Generating Knowledge and Avoiding Plagiarism: Smart Information Use by High School Students

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The article reports phase 2 of a two-year study, dubbed the Smart Information Use project, the focus of which was appropriate seeking and use of information by students at various stages of their high school education, along with the avoidance of plagiarism. In four Australian high schools, teacher librarians and classroom teachers developed and trialed strategies to teach students how to avoid plagiarism. Each school used action research and one of two pedagogical approaches, referred to as "instructional practice" and "inquiry learning." University researchers undertook evaluation using an interpretivist/constructivist framework. Students, teachers, and teacher librarians were interviewed, mostly in focus groups. The strategies used in both approaches are described, along with the findings of the evaluation. Both approaches were found to help students to avoid plagiarism. The discussion section includes student and teacher predictions about changes in future practice, the importance of student engagement with topics, and assessment issues. The conclusion discusses the lessons learned, focusing particularly on the need for a whole-school policy if plagiarism is to be counteracted. Good collaboration between teachers and teacher librarians is crucial. The two pedagogical approaches, taken together, provide a powerful repertoire of ideas that can be implemented over time in any secondary school anywhere.

Introduction

Plagiarism is a much discussed problem, especially at the college level, with a new book on the subject (Blum 2009) providing recent in-depth exploration of the problem in relation to college culture. The issue has received some consideration at the high school level, especially in relation to the contribution of the Internet. As early as 1998, Todd (2008) showed the extent to which the electronic environment played a part in the problem of plagiarism at the high school level (28).

In 2007 an article appeared in *School Library Media Research*, documenting the first phase of a three-phase Australian project (Williamson et al. 2007), called the Smart Information Use project, which aimed to help students learn to avoid plagiarism. The idea for the study originated with previous research (McGregor 1993; McGregor and Streitenberger 1998) where plagiarism was discovered but finding solutions was not an objective of the research. The project was supported by Australian Research Council Linkage funding and, as well as university researchers**,** involved four high schools as collaborating organizations. The plan for the study was, in the first phase, to benchmark students' information use from the perspective of "good practice," one criterion of which concerns avoidance of plagiarism. This first phase also explored understandings of what plagiarism is, from the perspectives of students, teachers, and teacher librarians. It involved a large qualitative sample of students at various stages of their high school education from the four Australian high schools involved (Williamson et al. 2007). It is worth noting that in Australia, high school includes years (grades) 7 to 12.

The present article reports the second phase of the Smart Information Use project, in which, based on the findings of the first, benchmarking phase, teacher librarians and selected classroom teachers in the four schools developed teaching strategies designed to assist students to avoid plagiarism and to generate their own knowledge. The project researchers evaluated the outcomes of this developmental stage. The aim of the third phase of the project (not reported here) was to develop an innovative electronic resources kit based on the outcomes of the project, with the intention of disseminating the findings of the project both nationally and internationally.

Given that the focus of much discussion about plagiarism has been on methods of detection rather than on how to assist students in avoiding it, the literature review that follows is somewhat limited. It is followed by descriptions of the underpinning philosophy of the research and the method; the main teaching strategies, developed and tried by the

participating schools; the evaluation of those strategies by the research team, presented from the perspectives of students, teachers, and teacher librarians; and the researchers' conclusions.

Literature Review

As will be discussed later, theories concerning the development of students' higher order cognitive processes, which could be seen as one way to foster the avoidance of plagiarism, have existed for some time. Otherwise, there appears to be no well-developed theory about how to help students avoid plagiarism. Approaches, some of which are considered to be effective, have tended to be not only varied but, in some ways, ad hoc. This review begins with a discussion of those approaches.

Varied Approaches to Assisting Students in Avoiding Plagiarism

Approaches include raising awareness of the problem of plagiarism and increasing students' ability to recognize it; teaching students to synthesize information, including through note taking and paraphrasing; and teaching attribution of sources of information (citation and referencing methods) in all contexts (for quotations, paraphrases, and acknowledgement of ideas).

Raising Awareness

Writers who believe that the problem of plagiarism can be ameliorated through raising awareness include Walden and Peacock (2006), who suggested that it is better to lessen the emphasis on detection of plagiarism and rather engage with the causes and attempt to make students aware of them. Authors such as Sterling (1992), Auer and Kripner (2001), McCollum (2002), Taylor (2003), and Thomas (2007) have noted the need to raise students' awareness of the nature of plagiarism to increase their ability to recognize plagiarism in its various forms and to understand the ramifications if they are discovered resorting to the use of unattributed information.

Synthesis of Information

Researchers who have focused on the teaching of synthesis of information as a way of assisting students to avoid plagiarism have tended to link the problem with the lack of deep understanding of content being taught and learned. They have observed the difficulties students have with the processes of information use, including synthesis. Studies in the 1980s and 1990s that indicated this include Kuhlthau (1989, 1993), McGregor (1993), McGregor and Streitenberger (1998), and Pitts (1994). Teacher focus seems to have been on the notion that the lack of deep understanding of topic content results in difficulties for students in synthesizing information and expressing it in their own words without blatantly or inadvertently copying the original. Most of the relevant articles seem to have been produced by classroom teachers reporting on their attempts to equip students with practical skills, for example, Lambert and Nowacek (2006). One suggested way to help students express information from their own perspective and in their own words is through teaching effective note taking and the synthesis of information by paraphrasing. Suggested methods of doing this tend to share common features, such as the identification of key information, the systematic recording of notes (rather than copied text), and the use of this summarized material in final assignments. Examples include those provided by Maas (2002), McCullen (2003), and Guinee and Eagleton (2006). The effectiveness of such strategies to foster deep understanding and good synthesis was reported by Kirschner, Sweller, and Clark (2006). The need to teach accurate attribution of sources in relation to this also has been noted, as discussed below.

