

CHAPTER 2

IS IT SO HARD TO SEEK HELP AND SO EASY TO USE GOOGLE?

André Tricot and Nicole Boubée

INTRODUCTION

One of the most important issues in help-seeking theory and research is that of help versus information seeking: they can both be solutions when faced with difficulties during learning and performance. Karabenick (2006) introduces the topic of help seeking as behavior adopted if “[previous] efforts are ineffective” (p. 1). In the list of previous efforts, there is “searching for information available online.” Thus help seeking appears as a secondary solution to deal with difficulties, whereas searching for information online appears as a primary solution. The literature on help seeking (where the helper is a human) emphasizes its demands and difficulties whereas the literature on information seeking (where the source of help comes from the digital environment) focuses on its relative ease. Nevertheless, in terms of its relative cognitive complexity, interacting with humans can be easier than with machines. That is because communication with humans is based on primary, implicit and flexible knowledge that does not involve particular cognitive cost (e.g., Geary, 2008), whereas communication with machines requires secondary, explicit and rigid

knowledge that involves cognitive effort, especially when the machine is new and can therefore be very costly (e.g., Wickens, John, Liu, & Gordon Becker, 2004). From the latter perspective, information search should be preferred since it is deemed easier than help seeking and should be preferred over seeking help from humans.

Classic research on help seeking (see Karabenick & Newman, 2006) outlines its benefits, especially knowledge acquisition (learning) as well as its costs. The costs are very important for a variety of reasons: social because it implies to interact, to negotiate, to communicate with someone else (see Puustinen & Bernicot, this volume), personal (self-perception), emotional, motivational, cognitive and metacognitive. Also because help seeking is based on demanding processes and strategies, from need awareness and decision making (see Huet, Dupeyrat, & Escribe, this volume) to strategies elaboration and management. These costs can be perceived as so important (and actually are) that some pupils are discouraged from seeking help: the help-seeking benefit/cost ratio can be very often disadvantageous. The research focuses on analyzing why it is so difficult to seek help, what processes underline this behavior and how the decision to seek help, and help seeking itself, can be encouraged, supported and enhanced.

Classic research in adolescents' information seeking on the web (e.g., Bilal, 2000, 2001, 2002; Fidel et al., 1999; Hirsh, 1999; Schacter, Chung, & Dorr, 1998; Wallace, Kupperman, Krajcik, & Soloway, 2000) outlined the difficulties participants had to find relevant information. Most of these studies compared adolescents (as novices) to adults (as experts), and concluded that experts perform better than novices. Analysis of the difficulties was mainly focused on the cognitive and metacognitive levels; novices lacked skills and knowledge, and their plans and strategies were inefficient. More recent studies in this domain tend to show that adolescents today are different. Even if it is difficult to precisely describe the "digital natives" (i.e., persons who grew up using digital technologies) as a homogeneous population, it seems easier for adolescents today to use Google, to formulate and reformulate queries, and to locate information; 93% of 3,348 postsecondary students, both graduate and undergraduate, are satisfied or very satisfied with their experience of search engines (OCLC, 2006). "Encouraging signs" (Gasser, Cortesi, Malik, & Lee, 2012) appear in recent studies about information evaluation; youth information evaluation is becoming similar to adult information evaluation: the gap is less pronounced. This deep and rapid evolution, however, is not observed in the domain of help seeking, which was and is still difficult for most of the adolescents. The aim of this chapter is to answer why these evolutions seem so different. Our main argument is that it is possible to consider

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how emotional, social and personal costs are unimportant in information seeking by adolescents, whereas they are important in help seeking.

In others words, the main purpose of this chapter is to show that managing an “anomalous state of knowledge” (Belkin, 2005), solving this problem of knowledge and searching information, involves three different tasks. The fact that sometimes the same human performs these three tasks is not evidence of an intrinsic relationship between them. Some anomalous states of knowledge are not managed and not solved. There are many different ways to solve problems of knowledge, including help seeking and information searching. There are different ways to seek help (direct or indirect) and different ways to search for information (in daily tools like Google or in specialized environments). These different ways involve different social, emotional, cognitive and metacognitive processes.

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This chapter also discusses some methodological issues, because the literature on information seeking uses two different kinds of experimental design (the information goal is prescribed by the experimenter or by the participant) that are very difficult to compare. Only prescribed goals in information searching experiments can be compared with help-seeking experiments. In order to simplify comparisons between youth and adults, we focus on adolescents in their scholarly and daily activities, when they seek help during information searching and when they search for information without seeking help.

INFORMATION SEARCHING

Information seeking is “a process in which humans purposefully engage in order to change their state of knowledge” (Marchionini, 1995, p. 5). This definition serves to describe active information behaviors in which actions are goal-directed and involve active interactions with information systems, such as humans or computers. Usually, interactions with information systems refer to information searching, a sub process of the information-seeking process. Taylor (1967), a pioneer in human information-seeking studies, had given a simple view of the information-seeking process, focused on information activities within libraries and information centers, and described an information searcher as a “self helper.” Conceived in this way, information seeking and help seeking are two competing processes. That was not the position taken by Keefer and Karabenick (1998), however, who claimed that help seeking may or may not involve information search, and that information search may or may not involve help seeking.

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Classic empirical studies on information seeking among young people focus on pupils and students. The majority of studies in library and

information science examined information-seeking activity in the context of the school, with prescribed tasks (Fisher, Marcoux, Meyers, & Landry, 2007). These students are most often described as novices. Whatever the level of education, these studies show the vast majority of difficulties in information seeking. We will now examine the various aspects of information seeking among youth, highlighting any differences between classic and more recent studies.

Planning

Difficulties in information searching are often linked to the lack of systematic strategies and the very short time devoted to planning the task. Marchionini (1989), studying the activity of second, third, and sixth graders using an electronic encyclopedia, notes that students are more “interactive” than they are “planners,” making no plans but rather reacting to system responses after formulating a first query. Fidel and colleagues (1999) observed 10th and 11th graders performing a prescribed task in the field of horticulture (having no previous knowledge on the topic). Results show that students believe that it is not necessary to have a plan in mind; that the search process will be fully determined by what students see on the screen. Fidel and colleagues found the highly interactive nature of student activity, but also note that although young people say they have no plan, they still have some initial ideas on how to begin their search. High school students say they have one or two ideas in mind, try one or the other, and combinations of terms, which suggests some planning before search terms are entered.

