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Information Seeking and Use by Secondary Students: The Link between Good Practice and the Avoidance of Plagiarism

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individual's perceptions of what is real may differ from that of others (Hammersley 1995). This

phrases had been taken from which books and Web sites, a system that worked very successfully in the pilot project. In this way, the percentage of copying by each student, with and without acknowledgement, was calculated. This in no way disadvantaged students and neither their teachers nor school library media specialists were given the results.

Smart Information Use: Findings and Related Literature

Each section begins by presenting an overview of the literature, followed by the finding from the Smart Information Use project, which will be discussed in relation to the similarities and differences with other studies.

Preferences for Information Sources

Recent literature tends to focus on electronic sources of information, particularly the Internet, making comparisons with other sources difficult to find. For example, the Pew Internet and American Life Project (Lenhart, Simon, and Graziano 2001) focused specifically on the Internet and education, finding that 94 percent of their survey sample of 754 youths aged twelve through seventeen, used the Internet for school research, with 71 percent having used the Internet as the major source in their most recent project. The next year, another iteration of this project (Levin and Arafeh 2002) found, through a qualitative American wide study of 136 students aged eleven through nineteen in fourteen focus groups, that virtually all "Internet-savvy students describe dozens of different education-related uses." The researchers concluded that "using the Internet is the norm for today's youth," with "school work" being one of the most important activities being reported (ii). The reasons included the speed of completion of school work using the Internet, being easily able to find information they understood, and the ability to find up-to-date sources. While there is a discussion of the "roadblocks" to Internet use that students said that they faced (iv), there were no negatives mentioned with regard to the quality of any of the information available on the Internet.

Despite the fact that Fidel et al. (1999, 32) conducted their study some time ago and had a limited sample (only eight student participants from the eleventh and twelfth grades at West Seattle High School), the enthusiasm for the Web still emerged strongly, with books also being mentioned as a useful source for "about one-half" of the group. While there were frustrations, particularly with access to the Internet, technical issues, and searching problems, the students liked searching the Web because of the variety of formats available (scientific, popular, commercial, and so on), the ease of access ("ease of one-stop-shopping convenience"

requirement in one school that the students use three different types of resources and in another that students use at least one reference book, one encyclopedia, and one Web site, the Internet was the preferred source for about two-thirds of students. Books or, in one case, the text book, were the next preferred source (with slightly less than one-third of students).

As the following quotations illustrate, students gave a number of reasons why they liked the Internet, with the main ones being the range and quantity of information available; the ease and speed of access, including its accessibility from home; and the access to up-to-date information. These findings confirm most of the points made in the literature, cited above (Levin and Arafeh 2002; Lenhart, Simon, and Graziano 2001; Fidel et al. 1999)

> ...the online things are more specific. [They have] ... more facts about certain things. (Year 8)

> Most of it was very up-to-date information that really is only available online, so that's why I mainly used the internet. (Year 11)

> Because, well I don't really go to the library that much, but it was just the easiest way that I could do it from home. (Year 7)

> I did it all at home...Access, easy, you know, straight away. And anything I'm looking for, I can type in the right kind of words in Google and it's not to good. (Year 10)

Students who preferred books thought they were easier to manage, provided depth of information, and were more reliable:

> Books are probably easier because they just have the main things that you want in them and you can look it up, the part that you want to know. (Year 7)

> [I preferred the books] because they had in depth stuff about it, yeah. (Year 10)

Even here, the Internet was not far from the thoughts of those who still claimed to prefer the book:

> I think the information in the textbook's more reliable...It's just that I prefer using a book over the Internet, it

identified many difficulties experienced by students, such as the choice of keywords, search strategy, browsing strategy, and rapid surfing. Valenza (2006) explored similar and more recent literature to conclude that students still struggle to find what they need. The "Internet-savvy" or "technologically elite" students identified by the qualitative iteration of the Internet and American Life Project (Levin and Arafeh 2002), discussed above, were found to comprise some 30 to 40 percent of teenagers. These were the students who used the Internet with confidence for many purposes. Even these students, however, were not always able to find just what they needed. A later Pew report (Fallows 2005) found that young people are confident but unsophisticated users of search engines.