Recently, the now frequent retrieval of information from the Internet has led to another set of concerns that could exacerbate problems of information processing and synthesis. These concerns focus on the nonlinear ways web information is often structured, which, as research is indicating, presents an impediment to good comprehension and understanding of topic content. For example, Cohen (2006) pointed out that the typically nonlinear, interactive and multimedia formats of the web present "a range of challenges for the reader that may require new comprehension strategies for deriving meaning" (174). Lorinc (2007), drawing on research about information overload and multitasking, pointed out that the human brain is "ill equipped to function effectively in an information-saturated digital environment

characterized by constant interruptions" (n.p.). Thus the multitasking often undertaken on the web may not result in good information processing because "the science of interruptions suggest our brains aren't nearly that plastic" (n.p.).

Thus the problems with information processing, shown to exist among students in pre–Internet days, may now be of even greater magnitude. Different strategies may now be required to teach students to synthesize information from various sources rather than employ the now-easy "copy and paste" function available to them.

Attribution of Sources

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. The results indicated that the Texas group, who had been instructed about the need to acknowledge sources of information, had lower levels of outright plagiarism than the Alberta group who did not receive this instruction.

The need to teach the conventions of attribution for paraphrases, quotations, citations, and bibliographies has been discussed by a range of authors, for example, Silvester (2004), McCollum (2002) and Fryxell (1996). Chanock (2008) explored the practices of attribution learned by students before arriving at university, revealing that 34 percent of surveyed students in an Australian study claimed that in year 12 they had not been required to provide references when they quoted directly, and another 25 percent believed they only needed to include the reference in the bibliography. The number of students who claimed they were not expected to reference sources they had discussed in their own words was even higher: 66 percent said not at all and 19 percent said only in their bibliographies (6). Clearly there is confusion in students regarding appropriate attribution of the words and ideas of others.

The Development of Higher-Order Cognitive Processes

Another possible way of teaching students to avoid plagiarism is through the development of higher-order cognitive processes and the fostering of creativity. Examples come from constructivist and collaborative pedagogical theories about teaching students to think creatively and to learn how to learn, such as those endorsed by Harring-Smith (2006) in what seems to be a thorough review of the literature on creativity research. One approach is based on the principles of "understanding by design," outlined by Wiggins and McTighe (2001), which promotes "the design of curriculums to engage students in exploring and deepening their understanding of important ideas *and* the design of assessments to reveal the extent of their understandings" (3). Other contributors, Ron Ritchhart and David Perkins in Project Zero (Harvard Graduate School of Education 2009) have undertaken extensive work on the development of "thinking." Ritchhart's (2002) major work, on intellectual character, outlined his pedagogical approach to developing a classroom where thinking is identified in relation to the learning tasks and where a culture of thinking is developed (145). He placed emphasis on student attributes, referring to them as thinking dispositions. They included scepticism, open mindedness, curiosity, and truth seeking. In Ritchhart's view the classroom needs to become a place where thinking and exploration of thinking is made explicit and where a culture of mindfulness is established. In the proposed classroom, questions are explored from many perspectives, hypotheses are tested, and assumptions are surfaced for deeper examination.

The strategies that the four schools developed and tried in phase 2 were selected independently, resulting in them choosing one or more of those outlined above in the literature review, with only one school overtly choosing to underpin their work with an attempt to develop thinking processes amongst their students.

Research Philosophy and Design

The Smart Information Use project involved a cross-section of four Australian high schools: a country coeducational government school, a girls' Catholic school, and two other nongovernment, independent schools—one for boys only, the other coeducational. As mentioned above, there are three major components to the research approach of the project, with the second phase only being the focus of the present article.

The philosophical underpinnings of the project emerged from the interpretivist tradition of research, and the study design was based on the constructivist paradigm. This fits well with the constructivist philosophical approach to learning,

espoused for some time by leading educators (e.g., Dewey 1944; Bruner 1973; Jonassen 1999) who posit that constructivist principles (i.e., that learners are active constructors of knowledge) should underpin teaching and learning. In research, constructivists emphasize 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 in which the researchers are concerned about understanding the viewpoints, or meanings, of a range of different students and staff regarding information use and strategies for avoiding plagiarism in different school settings. The parallels to the constructivist approach to learning are evident.

The research design for phase 2 of the project included

- some action research, used by teachers and teacher librarians in developing and testing the chosen strategies and models to assist students in avoiding plagiarism; and
- evaluation by the researchers to gauge the extent to which the new teaching strategies or models influenced students' understandings and avoidance of plagiarism.

The latter was underpinned by the interpretivist/constructivist philosophy described above.

