Digital Natives?

Swedish High School Students’ On-line Information Gathering Strategies when

Reading in English

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Abstract

In today’s society searching for information has become a question of whether one can use a computer or not. This study examines six Swedish high school students’ digital literacy skills. Specifically how they search for information on-line, how their digital literacy is displayed, what strategies they use to collect the information that is needed for a task and how they do this when they read in English, which is their second language.

The main thesis of this study is that students are assumed to be digital natives and society needs to have knowledge about what strategies they use when reading on-line in English and how they think while completing a task. Questions which have been asked are, what strategies do students use while reading on-line? What impact does the subject of the text have on the students reading efficiency? Are students efficient on-line readers in English? And are students really so-called digital natives?

The method developed into three main stages which were constructing a questionnaire, constructing a task and performing think-aloud recordings. The questionnaire intended to enable the selection of participants as well as provide background information for constructing the appropriate task for this study. The second stage was to construct two texts with questions and the third stage of the study was to perform think-aloud recordings with the participants as they were answering the questions. By developing the students’ language skills in English combined with digital literacy, the participating students have the ability to become more efficient on-line readers in English, thus make it easier for them to effectively gather information on-line.

Keywords: Digital literacy, English as a second language, High school, On-line reading strategies.
Preface

First of all I would like to say thank you to my supervisor Lydia Kokkola. She introduced me to the subject of this study and has also been very supportive and helpful me during the entire process of this essay. Another big thank you goes to the six participants whom were willing to participate in this study, I would not even have an essay without all of you.

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Sofia Betcke
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1. Introduction

In today’s society people read everywhere they go, on computers, advertisement, e-mails, text messages and e-books, just to name a few. The internet and cell phones have become mans’ new best friends and many people stay on-line even when they do not have to. Communication and how people find information have rapidly become important for society and therefore important to learn more about. Reading on-line is as well something that has grown with the same pace as the technology that is now emerging, which means that this is also an area which needs to be explored.

The rate of growth in online reading has been exponential. In the history of literacy, no other technology for reading, writing or communication has been adopted so rapidly, by so many people, in so many places, and with such expansive implications for literacy. These changes have prompted research in online reading comprehension that seeks to understand what it means to read online and how best to support students in doing so (Leu et al., 2008, p. 322)

According to Leu et al. (2008) people need to have more knowledge about on-line reading, what strategies one use while reading on-line and how teachers can help and develop students’ strategies in the on-line reading process.

People use computers, cell phones and tablets daily which means that children and youngsters today are used to using these electronic devices, from home or from school. Young people come in contact with on-line reading quite early in their lives and they are sometimes being called “digital natives” (Prensky, 2001). Digital natives are today’s generation of children and young adults who are brought up with the internet and therefore are assumed, by society, to be good at using the internet. These so-called digital natives are described as good internet users and on-line readers (Prensky, 2001), but are they really? And what is known about these skills? Åkerfeldt, Karlström, Selander and Ekenberg (2013) have noticed that many schools in Sweden strive towards every teacher and every student having a computer of their own while in school. If a computer should be handed out to each and every student then teachers and schools should take responsibility for teaching the students how to become efficient on-line readers. But if the teachers and schools should take on this responsibility, they also need to understand which on-line reading strategies students have and how students use the computers.

Bennett, Maton, and Kervin (2008) state that “without critical rational discussion, little progress can be made towards a genuine debate about digital natives” (p. 783), this might seem as given, but this debate should also include what happens when so-called digital natives read on-line in English as a second language (ESL). Students might feel comfortable and have knowledge in today’s technology in their first language, but when talking about English as a second language, what happens then? As written above communication is an important part of people’s lives, and to be able to communicate in a foreign language has become necessary. Communication touches upon both the internet and ESL, and that is why teachers must have knowledge about how students use the internet and read on-line when talking about ESL. This
aspect is something that needs to be developed and discussed more since on-line reading and ESL is not a debate that is discussed today, compared to the discussion concerning on-line reading in one’s first language.

Why I chose to investigate about students’ on-line reading strategies was because of my supervisor, Lydia Kokkola. The idea of performing a think-aloud study with students in school about their skills when reading on-line made me interested in Lydia Kokkola’s project and since I am becoming a high school teacher in English, I also liked the idea of the study focusing on ESL.

To be able to understand more about how students read on-line and what strategies they use while completing a task so-called ‘think-aloud protocols’ have been performed. Think-aloud protocols are a kind of verbal reporting which is “a special type of introspection and consists of gathering protocols, or reports, by asking individuals to say what is going through their minds as they are solving a problem or completing a task” (Mackey & Gass, 2005, p. 77). This method will help in the understanding of students’ strategies in on-line reading as well as their own understanding of how they search for information on-line.

1.1 Aim

Because students are assumed to be digital natives, society needs to have knowledge about what strategies they use when reading on-line in English and how they think while completing a task. This paper examines the following questions:

1. What strategies do students use while reading on-line?
2. What impact does the subject of the text have on the students’ reading efficiency?
3. Are students efficient on-line readers in English?
4. And are students really so-called digital natives?
2. Background

When talking about on-line reading the term digital literacy (also known as ‘the new literacy of the internet’) becomes a central word to acknowledge. Digital literacy is not only one thing, since digital literacy includes and involves finding information on-line, communicating and to evaluate the information that is found (Leu et al., 2004). Everyone can learn to communicate on-line but to be efficient while doing so, both skills and strategies are necessary tools.

On-line reading and communication are important aspects when discussing digital literacy in society, but one should not forget the importance of reading in a second language. There are vast differences when people acquire their first language compared to a second language. A study by McLaughlin (in O’Malley & Chamot, 1990), focused on reading with first language (L1) readers and second language (L2) readers in English, which showed “that native speakers of a language focus on meaning and process the structural aspects of the text automatically. Individuals with less proficiency in the language devote both attention and processing energy to encoding both meaning and structure” (p. 65). Since this study was an off-line reading study the structure of the text becomes a misleading discussion for this essay, because on-line texts and off-line texts are not structured the same. But meaning is important in both on-line and off-line reading, since understanding the text will always be necessary.

In Sweden today schools are starting to focus on information gathering on the internet and the importance around this gathering (Swedish National Agency for Education, 2011a). The internet plays a big role in students’ daily life and for schools to help students conquer the skills and strategies in becoming efficient on-line readers in both their L1 and L2 is both helpful and necessary.

2.1 Digital literacy becomes the new literacy

The Swedish National Agency for Education (2013) suggests a definition of digital reading as well as traditional reading. Digital reading is when one reads texts from a computer screen which are available on-line and traditional reading is when one reads printed texts. The Swedish National Agency for Education (2013) also mentions e-books which land somewhere in between digital reading and traditional reading, the text is on a screen but the reading is reminiscent to traditional reading.

Reading literacy is a term that comes into focus when speaking about reading comprehension. Today the term literacy has adapted a new meaning since what, where and when people read has changed through time and researchers now mention new literacy when talking about on-line reading. The Organisation for Economic Co-operation and Development (OECD) carry out tests around the world every 3rd year to see how 15-year-olds’ skills in mathematics, science and reading develop. The tests are called Programme for International Student Assessment (PISA) and the PISA test that was carried out in 2012 gives a definition of literacy as “reading literacy is understanding, using, reflecting on and engaging with written texts, in order to achieve one’s goals, develop one’s knowledge and potential, and participate
in society” (OECD, 2013, p.61). But as Leu et al. (2004) write, new literacy is complex and is difficult to describe but they give a definition such as:

The new literacies of the Internet and other ICTs [Information and communications technology] include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others. (p. 1572)

Reading literacy and new literacy have overlapping similarities such as reflecting on texts, but the new literacy focuses more on adapting knowledge fast and with a critical mindset.

A great difference between reading on-line and traditional reading is the fact that on-line, people can jump between texts and the structure of the on-line texts is sometimes combined with films, advertisement and sound. Traditional reading and printed texts almost always involve narratives or reading for pleasure while on-line reading is strongly linked to skim reading and searching for information. One can search and find information in books and papers, but books require to be read carefully to understand as a whole, while on-line reading is built up for people to skim read, click on links and be tempted to follow advertisement (Swedish National Agency for Education, 2011b).