It is interesting to consider these findings—suggesting that student self-perception of skills outstrips ability—in relation to the literature that discusses the seeking of help by students. As early as 1991, Kuhlthau (1991) established that anxiety was an integral function of the information search process and that it was natural that information seekers would look to others for help in overcoming their uncertainties. Since then, other American researchers have supported these findings. For example, the study by Fidel et al. (1999, 28) found that searching was "both a social and an academic event" for their eleventh- and twelfth-grade students. The students provided each other with mutual assistance as well as actively seeking help from the teacher and the librarian.

Both Hirsh (1999) and Lorenzen (2001) confirmed that school students sought assistance from their teachers, librarians, and peers. Lorenzen also noted that some mentioned family members. Branch (2003) concluded that students needed teaching and support in order to improve their skills and urged teachers not to overlook the importance of the affective domain, recommending Kuhlthau's 1991 findings as a guide. In the United Kingdom, Madden, Ford, and Miller (2007) iterated that students used other people, including relatives and peers, as an information source. However, as students grew older, especially in the final critical years of their schooling, when their needs became increasingly specialized, this reliance upon other people declined. At that stage, the students' use of books and electronic sources increased, although they continued to

I just pretty much used the same strategy I always have. I looked it up on the Internet or in a book, typed in directly to Google what I needed, came up with the information, put it into my own words. (Year 8)

groups of information users, as noted above. Only six students denied having consulted anyone. The people generally nominated were teachers or school library media specialists, fellow students, and family members. The tasks for which students sought assistance included locating sources at school, accessing Web sites and interpreting information in them, using encyclopedias, compiling bibliographies, and locating sources at home. Some students involved family members in the creation of their assignment:

> Yeah, [the teacher] helped me with the encyclopedia because I didn't know about it. (Year 7)

> I did actually ask the head librarian and she gave me some very good directions on how to go about setting it out. (Year 11)

> Yeah, like we talked through with people in my class how they were finding it and where they got their information. (Year 10)

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by Todd and Kuhlthau (2005). These researchers found that 92.8 percent of the students valued the instruction of library staff in developing their ability to evaluate information. Even more promising were the results of a teaching unit on the critical evaluation of Internet sites devised by Heil (2005). Heil surveyed a group of eighth-grade students prior to conducting the unit, then compared those results with the students' post-unit responses. She found that students increased their understanding of how to evaluate internet site information.

Jimmy Wales (2007, 17) himself, co-founder of the phenomenally successful online encyclopedia, Wikipedia, replied to criticism of the authenticity of the information on his juggernaut by declaring that "To discourage (students) from using it is unlikely, so instead we
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example, information seekers may take the satisficing approach as they weigh up the cost in time or effort of finding better information if they continue their search.

Agosto's (2001) research, using twenty-two ninth- and tenth-grade females, focused not only on the concept of satisficing, but also on that of "bounded rationality," again based on Simon (1955, 1956), who argued that "due to time restraints and cognitive limitations, it is not possible for humans...to make fully reasoned, purely rational choices" (Agosto 2001, 16). Agosto found that time constraints were a constant problem for students using the Web. Information overload

> ... if people don't have time and that. A lot of people, well kids these days in our year have jobs and stuff and a lot of other commitments. So to find time to put aside can be quite hard for some and that. (Year 10)

The issue of information or cognitive overload also emerged in various ways. With the Year 7 class, for example, some students mentioned that they found whole books difficult to deal with and preferred compendium-style books with a single chapter on their topic. The quotation from a Year 8 student alludes to the complexity of information students can face:

> Yeah, because it was sort of more, not the whole story but the main points. So that helped a lot, so cut it down ... (Year 7)

> ... sometimes if people don't understand the information, they might copy it, like trying to translate it and figure out what it means. (Year 8)

With regard to the now ubiquitous Google issue, the observation undertaken in the classrooms while students worked on their assignments, as well as their interview responses, indicated that they used the search engine extensively, although in a limited way, as Haigh's (2006) article observed.