Two major pedagogical approaches emerged in the kinds of strategies teachers and teacher librarians developed to try with students. The first approach was associated with those discussed in the earlier sections of the literature review, the second with the development of higher-order cognitive processes. Although both strands share common features, and although there was some degree of overlap within the schools (e.g., the school focusing on the development of higher-order cognitive processes also modeled appropriate information use practices), they are different enough to be treated separately. They are referred to throughout this article as "instructional practice" (IP) and "inquiry learning" (IL). In the IP approach, teachers in three of the schools provided direct instruction and modeling of skills; in the IL approach and the remaining school, teachers implemented a constructivist and collaborative model of learning by inquiry. These two approaches are described in detail below.

The Action Research

The plan was for teacher librarians and teachers in the four schools to develop the strategies and models together, using the action research approach of the practitioner as researcher. There were to be two action research cycles of planning, implementing change, observing the results of changes, reflecting on outcomes, and considering further modification. Teacher librarians and teachers were to meet with researchers to discuss outcomes of the first cycle and changes and modifications to be made before the second cycle. Time defeated this goal. The schools all used elements of action research, with one school developing, evaluating (with students, teachers, and teacher librarians), and modifying their unit of work three times, although this occurred intuitively rather than being planned. The school that adopted the IL approach undertook formal action research using three cycles and their own timeframe. Reflection occurred throughout, and a moderation meeting of staff evaluated each cycle as it was concluded, discussing the changes and modifications to be made before the next cycle took place. At the request of the staff of the school, the university researchers did two rounds of evaluation at this school. All schools used assignments as part of their teaching. The final evaluation by the researchers occurred at the end.

Evaluation

The technique commonly used in interpretivist/constructivist frameworks, the interview, was used for the evaluations to explore the experiences, perceptions, and meanings of participants involved in the trials of the strategies. All student interviews took place in focus groups (eleven in total, each consisting of eight to twelve students).

Samples

Table 1 provides an overview of the year levels of students and the subjects and topics involved in phase 2 of the project.

As can be seen from **table 1**, year 7 was the most popular year level chosen by staff for phase 2. Nevertheless, all levels except year 12 (the final year of high school in Australia) were included. Subjects and topics were varied.

The teachers and the teacher librarians involved in the second phase of the project were all interviewed. Numbers varied from school to school and ranged from one teacher and one teacher librarian in the smallest school to five teachers and four teacher librarians in the largest school. The teachers and teacher librarians in a particular school were interviewed together (in small focus groups), except in one of the larger schools; that school had separate focus groups of teachers and teacher librarians. At the school where there were two iterations of evaluation, there was a combined focus group the first time and a separate interview with the two additional teachers who had become part of the project for the second iteration. Decisions regarding the organization of the focus groups of teachers and teacher librarians were made on the basis of what was possible in each school because of scheduling and timetables.

Data Collection

In the three schools using IP approaches, the data collection for the evaluation took place from April to August 2007. In the school taking the IL approach, the first iteration took place within the same timeframe as for the other schools, the second one in November 2007. In this phase, the degree of plagiarism was not sought and quantified as it had been in phase 1 (Williamson et al. 2007) because of the sheer number of students and student papers involved and the change of emphasis from detection to development in student thinking.

The interview questions asked were similar across the schools using the IP approach, although the specific assignments involved had to be taken into account. They focused on what students thought they had learned about plagiarism: their opinions of how useful particular strategies were to them, and whether they thought students, including themselves, would plagiarize in the future after having been taught about it. In the IL school, the questions focused on the differences in this approach compared with those used in the past, particularly concerning the learning that took place with the new approach; the extent to which they felt that they had contributed their own thinking, and were involved and engaged; and whether they thought that they had learned anything about plagiarism through the assignment.

Questions asked of teachers and teacher librarians included how teaching their topic was different for this project; the extent to which teachers and teacher librarians shared the same focus; what they thought worked well and what did not; whether students gained any metacognitive awareness of the processes they used; and whether they and their students would change their practices as a result of the study.

Data Analysis

After the audiotapes of the interviews were transcribed by an experienced transcription typist, two researchers were involved in the analysis of each of the resulting transcripts. The analysis initially involved detailed categorization and coding of the data with key themes emerging during that process (Morse 2008). To link themes and categories to quotations that might be used to illustrate the findings, a “voice sheet” was prepared for each theme. This is so named because it includes the quotations (voices) of participants. As each voice sheet was completed an overview or summary of the data in that voice sheet was written.

One theme in common for all the IP schools concerned what students thought that they had learned about plagiarism. An example of part of the voice sheet for one of the schools for this theme (without the summary and with just of few of the quotations included) is displayed in **table 2**.

Description and Evaluation of the Main Teaching Strategies

The teaching strategies used in each of the two approaches, IP and IL, are here presented separately. For each there is a description of the teaching strategies developed, followed by the evaluation findings. It should be emphasized that staff in each school worked independently in phase 2. Although there was some communication between the schools, the details of each school’s strategies were not fully disclosed until the trials and evaluations were completed.

Instructional Practice: Description of Teaching Strategies

Teachers and teacher librarians in each of the three schools that employed this pedagogy collaborated within their own schools to create a series of lessons on awareness of plagiarism and ways to avoid it, which occurred in tandem with assignments that students were undertaking as a regular part of the curriculum in their particular year levels. In these lessons, students were made aware that there was an explicit focus on avoiding plagiarism in addition to the content of the topics they were exploring.

The main teaching strategies included raising student awareness of the problem of plagiarism and the ability to define and recognize instances of plagiarism; the development of skills for the synthesis of information including note taking, paraphrasing, and generating their own ideas; aspects of acknowledgement, including paraphrases, quotations, citations, and bibliographies. These strategies are discussed here without specific reference to particular schools.

