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

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The article reports phase 1 of a two-year study that focused on seeking and use of information by students at various stages of their secondary education. The project used a large qualitative sample selected from four Australian schools and was undertaken during 2006 as part of a wider project concerned with using information creatively and effectively to minimize plagiarism. The field work included observation of students undertaking an assignment, two interviews with students, and the analysis of the completed assignments. Topics covered and reported, in the context of the available literature, include: preferences for information sources, self-perception of information skills, help from other people, trust in and perceived reliability of sources, attitudes to information seeking, recording and use of information, and attribution of information sources. Criteria for good practice include the avoidance of plagiarism by students, general attitudes to information seeking and use, and awareness of the need for an evaluative, critical approach to information. The responses of the students who plagiarised most are examined towards the end of the article. The discussion and conclusion explore the issues in greater depth, provide recommendations for future improvements, and outline the remaining two phases of the project.

Introduction

The advent of the electronic age has brought with it major changes in the ways in which information is being sought and used, including by secondary students. The implications for plagiarism were discussed by Todd (1998). While there has been research that documents the uptake of the Internet by students (for example, Levin and Arafeh 2002) and much has been written about the likely implications for source use generally, there remains a need for research that investigates the implications for good practice in information use in the electronic environment as well as with traditional sources, including in relation to the occurrence of plagiarism.

Research, focusing on the seeking and use of information by students at various stages of their secondary education, using a large qualitative sample, was undertaken during 2006 as part of a wider project concerned with using information creatively and effectively to minimize plagiarism. The present article focuses on findings from phase I of this project (referred to as the Smart Information Use project), particularly the seeking and use of information by the research participants. One of the criteria for good practice concerns avoidance plagiarism by students in their information use, to be discussed towards the end of the article, but there are other yardsticks relating to such matters as general attitudes to information seeking and use, and awareness of the need for an evaluative, critical approach to information. The data from the Smart Information Use project, to be discussed in the article, relate to the following topics: preferences for information sources, self-perception of information skills, help from other people, trust in and perceived reliability of sources, attitudes to information seeking, recording and use of information, and attribution of information sources. Given that the literature revealed discussion of all these topics, albeit not all aspects, the findings of the project are presented in the context of the available literature, rather than separated from it. Thus the philosophy and method for the project are presented in the next section, to be followed by the Smart Information Use findings related to the literature, then a discussion and conclusion.

Research Philosophy and Method

The Smart Information Use project involves a cross-section of four Australian secondary schools: a country coeducational government school, a girls' Catholic school, and two other non-government, independent schools--one for boys only, the other co-educational. There are three major components to the research approach. The first relates to the exploration of initial definitions and understandings, as well as the extent of recognition and occurrence of plagiarism (phase 1); the second to the development of models of teaching, in various subject areas, to encourage students to generate new knowledge and avoid plagiarism (phase 2); and the third to development of a toolkit to assist other schools (phase 3). This article focuses on phase 1 only.

The key aim of phase 1 of the project, relevant to this article, was to examine students' attitudes to finding and using information, understand learning and process in relation to

their understanding, and recognizing plagiarism. The approach for this phase was based on the pilot project undertaken by McGregor and Williamson during 2004 (McGregor and Williamson 2005; 2006).

The philosophical underpinnings for the project emerged from the interpretivist tradition of research, with the study design being based on the constructivist paradigm. This fits well with the constructivist philosophical approach to learning, espoused for some time by leading educators (for example, Dewey 1944; Bruner 1973; Jonassen 1999) who posit that constructivist principles (that learners are active constructors of knowledge) should underpin teaching and learning. In research, constructivists emphasise natural settings and seek to gain deep understanding of the meanings of the actors involved in the social phenomenon under study (Glesne 1999; Williamson 2002). One school of constructivists believe that reality for each individual is determined by each individual's perceptions (Lincoln and Guba 1985) and each individual's perceptions of what is real may differ from that of others (Hammersley 1995). This is appropriate for a project where the researchers are concerned with understanding the viewpoints, or meanings, of a range of different students and staff, regarding information use and plagiarism, in different school settings, and to facilitate the development of a consensus about these issues. The parallels to the constructivist approach to learning are evident.