That young people begin their information-seeking task quickly is often interpreted as evidence of the lack of planning. Speed was indicated in all phases of the process: selection of links, defining the words used in the query, choosing of documents (Bowler, Large, & Rejskind, 2001; Fidel et al., 1999; Large, 2004; Wallace, Kupperman, Krajcik, & Soloway, 2000). When electronic documents first appeared, researchers noted that readers spent a longer time in electronic compared to print documents. A greater cognitive load generally explained these results. Small and Ferreira (1994, as cited in Neuman, 1997) found that students spent more time and more effort to explore multimedia than documents. Ten years later, these results were not confirmed. Comparing the use of printed and electronic documents about vocational guidance, Martins and Ciaccia (2004) found no difference in the time required by students to find information or in recall assessed by postquestionnaires. Today, the speed shown by young people in these new digital environments is such that information

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seeking seems to be easy, even playful, which leads some researchers to conclude that information searching is a kind of game for adolescents (Large, 2004).

Control and Regulation

Classic research on information searching also highlights the difficulty that young people have controlling their actions. Hirsh (1999) notes that fifth graders performing an information-seeking task at school do not keep track of their research and tend to repeat it. Regulating informational tasks involves metacognitive skills, that is, abilities to plan, monitor and evaluate their own actions (Lazonder & Rouet, 2008). In their meta-analysis, Walraven, Brand-Gruwel, and Boshuizen (2008) concluded that the crucial lack of regulation of the activity explains in large part the inability of young people, teenagers, children (but also adults) to formulate the central question of the search, to determine what information they need, specifying the words of query and evaluating information. But more recent studies show that adolescents become better searchers, learn to monitor, to evaluate and to adapt constantly to the research process (see e.g., the special issue of *Computers in Human Behavior*, Walraven, Brand-Gruwel, & Boshuizen, 2008). Brand-Gruwel, Wopereis, and Walraven (2009), based on three empirical studies with high school and university students (some of them PhD students), stress again the main role of regulation, finding that high school students search and scan information more often than do university students. University students often click on the links in the results list, and, after examining a site, return faster to the results page to click on another link. University students less often perform such regulatory activities.

It is not certain that the general definition of regulation as used above is enough to exhaust the description of information searching. Remarkably, Bowler (2010) puts forward one aspect of regulation poorly studied: the control of curiosity for the research topic. Results show, for 16 and 18 year old students observed in an academic research task, with a topic chosen by themselves, that the control of curiosity is part of metacognitive activity necessary for information searching. The curiosity experienced by adolescents during the search process is accompanied by feelings of both pleasure and pain. Both feelings have to be managed during the research process. The self-regulation of curiosity and interest is a metacognitive strategy based on understanding one's own curiosity and related emotions.

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Literal Use of Instruction

Information searching by students is another common feature at all grade levels: when they are asked to search for certain information, students do not deviate from the terms of the question, using these words in their query and searching for them within the selected documents. Their goal seems to be to find the correct answer to the question rather than gradually build their own answers. Wallace, Kupperman, Krajcik and Soloway (2000) studied sixth graders performing a prescribed information-searching task on the web. They found that these students searched one web page, answering all the questions they had to answer; their activity was reduced to finding the “perfect document.” Wallace and colleagues note that finding a document on the web becomes the main task at the expense of the other phases of the research. According to them, it is possible that other prescribed school tasks, such as the search for answers in a textbook or an encyclopedia, reinforce the idea that, in students’ views, searching and gathering information are one and the same task.

Hirsh (1999) found that fifth graders search for the exact words used by the teacher or contained in the instructions. For example, if the name of a sportsman about whom they are searching for information is not in the book title, then they will judge that the book is not relevant. Fidel et al. (1999) noted the same trend among older students. The strong constraint exerted by the instructions on students is such that they search lines on the screen that correspond to their instruction sheet. Likewise, in a more recent study, Julien and Barker (2009) note that 10th and 11th graders in biology copy and paste directly in the field of web search engine (Google) the instruction that was given to them. The literal use of instruction seems not to change.

Navigation Versus Queries Formulation

Young people described as novice searchers show, in most of the studies, a significant preference for navigation, that is, a search behavior based on hyperlinks clicking. Thus, Schacter, Chung and Dorr (1998) noticed that students (fifth and sixth graders) use significantly more navigation (80% of the information searching activity) than an analytic strategy. However, in well-defined search tasks (e.g., searching a fact), they use more analytic strategies, that is, a search behavior based on query formulation and examination of the results. Bilal (2002) made the same observation. In all the required tasks, well-defined, ill-defined, or self-generated, seventh graders navigate more than they search with key-words and succeed better when they navigate.

Whereas navigation dominates in the actions, Large and Beheshti (2000) noticed that, during interviews, 6th graders talk about their searches mostly with key words. Large and Beheshti then supposed that hyperlink navigation appears as so easy that students do not see it as necessary to evoke. High school students of Fidel et al. (1999) go forward boldly, clicking new links and looking for new sites. But the authors noticed an important use of the back button of the navigator: young people say they use it not to get lost.

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Bilal and Bachir (2007) outline the importance of the use of this strategy in various empirical studies: young people prefer browsing rather than searches with key words regardless of their age, gender, search tool or website. We notice however an exception to this preference for navigation: sixth graders in the Wallace et al. (2000) study make little use of hyperlinks, rarely going far from the research engine pages. The authors wonder about this infrequent use of navigation in their study and propose it is a consequence of the information-searching task. Chen (2003), in her meta-analysis of the young people strategy in catalogs and the web, noticed that navigation in these two environments are, at the same time: (a) based on very poor or very rare queries; (b) very demanding of cognitive resources; and (c) lacking of reflections on information needs, planning research and information evaluation.