Coiro, (2011), Leu et al. (2008), and Mokhtari, Kymes and Edwards (2008) all suggest that on-line reading is problem-based, since on-line reading often begins with a problem or a question that “requires skills, strategies and dispositions that are likely to contain new aspects that are not acquired during offline reading comprehension” (Leu et al., 2007, p. 21). Leu et al. (2008) puts problem-solving and on-line reading in a perspective to each other by writing “…we read on the internet to solve problems and to answer questions. How a problem is framed, or how a question is understood, is a central aspect of online reading comprehension” (p. 323). The fact that on-line reading is a problem-based reading strategy is something that needs to be acknowledged.

Skilled readers have two main characteristics, one is their cognitive awareness which involves their ability to read between the lines and connect previous knowledge about a subject with the new information. The other characteristic is the skilled reader’s way to use the computer and navigate on the internet. For example if he or she has a problem-solving mindset, they evaluate their pathways to get to the answer and they reflect on what they are reading (Coiro, 2011; Coiro & Dobler, 2007). An interview was held by Mokhtari et al. (2008) with several researchers (members of the New Literacies Research Lab; W. Ian O’Byrne, Lisa Zawilinski, J. Greg McVerry and Donald J. Leu) about reading on-line where their research shows that on-line reading comprehension is strongly linked to five different areas such as:

1. reading online generate a problem or question from one’s social context,
2. reading to locate information online,
3. reading to critically evaluate information online,
4. reading to synthesize information online from multiple
As these researchers’ work has shown, these five areas need to be known to schools, teachers and students so that the students can develop their on-line reading comprehension skill.

The on-line reader needs to learn how to navigate through the text he or she reads on-line and since hyperlinks often appear in texts on-line it is even more important to learn how to navigate through a text (Swedish National Agency for Education, 2013). Hyperlinks are what really separate printed text from texts on the internet, and that is why on-line reading is called non-linear reading (Liu & Huang, 2008). In a study by Park and Kim (2011) they saw that the participants did use hyperlinks, but that every participant evaluated the hyperlinks differently before clicking.

2.2 Who is the reader?

Many people read today, but what is known about the reader? The questions about L2 on-line readers and whether the different sexes are efficient readers are questions that are important for this essay.

Park and Kim (2011) have noticed the importance of on-line reading strategies and second language reading strategies, and that they have to be put forward. They state “although both reading and strategy use in online contexts have become important, few researchers have investigated L2 readers’ online reading strategies” (p. 2158). What Park and Kim (2011) also figured out from their qualitative case study with ESL was that the “…ESL learners comprehend online text and employ tasks such as incorporating paper-based reading strategies, adopting them, and modifying them. They also invent new reading strategies through ongoing dialogues” (p. 2164). The students in Park and Kim’s study are called hybrids since they apply off-line reading strategies to their own second language knowledge in the on-line reading environment.

O’Malley and Chamot (1990) describe the learning process and the process of acquiring a new language as two complex cognitive skills and to investigate the different learning strategies with second language users they have used think-aloud as a method. The study O’Malley and Chamot (1990) performed was a “longitudinal study of learning strategies used by foreign language students for different language tasks” (p. 133) and using think-aloud protocols “allowed … to identify specific strategies used most frequently for particular language tasks” (ibid.). One of the strategies they found, was what they called advanced organization, which could be applied to reading and implied that the foreign language students prepared for a task by going through what knowledge they already had of the topic. Another strategy was that “students sometimes used directed attention to focus on a task while they were actively engaged in completing it rather than before starting it” (p. 136). Think-aloud protocols can give much information concerning second language acquisition and learning strategies but one should not forget the importance of understanding and acquiring strategies about on-line reading.
Understanding the mental process in the students’ minds while completing a task is difficult and that is why so-called verbal reporting such as think-aloud and talk-aloud methods are important. Ericsson and Simon (1987) claim that to understand the mental processes of a think-aloud project one has to make it manageable to understand, “take on a more “naive” view” (p. 38). During a think-aloud task the participants are asked to think out loud, with this in mind the think-aloud task could also provide with additional information such as knowledge about what the participants are doing physically (Ericsson & Simon, 1987). The learning strategies above links to second language learning, but can these strategies apply to on-line reading as well as SLA?

How boys and girls read on-line is also an important aspect in the understanding of language acquisition and on-line reading. According to Large, Beheshti and Rahman (2002) and Liu and Huang (2008), male on-line readers are more active on the internet than female on-line readers, this can be seen in the fact that the male participants in Large et al.’s (2002) study click on more hyperlinks per minute than the female participants. Liu and Huang’s study was a questionnaire to undergraduate students and graduate students in China while Large et al.’s study from 2002 was a case study with primary school children from Montreal, Canada. Another finding was that female on-line readers tend to appreciate reading on paper while male on-line readers had more interest in on-line reading (Liu & Huang, 2008).

2.3 On-line reading in Sweden

In Sweden today people live close to computers in their homes and statistics show that 91% of all people between the ages 16-85 have at least one computer at home (SCB, 2014). People often use their smart phone to access the internet which 6 out of 10 Swedes did during the first quarter of 2013 (ibid.). Reading news on-line is very common (82%) between the ages 16-24. 82% also use the internet to collect information about products and services, 89% answered that they “have used the internet to consult wikis (e.g. Wikipedia)” (SCB, 2014, p. 78) during the first quarter of 2013 and only 23% use the internet to borrow/reserve books at libraries or read e-books. The most common act on the internet for 16-24-year-olds are sending and receiving e-mails which 94% do.

The use of computers and the internet is very common in Sweden for 16-24-year-olds and reading is involved in almost every act above (reading news, searching on wikis, reading e-mails). The difference between reading on-line and off-line is still an area which is emerging but many researchers argue that on-line reading is a type of problem-based process (Coiro, 2011; Leu et al., 2008). Mokhtari, Kymes, and Edwards (2008) have noticed that “online reading comprehension is almost always a problem-solving process with informational text. It begins with a question and takes place within a nearly limitless informational space where anyone may publish anything” (p. 354). Understanding that there are differences between on-line and off-line reading is one step in becoming an efficient reader, the next step then becomes knowing what the differences are, for example that on-line reading is often a problem-based process.
During 2009 the Programme for International Student Assessment (PISA) investigated 15-year-olds’ reading comprehension on digital reading. This year was the first time PISA had a study concerning students’ reading comprehension on the internet. The Swedish National Agency for Education (2011b) put together the results for Swedish students’ reading skills in the PISA study. The result showed that if a student was good in traditional reading he or she was good at digital reading as well and also the other way around, but there were of course exceptions. Other findings showed that the group called “good readers in general” had more girls in it and they read more on paper compared to the group “less good readers in general”. The results also showed that both gender and socio-economic background are important when talking about students’ reading skills (Swedish National Agency for Education, 2013).

Another necessity is for students to have the ability to navigate through digital texts since one must search for information, reflect and evaluate what kind of information that is relevant (2011b). In the Swedish curriculum for high school, the Swedish National Agency for Education (2011a) writes that “it is the responsibility of the school that all individual students…can use books, library resources and modern technology as a tool in the search for knowledge, communication, creativity and learning” (p. 9) also the Swedish National Agency for Education writes in the syllabus that “teaching should make use of the surrounding world as a resource for contacts, information and learning, and help students develop an understanding of how to search for, evaluate, select and assimilate content from multiple sources of information, knowledge and experiences” (p. 53). The school should then help students develop their understanding and evaluate their collected information with help of modern technology, but what knowledge do students have before they enter high school? There is an age gap between students in school and teachers and this age gap becomes clear when one looks at the fact that young adults in school today grew up with modern technology while their teachers did not. There is a possibility that students who enter school might have better knowledge about finding information on the internet than some teachers and this makes the teachers’ role even more important, to help students become efficient internet users and readers (Leu et al., 2004).

