got a 2.10 trust rating, these two sites scored significantly higher (3.0 and 2.0). The reason may be a combination of authority and credibility.

An information literate person has access to strategies that may help in filtering out disreputable information. One such strategy is to verify the information by checking if additional sources mirror the same facts, and most pupils reported that they did this. This is an easy way to check the credibility of a website without having to go looking for the credentials of the author. If several websites say the same thing, then chances are that there might be something to it.

There were various webpage elements that the pupils rated as influential when deciding to use a webpage as a source. The title of the webpage was influential, which may be connected to previous experiences and website authority. As expected, commercials had little influence. Quality stamps mattered, and the lack of an author name also had some negative impact. Reporting these influences is one thing, although it is not certain that they actually pay attention to these elements when they are not put right in front of them. Even so, the results once again prove that they are aware of what may contribute to the credibility of source, and that may suffice when arguing for the pupil's information literate skills.

Domain names and TLDs may contribute to the authoritative status of a webpage, which became evident in this study. Most pupils preferred the *com* and *net* domains as the best websites to visit. This may indicate the perceived authority of these TLDs. The domain name also seemed to play a part in the evaluation process. The pupils preferred a domain name that they probably had not heard before to that of Wikipedia. This domain name contained relevant keywords, which may have been the determining factor in their preference.

The pupils were quick to figure out if a website was relevant. Most websites visited during the experiment that was not listed as a source, were in most cases scanned for less than one minute, and in some cases, less than ten sections. The pupils seem to know fairly quickly if a website is relevant or not.

Research has pointed out that the top positions in Google gain automatic trust, and people will click on the top position even though the results have been manipulated with. The idea of the top must be the best still lives on in the SERPs. This way, Google helps to shape Wikipedia's perceived authority.

Although these processes in the last two sections have been discussed separately, they are all part of a larger system. The pupils displayed the traits that signify an information literate person, although they could still benefit from a more diverse toolbox, both when searching for information and evaluating a source. The way they find information was very limited and ritualistic, while the strategies they used to evaluate the information relied heavily on authority, although the results suggest that they have a system in place for filtering out bad information.

5 Reflections

The main research questions have now been addressed, but there are still a few loose threads that should be wrapped up in order to create a complete picture. The introduction mentioned two focus areas that were promised more exposure throughout this thesis. This chapter still keeps a focus on school and education, but aims to look at these two focus areas from a broader perspective.

5.1.1 *Googlepedia*

It has been established that Google and Wikipedia played a significant role in controlling the information that they pupils gained access to in this study. This section has been named *Googlepedia* to illustrate the strong relationship that appears to exist between these two giants. Much of Wikipedia's success may be credited to the traffic it gets from Google. This search engine delivers approximately two-thirds of all traffic to Wikipedia, and the traffic to Wikipedia has grown by a factor of 4,000 in just five years (Nielsen Online 2008:1). Without this massive traffic, Wikipedia would probably not hold the strong position online that it has today.

Google and Wikipedia share a mutually beneficial relationship. Wikipedia keeps an active community of contributors who add content on any topic imaginable, and Google picks up these articles and drives traffic to them when web searchers type in a relevant search query. A search engine relies on the satisfaction of its users, and Wikipedia appears to suit the average web searcher well.

There may be many reasons why Wikipedia ranks so well in Google without speculating that Google has a Wikipedia-friendly function built into its search algorithm. For instance, Wikipedia has many articles on any topic imaginable, and there may not be any similar content that give that topic the same degree of justice that Wikipedia does. Google also favors websites that has many incoming links, and Wikipedia has a lot of these.

Wikipedia impose few restrictions on its content compared to the strict copyright laws that stops other quality content to be available online. Wikipedia may not be the best content available, but it is easily accessible with few strings attached. The website may be more reliable than content written by an anonymous blogger. The Articles at Wikipedia are also peer-reviewed by those who share a passion for a particular topic. Such a person can edit the content, add references, and generally try to improve the quality of the article.

The pupils that took part in this study embraced Wikipedia more or less voluntarily. Google played its part, while the recognition and authority factor sealed the deal. There seems to be a trend developing on how students do research. Camihort (2009) points to several aspects of this trend. Wikipedia has become a regular part of research, but then points out that Wikipedia is not a “proper reference source for a scholarly paper” (Camihort 2009:30). The reason is that the articles are anonymous, and therefore unfit to be used in higher learning institution as references. However, this does not mean that Wikipedia should not be used at all. It can be used as the stepping-stone to a topic, as its articles often provides a good starting point for further studies. In addition, it is a good source of information for pupils in the lower secondary school where the need to check for credentials may not be that important.