However, more recent studies show that teenagers do not necessarily prefer navigation, especially in situations in which they have their own goal. For example, Boubée and Tricot (2011) show that high school students, in self-directed information-seeking tasks, perform half as many navigation actions (e.g., clicking a link within a text) than they formulate or reformulate queries. Most of the students formulate a query, select a document, read part of the document, reformulate a query, and so on.

Difficulties in Queries Formulation

Young learners have the most trouble with analytic strategies, linguistic-related, spelling, lexical or semantic difficulties, or else logic in the manipulation of the Boolean syntax during the formulation and modification of the queries. Furthermore, they do not know the operating rules of the information retrieval systems. These difficulties are an obstacle to using the digital information systems, especially the structured systems. In early studies of this phenomenon, students showed a preference for the printed catalog and neglected the first digital catalogs. According to Solomon (1993), those preferences can be explained by the early systems' poor interfaces. But the lack of usability is not the only cause. It is the cognitive incapacities that provoke the failures noticed in every empirical

study, whether online catalog studies (mainly until 1997 according to Chen, 2003) or web studies.

But regardless of the information system, all these studies concluded that young learners have the same difficulties. Nahl and Harada (1996) outline the conceptual complexity of query formulations (i.e., the choice of the words and logic operators of the query) that demand linguistic processing capacities including capacities to identify the main ideas of the query, to produce the terms of the search theme and the associated terms, and to combine them with logic operators. Bowler, Large, and Rejskind (2001; Large, 2004) noticed, that 6th graders using the web used several words instead of a single keyword, entered it quickly and repeatedly. These query formulations point out both a lack of planning and a degree of fluency in the theme viewed as “simple” (e.g., The Olympic Games). Shenton and Dixon (2004), in a large study including pupils from kindergarten to 18 years old for the oldest, did not corroborate these results and noticed that one-term searches are more frequent, even though some students 11 to 17 years old may use several terms in one request.

However, more recent studies show that teenagers formulate and reformulate their queries more easily, especially in situations in which they have a personal goal. For example, Boubée and Tricot (2011) in the study with high school students mentioned previously, analyzed the content and form of the queries. The majority of queries contained one to two keywords. The number of queries containing more than two keywords equaled the number of queries with a single keyword. The natural language queries are two to three times less frequent than queries formulated with keywords. Analyzing 15 pairs of students in information-seeking tasks, they observed 118 query reformulations. About 90% of the reformulations concern the conceptual content of the query; most often a more specific query is reformulated (generalization or the use of synonyms are far less used, as observed by Rieh and Xie (2006).

Warwick, Rimmer, Blandford, Gow, and Buchanan (2009) analyzed the development of the expertise, in a 2-year longitudinal study with undergraduate students in information management. They used surveys and observations featuring thinking aloud and interviews on information searching for academic work. Their results show that the more complex the work, the more students are forced to adopt a larger repertoire of skills. Students were able to develop new strategies (in databases, library) when the usual strategies did not work. But the development of expertise is extremely rare. Students retain their usual strategies even after training. The authors refer to the work in the field of education and psychology to discuss their results: resistance of the learners to the acquisition of new capacities could be linked to negative emotions (anxiety, confusion). This study emphasizes the importance of peers in information seeking:

students quote sources or use strategies because their friends use them. Even though the experts do the same, the difference is that the students do not take it as a starting point for an investigation: they use them with no further exploration.

Language Difficulties

Solomon (1993) noticed common mistakes at all levels of primary school and sixth graders observed: spelling mistakes, query formulation in natural language, lexical mistakes (e.g., bibliography instead of biography by a sixth grader), no match between the search themes and the subject headings, and lack of knowledge to suggest terms. For Marchionini (1989), it is not surprising that many of the participants, young primary school students, novices in information searching who did not know how the information systems work, provide queries in natural language (phrases and sentences). The youngest consider the system as very intelligent. For Large (2004), young people responded positively to search engines that promoted the formulation of full sentences in the requests. Bilal (2000, 2001, 2002) noticed that the biggest problem for seventh graders is spelling, whereas her study *Yahooligans!* did not take these spelling mistakes in account. Students reveal a preferential use of “wide” terms and queries including natural language elements. It is not rare in case of failure that the students submit the same query or else completely change concepts.

Most of these difficulties are found with high school students. Chen (1993) noticed similar mistakes with 10th graders: typing, spelling, and typographic (spaces for example) mistakes, and using natural language phrases. The query reformulations are mostly spelling corrections or spaces modifications. Search terms are mostly those of the instructions, and matching with controlled vocabulary is rare. Students tend to modify their terms conceptually going from specific to general. Nahl and Harada (1996) raise the absence of use of words derived forms (e.g., “migrate” is kept, and such forms as “migration” or “migrating” are ignored). On the web, Fidel et al. (1999) noticed similar behavior. High school students rarely go toward specificity (add terms to the query). Generally, query refinement consists in changing the spelling (e.g., plural/singular, capital/lower case).

Difficulties in Logic

Young people mixed the operators AND and OR (Nahl & Harada, 1996). In their web searches, fifth and sixth graders did not use Boolean

operators (Schacter, Chung, & Dorr, 1998). Marchionini (1989) noticed that the youngest participants, third and fourth graders, tend, during the queries reformulations, to become more specific even though they got no result. This illogical behavior can, however, be explained by the fact that these young students did not understand how the logical operator AND (implicit in the encyclopedia used) was used despite the training received prior to the search. For these students, it's simply about adding terms and not constraining the search.

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Large, Beheshti, and Moukdad (1999) noticed, with 6th graders, infrequent use of Boolean operators during the use of the Alta Vista research engine, and when they are used, it was improperly. Large and Beheshti (2000) noted that 12 years old participants prefer to use quotation marks to search expressions in the engines Alta Vista and Infoseek. Thus they avoid combining keywords with logical operators. Kafai and Bates (1997) did not corroborate these results: their young students (until sixth grade) were quite able to learn the basics of how to use logical operators and when to use them. Likewise, Marchionini (1989) indicated that second, fourth, and sixth graders are able to use a digital encyclopedia after minimal training, including using the Boolean operator AND. Marchionini noticed that the use of advanced research functionalities ensures less success than the use of concrete terms in the simple search field.