Every student brings their own personal knowledge about the language of technology to school. To maintain interest, teachers and schools need to be prepared for this so they can help students learn and develop the skills of becoming efficient on-line readers. Marte Blikstad-Balas (2012) mentions that “it goes without saying that banning Internet activity will not contribute to developing students’ literacy skills. What might need more explicit attention, is that neither will allowing unlimited Internet access without any guidance or clear educational purpose” (p. 94). On-line reading needs to become a part of the teaching pedagogy since students need assistance from teachers to become effective on-line readers. This includes navigating on-line, finding information but also on-line reading needs to become a part of the teaching pedagogy (Henry, 2006). Another important aspect in the discussion about reading on-line is the amount of information that is available on the internet. Critical thinking is very important when reading on the internet and even though some
students already have learned to think critically, they may still need guidance from teachers to find the right information depending on the task (Leu et al., 2004).

3. Method

Think-aloud protocols have been used in this study to get a wider understanding of the research questions:

- What strategies do students use while reading on-line?
- What impact does the subject of the text have on the students reading efficiency?
- Are students efficient on-line readers in English?
- And are students really so-called digital natives?

In excess of the think-aloud protocols questionnaires, consent forms and the actual task had to be developed in order for the study to be carried out.

3.1 First stage – The participants and the topics

Firstly a questionnaire was constructed (see Appendix 1) which consisted of eight questions about the students’ internet habits and on-line reading habits, as well as their skills in English. The goal with the questionnaire was to examine if there were any differences in the students’ internet habits and their reading efficiency. The plan was to have participants who spent a large amount of time on the internet as well as participants who did not spend much time on-line, but since the participants’ reading habits were much alike, the questionnaire then served the purpose of deciding the topics of the starting texts/pages and questions.

Six high school students were selected to participate in the think-aloud project. Four students attended their first year in high school and two attended their second year in high school. The students were selected after having answered the questionnaire, which showed that all were experienced internet and computer users and had Swedish as a native language.

Since three of the picked out students were boys and three were girls, stereotypical texts were chosen to investigate whether there were any connection between the text they read and their reading efficiency, also because the questionnaires revealed stereotypical behaviour in the participants’ reading habits. The questionnaire revealed that all three boys were interested in ice hockey, while the girls were more into reading blogs and watching TV series, which made me decide to have ice hockey as one topic and fashion as another.

This first stage needs to address the sampling of a study since “questions of sampling arise directly out of the issue of defining the population on which the research will focus. Researchers must take sampling decisions early in the overall planning of a piece of research” (Cohen, Mansion, & Morrison, 2000, p. 92). In the study I have carried out, the six students represents the sample group. This cannot be deemed a representative sample but can still be illustrated of the target population. When the questionnaire was handed out to the students who attended their first year of high school, my intention was purposive sampling. Purposive
sampling means that I would pick out the participants that seemed most appropriate for researching reading habits and on-line reading efficiency, “in this way, they build up a sample that is satisfactory to their specific needs” (Cohen et al., 2000, p. 103). Since only four students were willing to participate, an additional questionnaire was given to students in their second year of high school, where two students were willing to participate. The sampling group then became a so-called convenience sample, which “involves choosing the nearest individuals to serve as respondents and continued sample size has been obtained” (Cohen et al., 2000, p. 102). This was a positive aspect for the essay since this convenience sample led to several research questions of this essay.

3.2 Second stage – Creation of the texts and questions

The two texts the participants were going to have as a starting page very much resembled a wiki-type of text. The information collected for the texts about ice hockey and fashion was copy-pasted from different websites, mostly Wikipedia. Since this study focuses on on-line reading comprehension, a decision for the students to already be on the internet while starting the task felt important, a word-document would not be enough and creating a website felt like a task too big for this study. I decided that creating a Google document for each text would be the best solution, since the students would already be on the internet when starting the think-aloud task, they could easily click on hyperlinks and open a new (or using an already existing) tab.

Another important aspect of the two texts was that they had to resemble each other as much as possible in structure. I focused on that they were going to be equally long, have around the same amount of hyperlinks and that the structure of the information should resemble as well, for example the text about ice hockey started with information about the history about the sport and the text about fashion started with history about fashion. The two texts were about 3000-3200 words, they had approximately 200 hyperlinks each, so about every 15th word was a hyperlink. After the texts were constructed four people at the university, with no further education in English since high school, read the two texts and were timed to get a perspective on how long it would take to just read the texts from top to bottom. This took roughly 15 minutes per text which made me decide that the students should have a maximum time at 30 minutes to answer all questions. The questionnaire played an important role in this study, as background information about the students’ reading and internet habits and as a reason to choose ice hockey and fashion as topics for the starting pages.

Ten questions were formulated (see Appendix 2) to fit the two starting texts, five questions about ice hockey and five questions about fashion. An important aspect was that the questions had to resemble each other and no answers, of the total of ten questions, could be found at the first page of the two texts. The resemblance of the questions had focus on where they could be found, so if the first question about fashion was found on the third page of the starting text the same would go for ice hockey. Also, if I asked for more than one answer for a question the
same went for the question about the other text, an example could be the third question in each text which was ‘Which cities host major fashion week shows?’ and ‘Which countries play in the Asia League Ice Hockey?’.

Since the task was to answer questions, this related to the fact that on-line reading is a problem-solving task type. The two texts were constructed in such length that the students would prefer to use search engines before the texts, since reading a non-linear text, such as a wiki resembling page as the starting texts, is not meant for long texts. This could also help in finding a greater understanding about how they navigate on-line if they would choose to find the answer to the questions without the starting texts.

Before the students started the task they had to roll a dice, to decide which set of questions to start with. After rolling the dice the participants opened the starting page/text where instructions (see Appendix 3) were received. The two texts were supposed to be structured similarly and the questions were supposed to be equally difficult or easy, so that whatever text the participants started with would be a random selection.

3.3 Third stage – Think-aloud protocols

The participants were recorded, one at a time, while completing the questions. The task was, as known, to answer a total of ten questions orally, where five of the questions were related to ice hockey and the other five questions related to fashion and all questions were in English. During the test, the participants were allowed to speak Swedish to be able to formulate what they were thinking while completing the task. After having answered the first five questions, the new set of questions was given to them after having opened the new starting page/text. I also timed the participant from when they received the first set of questions to be able to know how long it took to answer all ten questions and they had a maximum time, of 30 minutes, for completing the questions.

Think-aloud protocols are of qualitative character. A qualitative study, according to Mackey and Gass (2005), often includes a few characteristics such as “rich description…few participants [and/or] open-ended processes” (p. 163). Friedman (2012) mentions that “qualitative research is a distinct approach to scholarly inquiry that may also entail a different set of beliefs regarding the nature of reality (ontology) and ways of knowing (epistemology)” (p. 181). Think-aloud protocols are an introspective method and is described as a method “which tap participant’s reflections on mental processes, originated in the fields of philosophy and psychology” (Mackey & Gass, 2005, p. 77) and the think-aloud is a task type method. The think-aloud method is relevant for this study since it can gain insight in what the participants are thinking while completing the task, which involves on-line reading and language acquisition. In Stimulated Recall Methodology in Second Language Research (Gass & Mackey, 2000) the authors notice that stimulated recall (think-aloud is a kind of stimulated recall method) is a widely used method when researching second language acquisition strategies and cognitive processes, which is then suitable for this essay.
Since the participants communicate their thoughts by speaking, one should consider the positive and negative aspect with verbal reporting. The positive aspects are “that one can often gain access to processes that are unavailable by other means” (Mackey & Gass, 2005, p. 77) but one must always consider the reliability and validity when it comes to collecting verbal data. A researcher wants his or her study to be valid, meaning the results should be valid (Mackey & Gass, 2005). “In general, validity refers to the appropriateness of a procedure for measuring the underlying construct a study intends to investigate” (Révész, 2012, p. 203). Cohen et al. (2000) give examples of what validity in a study might address “the honesty, depth, richness and scope of the data achieved…and the disinterestedness or objectivity of the researcher” (p. 105). What Cohen et al. bring up is something that needs to be reflected upon when researching, “reliability is essentially a synonym for consistency and replicability over time, over instruments and over groups of respondents” (Cohen et al., 2000, p. 117). So the reliability of a study emphasizes if a study is reliable or not, with focus on if the study was carried out in a correct way so that others can perform similar studies.