Within this philosophical framework, ethnographic method, well-suited to a constructivist framework, was used. In undertaking modern ethnography, often called "participant observation" (Bow 2002, 267), a range of techniques can be used and there is also the flexibility to emphasise some techniques over others. The techniques used--in this case observation, interview, and document examination--were complementary and enabled the findings to be triangulated, an additional advantage of modern ethnography. These techniques were trialled, and found to elicit suitable data, in the pilot project.

The Samples

The sampleswere selected from each of the four schools involved, with the aim being to represent as many different year levels as possible. They included a Year 7 Integrated Studies class of twenty-two students, a Year 8 Humanities class of eleven students, a Year 10 History class of eighteen students, and a Year 11 Economics class of fifteen students.

Data Collection

The data collection involved three elements. The first was observation of students in their classroom and the library while they were undertaking their assignments. The second element involved two interviews with each student, based on Kuhlthau's (1995) Information Search Process (ISP). The initial interview took place when students were beginning their assignments, and was meant to gauge students' attitudes to the assignment and how they would seek the information they needed. When the assignment had been completed and the student papers had been analyzed, students were interviewed again, this time focusing on what had been learned about information seeking and use as well as

on their understanding of plagiarism. Questions ranged across the topics outlined in the introduction; for example, where they obtained their information and their level of trust in the sources, whether they thought they had the required skills, whom they asked for help and what form it took, whether they took notes from sources or copied and pasted from the Internet, what they learned about the process of finding and using information, if they had to acknowledge sources and how this was done, and what they understood about plagiarism. The teaching staff and school library media specialists also were interviewed about their understanding of plagiarism. The third element was document examination, which enabled the researchers to compare the original sources and the students' assignments to discover the extent of plagiarism.

Data Analysis

The audiotapes of the interviews weretranscribed by an experienced transcription typist. Although the analysis as undertaken does not constitute a "grounded theory," it was influenced by the "constructivist grounded theory" approach of Charmaz (2003). Charmaz says that, unlike the original grounded theory (Glaser and Strauss 1967) and, particularly, the later version written by Strauss and Corbin (1990), constructivist grounded theory is not "objectivist." It "recognises that the viewer creates the data and ensuing analysis through interaction with the viewed," and therefore the data do not provide a window on an objective reality (Charmaz 2003, 273). Charmaz (2003, 259) therefore recognises that researchers' backgrounds will influence their interpretations of the data. They cannot avoid being influenced by "disciplinary emphases" and "perceptual proclivities." This means that, although there is every effort made to look at "how 'variables' are grounded--given meaning and played out in subjects' lives" (Dawson and Prus 1995; Prus 1996, as cited by Charmaz 2003, 272), there is acceptance that "we shape the data collection and redirect our analysis as new issues emerge" (Charmaz 2003, 271).

The analysis initially involved the identification of the themes, to some extent determined by the questions asked. Two of the researchers were engaged in the process. The data within each theme were then analysed for categories and key quotes. A voice sheet for each theme was then set up, each of which was subdivided by the categories into which illustrative quotes were entered. An overview of the data for the voice sheet was then written. See table 1 for an example of part of a voice sheet for the theme Trust in and Reliability of Sources (without the summary and with just of few of the quotations included).

With regard to the assignments, each was converted to electronic format and analyzed to locate portions matching existing text available on the Internet. All books cited in the bibliographies were searched wherever possible. The student papers were color-coded to show which words and 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 America-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 ("one-stop-shopping convenience"), and the up-to-date information available (Fidel et al. 1999, 32). Chen (2003) took up some of the points made in the Fidel et al. study, emphasising the attraction of the multimedia environment, taking students "around the world" (Fidel et al. 1999, 32) and enabling them to see, hear, and interact (Chen 2003, 35-36).

Along with the popularity of the Internet amongst students has come the extraordinary Google phenomenon. Haigh (2006) charted the meteoric rise of the use of the Google search engine, including by students. He saw the reason as the gratitude of people for anything that purports to discriminate amongst the vast volume of information now available.

Smart Information Use findings also reflect the popularity of the Internet as an information source. All students in all schools used the Internet for their assignments. Despite the 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-thirds 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 so 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 parts 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's just more reliable. But the internet definitely is more convenient--easy access, especially from home. (Year 11)

The close link between the use of Google and the Internet emerged as well, confirming Haigh's (2006) views:

> Most of my information came from Google I'd say, so the Internet... (Year 8)

Self-Perception of Information Skills

The study by Fidel et al. (1999), introduced above, suggested that in spite of students' belief in the ease of Internet use, they were unskilled and often unable to find the information they needed. Chen (2003) analysed the literature investigating particular search problems and identified many difficulties experienced by students, such as the concept 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 consult their teachers. A large-scale survey involving 13,123 student respondents in Ohio showed that the students themselves considered that their school libraries played an active rather than a passive role in their learning because of the ways in which the staff provided help to the students (Todd and Kuhlthau 2005).