Some authors thus proposed a more positive interpretation of the adolescents' information seeking, without ignoring their mistakes and failures. Solomon (1993), who identified success and failure factors in the use of an online public access catalog (OPAC), found a surprising 66% success rate. Yet this encouraging number is due, in large part, to training support. Indeed, students who succeeded were those who admitted their problem with the system and asked for help (this result matches very well with Karabenick's (2006) position, mentioned at the beginning of the present chapter). Others were able to elaborate after failures with more effective strategies. He also noted a higher success rate when concrete terms are used. Solomon also reports possibilities of improvement of the search skills during interactions with the OPAC. But this only affects some of them. Borgman, Hirsh, Walter, and Gallagher (1995) showed that even without training young students are able to navigate in a catalog suitable for their age with a graphic interface (science library catalog).

Other factors can be involved in the performance of young learners. For Solomon (1993), an essential point of the development of capacities to use the OPAC lies in the interest of the student, as well as the importance of the instructions given by the adults. Self-confidence can make the young learners strategies in the structured systems more efficient. Nahl

and Harada (1996) thus noticed that higher levels of self-confidence are success factors leading to higher levels of success.

Difficulties in Using Digital Information Retrieval Systems

Early researchers noticed difficulties in the use of the commands of computer-based systems: the young people do not seem to see the instructions on the screen. Solomon (1993) provided an overview of the mistakes in the use the OPAC: students make mistakes in the choice of the access (e.g., entry of an author or a title in the interface dedicated to the theme) and syntax errors (spaces, punctuation). Chen (1993) noticed that getting a complete bibliographical notice is not easy for some participants who only refer to the summarized notice. Mistakes in copying the references (name of the author, titles) were also spotted. Nahl and Harada (1996) found that secondary students invent syntax forms such as “:” or the ampersand “&”.

The insufficient usability of the interfaces can be partly responsible for this apparent “distraction” of adolescents to the functionalities of the information retrieval systems. Some catalog, numeric libraries, or search engines for young learners are developed by library and information science researchers. Many examples are cited by Abbas (2005) in his review of the literature. However we notice that with the exception of Bilal’s works, which asks young people to use specific sites or engines, the most spontaneously used search engines by students are the general engines designed for adults (Alta Vista, Infoseek or nowadays Google), which adolescents have no difficulty using.

Source Preferences

Source preferences are an aspect of information searching more and more often considered in the literature. It seems that youth today, prefer sources that did not exist yesterday and/or are not preferred by older adults. For example, the convenient criterion is particularly common among the “millennials,” those born between 1979 and 2000 (Connaway, Dickey, & Radford, 2011). Convenient refers to the familiarity with a source, perceived ease of use and physical proximity. Bounded rationality is used to explain the source preferences (Agosto, 2002): If a student prefers a source it is because this source represents a good benefit to cost ratio, considering the fact that a student rarely has sufficient knowledge or information to perform this ratio evaluation.

Among students, the order of resource consultation has been clearly identified: first Google, second Wikipedia, and third library databases (for a review, see Biddix, Chung, & Park, 2011). According to its frequency of use, Wikipedia can be called a “first search tool” (Biddix et al., 2011). This behavior is to be seen in the emphasis on the web for academic work and shows that its use is growing in this academic context (Biddix et al., 2011). Identical findings have been obtained by Kennedy, Judd, Churchward, Gray, and Krause, (2009) who observed college students over 5 years found that the use of Google and Wikipedia intensified during this period while the gates of the university library remained at the same low-level during that period. The “Google Wikipedia” behavior today can also be interpreted as a consequence of the difficulties to use to structured databases, already observed before the web. Today, the web engines and the web holdings are the first mediation documents that reach the young, and this may be one factor involved in the order of resource consultation.

The adolescents’ frequent visits to the web and Google do not help to build knowledge about library resources and tools to access these resources. Connaway et al. (2011) showed, in a focus group with undergraduate and graduate students, that these young people do not understand databases better, and the fact that databases are resources of the university library. OPAC users use them as the engines in the web. Wilsson and Given (2010), in their study with 38 university students, performed an experiment with a prescribed task. They compared easy to spell and difficult to spell topics. Most of the participants chose “any field” rather than author field, title, subject: another recurring problem of lack of knowledge of documentary languages. Wilsson and Given provide many other examples of students’ lack of knowledge in using OPAC. They also show that students can often use common web resources to perform their tasks, including such subtasks as checking spelling.

In summary, many empirical results about source preferences seem coherent. They all show that preferences for Google and Wikipedia are linked to the recent development of these sources, that youth have skills in using these sources and that these skills do not provide knowledge or skills to use more classic and structured databases, which are still perceived as difficult to use.

Evaluation of Information

Most often, adolescents do not question the quality of the information. fifth and sixth graders appeared to ignore that it is necessary to question the information on the web (Schacter, Chung & Dorr, 1998). Kafaï and Bates (1997) noticed that this problem did not involve only information

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on the web but also anything found on the web or in their books. These contents seem proper “just because the information is there.” Large and Beheshti (2000) also noticed that sixth graders did not evaluate the reliability and validity of the information they found. Some students were, however, critical toward the content of the information—especially during the interviews. Yet their criticisms remain very general. Agosto (2002) observed that 9th and 10th graders are wary of the information found on the web. Still, their authority is rarely questioned, except for the websites designed by other students, generally considered as superficial.

Quality Versus Quantity

Shenton and Dixon (2004) found that young people typically consider “good information” as a source that has a large quantity of information. Thus, young teenagers appreciate a single document having all the information they need; encyclopedia articles fulfill these requirements. However the oldest among their participants were able to use several sources, which they connected together. Agosto (2002) also points out that 9th and 10th graders liken the quantity of information to its quality. Sites with a lot of information seem more reliable.

Speed of the Evaluation

Wallace et al. (2000) note that sixth graders spent an average of 28 seconds when consulting the site’s content. These very short reading times were also noticed by Hirsh (1999), who observed that only the first paragraphs or frames are consulted. High school students also make very quick decisions regarding the selection of the links to evaluate the site’s relevance. In the same manner, they go through web pages very quickly (Fidel et al., 1999).