This think-aloud study could be seen as a pilot study for Lydia Kokkola. A pilot study is often a small-scale study, which this is, and there are many possibilities to continue the study into a large scale trial. The advantage with pilot testing could be that “it can reveal subtle flaws in the design or implementation of the study” (Mackey & Gass, 2005, p. 43). For example that the participants should have their cell phones turned off before starting the think-aloud task, but also how one should place the film camera.

When working with for example interviews or videotapes the data that is collected needs coding. “Coding involves making decisions about how to classify or categorize particular pieces or parts of data” (Mackey & Gass, 2005, p. 221) and “one way of coding qualitative data can involve examining the data for emergent patterns and themes, by looking for anything pertinent to the research questions or problem” (Mackey & Gass, 2005, p. 241). Coding demands many decisions and steps along the way and Andrea Révész (2012) states that “each and every phase of the coding process entails a number of decisions and many opportunities for error” (p. 218). With six think-aloud recording one must go through the films more than one time to be able to spot patterns and the participants’ strategies. When coding the recordings for this essay the focus was on finding different or similar strategies when the participants were completing the task. The strategies that occurred several times and the strategies that were prominent among the participants was what took most of the time in the coding process. Another aspect which I took in consideration when coding was how much I spoke to the students during a recording, since that could have affected their time in completing the questions. But the main focus of the coding process was the strategies, which involved their actions on the computer, how much or how little they spoke and how much they used/looked at the questions that were on a printed paper and not on the computer. The strategies that were most prominent are presented in a table of strategies, see Appendix 5.
3.4 Ethical aspects

One should be aware of the possible moral issues and consider who are affected when performing a study and as Cohen et al. (2000) has noticed, “ethical issues may stem from the kinds of problems investigated by social scientists and the methods they use to obtain valid and reliable data. In theory at least, this means that each stage in the research sequence may be a potential source of ethical problems” (p. 49). Cohen et al. (2000) also point out the importance of collecting consent forms of the participants. According to Vetenskapsrådet (2002) there are four main requirements that should be followed. That is:

1. The requirement to inform the participants about the aim of the study as well as the method, in this case, the think-aloud project,
2. The requirement of consent, which means that the participants are allowed to say if they want to participate or not,
3. The requirement of confidentiality and also,
4. The requirement of use, so that information collected about individuals are only to be used for the purpose of the study.

With this in mind a consent form (see Appendix 4) was given to the participants to sign before starting the recording.

Protecting the names of the participants is necessary since it is required to maintain confidentiality. The names of the participants in this essay have therefore been modified by the participants themselves.

4. Results

The results will be presented in two sections, first a short summary of the questionnaire, then a larger section of the think-aloud recordings. The results of the think-aloud recordings will be introduced in the same order they were carried out and as narratives of each subject, followed by a quantitative summary of frequencies. The think-aloud task focused on what strategies the students used when answering the questions and not what kind of text they chose to read. All citation of the participants and myself have been translated from Swedish to English. A table of the strategies the participants used as well as tables of how long it took for them to answer all questions are to be found at Appendix 5.

4.1 Results of questionnaire

The questionnaire that the students answered consisted of eight questions which focused on their internet use and reading habits on the internet. All students spent four to six hours on their computers each day, and of those two were spent reading on-line. The texts the participants read varied and the three boys were interested in reading and watching films about ice hockey while the girls spent time watching TV-series on-line and read fashion blogs. The participants mainly read texts on the internet in Swedish, but sometimes in
English. All considered themselves to be good or very good at English and they all were 16 or 17-years-old.

4.2 Results of the think-aloud protocols

4.2.1 Think-aloud (TA) recording 1

The first recording was with Al, who is 16 years old. He started with the questions about fashion which took him approximately nine minutes to answer, while the text about ice hockey took him seven minutes. Al did not read the text from the starting page in either the text about fashion or ice hockey, he took a fast look at the text when he received the questions about ice hockey but started from Google for each new search he did. He seldom had more than one tab open (not counting the starting page/text which was open all the time though he did not use it) during his search results from Google. Also, he answered the questions he received in the order they were written, from top to bottom, even though the questions were not numerated.

When Al did a search in the Google search field he often used key words from the questions he had received from me, for example: “London fashion week men” or “fashion week cities”, sometimes he also chose a search example that was shown in the Google search field when he started typing. When a search was done he first read the blurb under the web page result to decide whether to open the page or not. This he said was because he wanted to read if the page he was about to open carried valid information. In many search results he clicked on the first or second alternative and in four of the five questions about fashion he retrieved the answers to the questions from Wikipedia. Often before he chose to go to Wikipedia he tried at least one other search result, for example when he was going to answer “In which year did London fashion week decide to devote an entire weekend to men’s fashion?” He first chose to open the homepage for The British Fashion Council, where he found a tab called “History and Heritage”, he skim read and scrolled down the page and stayed on the page about 2 minutes, until he went back to Google. He now chose to type “London fashion week men year” and clicked on the Wikipedia alternative where he found the correct answer.

When he worked with the questions about ice hockey, he used the same strategies as when he answered the questions about fashion. He answered one question at a time, starting from the top and down. He also said that he often skim read the search alternatives during a web search. When he was about to answer the question “How many teams play in the National Hockey League?” he was not sure but he thought there were 30 or 32 teams. I ask him to look up the correct answer even though he might have the right answer. He chose to go to the National Hockey League official webpage (where he had been before) where he counted the team logos which were placed on the top of the webpage and answered “30 teams” which was the correct answer.
During the recording Al did not speak very much, I asked him questions but his answers were short. But what I found out was that he always uses Google as a search engine, since he feels comfortable with that specific search engine and the same goes for Wikipedia. He often watches and search on films and information about ice hockey when he is on-line on his spare time and he said that he felt like the questions about ice hockey were easier to answer than the questions about fashion.

4.2.2 TA recording 2

The second recording was with Maggan, who is 16 years old. She started with the text about fashion which took approximately 14 minutes. The text about ice hockey took seven minutes. Maggan looked at the first question on the paper about fashion and started reading the starting text. She said that she wanted to read the whole text since she did not want to miss anything important, but she also did not really know what to look for. She started by reading thoroughly but after a while she started skim reading and scrolling down the text a bit faster. When she answered the first question about men’s fashion week she was a bit unsure and the answer was wrong. She continued reading and gave a correct answer. She continued to stay on the starting page and answered quickly the next question which was “Who is said to be the founder of Haut Couture?” and about 15 seconds later she found the answer to the next question. When she was looking for an answer to a question she tried to find a key word or something which resembled the topic of the question in the starting text. When she could not find the answer to the question “When was the first Vogue (fashion magazine) published?” she asked me if she could use Google. Maggan typed the whole question in the address field and clicked on the first Google alternative which was Wikipedia, upon which she gave the correct answer. After, she went back to the starting text and quickly found the answer to the last question in the text.

When Maggan started with the text about ice hockey she still had the tabs from fashion open. She first read the starting text about ice hockey, but choose not to use the same strategies with the following text. She said she wanted to skim read to find the subject of the question in the text instead of reading everything. Again she started reading, tried to answer a question with doubt in her voice, and gave the wrong answer and read two more sentences and then delivered the correct answer. During the second question she decided to use Google again. She clicked on an old tab about fashion and typed the whole question in the address field. She chose the first alternative which was Wikipedia and gave me the correct answer. She said that she often clicks on the first search alternative if it fits the information she is searching for and if it is a familiar page. She then went back to the starting text where she remembered she had read something about the Asian Ice Hockey League and answered the last three questions within 30 seconds.

Maggan used both the starting text as well as Google. She sometimes answered questions even though she was unsure if the answer was correct or not, which was noticeable since she sounded unsure and the answers were wrong. The text about ice hockey went faster than the
text about fashion. She only used Google when she searched for answers and she often opened the first alternative of the Google search (no advertising).