A drastic measure would be to ban the use of Wikipedia, but there are few reasons to do so. Maehre (2009) refers to an incident where the history department at Middlebury College banned the use of Wikipedia in papers and exams. He disagrees with the view of Maddox (2007) who praised this action by the Middlebury College. Maehre states that “Maddox’s glee from a policy that tells students what to do rather than attempting to teach them to think makes me very sad” (Maehre 2009:229). He warns that banning certain sites sends the wrong message to the students. He narrows his argument down to two juxtapositions: Firstly, learning as a process vs. producing a product, and, secondly, thinking individually and evaluating vs. following a set of rules. These points work well within the framework of developing Information Literacy skills. Instead of limiting the content, it is better to focus on learning critical thinking in schools, and focusing on Wikipedia as a good tool that can form a starting point for further investigation into a topic.

The pupils in this study visited Wikipedia frequently, but did check other sources as well. Only a few relied exclusively on just this one website. For school use, it is not a website that should be avoided, but the pupils should be told more on how to use Wikipedia, and learn of alternatives. One way of doing this would be to instruct them to check out the references that are listed at the end of each article.

There may be other reasons why pupils click on the Wikipedia links as well. It may be an action sequence that follows the pattern of searching on Google, clicking on the Wikipedia link, and read the article. They may also have been exposed to the website so frequently that they expect to find a link to this website.

5.1.2 Raising Information Literacy Levels in Schools

The way people find and evaluate information is based on a set of routines that has been referred to as Information Literacy. The study showed that there is plenty of room to improve these skills. For instance, the pupils, for the most part, did not use alternative ways to look for information. They used Google, and relied on the top ten positions there. There is a danger in linking authority to trust. Even though the pupils reported a lower trust rating in Wikipedia than most other sources, they were still prone to the pattern of making a search and clicking on the Wikipedia link.

Teachers have a responsibility to provide pupils with the tools needed to evaluate the information they find online. Bush (2009) raises the point that teachers need to “prepare students to become strategic, critical, divergent and creative thinkers” (Bush, G. 2009:446). The internet is a maze with many dead ends and traps, and young people should learn how to navigate through it. The consequences of not giving students the skills to do so will result in their surrender to irrelevancy and surrender to just sit in “archaic classrooms, read outdated textbooks, and lose their intellectual curiosity” (Bush, G. 2009:46). Even though the consequences mentioned here might seem a bit dire, they nonetheless emphasize the importance of learning to navigate the vast information with proper intellectual tools and resources.

Bush points out that teachers must “create a more meaningful learning environment, one that gives students the skills they need to succeed in an information society” (Bush 2009:446). Bush also looks at how this may be done. The students need to question the authority of the websites they use as a base for their content. The pupils need to examine the authority of the source and look for bias (Bush 2009:446). The challenge when using search engines is to find relevant information and to evaluate this information.

Simple measures to determine credibility should be thought in schools. For instance, a pupil may check a source he has found in Google scholar. The pupils can search for references to determine if the source is reputable. Simple searches for the name of the author in the search engines are also a good way to check if the person has any credentials worth paying attention to.

Critical thinking should also be put on the agenda. The pupils should learn how to evaluate texts, videos, and other digital media based on this model of reasoning.

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Appendices

Appendix A: Tables

Table A1: Reported Sources Used

Source	N	Min	Max	Sum	Total %	Std. Dev.	Variance	Male %	Female %
Wikipedia	36	0	1	31	86.1%	.351	.123	94.1%	78.9%
Globalis	36	0	1	18	50.0%	.507	.257	35.3%	63.2%
Google	36	0	1	11	30.6%	.467	.218	29.4%	31.6%
Koordinator en	36	0	1	6	16.7%	.378	.143	5.9%	26.3%
Daria	36	0	1	6	16.7%	.378	.143	17.6%	15.8%
Landinfo	36	0	1	5	13.9%	.351	.123	11.8%	15.8%
SNL	36	0	1	5	13.9%	.351	.123	5.9%	21.1%
Historienet	36	0	1	5	13.9%	.351	.123	11.8%	15.8%
Propaganda	36	0	1	3	8.3%	.280	.079	0.0%	15.8%
Needham	36	0	1	3	8.3%	.280	.079	11.8%	5.3%
Forsvaret	36	0	1	2	5.6%	.232	.054	5.9%	5.3%
Aftenposten	36	0	1	2	5.6%	.232	.054	0.0%	10.5%
Dagsavisen	36	0	1	1	2.8%	.167	.028	5.9%	0.0%
MIL	36	0	1	1	2.8%	.167	.028	0.0%	5.3%
Skoleforum	36	0	1	1	2.8%	.167	.028	0.0%	5.3%
Redd Barna	36	0	1	1	2.8%	.167	.028	0.0%	5.3%
Infoplease	36	0	1	1	2.8%	.167	.028	5.9%	0.0%
Kameratene	36	0	1	1	2.8%	.167	.028	0.0%	5.3%
Guidetorussia	36	0	1	1	2.8%	.167	.028	5.9%	0.0%
Leksikon	36	0	1	1	2.8%	.167	.028	5.9%	0.0%