Surface Criteria and Mistakes

6th graders’ most common evaluation method is to search within the selected document for the words that they expect to find. This leads them to pick documents unrelated to their theme. Result pages of search engines can be viewed as a sort of web’s table of contents. Hirsh (1999) refers to Piaget and imputes this behavior to the fact that fifth graders are “concrete thinkers” and are disturbed when the found terms and the question’s terms do not match. Search engines do not promote the evaluation activity by young people for another reason: they rely on the title for their selection (Kafai & Bates, 1997). Hirsh (1999) suggests that to evaluate the interest of the document fifth graders look at the title of the book, article or web page. They then go through summaries, when they exist, regardless of the type of document. Afterward they start reading the first sentences of the text, and result pages of search engines with titles and

truncated summaries (Bilal, 2002; Kafai & Bates, 1997) that do not ease their evaluation task and induce errors.

Relevance Criteria Used by Youth

Despite an evaluation of the succinct information, students make judgments of relevance similar to those of adults. The referential study over the relevance criteria by students is the one made by Hirsh (1999) with fifth graders. The research theme given by the teacher is to write a text including images about an athlete chosen by the students and to introduce this research work orally to the class. For this semiprescribed task, nine relevance criteria were identified and listed by how frequently students mention them when they think aloud during the search and the interviews:

- Topicality: criteria mentioned by every participant
- Novelty: information new to the students, is the second most mentioned criteria
- Interesting: personal interest
- Peer interest: peers, teachers
- Quality: quantity of information, or presence of images
- Recency/temporal issues
- Convenience/accessibility: for example book available at home
- Authority: very few students
- Language: comprehensible language, mother language

Criteria Change During Information Searching

Finding the information that matches the theme is relegated to the background, and personal interest seems to take on more importance in the evaluation. As in studies on relevance with adults, this change is attributed to the acquisition of new knowledge. After these observations and interviews, Hirsh (1999) noticed that most students are able to explain their decision-making process. Furthermore, she noticed that they became enthusiastic when they thought they had found interesting information.

Thus students apply a number of criteria. Despite the small number compared to those used by adults, students' reference to criteria shows that they are not always satisfied with the first document they find or, in other words, their selection is not purely opportunistic. Furthermore, the two most common criteria mentioned are the appropriateness to the theme and the novelty, as noticed with adults by Barry and Schamber (1998). Agosto (2002) nuances the appropriateness criteria: 9th and 10th graders consider these criteria as very important when they achieve prescribed tasks, but not important for their own information-seeking tasks, that is, self-generated tasks.

However the students of the Hirsch (1999) study did not apply the criteria of accuracy and validity. It is no longer the case for the oldest students defer to authority or respectability. High school students, of high academic performance, observed in class doing an academic task by Chung and Neuman (2007), raise the credential criteria of the organization or the author. However, the information content does not go through a validity evaluation. They simply pick the information that “echoes their personal views.” Young students in Hirsch’s study did not evoke the level of the text comprehension either, whereas older students of the 9th and 10th grades use another evaluation criterion: the perceived level of difficulty in website comprehension (Agosto, 2002).

→ Au: Chung & Neuman 2007 or 2008? See reference.

More recent studies provide results very similar to Agosto’s results. For example, Menchen-Trevino and Hargittai (2011) conducted over 200 observations and interviews with undergraduate students. Most of the participants use some criteria (e.g., credibility) when performing academic tasks, which they do not use when performing self-generated tasks. One explanation is provided by the authors: students are not allowed to quote Wikipedia as source in their academic work; then they do not use “academic” criteria when they use Wikipedia for their own purpose. Authors also discuss this result by comparing it to the fact that even information experts (journalists) can quote nonreferenced sources from Wikipedia. The nonuse of some criteria could be linked to the kind of source.

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The more knowledge one has, the more one is able to evaluate it. Braten, Stromso, and Salmeron (2011) presented to undergraduate students in education various types of documents on the polemic theme of global warming: textbooks, research texts, governmental, written press, oil companies. They measured the previous knowledge on the topic. Results indicated that those with more prior knowledge could distinguish between relevant and irrelevant documents. Those with less prior knowledge trusted more the documents from oil companies, leaning on superficial criteria, irrelevant for this theme and documents: the date (although the date difference was small). The status of the textbook was also important, although not as much as the other documents, whereas “neutral” content on natural and human causes was questioned. All the students trusted the textbook.

Is Information Seeking Easier Today?

From a cognitive and metacognitive point of view, it is difficult to understand why adolescents should prefer seeking information to seeking help, because for more than 20 years, literature on information seeking indicates that information seeking has been very demanding. It could be

argued that although information seeking was difficult in the past it is easier today (Horst, Herr-Stephenson, & Robinson, 2010). These authors define information seeking by young learners as “fortuitous searching” as opposed to “goal directed” behavior; that young people changed their attitude when faced with the massive quantity of information available and reachable. According to them, the information they seek is not factual information but a wandering from link to link that provides “random information.”

This type of search strategy, browsing, is not new; it is characteristic of search behaviors since the very beginning of the web. For example, Battelle (2006) who traced the history of web search engines concluded that Internet users (of any age) changed their attitude starting in the 90s, to “what is interesting there.” The Yahoo! directory satisfied this demand since people did not know what was on the web and needed ideas. This attitude changed toward the end of the 90s to “I want an answer to my question” with the idea that the web contained everything, the demand that various new engines tried to satisfy, culminating in the importance of Google. These results are based on indirect observations, interviews based on a synthesis of three years of collaborative, and ethnographic work. But claims about changes in information behavior of youth are being increasingly evaluated with direct, systematic observations of pupils and students’ searches (Boubée & Tricot, 2011; Griffiths & Brophy, 2005).