4.2.3 TA recording 3

The third recording was with Lars-Göran who is 16 years old. He started with the text about ice hockey which took approximately 12 minutes and the text about fashion took 8 minutes. Lars-Göran’s first strategy was to read the whole text and then answer the questions, he also started by reading the first three questions. Lars-Göran realised after a minute of reading that the text was very long and then decided to skim read the text. After a few minutes of reading he answered one of the questions (not in the order they were written on the question paper). He also tried to answer the question about the number of teams in the National Hockey League, which he claimed he read in the text, but thought he knew the answer by heart so he gave the wrong answer. He strategically marked the questions he answered with a pen (since he did not answer them in any specific order). After 8 minutes he opened a new tab and typed “Google”. He said that he always chooses to start from Google. His search words were “Asia League Ice Hockey” where he chose to open the second alternative which was Wikipedia. He said that choosing Wikipedia is a habit since he often finds information there.

Lars-Göran started by reading the starting text about fashion, he also said “I will read the text and hope I find something”. He read the text and after a few minutes he started answering several questions, he was looking on the titles in the text to locate the correct information he was searching for. Lars-Göran’s general response to these texts was that the text about fashion felt easier. He also said that he felt that searching for information on-line was easier in Swedish.

4.2.4 TA recording 4

The fourth recording was with Hedvig who is 17 years old. She only answered the questions about ice hockey since that took her 32 minutes. She started by reading through the questions and her general thought about the questions were that they seemed easy to answer. After two minutes she clicked on a hyperlink which brought her to the Wikipedia page about the National Hockey League (NHL). She then answered correct on the question about the number of teams in the NHL. She went back to the starting text where she founded a new hyperlink, which brought her to the Wikipedia page about Montreal. She jumped back and forth between the starting text and the text about Montreal. After 7 minutes she closed the Wikipedia text about Montreal and went to Google. She chose to the search words “first indoor hockey game” and went to Wikipedia where she found the answer. She chose Wikipedia since she read the blurb before she opened a search result. Hedvig tried to answer the questions by reading a few lines in a text but then gave up and went to Google. Sometimes she noticed that if she just had read a few more lines in the starting text she would have had the correct answer. Hedvig was also the only participant who misunderstood one of the questions which
was “how many Olympic gold medals have Great Britain won?”. I wanted to know how many gold medals Great Britain had won in ice hockey, Hedvig searched for an answer on how many Olympic gold medals they had won throughout history. She spent about 7 minutes on that question until I understood that she had misunderstood the question. She then found the answer in about 4 minutes.

Hedvig used hyperlinks in her way to finding the answers. She also said that she most of the time uses Google, Wikipedia or YouTube as sources of information on-line. She jumped between the starting text and Google but did not have many tabs opened at the same time. She also missed important fact because she stopped reading and thought she had found an answer.

4.2.5 TA recording 5

The fifth recording was with David who is 17 years old. He started with the text about ice hockey which took approximately 17 minutes and then answered the questions about fashion in 11 minutes. David chose to use Google from start. He also chose to type in the whole question in the Google search field. When he answered a few of the questions he did so by reading the blurb, under the search alternatives, and did not open any of the results. After he had answered the first question he went back to the starting text. I asked him why he wanted to go back to the starting page and he replied “I do not really know, but I felt like the answer to the latest question was only a year and this one felt like a bigger question so I might look here”. He skimmed through the starting text and then went back to Google where he gave the correct answer by reading the blurb and not by opening webpages. He then went to a webpage called Elite Prospects which was a page he usually went to in his spare time. He knew how to navigate and described to me how one could find information about players (himself included) and statistics.

When David started with the questions about fashion he typed “London fashion week” in the address field, but changed the search to “London fashion week when?” when he felt like the results did not give him any answers. He chose to work with one question at a time, and used Google to answer all five questions about fashion. He also said that one almost always ends up on Wikipedia. He also said that “It is usually Wikipedia who saves us [students]. It is a very large site which feels quite reliable since they check their information”.

David said that the questions about ice hockey were easier than the questions about fashion. He seldom opened any search results and instead he read the blurb under the links. He also read several of the blurbs in the same search to be certain of his answer. He used both the starting text and Google during the recording, but he answered all questions with the results of his Google search.

4.2.6 TA recording 6

The sixth recording was with Dani who is 17 years old. She started with the text about fashion which took approximately 9 minutes and then answered the questions about ice hockey in 8
minutes. Firstly she read the starting text and realised that it was very long, upon which she started skim reading and looking for words that could fit the subject of the questions. She then found the answer to the first question about fashion but decided to use Google for the next question. When I asked her why she wanted to use Google for the next question she answered “it feels like an answer one can find on the internet”. Dani considered Wikipedia to be a reliable source of information and did not return to the starting text for the following two questions. She said “Wikipedia is actually quite reliable, quite a lot of text but you can get quite simple answers if you know what to look for”.

When she started with the text about ice hockey she answered the first and second question by reading the starting text. During the third and fourth question she went to use Google and then opened the Wikipedia result. The last question which was about the number of teams in the NHL she wanted to Google. She opened the NHL official homepage but she went back to her Google search since she did not want to count all the team logos in the top of the webpage where their team logos were displayed.

Dani answered all the questions in the order they were written, she did not have many tabs open at the same time and she used both the starting text and Google to find answers to the questions. She said that the text about ice hockey was easier because there were a lot of statistics and graphs that was easy to read.

5. Discussion

5.1 Discussion - Method

To retrieve knowledge about students’ on-line reading strategies in ESL, think-aloud protocols have been both helpful and rewarding. The methods used in this essay have been suitable for the aim and even though one could discuss the number of participants, this was a qualitative study in which six participants were enough. Interviews and questionnaires about what strategies students use while reading on-line in English can also be alternatives instead of think-aloud protocols as methods. The aim of this essay is to find information about what strategies the students use, not what strategies they think they use, which could be the case if questionnaires and interviews were to be held. But one should not forget that the questionnaires in this study were extremely helpful since they served as information about the participants’ reading habits on-line as well as the decision to have ice hockey and fashion as main texts.

Difficulties with this study were to create a casual environment for the participants when they were being filmed. They were all well aware of the film camera and all recordings took place at the school they attended. My role as both their teacher on teaching practice and as an observer at the think-aloud recordings, could have affected them in either a positive way (since they knew me) or in a negative way. For example one of the participants’ cell phone rang during the think-aloud recording and the fact that the participant knew me probably played into the decision to answer the phone. To be an observer as well as getting the
participants to answer questions about why they choose to act as they do was something which became easier after a few sessions of recording. Using film cameras one needs to understand the advantages as well as the disadvantages. Using a camera is time consuming and needs preparation, and the actual recording and coding need to be properly done. An advantage when recording with a camera is that body language and other expressions are recorded while a disadvantage can be that both participants as well as the observer could be affected by the camera since it becomes an unnatural environment.

The think-aloud recordings have contributed with helpful information to answer the research questions, such as how efficient the students read on-line. Without the questionnaires the research question concerning the subject of the text would not have been a part of this research. Something that would have been interesting to know more about is if students see themselves as digital natives or not and if they know what digital natives are.

One thing which needs to be evaluated is the fact that the participants used and worked on a computer they had never worked with before, which could have affected their way of using the computer. Also, all computers have different standard settings and short commandos. The students used Mozilla Firefox as browser in this study and they might not have been used to this browser, which could have affected their results.

The reliability and validity of an essay are always important to discuss. Rarely everything goes according to plan, and one could always find things to adjust and improve. Since one of the questions was misunderstood by one of the participants I thought about whether I should have reformulated that particular question until the next recording, but that would have compromised the validity of the results since everyone would not have been given the same questions. Other questions one could ask about the reliability are if the questions were equally difficult or easy? Or if the questions about the number of teams in the NHL were too easy for the male participants who said they knew the answer to that particular question? Fortunately, none of the participants were certain of the correct answer about the NHL question. Since the participants were filmed, the camera could have stressed and/or affected their behaviour when completing the task. One of the most important parts of this method was to understand what the students think, one can also question if they said everything they thought.