Finally it should be noted that interpersonal sources of information have been shown to be crucial to all types of information seekers and topics. There are innumerable examples that include Mills' (2003) study of university academics, Heinstrom's (2002) survey of Finnish masters students, and Williamson's (1995 and 1998) research focusing on older people.

In the Smart Information Use project, the large majority of students in Years 8, 10, and 11 believed that they already possessed the skills necessary to complete the research tasks, confirming the findings of the literature discussed above. Essentially most thought that they did not learn anything new about the process of finding and using information for the assignment they had undertaken. Confidence in ability to use information was not always well-founded, as will be seen toward the end of this article.

> 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)

> [I had the skills.] I think that you needed to know how to use the information that you found, like use it from all different--like, I had to put the things I found on the net with the things I found in the book as well, so things like taking information from all different sources. (Year 10)

> I didn't really learn anything new. I just sort of knew it from past experience, so I did the same thing. (Year 11)

Even so, particularly some of the older students thought that they had refined their skills in seeking and using information.

> I definitely found out some pitfalls in what I had previously thought was the right thing to do. ... Specifically, when I'm referring to quotes and paraphrasing information, whether to take it off a respectable website or something that might be opinionated, I haven't really thought of before, but then obviously it makes a large difference. (Year 11)

> [I learnt] um, that it's definitely better just to read it all for yourself before you start taking notes. ... I know now that it's easier to sit there, take it all in, read it, understand it and then write down what you know and then look back at the references ... for stuff that you've forgotten. And then you really get it in your own words and you understand it more that way too. (Year 10)

The case of Year 7 students was quite different in that they overwhelmingly believed that they had learned something new. While they all already knew how to access the Internet, three learned how to make their keyword searches more precise. It should be noted that these students were taught information use directly for this assignment, in contrast to the other year levels, where there was less intensive instruction in relation to the assignment.

> And with the internet [the teacher] told me how to like look that precisely up. (Year 7)

Fourteen students thought that they had improved their information skills, either in using the computer catalogue, physically locating sources, or in constructing a bibliography and the same number, although not necessarily the same students, learned how to locate and use print encyclopedias, with five using an encyclopedia for the first time.

> I learnt a bit more about like how to get books from the library, like with their decimal system thing. (Year 7)

> It [an encyclopedia] gave me all the facts ... like it doesn't go into a lot of detail, it just gives you the main basic facts. (Year 7)

In the light of the general confidence of all but the Year 7 students, it is interesting that the large majority of students, at all levels, sought help from, or discussed their assignments with, at least one other person. This also is in keeping with a vast body of findings focusing on a wide range of 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. Sometimes 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)

> They [my parents] did sort of help me find stuff like the websites and things like that, which was necessary to do the project. (Year 8)

Trust in and Perceived Reliability of Sources

Perhaps linked to the confidence students have in their search abilities is their seeming trust in the sources of information they use. Moreover, in the electronic age, evaluating the authority of information sources on the Web has proved to be a singular challenge. As Lorenzen (2001) has pointed out, the traditional gatekeepers of print material, such as editors and peer reviewers, are largely missing from the Web. He found that while tenth- and twelfth-grade students in a Michigan high school thought the library and the Web were equally valid for locating information, they gave scant consideration to evaluating

the information on Web sites. Hylen (2005, 22) has also noted that prior to the emergence of the Web, students were only exposed to "preselected, quality library books."

While school library media specialists have for a long time realised the importance of questioning the authority of sources, it has been the growing awareness of the questionable nature of many Internet sources that has lent them support. Nevertheless, apart from Lorenzen, other researchers have found that both primary and secondary school students have a high level of trust in information found on the Web. Those who have found evidence of this in the later primary years include Schacter, Chung, and Dorr (1998), Hirsh (1999), and Wallace et al. (2000). A United Kingdom study (Shenton and Dixon 2003), with a large participant base of 188 students from fourteen year levels, both primary and secondary, across six different schools, also indicated that the students placed too much trust in the authority of information sources, especially the Internet. The researchers urged the need for greater attention to be paid to the teaching of evaluation skills (Shenton and Dixon 2003, 1045). On a different tack, Fidel et al. (1999, 32), in the study discussed above, found that their eleventh- and twelfth-grade students believed that information on the Web was more current than information in books, "reasoning that it was easier to update information on the Web than to publish a new book.".