Raising Awareness

The teachers in the three schools implementing an IP approach used a variety of strategies to engage students in discussion about the nature and problem of plagiarism, including group and classroom discussions and explicit instruction, such as a Microsoft PowerPoint slide show. Strategies, used to develop recognition of plagiarism in its various guises, included document comparisons, evaluation of a variety of hypothetical scenarios, and color-coded visualization in which examples of plagiarized passages were highlighted from unidentifiable student essays.

All teachers and teacher librarians in these three schools, regardless of variations in the specifics of their methods, aimed to raise the level of students' awareness of the moral, legal, and ethical implications of plagiarism and to develop in students an empathetic identification with people whose work had been plagiarized. From these discussions, students extended their understanding of plagiarism beyond a simple concept of verbatim copying or copying and pasting from the Internet.

Developing Information-Handling Skills

The features of effective practice in note taking, discussed in the literature review, were common to the strategies enlisted by teachers in the three schools. They considered good practice in note taking to include the following elements: identifying main facts and ideas, retaining essential information only; recording main points in bulletpoint form using the students' own words; identifying and clarifying unfamiliar words and phrases to ensure understanding; and the relationship between points (and ideas) in the higher levels.

The teachers taught by modeling and demonstration of skills; students then attempted to emulate these skills. Despite variation in individual designs between schools, there was commonality in the use of note-taking worksheet templates that provided students with a scaffold for the note-taking process. The teaching team in one school devised a three-step strategy for note taking. The format of the worksheet contained three boxes. In the first box, students were required to make preliminary notes of "some important ideas." In a second, significantly smaller box, these notes were to be reduced to summary notes of "the most important ideas." Finally, students were required to write a brief summary of the article in their own words, referring only to their own summary notes. In another school, the note-taking tool was a single-page template, with one page only to be used per source. Each page provided space for recording bibliographical details, bulletpoint summary notes, and unfamiliar words and phrases. An overhead transparency of the template was used by the students to rehearse the skills they needed to learn. In another school, the teaching team engaged students in a whole-class exercise in effective note taking by working an example with the students using an interactive whiteboard. Students in this school also were taught to colorcode their own notes to obtain the visually distinguishing effect of the difference between their verbatim use of information, paraphrasing, and the generation of their own opinions or ideas.

The skill of transforming information through thoughtful paraphrasing requires students to understand the information they have read and on which they have taken notes, then to bring together ideas from various sources and express this critical act of synthesis in their own words to create something new. Teachers fostered the development of this difficult skill by emphasizing the need to avoid simply changing a few words or moving the component parts of a sentence, and by requiring students to refer to and work only from their own notes, as in the instance reported above, rather than returning to the original sources of their information. Finally, students were required to hand in their notes to provide evidence of the construction of their own work.

Teaching about Attribution

A well-synthesized essay or assignment requires more effort from the writer than just cobbling together chunks of information from a variety of sources. It also requires the development of an argument or set of viewpoints using a variety of sources for background or support, together with accurate attribution of those sources, an essential aspect of the responsible use of information. Students were taught that attribution of the source is required for all directly quoted material and for the use of ideas in paraphrased information, although teachers did not introduce the method of in-text author-date citation at the year 7 level. Teachers modeled these skills for students, providing them with a pattern to follow. The main strategy for teaching the compilation of a bibliography was the provision of a pro forma for keeping a systematic record of source details. In two schools, students used one sheet per source for making their bulletpoint notes to keep their notes coherent and attached to the source. All schools taught students to keep a progressive record of the bibliographical details of each source they consulted. In one school, the teacher librarian had devised a bibliography game by typing all the component parts of real bibliographical details onto large cards, cutting them up and laminating them. Students then reassembled the cards into their correct order.

Instructional Practice: Evaluation

The emphasis of the evaluation was on the impact on students of the strategies trialed in the classrooms, mainly drawn from students' responses in focus groups, although observations and comments of the teachers and teacher librarians also have been incorporated. For the schools using the IP approach, the discussion focuses on how student learning is affected by the trialed strategies in terms of student awareness and recognition of plagiarism, ability to synthesize information, generate their own ideas, and acknowledge sources of information.

Developing Awareness

Apart from about half the year 7 students in one school, all the other students had some prior knowledge of plagiarism. After specific teaching, all students demonstrated an increased awareness of the nature and seriousness of the problem. Where previously their understandings tended to equate plagiarism with verbatim copying, or copying and pasting from the Internet, all had progressed in their awareness that ideas could be plagiarized and that the sources of all information, including graphic material, should be acknowledged. As one year 7 student noted, he had learned that "you could do it with pictures as well." A year 8 student probably spoke for many when he acknowledged that "I think I did it a lot more than I realized. Like, I plagiarized a lot with writing I did and now I know not to." The most junior and senior students in the study (those in years 7 and 11) indicated the strongest internalization of the ethical issues associated with plagiarizing, indicating that they were developing intrinsic personal motivation to avoid plagiarizing. Year 7 students demonstrated a lively awareness of legal and moral implications. In middle school levels, students were somewhat more inclined to refer to a desire to avoid detection and the consequent penalty of loss of marks on the assessment rubric, indicating that their motivation tended to be more extrinsic. Student ability to recognize instances of plagiarism also showed a marked development. In the school that presented students with a series of hypothetical scenarios, one year 9 student reported that the exercise "helped because it showed you what you can do and what you can't, and how much [acknowledgement] you need to put in."