5.2 Discussion - Results

5.2.1 What strategies do students use?

The strategies the students used were

- Used Google to answer all questions
- Gave up on the starting text and used Google
- Clicked on hyperlinks
- Had few tabs opened
Googled the whole questions
Googled key words
Skim reading
Detailed reading
Read blurbs (from the search results)

Several researchers argue that on-line and off-line reading are two different processes. On-line reading have what the researchers call ‘a problem-solving mindset’ (Coiro, 2011; Leu et al., 2008; Mokhtari et al., 2008). This study has a problem-solving approach towards on-line reading since the task is to answer questions, the problem have already been formulated. But when looking at the results, the six participants did not seem to have a clear view of how they were going to answer all questions. Problem-solving is what it sounds like; to find a solution to a problem. The problem in this study is the questions, and every participant found a way to answer every question they had the time to answer. To decide if a person is efficient in solving a problem one must look at his or her strategies.

Coiro (2011) mentions four different stages when reading on-line and how successful readers think when going through these four stages. They include “approaching online reading task with a problem-solving mindset”, “navigating and negotiating online texts”, “monitoring comprehension of and pathways through online texts” and “responding to online texts” (p. 109), if the participants have this mindset while reading on-line they could be called efficient readers.

1. Problem-solving mindset

The task, in this study, involved questions that were going to be answered, which means that the students had to have a problem-solving mindset from the beginning. Coiro (2011) also writes that making a plan before navigating through the computer screen helps students to stay focused and not be distracted. For this study, using Google to find the answers (or using the ctrl+f application in the starting text) would be the most efficient way to find the answers to the questions. All students, except for Al, did not take time to generate a plan, which became noticeable since almost every participant gave up on the starting text and chose Google instead. Also, the students rarely read through all questions when they received them. They often read one question and started reading the starting text (not Al). This strategy is not very effective since the questions were not structured in the same order they were found in the text, which made the students, who read the starting text, read important information about another question they did not know were going to be answered as well. Some participants showed that they did not have any thought out plan, for example Lars-Göran who said “I will read the text and hope I find something”. Maggan did not have a plan before starting to navigate which became clear when I
asked her "why do you choose to read the whole text?" and she answered “not to miss anything important, I do not really know what I am looking for”.

Solving the problem has been the focus for the students in the task they have carried out. An important factor in this first stage of Coiro’s is that problem-solving is not simply answering questions, but also constructing a problem. The problem-solving mindset involves being able to construct and answer questions which is something this study has not been able to focus on entirely, since the questions had already been constructed.

2. Navigating through the internet

The strategies the students had for navigating through a text were using hyperlinks, have few tabs opened and using web pages they had visited before and felt comfortable with. When talking about navigating and negotiating texts the participants were clearly comfortable in navigating on Google and Wikipedia since they often chose these alternatives. Unfortunately, they did not navigate well on websites which were not Google or Wikipedia, so when the participants arrived to webpages they did not recognise, they had no clear strategy how to search for helpful information. Another distraction was hyperlinks which only one participant, Hedvig, used. She was also the only one who did not complete all ten questions within the 30 minutes. No one tried to answer several questions simultaneously, most of the students answered each question in the order they were written.

3. Monitoring comprehension of and pathways through on-line texts

By controlling and evaluating one’s pathways and understanding of the on-line texts the students can work on their effectiveness in on-line reading. What is difficult to really understand is if they knew what they did, and understood the texts. Lars-Göran said “oh, this text was long”, and decided to start skim reading instead of reading thoroughly. What all participants (except Al) did was that they re-evaluated the strategy they had from the start into a new strategy. For example, Maggan started on her second text, when I asked her ”are you choosing the same strategy as before?” and she answered “no, I skim read to see where I can find anything about the subject instead of reading everything”. So even if Maggan did not have a thought out plan when she started, she found a strategy which was more efficient for her. The participants also evaluated the search result before opening the web page by reading the blurb. Both Dani and David commented on the fact the Wikipedia is reliable. David said “It feels like you always end up on Wikipedia and it is Wikipedia that saves us. It is a very large site but feels rather trustworthy since they check their information” and Dani said “Wikipedia is actually kind of reliable, there is a lot of text but often you find answers fast if you know what you are looking for”. Since every participant read blurbs before opening a search result they somewhat evaluate their pathways on-line.
4. Responding to on-line texts

Coiro (2011) describes this fourth strategy as “…summing up key ideas, making connections, looking deeper, asking questions, and contributing their own ideas in response to the posed challenge” (p. 109). A strategy some participants used was guessing the answer which Hedvig did on a few questions:

Hedvig: “was it in -89?”

Sofia (me): “No, that is not the year I am looking for”

Hedvig: “it was on the 17th of November, 1992”

Sofia: “No, what does the text you are reading say?”

Hedvig read the whole sentence and noticed that the text did not give her the information she needed to answer the question.

Hedvig “What I can understand, hmm, it was in 1998 when Japan decided to include women’s ice hockey as a medal sport in the Olympic Games”

Sofia: “Yes, 1998 is the year I am looking for”

What also happened when some participants ended up at the homepage for the NHL, was they did not start navigating through the page but instead evaluated the situation and either left to find the answer elsewhere or they counted the team logos which are displayed at the top of the official homepage for the NHL.

What becomes clear, in Coiro’s study when compared with this study, is that if one wants to become an efficient on-line reader they must also understand the language they choose to read in.

5.2.2 Impact of the subject of the starting texts

The two topics the students worked with were ice hockey and fashion since the questionnaire revealed that David, Al and Lars-Göran were interested in ice hockey and Dani, Hedvig and Maggan all had different interests when they were on-line but all did read blogs (about fashion and training), often in Swedish. This clear distinction between what the male participants read as well as what the female participants read when they were on-line made me decide to have this particular finding as a research question. The hypothesis was that since the male participants were interested in ice hockey they would be more efficient in the questions concerning ice hockey and that the girls would be more efficient in answering the questions concerning fashion. This was not the case, the only link between the students’ efficiency and the topic of the text was that the second text always took less time to answer than the first text. When the participants had finished all questions, a couple of oral questions were asked about what they thought of the texts. David said that he thought the questions concerning ice hockey were a bit easier “since I have knowledge about ice hockey I
recognised many of the questions when I found the answer and I also recognise many web pages”, even though he was six minutes faster about the five questions about fashion. David also used a web page which he uses on his spare time to find the correct information about the questions concerning ice hockey and even if he knew how to navigate on this page he did not know where to find the information necessary for the questions he was going to answer for this study. Lars-Göran on the other hand, who had an interest in ice hockey, found the questions concerning fashion to be easier than the ones about ice hockey. He performed better on the questions about fashion so one could say that the topic of the text does not seem to have any impact on whether the participants are to be efficient or not.

Both Large, Beheshti and Rahman (2002) and Liu and Huang (2008) have seen differences in the reading habits of male and female on-line readers, mainly this concerns the fact that female readers prefer to read on paper and that male readers click on more hyperlinks per minute. Concerning Large et al.’s (2002) results about hyperlinks this was something that could not be seen during the think-aloud project. Hedvig was the only participant who did use hyperlinks and was also the one who opened most different webpages that was not Wikipedia during her think-aloud task. The differences between the male and female readers in the think-aloud recordings were barely noticeable. They all had similar strategies and the only one who stood out from the rest of the group was Hedvig. One must not forget that she misunderstood one of the questions she was going to answer.

How fast the participants answered the questions was nothing that made any difference between the male and female readers in my study. A table of the participants’ answering times can be found in the appendix (see Appendix 5) where Al seems to be the most efficient of the six participants and Dani followed closely. The topic of the text did not play in any advantages of the gender. There were no differences between the male or female readers, none were more efficient than the other.

5.2.3 Are the students efficient?

The one who was the most efficient was Al and he answered all ten questions in approximately 16 minutes. The most distinct strategy was that he used only Google to find the answers. He also read the blurb before opening a search result and he had previous knowledge of one of the questions about ice hockey.

The one who was the least efficient was Hedvig who answered five questions in approximately 32 minutes. The strategies that she used were that she used both the starting text and Google. She also read in detail when she received the first five questions before she used Google and she read the blurbs before opening a search results. Another strategy Hedvig used was that she used hyperlinks and sometimes guessed the answer.