Recently encouraging results emerged from a survey of conceptions of help from their school library media specialists among a massive participant base of 13,123 students in Ohio conducted 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 need to do some education about media competence, how to evaluate sources--that's a skill that needs to be taught more across the board, with respect to television, newspapers and magazines, helping students to critically evaluate sources of information."

In the Smart Information Use project, the findings in the literature--that students tend to trust the sources of information they use--were generally confirmed with all but the youngest students. The students in Years 8, 10, and 11 generally had a high level of trust in the Web sites that they chose to use, although at times they claimed that they exercised selectivity, saying that they cross-checked information across different Web sites:

> After I've found information, I'll then go to another site to look up the same information and compare them before I type anything in. [If I found contradictory information] I'd look up a third one. (Year 8)

There seemed to unquestioned trust in government sites and sites that proclaimed themselves to be official:

> Yeah, I could trust them because they were certified and there was signatures on the Web page ...(Year 11)

Most students seemed to think that they could tell if a Web site was not trustworthy and knew how to evaluate the reliability of a site:

> A lot of times when you go on the Internet you just find someone's opinion, not fact. But I know how to like [find] education ones and everything--I know. You can tell when a site's all right. (Year 10)

Nevertheless there was some lack of trust in the Internet exhibited:

> Yeah, I probably trusted the books more because on the Internet you don't know what's right and what's wrong. (Year 10)

In fact, student trust in nonfiction books was virtually unquestioned:

> [Non-fiction books] are written by people that have also studied it [a topic] over a long period and wrote a whole book on it. (Year 10)

Complete trust in the school library was conveyed, as well as a conception of the traditional gate keeping role of publishers and librarians:

> [The books] from the library--you can be pretty sure that all of them are going to be good because they check [the ones they acquire]. (Year 8 student)

In the case of one school, the value of the subject text book owned by each student was taken for granted:

> Well, you never know where the information has come from on the Internet. Whereas with the text book ... if the school's using it, obviously it's going to be reliable. (Year 11)

Once again, the school with the youngest students indicated a difference. Here only five students indicated a very high level of trust in the Internet, although none of those five were among the students who attempted to check reliability. The majority had a medium level of trust and checked reliability against other sites, or against books or encyclopedias in print form. Also, only half the students indicated a high level of trust in books. Another five had a medium level of trust, having noticed conflicting information in books, and four of those employed cross-checking to resolve the problem. The remaining students did not make their position on this matter clear:

> Because the Internet--pretty much anyone can put a site on it. ... The books and encyclopedia were the most trustworthy and I compared the Internet notes and the book notes--they looked the same. (Year 7)
>
> Two books had like different dates of when she was born and stuff, so I went and checked in other books to see which one was right. (Year 7)

We can only speculate that the influence of the school library media specialist may have played a part in this more tentative approach on the part of these younger students--notably the group who also generally perceived that their information skills could be improved. The school library media specialist had worked very closely with these students who, being in their first year of secondary school, had more contact with the school library than some of the older students in the other schools.

Attitudes to Information Seeking

Apart from attitudes to reliability of sources of information and the evaluation thereof, discussed above, the literature on this topic points particularly to what is labelled as "satisficing" which, according to Agosto (2002), emerged from the work of Simon (1955), Newell and Simon (1972), and Simon (1979). The word combines the concepts of "sufficing" and "satisfying" (Goldstein and Gigerenzer 1996, 651) and, in our context, would refer to students making decisions about information selection and use that they would deem to be "good enough," although they might not be optimal. The concept is related to that of "optimal foraging," originally applied to hunter-gatherers or animals adapting their behavior to survive. It was then related to human behavior by Smith and Winterhalder (1992), with Sandstrom (1994) and Pirolli and Card (1995) extending this to help explain environmental factors that influence humans' information choices. For 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 manifested itself as a cognitive constraint, both in terms of the Web as a whole and within individual sites. Within the latter, "the participants found resources with large percentages of textual content, as opposed to graphic or multimedia content, to be tedious and mentally taxing" (Agosto 2001, 22).