Dresang (2005) had already proposed radical change theory in the 90s, which describes information searching as nonlinear and nonsequential. Koh (2011) proposes “Interactive seeking and remixing” as a new type of thinking and learning. Young people chose strategies other than those taught by their teachers: that is, “developing self-defined and controlled paths” (Dresang & Koh, 2009). Hypertext allows them to choose what they want and what they need to explore. Moreover, Dresang reminds us of Marchionini’s conclusions: browsing and full-text environments since the late 80s and early 90s are easier to use.

Does the information search really evolve? Do young people learn to develop their information needs on the web (see Mardis, 2008)? Our review of the literature, presented in this chapter, shows that young information searchers do not spend a long time to plan their search and search very quickly in new digital environments. However, they become better searchers, learn to monitor, to evaluate and to adapt constantly to the research process. They can control their own curiosity. They do not necessarily prefer navigation, especially when they try to reach their own goal but are increasingly able to formulate and reformulate their queries more easily. Adolescents today prefer Google and Wikipedia, and this preference is linked to the recent development of these sources.

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Young people have skills in using these sources, but these skills do not provide knowledge or skills to use more traditional and structured databases, that are still perceived as difficult to use. Students revert to their usual strategies even after training. They are still dependent on instructions and, often, just copy and paste it directly in the field of web search engine. They still have difficulties in search language and logic. They are still not able to evaluate the quality or validity of information, preferring the criteria of convenience. We will now examine the literature on help seeking in information seeking and as an alternative to information seeking. This examination will lead us to compare the two activities within the same context and to better understand why help seeking is less often used than information seeking.

HELP SEEKING IN INFORMATION SEEKING

Help Seeking in Internet Searching

When young learners seek information they most often are not seeking help. This general behavior is illustrated by their Internet use. Livingstone, Bober and Helsper (2005) provide a quantification of the unused help seeking by young online information searchers with an examination of Internet literacy and experience online. In regard to searching, the authors note that only 18% of young people between 9 and 19 years old “ask for help when they can’t always find something.” Indeed, 22% say they always find what they are searching, the majority (68%) say that they usually find the needed information, 9% say they cannot always find it, and 1% say they often cannot find the relevant information. For young people, Internet searching seems not perceived as a task that implies help, but help seeking can be an alternative when information searching doesn’t succeed, as Karabenick (2006) wrote. In fact, young people trust in their ability to find information in the Internet as 87% are confident in their search skills, which is considered by them to be an essential “key skill associated with the Internet” that opens online opportunities but is not a complex skill for them. Help seeking has mainly a role at the beginning of Internet use, as few (4%) have taught themselves to use the Internet and 96% have been helped by others (66% by a teacher, 44% by a parent, 33% by friends and 16% by a sibling). Help was necessary to learn, in a formal or informal way, to use Internet. But, help seeking has a tenuous role, only in the initial moments of Internet learning, although it should be noted that, in this instance, the task was learning how to use the Internet rather than using the Internet to successfully complete a task.

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Research conducted by Livingstone, Bober and Helsper (2005), named The U.K. Children Go Online project, was based on focus group discussions and a national survey of 1,511 participants (9-19 years old), around the United Kingdom, together with their parents. The qualitative aspect of this research investigated the links between the development of online expertise and its consequences, that is, the increase of opportunities and risks. Parental regulation was also analyzed. The results show a growth of expertise, more “online facilities” (opportunities such as “interactivities, civic, peer-to-peer, commercial/careers and others” and more risks, related to privacy and contact). Even if it is not focused on help seeking or information searching, this large survey provides a quantification of the rarity of help seeking by young people, the growing of their Internet expertise and their self-confidence in their ability. When young learners are searching for information they, most of the times, do not seek help—even with librarians, even in physical libraries. This infrequent use of help seeking during information searching on the Internet may be consistent with the long history in library and information sciences: help seeking with librarians.

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Help Seeking With Academic Librarians in Physical Libraries

Information on help seeking in libraries does exist, which has several features that are impacted by age: help seeking by young people is different from that of adults and has concluded that:

- Help seeking in physical libraries is very rare among university students, even after information literacy training sessions;
- High school students seek help most often from online help services; demands concern mostly school work, a focus on the project rather than on the information task related to the project; and
- Communication between adolescents and librarians is not easy.

One may claim that help seeking in academic contexts is not a difficult problem for students who engage in information activities. Indeed, librarians can be seen as easily available resources, well located in physical academic libraries. But, in academic libraries, students rarely use human sources, a long-standing pattern.

Before the emergence of the Internet, empirical research had identified a phenomenon of so-called *library anxiety*, “a negative feeling or emotional disposition which occurs when a student is in a library setting” (Mellon, 1986). Such a feeling is widely shared by students (undergraduate students in Mellon’s study), as 85% reported feeling it. The following studies have confirmed the extent of the phenomenon (see Onwuegbuzie & Jiao, 2004,

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for a review) and have revealed a series of barriers that tend to trigger feelings of anxiety in a library setting. Among all these barriers, a barrier with library staff is linked to the students' perceptions about librarians and other library staff: students perceive them as intimidating, unapproachable and too busy to respond to a help request. In a recent study in the U.K. designed to evaluate and improve the informational skills of students by Jones and Allen (2011), first year psychology students in focus groups indicated they were intimidated by the sudden change of scale (with school libraries) and the complexity of available resources in higher education. Gross and Latham (2007) have investigated whether having skills in information searching reduces the phenomenon of library anxiety. They conclude that there is less anxiety with respect to student's own knowledge of library tasks, but anxiety towards staff is not diminished.

The lack of help seeking, the wish to not speak to the staff is a recurrent finding. Gross and Latham (2012) show that a lack of information literacy does not lead to develop these skills or to seek help, even when participants fail to perform their task (poor information quality, incomplete answers). The information professionals do not seem to find these skills useful, as students are unaware that their expertise is greater than their own skills.

Gross and Latham (2012) have noted the Dunning-Kruger (1999) effect: people who are incompetent in a domain show a miscalibrated sense of their skills; that is, they think they are more skilled than they really are, and they tend to estimate their performance as above average (when asked to compare themselves with peers). The Dunning-Kruger effect predicts that people who are incompetent are unaware of their incompetence and believe they will do well (they overestimate their skills). They have a high confidence level and tend to be discouraged when they face failure. They also fail to recognize skills in those who possess them. Skills development brings those who lack the skills to recognize their shortcomings. Experts meanwhile tend to believe that others know what they know and tend to assign a skill level lower than their own (that they can achieve).