Table A2: Reported Trust in Sources

Source	N	Min	Max	Mean	Str. Dev.	Total	N Boys	Trust Male	N Girls	Trust Girls
Wikipedia	31	1	3	2.10	.539	2.10	16	2.19	15	2.00
Globalis	18	2	3	2.83	.383	2.83	6	3.00	12	2.75
Google	11	2	3	2.73	.467	2.73	5	2.80	6	2.67
Daria	6	2	3	2.17	.408	2.17	3	2.00	3	2.33
Koordinatorerna	6	2	3	2.17	.408	2.17	1	3.00	5	2.00
SNL	5	3	3	3.00	.000	3.00	1	3.00	4	3.00
Historienet	5	2	3	2.80	.447	2.80	2	2.50	3	3.00
Landinfo	5	2	3	2.60	.548	2.60	2	2.50	3	2.67
propaganda	3	2	3	2.33	.577	2.33	0	-	3	2.33
Needham	3	2	3	2.33	.577	2.33	2	2.00	1	3.00
Aftenposten	2	2	3	2.50	.707	2.50	0	-	2	2.50
Forsvaret	2	3	3	3.00	.000	3.00	1	3.00	1	3.00
Leksikon	1	1	1	1.00	.	1.00	1	1.00	0	-
Skoleforum	1	2	2	2.00	.	2.00	0	-	1	2.00
MIL	1	2	2	2.00	.	2.00	0	-	1	2.00
Infoplease	1	2	2	2.00	.	2.00	1	2.00	0	-
Dagsavisen	1	3	3	3.00	.	3.00	1	3.00	0	-
Reddbarna	1	3	3	3.00	.	3.00	0	-	1	3.00
Kamerat	1	3	3	3.00	.	3.00	0	-	1	3.00
Guidetorussia	1	3	3	3.00	.	3.00	1	3.00	0	-

Table A3: URL List

Identifier	URL
amnesty.org	http://amnesty.org/en/library/info/ASA11/016/1999
an.wikipedia.org	http://an.wikipedia.org/wiki/Envasi%C3%B3n_sovietica_d%27Afganist%C3%A1n
answers.com	http://wiki.answers.com/Q/Why_did_the_Soviet_Union_invalidate_Afghanistan
caplex.no	http://caplex.no/Web/ArticleView.aspx?id=9333486
commons.wikimedia.org	http://commons.wikimedia.org/wiki/Category:Soviet_war_in_Afghanistan?uselang=no
cscs.umich.edu	http://cscs.umich.edu/~crshalizi/reviews/kakar-soviet-invasion/
daria.no	http://daria.no/skole/?tekst=431
de.wikipedia.org	http://de.wikipedia.org/wiki/Sowjetisch-afghanischer_Krieg
en.wikipedia.org [Leaders]	http://en.wikipedia.org/wiki/List_of_leaders_of_the_Soviet_Union
en.wikipedia.org [Afghanistan]	http://en.wikipedia.org/wiki/afghanistan
en.wikipedia.org [SovietWar]	http://en.wikipedia.org/wiki/Soviet_war_in_Afghanistan
globalis.no [Konflikter]	http://globalis.no/Konflikter/
globalis.no [Konflikter/Afghanistan]	http://globalis.no/Konflikter/Afghanistan
globalsecurity.org	http://globalsecurity.org/security/profiles/soviet_union_invalidates_afghanistan.htm
guidetorussia.com	http://guidetorussia.com/russia-afghanistan.asp
historienet.no	http://historienet.no/spor-oss/hvorfor-okkuperte-sovjet-afghanistan
infoplease.com	http://infoplease.com/ce6/history/A0802662.html
iran-bulletin.org	http://iran-bulletin.org/policital_commentary/afghanestan.html
koordinatoren.com	http://koordinatoren.com/index.php?option=com_content&view=article&id=611:sovjet-invaderer&catid=148:nyere-historie&Itemid=311
landinfo.no	http://landinfo.no/index.gan?id=401&subid=0
leksikon.org	http://leksikon.org/art.php?n=2870
mil.no	http://mil.no/start/aktuelt/nyheter/article.jhtml?articleID=63500
needham.k12.ma.us	http://nhs.needham.k12.ma.us/high_school/cur/Baker_00/2002-p4/baker_p4_12-01_mj_sz/
no.wikipedia.org [AfgDemRep]	http://no.wikipedia.org/wiki/Afghanistans_Demokratiske_Republikk
no.wikipedia.org [AfgSovKrig]	http://no.wikipedia.org/wiki/Den_afghansk-sovjetiske_krig
no.wikipedia.org [DenKaldeKrigen]	http://no.wikipedia.org/wiki/Den_kalde_krigen
no.wikipedia.org [KrigAfg2001]	http://no.wikipedia.org/wiki/Krigen_i_Afghanistan_(2001%E2%80%932002)