Agosto (2001, 23) also found that information overload resulted in satisficing behavior, particularly through "reduction methods." One tool here was a trusted search engine. It seems, however, that this approach also brings problems. According to Haigh (2006, 16) Google is regarded by students as "like an infallible brainy kid whose work they can copy" yet "tends to leave huge vistas of the web unexplored."

Adding weight to the above is the work of Kuhlthau (1993), mentioned above, who demonstrated the uncertainty faced by students in the early stages of information seeking. This is again reinforced by the work of Wallace et al. (2000), who found students made efforts to reduce the complexity of tasks. In a study involving eight sixth-grade students (four dyads), Wallace et al. (2000, 84) found that many students reduced their task "to finding a single page--the perfect source where the answer could be found"--and were rarely engaged with the subject matter. Because of these kinds of findings, Kalbach (2006) argued that reducing uncertainty and complexity for students can be helpful and that taking affective concerns into account is important in developing Web search interfaces.

There are clues in the data from the Smart Information Use project regarding the attitudes to information seeking that were raised in this literature--particularly related to time pressures resulting in "satisficing behavior" in its sense of students making less-than-optimal decisions in order to save time. These come from the responses to the question asked of all interviewees--students, teachers, and school library media specialists--concerning why students plagiarise. When interviewees were asked why they thought students would plagiarise, a common response was that plagiarising required less time and effort. They used such descriptors as "quicker," "easier," "can't be bothered," and "lazy." Some mentioned problems with time management:

> Maybe they're running late and they just need to put something down to get their marks ... or, they just can't be bothered, like, putting it in their own words. (Year 7)

> Because it's the easiest way to get marks ... [and] ... cause they're lazy. (Year 11)

As Agosto (2002) found, time constraints also loomed large as a reason why students plagiarise:

> Because they had to get something done quickly, like they had a lot to fit in. (Year 8)

> ... 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 might 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 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 the 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 forty-two 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 and Kulthau (2005) survey in Ohio found that students valued instruction in making effective notes and organizing information in ways that enabled them to generate new meaning for themselves. On the other hand, a naturalistic study of the spontaneous notetaking practices from a history textbook by sixty-six seventh-grade students showed that, while 79 percent of the students rated themselves as being able to make satisfactory notes, they had an inflated sense of the effectiveness of their own skills (Brown 2005). This confirmed earlier studies between 2001 and 2004 of students' self-directed notetaking practices during research tasks (Guinee and Eagleton 2006). One of these studies revealed that more than three-quarters of thirty-eight eighth-grade students cut and pasted Web material while taking notes.

On the other hand, when Herring (2006) investigated the note making preferences of fifty-three Year 8 students in a United Kingdom school, he reported that 65 percent of the students preferred to handwrite their notes, and eighteen percent to type them. Only 12 percent had a preference for cutting and pasting Web information. Overall, 45 percent of the students said that their preferred personal style of notetaking assisted their level of understanding of the information that they had gathered.

In the Smart Information Use project, students in the Year 7 class were required to make notes in dot point [bulleted] form as part of their assigned task, resulting in almost all saying that they did this. All students at this school at least implied that they had used their own words in converting their notes to the text of their assignments:

> Yeah [my dot points were useful], 'cause when I was writing all my paragraphs about him, I just looked at my notes and then I just made it more interesting and more descriptive and everything. (Year 7)

Nevertheless, the lure of copying and pasting was hard to resist. The students in this class had been required to submit their notes. One remained defensive, even after her assignment had been penalised by a loss of marks because of the nature of her notetaking.

> Well, I got a couple of marks down for my notes, the Internet notes, because yeah ... when I take notes from the Internet I just copy and paste them into a Word and then when I'm typing up my thing I just look at this other Word document and take some things out of there and put them in my thing. ... Well, I think the dot points is a bit--yeah, the dot points was okay for the books. (Year 7)

In the other year levels, about a third to half of the students said they took notes in dot point form, with the majority saying or implying that they used their own words when incorporating their notes or information records into their assignments. The remainder of the students in all year levels used a variety of methods for recording information, including copying and pasting 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. As discussed above, the Brown (2005) research indicated a gap between students' self-perception of their notetaking skills and their actual abilities. The following quotations indicate the range of approaches to note taking used by the students:

> [I made notes by] copying and pasting them in a big Word document. (Year 8)
>
> I cut and pasted it but then I summarised it in my own words, I didn't actually copy it. I didn't want to take ... from someone else's work. (Year 8)
>
> Um, I had my information, most of it--a lot of it--was photocopied and then I just highlighted and scribed out what I found interesting ... I just write it out. I write out sentences or phrases that I think are useful ...That became my notes. (Year 10)
>
> I printed it up, then I'd read through it, highlight sort of main areas, and then the areas that, you know, that were important, I'd footnote them, I'd quote parts you can't really change and then just the general sort of talk, the basic ideas, put into my own words at he write up stage. (Year 11)
>
> I just summarised paragraphs and important sentences into just small dot points I could understand ... I wrote it down in biro ... I find that helpful. (Year 11)

Attribution of Information Sources

There appears to be little research investigating the ability of secondary school students to acknowledge the sources of the information that they include in their assigned work. The work of McGregor and Streitenberger (1998) placed some emphasis on this issue, and that of Britt and Aglinskas (2002) provides some insight.

Studies in the 1990s in Alberta and Texas (McGregor 1993; McGregor and Streitenberger 1998) compared the submitted assignments of two groups of eleventh-grade students with the original sources of their information. Levels of copying and plagiarism were high in the Alberta group. The Texas group also demonstrated high levels of copying. However, the teacher of this group had emphasized the need for the students to acknowledge information sources, and the degree of outright plagiarism was lower than that of the first group. Although the Texas students attempted more referencing, they did not prove to be skilful at paraphrasing or punctuating direct quotations correctly, and made many citation errors, including false citations, that seemed to indicate that many were simply fulfilling a requirement to include citations, not acknowledging appropriately.

Britt and Aglinskas (2002) provided high school and college students with a number of documents on a single historical event. Overall, the students did not, of their own

volition, pay attention to the range of document-level literacy skills that historical experts would invoke when analyzing documents. These skills included such aspects as sourcing (in this sense, identifying critical historical features of the source documents), contextualization, and corroboration. After instructional intervention, especially using a computer-based tutoring system devised by the researchers and rather wittily called the Sourcer's Apprentice, a comparison group showed improved ability to identify and incorporate source information into their finished work (Britt and Aglinskas 2002). The ability of students to attend to the mechanics of citation and to avoid plagiarism does not appear to have been the researchers' prime concern. However, these studies seem to provide interesting insight into the tendency of students to be relatively indifferent to the need to acknowledge the ideas and intellectual property of the authors they consult and to the mechanics of accurate attribution.

With the Smart Information Use project, there was a clear difference between younger and older students with regard to acknowledging sources, clearly reflecting the views of the teachers and school library media specialists about how this topic needed to be gradually introduced to students. None of the students in Years 7 or 8 demonstrated an awareness of the concept of citing an information source within a text. Some considered that paraphrasing obviated the need or that the provision of a bibliography satisfied the requirement:

> I did quote somebody ... I put quoted by, or said by. (Year 7)
>
> No, I didn't use any quotations. I think I put everything within my own words. (Year 8)
>
> By the bibliography [I acknowledge sources]... Like, if you're doing a book, you like write the author and title and if you're doing an encyclopedia, you just write the volume it is and different things like that. (Year 7)

The year 10 students were virtually evenly divided on whether or not they had had to acknowledge information in their work. Once again, the students who did not think that they had needed to cite information thought that paraphrasing obviated that need or that the provision of a bibliography satisfied the requirement to attribute sources:

> Oh yeah ...I did a couple of quotes...at the bottom...like you do little numbers. (Year10)
>
> Um, not really. It was all pretty basic information. Like, if it was in depth but when I found it and did a dot point and expanded on it, it became pretty much in my own words. (Year 10)
>
> I don't think I specifically did. No I, yeah, just in the bibliography. (Year 10)

On the other hand, all Year 11 students understood the concept of acknowledging information within the text of their work and constructing a bibliography. All said that they had had to do so and all stated that they had used footnotes, as required by the teacher. However, there was wide variation in their understanding of how, and demonstrated ability, to do so accurately:

> Yes, if it was a good quote I'd put it in quotation marks and use a footnote or I'd mix it around. (Year 11)

> I think that for some [sections of my assignment] ...I'd put the footnote after the full stop at the end of the paragraph, so that I assume that it's footnoting the whole paragraph. (Year 11)

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 don't you 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 the Internet than they did from books. Nevertheless, three students were confident about their skills, although one said that this was with the exception of time organization. One student identified writing in his own words as a problem, and another was unable to identify neither the skills needed nor those used. The teacher was the main source of help for these students.