Gascho Rempel (2010) studied the impact of a seminar (on how to do a literature review) on information searching. The results show a change (undergraduates vs. advanced students) in the ability to use specific databases but found no change in the likelihood of help seeking, especially from librarians. A questionnaire survey (more than 2000 responses of undergraduate students in the United States) by Head and Eisenberg (2009) shows that librarians are under solicited: 80% of the students say they rarely ask for help if ever. Even if the students were trained by librarians to use library resources, students will return to their preferred teachers as "coaches" to perform valid research. The professionals themselves

provide an interesting reflection. Libraries contribute to maintaining the status of students as novice because of incessant technological changes in libraries themselves (Allen & Weber, 2012). Technical changes in libraries have these effects on students because new resource providers are constantly emerging at an accelerated rate, the reconfiguration (re-package) of reviews and updating of the interfaces, new databases in the university library, and so forth. Semester after semester students continue to be novices. Moreover, the fact that open access journals are available on the Internet complicates the situation: it is not surprising that students prefer to start their search in Google and avoid libraries. More information products cause more uncertainty.

Things are different in high school when students are searching for information with a teacher and/or a school librarian who can support this information task. The way this task is supported is similar to a negotiation process. Long before the emergence of OPACs, Taylor (1967) noted since the 1960s the importance of dialogue between users and librarians to support the process of clarification of an information need, which is most often confused, due to the lack of knowledge; that is, the formalization and formulation of necessary information (i.e., knowing what information we are searching, query tools). When asked about the assistance provided by librarians, among high school students, librarians engage in a task that actually interferes with the conventional process of negotiation defined by Taylor. Indeed, they use these “teachable moments” to explain the methods of locating information to the detriment of the negotiating process rather than focus on the information needed (see Mardis’ [2008], state of the art).

Information and Help Seeking That Involves a Teacher

Help seeking is frequent when part of sessions supervised by teachers and school librarians. Fidel et al. (1999) report that starting a new search with new words is the hardest and most frustrating phase given the students’ lack of knowledge; it is also the information task that requires the most help and evokes the most help seeking. While other students in the classroom may have the answer, the students prefer to ask the librarian first (help seeking is about the information-searching process, especially, and on the instructions). From their questions, Fidel et al. found that students want to step back and receive directions about their actions (Where am I supposed to go? What page? What URL should I try? What do I need to do to find the information I need?). Most students want to receive specific and relevant support. Students also reported that observing how

the librarian solves problems could lead them to learn new strategies that will serve them in their subsequent research.

When they go to university, however, academic librarian help-seeking behavior does not generalize. The study of Agosto and Hughes-Hassell (2005) focuses on adolescents and librarians. They used several methods: surveys, written activity logs, audio journals, photographic tours, and group interviews. Urban youths aged 14 to 17 years old were interviewed about the types of information sought and choice of resources for their daily information needs: schoolwork before leisure activities constitute their first information need, and persons other than librarians were preferred. The authors write:

The most frequently consulted people included friends, family, and school employees, which is consistent with the findings of Latrobe and Havener (1997). Librarians appeared low on the final typology, after mentors and customer service personnel, such as store clerks. The relatively low ranking of librarians is consistent with Latrobe and Havener's findings, as well as those of the Urban Libraries Council (2001). Like the teenagers interviewed by the Urban Libraries Council, the participants conveyed negative attitudes toward libraries and librarians and reported frustration with many of the same aspects of library service such as strict rules, unpleasant staff, lack of culturally relevant materials, dreary physical spaces, and limited access to technology. (pp. 160-161)

Radford and Connaway (2007) confirmed this result in a focus group study with participants from 12 to 18 years old. These "screenagers," to borrow the term used by the authors, prefer to use Google, other search engines, browse the web, and ask friends rather than ask a librarian for help. Young people have more confidence in Google results and find guidance for librarians. Yet young people prefer (unexpectedly according to the authors) human interactions when they choose to seek help, and have established strong relationships with their librarian (public or school librarian). Despite the value of interpersonal relationships with a librarian, the young retain negative stereotypes. The explanation proposed by the authors refers to Goffman: "It is obvious that the screenagers chose to avoid possible embarrassing situations and perceive these interactions as face threatening" (p. 194).

Online Help Seeking

Young people can spontaneously ask for help on the Internet. Maridis (2008) investigated the questions asked on an Internet public library (a question and answer service run by students and information profes-

sionals), with 952 participants. She found that most of the students, from 11 to 14 years old, primarily used specific websites or search engines, before asking their question. But some ($n = 131$) began their research by asking questions using the Internet public library. For the author, this indicates that the task of defining the topic can be overwhelming for young people (see also Shenton, 2007). Another lesson from the study is that young people do not only ask questions about locating the content or sources but also seek help regarding the process of completing the project, that is, forming their hypothesis for scientific experimentation. The existence of this question and answer service shows that assistance is needed, especially for tasks prescribed by teachers, for the whole task, not just the information searching task itself; that is, how to search.

Teenagers also have different communication styles compared to previous generations: Radford and Connaway (2007) used a sample of 600 chat reference transcripts for 18 months from 2004 to 2006. Within this sample, they analyzed 431, and 90 were identified as being written by high school students (21%). In contrast to older users:

- Adolescents have lower average occurrences of “facilitating communication” items (thanks, self disclosure, agreement to try suggestion, seeking reassurance, closing ritual, admitting lack of knowledge), higher levels of self-presentation, they are reluctant to admit their lack of knowledge, little end ritual (disappear without a word), usually impatient. But they know how to express thanks (show good manners).
- Adolescents have higher average occurrences of “relational barriers” items: abrupt, impatient (difficulty in building a relationship), laugh (goofing), rude or insulting.