The four stages of on-line reading efficiency that Coiro (2011) mentions was “approaching online reading task with a problem-solving mindset”, “navigating and negotiating online texts”, “monitoring comprehension of and pathways through online texts” and “responding to online texts” (p. 109). How do these stages relate to the students strategies? The approach
stage, which focuses on having a problem-solving mindset, was difficult for most of the participants. What the students struggled with the most was to “take the time to generate a focused plan of attack before navigating the mouse across the computer screen” (ibid.). When the students received the questions for each text they (everyone except Al who used Google from the beginning) immediately started to read from the starting text which they eventually found ineffective. This is why many students chose to change focus during the task, from the starting text to Google. David chose to use the starting text in his first subject (ice hockey) but always Googled the answer since he could not find relevant facts in the starting text. During his second text David only used Google and did not use the starting text about fashion.

The navigating and negotiating stage focuses on “determining important ideas, judging the relevance of those ideas in relation to their purpose, investigating author credentials, detecting author agendas and corroborating questionable claims” (ibid.). This was something that Hedvig lacked. She clicked on hyperlinks which took her to web pages where she could not find relevant information about what she was searching for. She explained why she clicked on a link, but did not judge the relevance of the fact she found after opening the new link for example when she clicked on the hyperlink about Montreal:

Sofia: “Why did you choose to open that hyperlink?”

Hedvig: “Because it said that it was the first place people played ice hockey and then I wanted to know if they played outdoors or indoors”

The hyperlink took her to the Wikipedia page of Montreal where she found information about the history of Montreal, geography, climate etc, she did not reflect on the relevance of what she did or read.

The monitoring comprehension of and pathways through on-line texts stage focuses on that “skilled readers stop to revisit their purpose while monitoring both their understanding of the content and the relevance of their chosen reading path” (ibid.). This is one of the stages that many of the participants in this study are missing. First of all, to know if the students have properly understood what they have been reading was difficult to see during the think aloud tasks but several times I noticed that I received the incorrect answer from Hedvig, much because she did not read or understand properly.

The last stage is how students are responding to on-line texts. This stage is somewhat difficult to evaluate from the students’ points of views, since reflecting, summing up ideas and looking deeper for information was not something the study gave space for. But what the students might do in this stage is to evaluate their own on-line reading skills according to these ideas. An important aspect about the students’ strategies in this stage was that the second set of questions always took less time than the first set of questions. Perhaps they reflected on their on-line reading strategies but one should consider other facts. Since I was an active observer and asked the participants questions, I tried to ask the equal amount of questions to every participant on each text but that could have affected how fast or slow the participants found the information. But the facts are clear that all students who did two set of questions
performed faster on their second one, so they did work more or less according to Coiro’s stages at some point during the task.

Another characteristic which plays a central role in on-line reading is that students, as well as others, need to have a critical view of the information which is found on the internet (Coiro, 2011; Henry, 2006; Leu et al. 2004). David was one of the participants who had a critical view when looking at his search result on Google. He only used web pages he recognised and if there was a blurb with information which he found relevant he always read another blurb before delivering the answer to me. What every student did in this study was to read the blurb before deciding whether to open a result or not. But does reading a blurb denote that the students are critically evaluating the information they retrieve? Reading the blurb before opening a webpage is a step in the direction of having a more critical view of the information that is found on-line. But students need to have more knowledge of this, for example how Google rank their search results depending on sponsors and commercials in many cases, especially since the students continuously use Google as search engine.

What the students lack in reading efficiency in this study is a little bit of every stage (“approaching online reading task with a problem-solving mindset”, “navigating and negotiating online texts”, “monitoring comprehension of and pathways through online texts” and “responding to online texts” (Coiro, 2011, p. 109)). They do not entirely fulfil the needs of being an efficient on-line reader. What everyone managed to do was that they improved during the test, since they performed faster on the second text. They evaluated their strategies and were able to change them to become more efficient.

5.2.4 Digital natives?

Are these students really digital natives? Yes, in the sense that they do know and understand how to navigate and use a computer as well as searching for information on-line. What is missing in the discussion about digital natives is if these digital natives, who very well know how to use computers, can become even more efficient on the internet. If they can develop a critical mind, to become even better at finding information on-line, learn to navigate and to reflect on their own internet reading skills, students would become even more efficient. Students might know how to open a web page and to make a search on Google but in today’s society, with a great deal of information easily accessible on-line, these students also need to have knowledge how to select and evaluate the information they find. They need to be able to read non-linear texts such as wiki-pages and to be able to use hyperlinks without getting lost in the process. What needs to be noticed is that Bennett at al. (2008) point to that “the picture beginning to emerge from research on young people’s relationships with technology is much more complex than the digital native characterisation suggests” (p. 783). So the term digital native should maybe change meaning as long as society will continue to research and develop.

These digital natives have also learnt a great deal using the internet at both their homes and in school, so the process about becoming more efficient in on-line reading and information gathering should continue in school and afterwards in their working life.
5.2.5 On-line reading and ESL

The participants in this study do not properly fulfil Coiro’s four stages, hence they do not meet the requirements of being efficient on-line readers. One strategy that the students used was that when they were typing the key words or the questions in the address field or the Google search field, they looked at the questions for help in spelling. Park and Kim (2011) noticed in their study that students who read ESL applied off-line reading strategies to their own second language knowledge in the on-line reading environment. Lars-Göran said “when it is texts in Swedish it is easier to search for answers on-line, but when it is in English I prefer reading”, this suggests that Lars-Göran has been taught how to search for information in Swedish on-line, but during English lessons, they might not work as much with on-line reading as they do in books and on paper. So Lars-Göran applied his off-line reading strategies (since he is comfortable in reading in English instead of searching on-line) to the on-line reading task, and he mostly used the starting text to answer the questions.

According to the results in this study, the efficiency of the students’ on-line reading and information gathering can be enhanced. The method for students to develop this skill is to introduce on-line reading efficiency and information gathering in schools in larger extent. An example could be that students also should learn to search for information in English, and not only their native language, to develop their language skills and to learn how to navigate on web pages in English. Continued development in English as well as sufficient information gathering techniques will be of use in both continued studies as well as in their working life.

5.3 Continued research

This study is a pilot study so the possibility to continue researching in this field is optimistic. When a think-aloud method is carried out, background knowledge, a good setting and participants are important. When recording the think-aloud task, one camera was enough for this study, but with several film cameras a more complex study could have been made. For example one camera could give information about what the students are doing on the computer at all time, so that every step of their pathway is documented. Another could record what the participants are saying. Also to record in an area with no disturbance would be preferred.

This study has not focused on the part where problem-solving is constructed as a problem, since the questions were already handed to them. Also one should not forget to emphasise that this cannot be considered as a sample of a whole population but still illustrate the target population.
6. Summary and conclusion

The main strategies the students showed were:

- Used Google to answer all questions
- Gave up on the starting text and used Google
- Clicked on hyperlinks
- Had few tabs opened
- Googled the whole questions
- Googled key words
- Skim reading
- Detailed reading
- Read blurbs (from the search results)

The subject of the text, whether the topic was ice hockey or fashion, did not matter whether the students were to be efficient or not. What really mattered was that throughout the think-aloud task the participants learned how to work more efficiently with the questions. The students can become efficient on-line readers if they work on their strategies and their language skills.

Are these students really digital natives? The answer to that question would be yes, but since the internet and digital literacy develop, as must the term digital natives. Today the term digital native refers to a person who is brought up during the technology era, but that does not necessary denote for a person to be skilled or effective when using the computer or being on the internet.