Teaching Information-Handling Skills

Students were asked if they were more aware of *how* they were doing their assignments. Younger students who did not have established note-taking habits seemed to be the most responsive to trying to adopt the note-taking techniques they had been taught. In the other year levels, most students agreed that the strategies were helpful and had dutifully completed them as preassignment exercises. Not many students seemed to make an explicit connection to the transfer value of these practices to their later work. Most considered them to be time consuming, and there was a marked tendency to revert to preferred personal habits in note taking when writing their assignments. A student in year 11 conceded that "you think about it when you're doing [the exercise] but then . . . it's a long process to do, so you might try and cut corners, maybe not do the whole three-step stage." Only a minority of students considered that the methods could ultimately save time and assist them to paraphrase more effectively. An example is a year 8 student who acknowledged that the three-step strategy he had been taught "was a little bit longer, but in the long run it's a lot shorter, because you had the information in front of you to just go to when you needed it." As in phase 1 of the project, all students claimed to use their own words when writing information in their assignments anyway, and so, to that extent, they did not consider they were doing anything very differently.

Few students were consciously aware of value adding by way of creatively generating new ideas when using information. One year 11 student declared that “it’s very hard to do that.”

However, most were able to recognize that they had been required to offer their own opinions at some points. The most engaged and astute students at either end of the age spectrum, who were in the minority (at least in their ability to articulate the issue), perceived that paraphrasing and synthesizing information effectively led to an increased depth of understanding, learning, and retention of the topic. For example, one year 7 student realized that plagiarizing means that “you don’t learn anything, because you’re just copying it . . . because you might not read through it and you don’t do as much work.” A student in year 11 recognized that

> when you’re given work it’s supposed to be your ideas and opinions, not someone else’s, and the teacher’s looking for what you know and understand, and if you’re plagiarizing, just taking off what different authors, different people’s ideas [are] then it’s not your work and there’s no point in writing it.

Teaching about Attribution

Students across all year levels reported a vastly increased awareness of the need to acknowledge the sources of their information and focused on taking care with the mechanics of acknowledging direct quotations, in-text citations, and the formatting of bibliographies. A year 9 student said, “I took notice about including like all my references, which maybe I wouldn’t have done if I didn’t know the seriousness of plagiarism.” A student in year 8 realized that keeping a progressive record of source details made it “very easy when you go to do your bibliography.” However, in predictions of future behavior, described in a later section, many students admitted that they found this level of attention to detail tedious and were tempted to avoid it. Some students conceded that they had taken particular care with referencing in this assignment because avoiding plagiarism was a major focus of the unit of work and they did not want to risk losing marks for noncompliance. In-text citation was not generally taught at the year 7 level.

Impact of the Instructional Practice Approach

One year 11 student seemed to sum up much of the impact of the strategies that had been trialed with the aim of teaching students how to avoid plagiarism and use information effectively:

> Well I can say we learnt a lot about how not to plagiarize in work, how to take notes on things and not to just place the author’s work into your work. You have to use your own words in re-writing work and including a bibliography to cite all the sources you used.

While students made many positive statements about their learning, we cannot know the extent to which this learning will be applied in future written work.

Inquiry Learning: Description of Strategies

As indicated above, one school designed their year 7 unit of work according to the principles of IL, particularly attempting to develop improved thinking and cognition among students. A learning objective of avoiding plagiarism was not particularly emphasized by the teaching staff, but “intellectual and academic honesty” (International Baccalaureate Organization 2006), one of the tenets of the International Baccalaureate program in which they participated, underpinned their method. The main aim was to develop in students the confidence to generate their own understandings of the topic and express their ideas in their own words. The students undertook an inquiry-based history research assignment with the research conducted in a collaborative manner.

Teachers and teacher librarians emphasized that students’ ideas were valued and that there were no absolutes in terms of right or wrong answers. Information kits compiled by the teacher librarians deliberately limited student information searching, especially with regard to obtaining information from the Internet, although this was not forbidden. The decision to do this was influenced by the kind of research discussed above (e.g., Cohen 2006). A high premium was placed on the engagement of students with the topic as a way of promoting students’ ability to synthesize information, think for themselves, and generate new (their own) ideas. In other words, “student voice” was encouraged from the beginning.

The students were arranged into groups, with each group researching one aspect of the topic. They were required to generate a hypothesis as a focus for their research. Each group then delivered an oral presentation to their peers and distributed a written report to each individual student. As part of the report, the group was required to nominate the three sources that had been most valuable to them rather than being required to compile a carefully structured bibliography of all sources. The final assessment of each student was through an individual essay written about a week after the unit of work was finished. The essay was conducted under test conditions, being time limited and undertaken individually in silence. The only materials the students were permitted to take into this assessment period were the six group reports produced by their peers. Staff placed a high value on students' authentic voices being evident in the final essays. They had placed verbal emphasis and reassurance on this point throughout their teaching.

Inquiry Learning: Evaluation

The impact of the trialed strategies on student learning, in terms of engagement with the topic, ability to synthesize information, ability to generate their own ideas, and ability to acknowledge sources of information, is discussed and evaluated.