Human Versus Nonhuman Sources

In their review of the literature (which includes adults), Lu and Yuan (2011) note that, in organizations, professionals use both human (e.g., colleagues, experts) and nonhuman (e.g., documents, information systems) sources. Humans are particularly solicited when the need corresponds to tacit knowledge. The preconditions for the use of human sources are: knowing who knows what and establishing a network of relationships with information providers. Nonhuman sources (such as an intranet) are also interesting: it is possible to easily switch between instant messages or asynchronous communication, to formulate multi-

ple queries and to search beyond the boundaries of the organization. Lu and Yuan analyzed the priority when selecting a type of sources. They compared the use of quality criteria (appropriate to the task and positive criteria of accuracy, confidence, understandable particular can be applied to content and the source) and accessibility criteria (e.g., ease of acquisition). The authors' main hypothesis is that the level of need for information would be a good predictor of the criteria used for documents selection. The results show that a high-level of information need favors the use of quality criterion, and, at the opposite, low and medium level information need promotes accessibility criterion. The authors also found that for low-level information needs, participants prefer to ask systems rather than individuals. For high-level information needs, interacting with other humans is envisaged. It then could be possible to consider a simple rational hypothesis: for the information has low benefits, participants will not engage in help seeking that possibly has high social cost; for high-level benefits, they will.

No similar work has been conducted with younger populations, but the dichotomy between nonhuman and human sources has always been taken into account. A recurrent finding (Case, 2002) establishes that people (families, easily accessible, peers experiencing similar needs, teachers considered experts, see Shenton & Dixon, 2003) are highly sought by young people, rather than nonhuman information systems. The close entourage plays, especially for children, a crucial role. But the use of human sources tends to decrease over time in favor of the consultation of other sources of information: Internet, magazines and newspapers, books, television, radio, encyclopedias and dictionaries, multimedia (Hughes-Hassell & Agosto, 2007; Shenton & Dixon, 2003). Madden, Ford, and Miller (2007) asked young people aged 11 to 16 about the perceived utility of different types of sources. The results show that the Internet is ranked first as the most helpful source. But humans are used most because of their greater accessibility, based on data collected in 2002.

Analyses of adolescents' information needs take into account the problem of information need awareness, its formulation, or its denial. Vocational guidance provides a good example. Julien (1999) indicates that young people do not always know where to seek information, and when they receive help about information sources, they do not know what questions to ask. Todd (2004) also noted the weight of social norms, with Australian adolescents avoiding information seeking on drugs despite their need for information on this topic.

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DISCUSSION

Prescribed Versus Nonprescribed Searches

As it has been shown in this chapter, there are two very different approaches used in information-seeking studies: prescribed and non-prescribed. The prescribed searches use protocols where a participant is asked to reach a target; that is, to search for information that is defined by the experimenter. In these cases, determining the target is not the actual participant's goal. She or he does not need to be aware they lack knowledge and how it can be transformed into the need for information. By contrast, the nonprescribed (or spontaneous) search studies use protocols where participants are asked to seek information they need. The research is focused on determining the participant's preferred goal (what is important vs. unimportant). Compared to these two types of protocols, typical help-seeking studies use protocols where participants are asked to understand or to do something when knowledge is supposed to be insufficient; for example, to solve a problem. The participant needs to be aware of this lack of knowledge and how this lack can be transformed into a need for information.

The benefits and costs are very different in these types of situations. Prescribed information-searching goals are far easier to manage: there is no problem of awareness. Nonprescribed searches are much more complex since the participant has to be aware of his or her information need for information and define his or her information goal. Nonprescribed searches are typically about topics that are familiar to the participant, information goal that are meaningful and useful. However the self-generated information-seeking tasks can be difficult. In some fields that primarily involve teenagers, such as vocational guidance (Julien, 1999), health and sexuality (Burek Pierce, 2007), or drugs (Todd & Edwards, 2004), studies show that young people do not only seek facts, but also witnesses, contextualized and personalized information that answer their often complex questions on those themes.

In sum, just as it is difficult to compare help-seeking and information-seeking results and theories, it is also very difficult to compare prescribed vs. non-prescribed search results and theories in help-seeking domains. Research using prescribed information-searching goal provides many results that could obscure the nature of the processes involved in real-life information seeking.

Why Do Adolescents Prefer Information Seeking Rather Than Help Seeking?

Our review of the literature shows that while teenagers have difficulties seeking information, they prefer information seeking rather than help seeking. This is consistent with Karabenick's (2006) position, quoted at the beginning of this chapter. The evolution of teenagers over the last 20 years show they mostly have difficulties in information seeking when the goal is prescribed. Investigations of information evaluation by the young people still show major difficulties at the initial stage of the process with prescribed goals, but self-generated searches by adolescents are based on other (and new) criteria. For these self-generated goals, many coherent empirical results attest that information search is becoming easier. This evolution is mostly linked to the massive use of Google and Wikipedia. One of the major difficulties of help seeking in an information-seeking context is due to the teenagers not knowing who to turn to for help, or believing that those persons are not competent and that their help would be useless, or being anxious about asking for help from others, particularly librarians. In short, teenagers may estimate that the probabilities their help seeking could fail and/or its social or emotional or personal cost is important are both high. By contrast, with Google and Wikipedia, teenagers learn that they can find what they want and are rarely disappointed when they deal with self-defined goals that do not require difficult social relationships with an interlocutor, such as the need for reciprocity or ego threat due to revealed incompetence—these emotional or personal costs are very low.

Therefore it is not that the information-searching process that has gotten easier per se. It is still necessary to formulate a query, to examine the results page, to evaluate the documents, and so forth. However, for the global activity of information seeking, teenagers have a rather fair representation of their informational goals. They have a clearer representation of what they can find and how they can find it. In addition, information seeking with Google and Wikipedia allows for success even with fuzzy and evolutionary goals: the probability to be disappointed and/or to receive negative feedback is lower with this kind of goal. Yet the efficacy and efficiency of self-generated information-seeking tasks are not comparable to the efficacy, efficiency and possible costs of prescribed information-seeking tasks and help-seeking tasks. What is clear is the ongoing need to examine these issues to better facilitate both the help-seeking and information-seeking process among youth, but also of those in older age categories given the dynamic changes in the information environment.

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