The results of this essay will help me in my future profession as a teacher in English. When talking and reading about on-line strategies and language acquisition one becomes aware of what and how one actually uses the internet and reads on-line. This is of course a small scale study but since people need to learn more about how people read on-line one might have to start thinking of the reading strategies that oneself uses. For schools to have more knowledge about students’ on-line habits and L2 acquisition will be of help for schools, students and teachers. The start in this area (on-line reading strategies in English) is to find awareness among people so that this could enhance their time spent on-line searching for information.
Bibliography


http://www.cm.se/webbshop_vr/dfs/pdffer/etikreglerhs.pdf

Appendix 1 – Questionnaire

Questionnaire


1. Skulle du vara intresserad av att vara med i min studie? (Man är självklart helt anonym)
   ( ) Ja
   ( ) Nej

2. Hur många timmar om dagen spenderar du på datorn?
   _______ timmar

3. När du använder dig av en dator, vad gör du då?
   ____________________________________________________________
   ____________________________________________________________

4. Hur många timmar spenderar du på att läsa på internet (vilka texter som helst)
   _______ timmar

5. Vilka typer av texter?
   ____________________________________________________________

6. Vilket språk brukar texterna du läser (om du läser) på internet vara?
   ____________________________________________________________

7. Hur är dina kunskaper i engelska?
   ( ) Inte så bra
   ( ) Bra
   ( ) Väldigt bra
   ( ) Fantastiskt bra

8. Har du svenska som modersmål?
   ( ) Ja
   ( ) Nej
Appendix 2 – Questions: Ice Hockey and Fashion

Questions - Ice Hockey

In which year did women’s ice hockey become a sport in the winter Olympics?

What is the name of the rink where the first official indoor ice hockey match was played?

Which countries play in the Asia League Ice Hockey?

How many Olympic gold medals have Great Britain won?

How many teams play in the National Hockey League?

Questions – Fashion

In which year did London fashion week decide to devote an entire weekend to men’s fashion?

Who is said to be the founder of Haut Couture?

Which cities host major fashion week shows?

When was the first Vogue (fashion magazine) published?

What is the French term for “Ready-to-wear” clothing?
Appendix 3 – Think Aloud instructions

Instructions

- This is your starting page. All the information in this document has been taken from websites and copypasted here with only small changes made to make the different clips fit.
- You have been given a set of questions which I would like for you to answer.
- You are free to read the text here or use any search engine you would like or any other means you would like: the only limitation is that the search words and texts should be in English.
- I am interested in what strategies you use to find information, not what kind of texts you read, I will copy down the search terms you use.
- I will ask questions while you are completing the task and you can answer in either Swedish or English, you decide.
- The task is over when you have answered all the questions correctly, but I will stop you if you take more than 30 minutes.

Good luck!

- Detta är din startsida. Information i detta dokument är kopierat från andra webbsidor med en del små förändringar för att få texten ska flyta på bättre.
- Du har fått frågor som jag vill att du besvarar.
- Du får läsa texten här eller använda dig av vilken annan sökmotor du vill: det enda villkoret är att sökorden du använder och texterna du läser är på engelska.
- Jag är intresserad av vilka strategier du använder när du söker information, inte vilken typ av text du läser, jag kommer att kopiera dina sökord du använder dig av.
- Jag kommer att ställa frågor (på svenska) medan du genomför uppgiften och du kan välja att svara på svenska eller engelska.
- Uppgiften är färdig när du har svarat rätt på alla frågor, men jag kommer att stoppa dig om det tar mer än 30 minuter.

Lycka till!
Appendix 4 – Consent form

Forskningsetiska principer – blankett

Jag, Sofia Betcke, studerande på Luleå tekniska universitet skall genomföra en studie till mitt examensarbete som planeras vara klart i maj 2014.

Som deltagare i denna studie skall du bli informerad om dina rättigheter och vad jag har för syfte med uppsatsen.

Syftet med uppsatsen är att belysa svenska elevers läskunskaper på internet då de läser texter på engelska. En frågeställning som kommer vara central att besvara är om eleverna har tydliga lässtrategier då de läser på engelska på internet, vilka är då dessa strategier?

Metoden som jag kommer att använda mig av är så kallade ”think-aloud” protocols, tänka högt metoden på svenska. Eleverna kommer en och en bli filmade där de får en uppgift (om ett specifikt ämne, t.ex. engelsk litteratur) som kommer att involvera att läsa engelska texter på internet, jag kommer att agera delaktig observatör och fråga eleverna varför de väljer vissa sökord och texter.

Det är viktigt att poängtera att studien är anonym. Det är jag samt Lydia Kokkola (professor i engelsk litteratur för institutionen för konst, kommunikation och lärande vid Luleå tekniska universitet) som kommer att ta del av det filmade materialet. Det som publiceras är ett resultat av det jag samt Lydia ser som relevant information under filmsessionerna som en del av mitt examensarbete där era namn och skola ej kommer att tas upp.


Huvudansvaret för denna studie ligger hos Luleå tekniska universitet.

Med din underskrift intygar du samt din målsman att ni tagit del av denna information:

_________________________________  ___________________________________
Elevens underskrift och datum  Målsmans underskrift och datum
Appendix 5 – Table of strategies and table of time

Table 1. Who did what? A table of strategies the participants used

<table>
<thead>
<tr>
<th>Strategies/students</th>
<th>Al</th>
<th>Maggan</th>
<th>Lars-Göran</th>
<th>Hedvig</th>
<th>David</th>
<th>Dani</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Google to answer all questions</td>
<td>Used Google to answer all questions, had the best time of all participants. Never used the starting texts</td>
<td>Used the starting text to answer most of the questions, but also used Google</td>
<td>Used both the starting text and Google to answer questions. Came back to the starting text after using Google</td>
<td>Gave up on the starting text and used Google</td>
<td>Gave up on the starting text and used Google</td>
<td>Gave up on the starting text and used Google</td>
</tr>
<tr>
<td>Used both the starting text and Google to answer the questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used hyperlinks</td>
<td></td>
<td></td>
<td></td>
<td>Used hyperlinks, answered 5 out of 10 questions in 32 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Googled the whole question</td>
<td></td>
<td>Maggan used Google, she Googled the whole question. She did not type by hand, but looked at the paper on which the questions were written</td>
<td></td>
<td></td>
<td></td>
<td>Googled whole questions</td>
</tr>
<tr>
<td>Googled key words</td>
<td>Googled key words, for the questions. Had to add words if the results from the search did not fit what he was looking for</td>
<td>Googled key words. Had to add words if the results from the search did not fit what he was looking for</td>
<td>Googled key words. Had to add words if the results from the search did not fit what she was looking for</td>
<td>Googled key words. Had to add words if the results from the search did not fit what he was looking for</td>
<td>Googled key words. Had to add words if the results from the search did not fit what she was looking for</td>
<td>Googled key words. Had to add words if the results from the search did not fit what he was looking for</td>
</tr>
<tr>
<td>Detailed reading: starting text</td>
<td>Detailed reading from the beginning, first text (fashion)</td>
<td>Detailed reading from the beginning, saw the text was long, used Google</td>
<td>Detailed reading from the beginning, then she used Google</td>
<td>Detailed reading from the beginning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read blurbs</td>
<td>Read blurbs before opening a search result. Opened the first or second result (often Wikipedia)</td>
<td>Read blurbs before opening a search result. (Always Wikipedia. Only used Google for two of the questions)</td>
<td>Read blurbs before opening a search result</td>
<td>Read blurbs before opening a search result. (Felt Wikipedia was a reliable source)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used previous knowledge to answer questions</td>
<td>Had a clue of how many teams that were in the NHL (answered correctly on his guess, but I asked him to look it up anyway)</td>
<td>Guessed on the question about how many teams play in the NHL (gave the wrong answer)</td>
<td></td>
<td>Read blurbs before opening a search result</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

35
Table 2. Total time of answering questions

<table>
<thead>
<tr>
<th>Participants</th>
<th>Time of answering questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>16 minutes</td>
</tr>
<tr>
<td>Dani</td>
<td>17 minutes</td>
</tr>
<tr>
<td>Lars-Göran</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Maggan</td>
<td>21 minutes</td>
</tr>
<tr>
<td>David</td>
<td>28 minutes</td>
</tr>
<tr>
<td>Hedvig</td>
<td>32 minutes (answered 5 questions)</td>
</tr>
</tbody>
</table>

Table 3. Mean value time for each text

<table>
<thead>
<tr>
<th>Mean value time</th>
<th>Participants</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean value time on answering questions about ice hockey</td>
<td>All participants</td>
<td>13,8 minutes (if one do not include Hedvig’s time the mean value time becomes 10,2 minutes)</td>
</tr>
<tr>
<td>Mean value time on answering questions about fashion</td>
<td>All but Hedvig</td>
<td>10,2 minutes</td>
</tr>
</tbody>
</table>