Stimulating Engagement with the Topic

Findings from the pilot study led the researchers to explore the degree to which students were engaged with their topic. The pilot study found that students who were less engaged tended to show higher levels of plagiarism; were less able to recognize examples of plagiarism; demonstrated less interest in learning, seeking meaning, or understanding; and could remember less content a month later (McGregor and Williamson 2005). While the current students exhibited a range of levels of engagement with the assignment, those who were most engaged valued the richness of the results produced within their collaborative groups as well as those produced by learning across the groups. They exhibited a higher degree of mindfulness (Ritchart 2002) as they appropriately incorporated their peers' ideas into their own final essays. One student reflected, "Not in any other projects have I understood the other topics just as much as we did when we were writing . . . a report about it. We had to incorporate everything in it and . . . I really got involved with all of the topics." Most students felt their original work was valued by their teachers because they were encouraged to develop their own voices. They felt rewarded for doing the kind of thinking that resulted from "really putting in the effort to make sure that you have proof, to make sure that you have all these things to make it a really good kind of argument." As one student put it, "You knew they were going [to], like, respect what you were saying and acknowledge it."

Developing Information-Handling Skills

Even though direct teaching about note taking was not part of this unit, all students reported making notes in bulletpoint form. They all reported writing their essays in their own words, claiming this to be standard practice, albeit better accomplished in this project than in previous assignments. Most of them believed they would remember better what they had learned, and to a greater depth, possibly because of a higher level of processing and synthesizing the information than they typically experienced. One declared that "I think we'll all remember it and now we've got a better understanding of how things work." Students felt that they would be more likely to remember historical issues learned in this manner than facts and dates. Because of the learning design of the assignment, they also began to develop a sense of the interactive role of information presented by others (in this case their peers but potentially transferable to unfamiliar experts and authors) in forming their own interpretations: "I think I definitely learnt more in this topic because . . . when we had to read about other people's reports . . . I also learnt a lot about . . . their topics as well."

Encouraging the Generation of Ideas

Many students were quick to agree that they had been encouraged to think for themselves and were able to recognize the value of creative thinking as a potent way of avoiding plagiarism. One student noted that "we had to be more creative about our thinking . . . get information and put it together and then be more creative and try and work out what we thought" (first iteration), and another realized that "the whole assignment was about your opinion, so it wasn't about trying to find out the most information" (second iteration). They were aware of thinking for themselves, at least in the sense of forming their own opinions, if not always quite being able to articulate the concept of creatively generating new knowledge based on their own ideas. Indeed, the assignment was generally regarded by students and teachers alike as

achieving its main aim of promoting original thinking, indicating that students did manage to perform this higher-order cognitive task effectively.

Teaching about Attribution

The mechanics of acknowledging and citing references were taught to this group of students but not greatly emphasized, and they had difficulty linking the technicalities of this task with the inquiry process. Students had been provided with a prescribed format for progressively recording the details of sources as they used them, which they agreed was helpful but admitted to not always using effectively, having a marked tendency to forget to fill it in. One student confessed, “We all kept forgetting to write in our references.” Interestingly, though, some students demonstrated spontaneous attribution of the reports of other groups, possibly because they knew that the source of their ideas would be obvious, but also perhaps because they could identify with the relevance of acknowledging the creative output of their peers. They tended to cite their acknowledgement by color (saying, e.g., “as the yellow group said”) or by the subtopic of the group they were citing. Thus, on their own initiative, some students employed one of the main strategies for avoiding plagiarism. All groups reported having compiled bibliographies for their group reports.

Impact of the Inquiry Learning Approach on Promoting Avoidance of Plagiarism

The organization of the class into groups, the collaborative thinking and writing, and the style of the final assessment were designed in such a way that teachers hoped that opportunities for synthesis would be created, plagiarizing would be limited and temptations to plagiarize would be minimized. Memorably, one student declared that in the project, it was “actually quite hard to pursue plagiarism . . . because . . . there wasn’t actually written information about what you were meant to write about, so there wasn’t anything to copy or do plagiarism [from].”

Discussion

Other issues emerging from the study included student and teacher predictions of future behavior after direct teaching to avoid plagiarism, the need for continual reinforcement of good practice in the development and maintenance of student skills, the importance of engaging students’ interest, issues involved in the assessment of student work, and the importance of teacher and teacher librarian collaboration.

With regard to student predictions about future behavior, the responses of students in the school using the approach of IL were not sought because the avoidance of plagiarism had not been an overt objective of their unit of work. In the schools where the strategies were based on IP, and avoiding plagiarism was a conscious goal for students, their responses provide further insight into the impact of the teaching on their potential future behavior.

Future Behavior: Student and Teacher Predictions about Changes in Practice

Students in the IP schools were asked if they thought they would use information in the future without plagiarizing, even if the teacher did not emphasize it. It was made clear to students that this was a personal question: honesty was urged and confidentiality assured. On the whole, students were far less likely to admit that they, personally, would plagiarize in the future than they were to assume that others would. Some adopted a strong stance on the matter, suggesting the internalization of intrinsic motivation, including a strongly expressed commitment to intellectual honesty and the satisfaction and pride to be gained from the consciousness of having done one’s own work. Another single group of students, notable for perceiving themselves as being least likely to plagiarize, were those in year 11, who invoked the seriousness of their studies in the last two years of their school career and the gravity of penalties imposed upon detection, as well as ethical issues in general. However, some students were prepared to admit that they might plagiarize if they thought they would get away with it. Such students seemed to require extrinsic motivation, such as teacher emphasis, fear of detection and enforcement of penalties, or the reward of marks allocated specifically for compliance as part of the assessment criteria.