> ... probably three sites I think I did and just decided, the basic information, whether it was true or not, by the majority. (Year 10)

> If you type something in on Google, you've done a search and a Web site that's at on the tenth page, it will not be as relevant as a Web site on the first page. (Year 11)

Recording and Use of Information

Synthesising or "creating", as conceptualised by Anderson and Krathwohl (2001), is considered by many to be the highest order of thinking skills. In the everlasting quest to help students write it in their own words, teachers have long exhorted them to make notes as they gather information. For teachers, it is an article of faith that effective notetaking will enhance comprehension, selection, organization, analysis, and ultimate synthesis of that material in order to create new meaning. Typically, students have performed that task to a greater or lesser degree according to their individual academic capabilities.

In the electronic age, technological advances facilitating the recording and using of information may have the capacity to subvert the goal of teaching students to generate new knowledge and use information responsibly. Print material can be photocopied; Internet or CD-ROM information can be downloaded and printed, or copied and pasted into a Word document. Even the humble highlighter pen can offer relief from the tedium of notetaking by allowing key points to stand out on the printed page. The analyses of the research papers of two groups of eleventh graders by McGregor and Streitenberger (1998) revealed high levels of copying, sometimes as high as 70 percent in one group, suggesting that the students incorporated very little of their own understandings into their completed work.

With regard to analysis and synthesis, Todd (1998) reported that the ability to generate knowledge through analysis and synthesis was poorly developed among the Year 6 Australian

secondary students involved in his research. When searching for information on the Internet, the students tended to scroll through the Web sites for answers, then copy and paste information directly into the work that was submitted to the teacher. Similarly, the Fidel et al. (1999) study found that the prime focus of the students was to find correct answers to their assignment questions in order to complete their work. To that end, they often copied sections of the relevant text into the final copy of their assignments.

With regard to notetaking, the Todd a

from Web sites, printing from Web sites, and highlighting key points or photocopying from books and highlighting key points. These students, too, mostly said that they used their own words when converting their notes to the text of their assignments. Because their notes were not checked by the teachers in these schools, we have no way of knowing how well this happened.

The correct citation of ideas as opposed to verbatim quotations also caused difficulty:

> But the critique I was given from [the teacher] was that I didn't footnote the ideas. The ideas are real kind of grey areas at the moment. Which do you footnote, which you don't footnote? ...For example, a lot of the information I got was basically, was more like a fact...[But the teacher said] these ideas, where did you get them from? (Year 11)

The Impact of Plagiarism

As mentioned in the discussion of the method, students' assignments were examined for the amount of copying that had taken place. This section discusses what was learned from the assignments of the five students who copied extensively. In each case, at least 50 percent of these students' assignments were copied (with four out of five copying more than 70 percent) all unacknowledged except in the case of one school, where two students copied considerable slabs of text but with some footnotes. The interview data of these students also have been examined and will be included as relevant.

With regard to source preferences, these students varied, with some favoring books and some the Internet. One student, who claimed she used books, actually gained half her information from books and half from Wikipedia. The examination of the assignments revealed that all copied more from t

Discussion

Emphasizing the changes already wrought by the electronic age, Internet sources were preferred by two-thirds of the samples in the Smart Information Use project. This is in keeping with the trends shown in the Pew studies (Lenhart, Simon, and Graziano 2001; Levin and Arafeh 2002). While increasing dependence on electronic sources seems inevitable, there are implications for the ways in which information is sought and used and for increasing plagiarism if students are not helped develop good practices. As mentioned above, all the students who copied extensively in their assignments did so more from Internet than from Internet sources.

The Smart Information Use project revealed examples of good, bad, and potentially problematic practices in information seeking and use. Examples on the positive side include students who were aware of the need to check, in multiple sources, the authority of information, and many students who claimed that they took notes in dot point form and then used their own words when incorporating their notes or information records into their assignments. Although most of the students, who copied extensively, also claimed they wrote dot points, (g)10(e)-6(y) pp(a)4(l)-(ot)rd ex(dekie(i)-r own wo2(a)2()]TJ T* [(i)-2(nook not)-2(e)4(s)-1(i)-2(n de)42(s)(r-2(n)-10U)-82-Uoughvir62 owt it mar6r6()

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