Identifier	URL
no.wikipedia.org [Mujahedin]	http://no.wikipedia.org/wiki/Mujahedin
no.wikipedia.org [AfghHist]	http://no.wikipedia.org/wiki/Afghanistans_Historie
no.wikipedia.org [BarakKamal]	http://no.wikipedia.org/wiki/Babrak_Kamal
no.wikipedia.org [Hafzulla]	http://no.wikipedia.org/wiki/Hafizullah_Amin
prio.no	http://prio.no/CSCW/Research-and-Publications/Publication/?oid=56854
snl.no [Afghanistan]	http://snl.no/Afghanistan
snl.no [Afghanistan/Historie]	http://snl.no/Afghanistan/historie
snl.no [Historie]	http://snl.no/historie
snl.no [Mujahedin]	http://snl.no/mujahedin
snl.no [SovjetHistorie]	http://www.snl.no/historie
snl.no [AfgStatsoverhoder]	http://www.snl.no/Afghanistan_%E2%80%93_historie/Statsoverhoder
vgd.no [forum]	http://vgd.no/samfunn/historie/tema/tittel/sovjetunionens-invasjon-av-afghanistan/threaded/true/side/ale
aftenposten.no	http://www.aftenposten.no/fakta/afghanistan

Appendix B: Task

Deltakernummer: _____

Oppgave

Under den kalde krigen ble Afghanistan invadert av Sovjetunionen. *Skriv en kort tekst hvor du forteller om denne invasjonen.*

- Bruk Internett for å finne informasjon.
- Skriv teksten i Word.
- Skriv ned kilder du bruker i Word-dokumentet.

Appendix C: Questionnaire

Deltakernummer: ____

Spørsmål 1: Kryss av om du er gutt eller jente.

Gutt

Jente

Spørsmål 2: Skriv ned alle kildene du brukte i arbeidet med oppgaven. For hver kilde krysser du av hvor mye du stoler på kilden (lite, passe, mye).

Kilde	Stoler <u>lite</u> på kilden	Stoler <u>passe</u> på kilden	Stoler <u>mye</u> på kilden
1)	O	O	O
2)	O	O	O
3)	O	O	O
4)	O	O	O
5)	O	O	O

Spørsmål 3: Pleier du å sjekke andre nettsider for å dobbelsjekke at informasjonen du finner på en nettside stemmer?

Nettside	Svar
Ofte	<input type="checkbox"/>
Noen ganger	<input type="checkbox"/>
Sjelden	<input type="checkbox"/>
Aldri	<input type="checkbox"/>

Spørsmål 4: Hvilken nettside bruker du mest til skolearbeid?

Svar: _____

Spørsmål 5: Hvor mye stoler du på informasjonen du finner på disse nettstedene? Velg mellom lite, passe, eller mye. Dersom du ikke har hørt om nettstedet krysser du av i firkanten.