Teacher and teacher librarian expectation of change varied across the schools. Some thought the students would fall right back into old habits because of time pressures, while others thought the students would be more likely to acknowledge other people's words. One teacher suggested that continued practice was what they needed, an idea that ties in with the whole-school approach recommended by many. Another teacher believed that if students realized their opinions and voices were valued, they would be more likely to change their practice: "There's a trust that your thinking is as good as someone else's thinking, and that's the thing that's most likely to change practice."

Engagement with the Topic

The school implementing the approach of IL articulated a specific premium on the value of a high level of student engagement with the topic in promoting student ability to synthesize new information, think creatively for themselves, and develop their own interpretations, as mentioned above. However, the staff in the schools using an IP approach also sought to stimulate student engagement with the topic, believing that depth of understanding promotes student ability to more fully synthesize information. In one classroom discussion aimed at raising student awareness of the issue of plagiarism, the teacher librarian proceeded to read, with great admiration, a poem she said had been submitted by a student. The stanzas were in fact composed of the lyrics of a song highly popular with the age group. As the teacher expected, the class instantly recognized the song and dismissed the claim of student originality with scorn and indignation. The issue of plagiarism was thus very successfully brought home. In another school, the student assignment focused on a local issue with which students were able to identify readily and form strong opinions. In spontaneous, fast-action line debates, students arranged themselves on either side of the classroom for the negative or the affirmative, literally swapping sides as they assimilated new information and changed their opinions.

In all these instances, student participation occurred in a classroom climate of trust, where students had the confidence to take intellectual risks. However, it must be admitted that some of the students in the study who were neither the youngest nor the oldest (years 8–10) indicated some degree of boredom with the meticulous nature of some of the skills that they were being taught. With regard to this problem, some teachers and teacher librarians felt that some latitude should be extended to younger students with regard to the degree of detail required in bibliographies, so long as the necessity for not claiming the work of others as their own was understood and demonstrated. The teachers and teacher librarians expressed expectations for the sophistication of the students' attribution techniques increasing over the years.

Encouragement to Use Non Web–Based Sources

As mentioned above, there is now growing awareness in the literature about the negative impact on information processing and learning stemming from the way that information is structured on the web. All the schools encouraged students to use non web–based sources of information, although web-based resources were certainly not forbidden, with the IL school particularly attempting to promote other information sources through the provision of starter kits for each of the groups. The evaluations revealed that the level of engagement and learning of students in this school was strong, although there were many reasons why this was the case. There are no clear empirical findings here, but this issue is important and requires further consideration in any further study of information use in relation to plagiarism.

Assessment Issues

Teachers and teacher librarians in all schools strongly valued student voice, and they were conscious of the need to design assignments that stimulate thinking and encourage students to reach their own interpretations of a topic. The staff of the school following the pedagogy of IL, in particular, urged tolerance and acceptance of student writing skills. Young writers are generally in a developmental stage and are mostly very unlikely to express themselves in the sophisticated language of the information that they find during the course of their research. To minimize the temptation for students simply to reproduce the text of information sources, they need to be reassured that the expression of their ideas in their own words is valued. Teachers and teacher librarians, especially in the schools using IP methods, felt that real value needed to be placed on the acknowledgement of source material in student work by the allocation of marks in the assessment rubric and that teachers needed to reinforce that expectation consistently.

The Effect of the Action Research

Most schools used elements of action research in developing their strategies. The approach of reflection and then adjustment was considered very valuable. In one school, a teacher commented,

> I can tell the difference between the first time we did the program and the second time. I think there were heaps of improvements, especially with that sheet structure [for note taking]. And you could see the difference—they seemed to pick it up, because I actually have a slightly less able class this semester.

It was this teacher who later said about the use of action research: "The rejection of strategies is just as important as the success."

In the school where there were two consecutive evaluated iterations by the researchers, there was general agreement that the second iteration was more successful. Certainly the researchers found this with the second focus group of students at this school.

Collaboration between Teachers and Teacher Librarians

The importance of teamwork, including between teachers and teacher librarians to build the focus, often emerged. As well as emphasizing this aspect, the following quotation indicates the team and whole-school approaches that were espoused by many. The teacher team member making this statement summed up the huge benefits of collaboration perceived by both teachers and teacher librarians:

> I think the working together is profound. . . . We know that, teachers in isolation doesn't tend to improve practice. Teachers working together improves practice enormously, the research tells you. . . . If we did nothing else, but we work together, we would arrive at a better practice just by doing that. My other feeling about improving teachers' practice is to get a really whole-school, shared understanding of what you're teaching for. If we're teaching for content, we will do the same thing and it will be plagiarized, if we teach for understanding [they] don't plagiarize.