With regard to trust in and reliability of sources, two students had more trust in books than the Internet, with one commenting that although books are "true":

> I just sort of hoped that it [the Internet] was true.

One student was unsure about reliability and looked for confirmation, two mentioned that they trusted Wikipedia, and another made the surprisingly misinformed statement:

> I think there's a thing that shows you down the bottom of the website whether it's a locked website or whether someone can tamper with the information or something like that.

Although three students admitted to some copying and pasting, it is interesting that four out of five claimed that they recorded their notes with dot points. If they did this, it seems they did not use these notes, given the high level of copying that took place. These students also had no clear sense of how to use text with attribution, as the following quotes attest. It should be noted, however, that the youngest students had not yet been taught to acknowledge sources in the text:

> I didn't mention that in the actual booklet [text of assignment] ... Just in the bibliography.

> If it's [a quotation] major, if it's more than three lines I guess, but if it was something minor, I wouldn't do it [footnote].

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 non-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, it appears that many students did understand the benefits of note taking and how this process should be used, at least in theory.

Into the potentially problematic category we would place the unquestioning attitude about the search engine, Google, which many students see as the total answer to all their information needs. Clearly Google is a very useful tool, one that the vast majority of Internet users now find indispensable. Nevertheless, we would argue that total dependence on it for finding information could be problematic.

With regard to gauging the authority of Web sites, our findings indicate that not all students are convinced that it matters. There is a common view that Web sites that look official--are under the auspices of government or educational institutions, for example--are authoritative and reliable. This is not always the case. One way of tackling the problem is to show students examples of Web sites that appear authoritative and official, but are still of dubious quality, pointing out the reasons for these judgments.

In relation to notetaking, we pointed out above that most students had a concept of doing this in dot point form. However, even if students do make notes in this way, it is important to realise that this does not mean that they will actually incorporate them into their assignments in preference to copying and pasting. Strategies for using the dot point notes to synthesize ideas from multiple sources should be taught.

It is important that students learn to acknowledge sources in the text and reference lists, but this necessarily must be related to the age and experience of the students involved. This is an issue which the next phase of the Smart Information Use project is tackling.

Conclusion

The project indicated that, overall, the students had a confidence in their skills in information seeking and use that was not always well-founded. When they felt they needed help, they were likely to turn to their teacher or school library media specialist, both of whom are thus well-placed to provide assistance. It is therefore important that they also demonstrate good practice.

In all the schools involved, it was the younger students who had more contact with their school library media specialists and therefore had more opportunity to be influenced in good information practice. We saw evidence of this, as discussed above, and suggest that greater contact with school library media specialists should be extended to all levels. If the older students had developed better practices in their earlier years of secondary schooling, some, at least, seemed to have regressed. Some of the older students, particularly, were more confident than they should have been and, moreover, appeared to believe they already knew all there is to know. While engaging such students will not be easy, this is a challenge that needs to be met.

The next phase of the Smart Information Use project is now underway. Teachers and school library media specialists have tried a range of different strategies to assist students to avoid plagiarism. These extend across developing general understandings of plagiarism issues, to notetaking skills, to acknowledgement processes, to stimulating creative thinking. In the third phase of the project, a toolkit of these strategies will be developed and made available worldwide.

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Table 1. Trust in and Reliability of Sources

Category	Quotations
Internet: Confidence in selection and cross-checks	Um, probably cross reference it with something else. ...and so see if the same sort of thing is in another trusted source. ...a lot of times when you go on the internet you just find someone's opinion, not fact. But I know how to like [find] education ones and everything--I know. You can tell when a site's all right.
Internet: Lack of trust	Cause you don't know who's written most of the stuff on the internet. [They could be] making it up. Yeah, I probably trusted the books more because on the internet you don't know what's right and what's wrong.
Books: Trust in non-fiction	...books are more factual I find. ... At least you know then that they've kind of been approved by the public and that, or otherwise it wouldn't be, even been published type thing. They're written by people that have also studied it over a long period and wrote a whole book on it ...