Nettside	Kryss her om du ikke har hørt om nettsiden	Stoler <u>lite</u> på nettsiden	Stoler <u>passe</u> på nettsiden	Stoler <u>mye</u> på nettsiden
vg.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
daria.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
linksidene.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
nrk.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
wikipedia.org	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cnm.com	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
perezhilton.com	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dagbladet.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seher.no	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Spørsmål 6: Hvor ofte bruker du disse søkemotorene? Velg mellom ofte, noen ganger, sjelden, eller aldri. Dersom du ikke har hørt om søkemotoren krysser du av i firkanten.

Søkemotor	Kryss her om du ikke har hørt om søkemotoren	Ofte	Noen Ganger	Sjelden	Aldri
MSN	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yahoo	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sesam	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kvasir	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BING	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Spørsmål 7a: Hvilken søkemotor mener du gir de beste søkeresultatene?

Svar: _____

Spørsmål 7b: Hvilken søkemotor bruker du oftest?

Svar: _____

Spørsmål 8: Hvilke *nettleserer* bruker du på skolen og hjemme? Svar om du bruker nettleseren kun på skolen, både hjemme og på skolen, eller kun hjemme. Dersom du ikke har hørt om nettleseren krysser du av i firkanten.

Nettleser	Kryss av her om du ikke har hørt om nettleseren	Brukes kun på skolen	Brukes på skolen og hjemme	Brukes kun hjemme
Chrome	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Firefox	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet Explorer	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Opera	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Andre: _____	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Spørsmål 9a: Hvilken nettleser bruker du mest?

Svar: _____

Spørsmål 9b: Hvilken nettleser mener du er den beste?

Svar: _____

Spørsmål 10: Stoler du på informasjonen du finner på Wikipedia?

Alternativ	Svar
Ja	<input type="checkbox"/>
Delvis	<input type="checkbox"/>
Nei	<input type="checkbox"/>
Usikker	<input type="checkbox"/>

Spørsmål 11: Hvor mye stoler du på disse kildene?

Kilde	Stoler <u>lite</u> på kilden	Stoler <u>passe</u> på kilden	Stoler <u>mye</u> på kilden
Lærebøker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV-programmer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blogger	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nettavisar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wikipedia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lærere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fagsider på nett	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Spørsmål 12: I hvilken rekkefølge ville du besøkt disse nettsidene dersom oppgaven var å finne ut informasjon om **Jugoslavia under den kalde krigen**?

Bruk tallene fra 1-5. Velg 1 for det resultatet du ville besøkt først, og 5 på det du ville besøkt sist. Skriv svarene i boksene til venstre.

<input type="checkbox"/>	<p>Den kalde krigen - Daria.no *Hvilken stilling hadde Jugoslavia under "Den kalde krigen"?*. Jernteppet deler Europa. I Jugoslavia var kommunistene i flertall, men lederen, Tito, ... www.daria.no/skole/?tekst=7653 - Bufret - Lignende</p>
<input type="checkbox"/>	<p>Om oppdelinga av Jugoslavia (omtale) Under den kalde krigen var Jugoslavia et nyttig land både for USA og Sovjetunionen i kraft av å være en uavhengig buffer mellom blokkene. I og med den kalde ... marxisme.no/index.php/2008/13-nr-1.../273-mathias-bismo.html - Bufret</p>
<input type="checkbox"/>	<p>Jugoslavia-krigene - Wikipedia Gå til Bosnia-krigen: ... det tidligere Jugoslavia at 102 000 mennesker døde under krigen, ... på den kalde krigen og fallet av kommunismen i tidligere ... Konfliktene - Slovenia-krigen - Se også - Referanse no.wikipedia.org/wiki/Jugoslavia-krigene - Bufret - Lignende</p>
<input type="checkbox"/>	<p>Josip Broz Tito - Wikipedia I 1915 blir han sendt til Galicia i krig mot Russland. ... I 1920 Josip Broz blir medlem av det Jugoslaviske Kommunistpartiet. ... 5. april 1945 skrev Tito under en avtale med Sovjetunionen hvor man tillot «midlertidig adgang for ... Personer fra den kalde krigen Kommunister Fødsler i 1892 Dødsfall i 1980 ... no.wikipedia.org/wiki/Josip_Broz_Tito - Bufret - Lignende</p> <p>+ Vis flere resultater fra no.wikipedia.org</p>
<input type="checkbox"/>	<p>Oppsplittelsen av Jugoslavia - Norsk Skoleforum Den geostrategiske situasjonen under den kalde krigen gjorde at de ulike jugoslaviske folke-gruppene var avhengige av den kollektive sikkerheten Jugoslavia ... www.skoleforum.com/stiler/saeroppgave/det.aspx?id=2522 - Bufret - Lignende</p>

Spørsmål 13: Hvilket av disse nettstedene tror du vil ha best informasjon om den kalde krigen?