Conclusions and Implications

When students were interviewed in focus groups some time after the completion of their assignments, most demonstrated very good recall and retention rates of learning with regard to the strategies they had been taught for avoiding plagiarism in conjunction with their assignments. The most readily recalled strategy in most year levels was the technique for making notes, usually in bulletpoint form, before converting these notes into their own words. Generally, they learned to acknowledge direct quotations and ideas that they had paraphrased, to keep a progressive list of the sources they had consulted to facilitate the compilation of a comprehensive bibliography, and to format a bibliography correctly. In-text citation of paraphrased information had typically been introduced after year 7. The strategy that was least well-recalled in any year was the creative generation of their own ideas, although most understood the concept of providing their own perspectives and agreed that they had been encouraged to do so. There was particular understanding of this by students in the IL school, where staff had placed strong emphasis on it.

A key finding of the project was that there is a need for sequential teaching according to the capacity of year levels to cope. For example, in-text citations need not be required from younger students. However, there also is a need to maximize teaching when students are at the highest stages of responsiveness. Because the ability to synthesize information plays a key role in avoiding plagiarism, effective note-taking practices, especially, are of crucial importance to achieve in year 7 to begin to make good practice habitual. Otherwise, the findings of this research indicate that students will tend to revert to personal preferences in note taking developed over time and tend to dodge the more rigorous skills that promote better synthesizing of information. There is a need to continually reinforce good note taking, as well as other skills that help students to avoid plagiarizing and to allow sufficient time for students to develop skills during assignment work. There were suggestions from many participants, particularly students, that there should be reward for good practice through the allocation of marks in assignments.

Other conclusions we draw is that assignment design is crucial, that teachers need to engage students through interesting approaches to learning, and that the selection of suitable and engaging topics is critical in promoting the ability in students to generate their own ideas. There also is a need for teachers to consistently encourage the development of individual "student voice." This requires a tolerance of authentic but often undeveloped written expression, which may create a problem in assessment when the work of students learning to express themselves may appear inferior in comparison with the writing of those who have copied.

Clearly emerging from the study is the need for a whole-school policy to counteract plagiarism through teaching students to use information appropriately implemented with consistency across all year levels by all teachers. The teachers and teacher librarians in all the schools in the study were adamant that the problem of plagiarism would persist, despite the efforts of individual staff, unless a whole-school policy were adopted across all years and implemented and reinforced by all staff. A policy should deal not only with standards and approaches but also with supporting the collaboration needed to develop a whole-school culture. (For a discussion of the findings regarding collaboration between teachers and teacher librarians from the Smart Information Use project, see Williamson, McGregor, and Archibald 2010.) The goal of any policy should be to promote a community of practice within which intellectual honesty is valued and respect for the work of others becomes ingrained.

The findings demonstrate that raising student awareness of the nature of plagiarism, and teaching them how to avoid it, need to be undertaken from the outset of secondary school and reinforced consistently and continuously across all subjects and year levels. In relation to strategies that can be used, the two pedagogical approaches discussed in this article, taken together, provide a powerful repertoire of ideas that can be implemented over time in any secondary school classroom anywhere. Teachers and teacher librarians, working in collaboration, are in a unique position to coordinate a blend of teaching strategies over the years of secondary schools, developing and executing the fine balance between the instructional practice and the inquiry learning approaches to teaching students to avoid plagiarism. Developing proficiency in the use of the various information handling strategies such as attribution and synthesis, and through use of their personal voices to express their own ideas, will enable students to manage responsibly the plethora of information to which they are exposed.

Teacher librarians, in particular, are well placed to coordinate the blending of the best elements of the instructional practice and the inquiry learning pedagogical approaches and to incorporate these ideas both across the curriculum and longitudinally over the years of schooling. No one in a school has a more complete whole-school view of curriculum potential within individual classrooms and grades and across the grades. While student awareness was the focus of this study, developing teacher and principal awareness is of prime importance. The visionary teacher librarian can work both at the policy level and the classroom level to lead the effort and to participate in creating responsible users of information. Working directly with school leaders to educate them about the necessity for a whole-school policy regarding appropriate use of information, as well as the development of a community of practice around the issue, will lay the groundwork for coordinated, planned, and strategic implementation. We suggest that the ideas arising from the findings of this research should not be presented as an effort to curb bad practice. Rather, they can be seen as strategies for developing engaged, thoughtful, and honest citizens who respect and value the work of others but who also are comfortable expressing their own voices.

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Table 1. Sample Description

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School	Year Levels	No. of Focus Groups	Subject	Topic
1	Years 7 and 9	2 (1 for each year level)	English	Year 7 English: Response to text Novel—Parvana; Year 9 English: Response to text Film—*Bend It Like Beckham*
2	Year 7	2 (2 iterations with different students were evaluated at this school)	Humanities: History Inquiry Project	The causes of the breakup of the Roman Empire
3	Year 8 (aged about 14)	1	(1) Year 8 Science	(1) Water Conservation
	Year 9 (aged about 15)	1	(2) Year 9 History	(2) Gallipoli—how accurate a portrayal is the film?
	Year 10 (aged about 16)	1	(3) Year 10 Design Technology	Product Design

	Year 11 (aged about 17)	1	(4) Year 11 English	War Poetry
4	Year 7	3	History	Famous person

Table 2. Learning about Plagiarism: Voice Sheet

Category	**Quotations**
No prior knowledge about plagiarism	I didn't know nothing about it until [the teacher] and that told me about it.
Prior learning about plagiarism	I wrote [on the card designed to show prior knowledge] that plagiarism is copying someone else's work without giving the original owner credit.
New learning about plagiarism	[I learned that] You could do it with pictures as well. It's when you don't learn anything, because you're just copying it