Webside	Svar
coldwarfacts.org	<input type="checkbox"/>
coldwarfacts.net	<input type="checkbox"/>
coldwarfacts.com	<input type="checkbox"/>
coldwarfacts.info	<input type="checkbox"/>
Usikker	<input type="checkbox"/>

Spørsmål 14: I hvilken rekkefølge ville du besøkt disse nettsidene dersom oppgaven var å finne ut informasjon om Vietnam-krigen?

Bruk tallene fra 1-5. Velg 1 for det resultatet du ville besøkt først, og 5 på det du ville besøkt sist. Skriv svarene i boksene til venstre.

<input type="checkbox"/>	<p>Vietnamkrigen - Wikipedia Vietnamkrigen (fra siste halvdel av 1950-tallet–1975), også kalt andre indokinesiske krig, startet da Nord-Vietnam infiltrerte og etter hvert invaderte ... Andre verdenskrig og tiden etter - Ny krig - Amerikansk opptrapping no.wikipedia.org/wiki/Vietnamkrigen - Bufret - Lignende</p>
<input type="checkbox"/>	<p>Kategori:Vietnamkrigen - Wikipedia [+] Personer fra Vietnamkrigen (16 sider). Artikler i kategorien «Vietnamkrigen» ... Hentet fra «http://no.wikipedia.org/wiki/Kategori:Vietnamkrigen» ... no.wikipedia.org/wiki/Kategori:Vietnamkrigen - Bufret - Lignende</p>
<input type="checkbox"/>	<p>Vietnamkrigen - Daria.no Det ble faktisk bombet 3 ganger så mye i Vietnamkrigen som i 2. verdenskrig og veldig mye av det i Sør. Dette kom av at i nord ble det bombet politiske mål, ... www.daria.no/skole/?tekst=1312 - Bufret - Lignende</p>
<input type="checkbox"/>	<p>Vietnam-krigen - Daria.no Vietnam-krigen er et vidt tema med mye interessant stoff. Personlig valgte jeg emnet fordi jeg interesserer meg for verdens kriger. ... www.daria.no/skole/?tekst=4831 - Bufret - Lignende</p> <p>Bilder funnet av vietnamkrigen - Rapporter bilder</p> 
<input type="checkbox"/>	<p>Store norske leksikon - Vietnamkrigen Vietnamkrigen, den væpnede konflikten mellom Nord-Vietnam (med FNL fra 1960) og Sør-Vietnam fra midten av 1950-årene til 1975; særlig i tiden 1963–73 da USA ... www.snl.no/Vietnamkrigen - Bufret - Lignende</p>

Spørsmål 15: Hvilken av disse lenkene til nettsider tror du vil lede til den beste informasjonen om den kalde krigen?

Webside	Svar
answers.com/topic/cold-war	<input type="checkbox"/>
historylearningsite.co.uk/coldwar	<input type="checkbox"/>
wikipedia.org/wiki/Cold_War	<input type="checkbox"/>

På de neste sidene skal du svare på noen enkle oppgaver

Oppgave 1a

Du skal nå vurdere om du ville brukt denne nettsiden som kilde i en oppgave om *Trumandoktrinen*. Bruk ett minutt på å studere dette skjermbildet før du blir om til neste side.

The screenshot shows the 'Store norske leksikon' website. At the top, there are promotional banners for book clubs. The main header reads 'STORE NORSKE LEKSIKON' with a search bar and the text 'Norges ledende oppslagsverk gjennom 100 år'. Below the header is a navigation menu with links: Forsiden, Om leksikonet, Min side, Bli fagansvarlig!, Bidral, and Logg inn.

The article titled 'Trumandoktrinen' is the central focus. It is written by Torbjørn Sirevåg and was last updated on 31.08.2009. The article text reads: 'Trumandoktrinen, populær betegnelse på de retningslinjer for USA's utenrikspolitikk som president Harry S. Truman la frem i en erklæring 12. mars 1947. I erklæringen fastslo Truman at USA måtte støtte alle frie nasjoner som prøvde å motstå undertrykkelse fra så vel minoriteter i landet som utenlandske krefter. Truman så dermed for seg USA i rollen som «verdens politimann». Hensikten var å motvirke kommunistisk innflytelse. Truman bad i samme tale om militær og økonomisk støtte til Hellas og Tyrkia, etter at Storbritannia hadde erklært seg ute av stand til å gi Hellas den nødvendige hjelp mot kommunistisk partisanvirksomhet. Trumandoktrinen var et vendepunkt i amerikansk utenrikspolitikk og et utslag av containment-politikken. Konkrete utslag av doktrinen viste seg med etableringen av Marshallhjelpen og opprettelsen av NATO. Se for øvrig kalde krig.'

On the left side of the article, there are sections for 'Slik siterer du' (with a link to citation guidelines), 'RSS-lenker' (with links for the latest articles and commented articles in the category), and 'Les mer'.

On the right side, there is a 'DEL' button with social media icons, a 'Kvalitetssikret' badge, and a 'Bidral' section. The 'Bidral' section lists 'Ottar Julsrud' as the article's author and fagansvarlig, with a link to 'Lag artikkel om nytt tema' and a 'Historikk' link.

At the bottom of the article, there is a small image of a spiral notebook with the text 'Ingen minstebeløp' and a checkmark.

Oppgave 1b

Du skal nå avgjøre om punktene nedenfor har betydning for om du ville brukt denne nettsiden som en kilde. Kryss av i tabellen under.

4 STORE NORSKE LEKSIKON

SØK Norges ledende oppslagsverk gjennom 100 år

Forsiden Om leksikonet Min side Bli fagansvarlig! Bidra! Logg inn

1 Slik siterer du
Vi håper på mest mulig bruk av Store norske leksikon-artikler i andre sammenhenger ...
Les mer

2 Bli medlem i Bokklubben Nye Bøker
Få 3 bøker + DVD Menn som hater kvinner GRATIS*

3 **Trumandoktrinen**
Forfatter: Torbjørn Sirevåg
Sist endret: 31.08.2009

5 Kvalitetssikret

Trumandoktrinen, populær betegnelse på de retningslinjer for USA's utenrikspolitikk som president Harry S. Truman la frem i en erklæring 12. mars 1947. I erklæringen fastslo Truman at USA måtte støtte alle frie nasjoner som prøvde å motstå undertrykkelse fra så vel minoriteter i landet som utenlandske krefter. Truman så dermed for seg USA i rollen som «verdens politimann». Hensikten var å motvirke kommunistisk innflytelse. Truman bad i samme tale om militær og økonomisk støtte til Hellas og Tyrkia, etter at Storbritannia hadde erklært seg ute av stand til å gi Hellas den nødvendige hjelp mot kommunistisk partisanvirksomhet. Trumandoktrinen var et vendepunkt i amerikansk utenrikspolitikk og et utslag av containment-politikken. Konkrete utslag av doktrinen viste seg med etableringen av Marshallhjelpen og opprettelsen av NATO. Se for øvrig kalde krig.

Artikkelansvarlig
Ottar Julsrud er ansvarlig for denne artikkelen og fagansvarlig for alle artikler i fagkategorien USA (Nord- og Mellom-Amerikas historie)

Bidra!
Rediger
Lag artikkel om nytt tema
Historikk

Punkt	Har betydning	Har liten betydning
1) Dato for endring av innhold (31.08.09)	<input type="radio"/>	<input type="radio"/>
2) Reklame fra bokklubben	<input type="radio"/>	<input type="radio"/>
3) Navnet på forfatteren av artikkelen	<input type="radio"/>	<input type="radio"/>
4) Navnet på nettstedet (Det Store Norske Leksikon)	<input type="radio"/>	<input type="radio"/>
5) Kvalitetsstempleet	<input type="radio"/>	<input type="radio"/>

Ville du brukt siden som kilde?

Ja

Nei

Begrunn svaret her:

Oppgave 2a

Du skal nå vurdere om du ville brukt denne nettsiden som kilde i en oppgave om *Marshallhjelpen*. Bruk ett minutt på å studere dette skjermbildet før du bler om til neste side.

Prøv tabletten som kan løse problemet ditt NÅ!

[Les avsløringen her](#)



HAR DU STIL?

VINN LOUIS VUITTON DESIGNER SKO



Daria.no Bli venn med Daria på [Twitter!](#)

Brukernavn: Passord: [Logg inn](#)

[Registrer deg!](#) [Glemt passord](#) Husk meg

Nettavis Skole Jobb Venner Mobil Spill Forum Medlem

Last opp stil Søk etter stiler Emne katalog Diskuter skole

Annonsler fra Google EU Politiske Partier EU OG EØS ØST Europa

Velg sjanger

- Analyse/tolkning
- Anmeldelse (bok, film...)
- Artikkel
- Biografi
- Dikt
- Essay
- Eventyr
- Faktaoppgave
- Fortelling
- Kåseri
- Leserinnlegg
- Novelle
- Rapport
- Referat
- Resonnerende
- Sammendrag av pensum
- Særemne
- Særøppgave
- Temaoppgave
- Annet

Marshallhjelpen

Essay arbeidsoppgave om den kalde krigen.
Karakter: 5+

Sjanger: Temaoppgave
Språkform: Bokmål
Forfatter: Anonym
Tema: Den kalde krigen
Lastet opp: 26.05.2004
Verktøy:

Dømmer Ikke (inndratt bok)
av Milorgsjef Oliver H.Langeland Terningkast 5 i VG. Bestilles her [www.maxmanusleser.no](#)

Annonsler fra Google

Jeg tror det må være riktig å si at etterkrigstiden, slik vi kjenner den på vestlig side, begynte med Marshallhjelpen. Det var først med Marshallhjelpen at det ble fart i gjenreisningen etter andre verdenskrig. Europa var i 1947 stadig både nedslitt og utmattet. Kontinentet trengte en blodoverføring - økonomisk, politisk og ikke minst psykologisk. Marshallhjelpen dekket dette behovet på mange måter men hadde også sine negative sider.

For Norge, som slet med en valutakrise i 1947-48, kom Marshallhjelpen som en stor gave mente mange. I alt mottok Norge nærmere tre milliarder kroner i økonomisk bistand fra USA i perioden 1948-51. Dette tilsvarte omlag 13 prosent av BNP i 1949. I dag er dette omtrent like mye som det ett års inntekter fra olje- og gassvirksomheten utgjør av den samlede verdi- skapning i norsk økonomi. Marshallhjelpen bidro derfor i høy grad til å lette det økonomiske presset på Norge. Regjeringen kunne gjennomføre sine planer for gjenreisningen og holde investeringene oppe uten å måtte gå til nedskjæring av privat forbruk. Det gjorde at folk forholdsvis raskt og konkret fikk merke resultater av gjenreisningen. De opplevde selv at det gikk fremover. Dette bidro til å opprettholde den politiske stabiliteten i landet.

Annonsler fra Google

Økonomisk Marshallhjelpen styrket de personlige, økonomiske og politiske bånd mellom Norge og USA (noe det er uenighet om). De som administrerte hjelpeprogrammet

Søk i stiler

[Søk](#)

Topp 5 fargebilder

- 
- 
- 
- 
- 

HAR DU STIL?

VINN LOUIS VUITTON DESIGNER SKO



Oppgave 1b

Du skal nå avgjøre om punktene nedenfor har betydning for om du ville brukt denne nettsiden som en kilde. Kryss av i tabellen under.

The screenshot shows the Daria.no website interface. At the top, there is a banner for 'Prøv tabletten som kan løse problemet ditt NÅ!' with a cartoon character and a link 'Les avsløringen her'. Below this is a navigation bar with categories like 'Nettavis', 'Skole', 'Jobb', 'Venner', 'Mobil', 'Spill', 'Forum', and 'Medlem'. A search bar and login options are also visible. The main content area features an article titled 'Marshallhjelpen' with a sub-heading 'Essay arbeidsoppgave om den kalde krigen. Karakter: 5+'. The article text discusses the Marshall Plan's impact on Norway. To the right of the article is a sidebar with 'Søk i stiler' and 'Topp 5 fargebilder'. At the bottom right, there is a large advertisement for 'HAR DU STIL? VINN LOUIS VUITTON DESIGNER SKO' featuring a woman and high-heeled shoes.

Punkt	Har betydning	Har liten betydning
1) Reklame for Louis Vuitton designer sko	<input type="radio"/>	<input type="radio"/>
2) Karakteren på oppgaven (5+)	<input type="radio"/>	<input type="radio"/>
3) Navnet på nettstedet (Daria.no)	<input type="radio"/>	<input type="radio"/>
4) Anonym forfatter	<input type="radio"/>	<input type="radio"/>
5) Dato for opplasting av innhold (26.05.04)	<input type="radio"/>	<input type="radio"/>

Ville du brukt siden som kilde? Ja Nei

Begrunn svaret her