

# Do Scribes Learn?: Copying and Information Use

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This study provides a description of two situations in which papers written by senior high school students have been examined for signs of plagiarism. The reader of this report should keep in mind that these two cases were not subject to experimental methods which would have required attempts to control for major factors which might affect student performance and behavior. The analysis presented here, therefore, should not be accepted as conclusive. Rather, it should be considered as observation which justifies further research under more controlled conditions. The insights from the authors provide a foundation for further investigations concerning the intervention role of the teacher of information skills and composition. The discussion which follows is an important step in helping us consider new methods that may move students further along in their responsibilities as learners who use information constructively and creatively. — *Daniel Callison*

*Two qualitative field studies observed the behavior of eleventh grade students as they used reference sources to write research papers. In 1993, a naturalistic case study took place in a high school in Alberta, Canada. In 1996, a second study in Texas examined in depth particular findings of the Alberta study. The first phase of analysis in both cases compared students' final papers with the original sources of information. The first group received little direction in proper citation and the avoidance of plagiarism. The second group was very conscious of the need to cite properly and to avoid plagiarism due to emphasis by the teacher. Although both groups demonstrated a fairly high rate of direct copying from the source, copying in the second group differed from that of the first group. Students in the first group tended to copy directly from original sources. Students in the second group were more likely to parenthetically reference information, but omit to enclose the quoted passages in quotation marks. Few of the papers demonstrated the connection between paraphrasing and citing ideas. Citation errors in such passages suggested that students were simply scribing—trying to fulfill a requirement—and not considering the topic or synthesizing the information. Teacher interventions regarding the format and rules of correct citations seemed to limit the amount of blatant copying but did not help students learn from the sources or construct their own understanding of their research topics.*

Picture a class of eleventh graders gathering information in the library for a research paper assignment. Some students stand at the reference shelves, reading titles on spines. They pull a book off the shelf and open it, perhaps to the front or the back or to a specific page. They either restore the book to the shelf or take it to their table. A few students linger around the microfiche readers, waiting their turn. Some of them search through the drawers of microfiche. At the

computer catalog, several students punch the keys and stare at the screen. Several students are lined up to use the photocopier. Other students are seated at the tables, writing. Most of these students have a book open in front of them, and they look back and forth from the book to their paper as they write. Students at one table talk to each other. Others stand waiting to talk to the teacher. The room is busy and not very quiet. In this beginning stage of their assignment, the students are locating and starting to gather information from the books, the microfiche, and the computers.

Two days after the above scenario, the scene has changed somewhat. The noise level is down and movement is lessened. Most students are now sitting at the tables, writing. The teacher is sitting alone at another table, reading and writing. Talk occurs at some tables, while other tables are quiet. Fewer students wander around, stand at bookshelves, or line up at the microfiche reader and photocopier. Those who are moving around complete their task quickly and return to a table where they might make a comment to another student or else sit down quietly and begin writing. At this point, most students have moved from locating sources to gathering information from those sources.

Now we look at the next week. The students are back in the classroom. They are surrounded by cards filled with notes and lists, some scattered, some sorted into piles. A few students are writing, others are shuffling cards. Still others are talking to each other and some are waving their hands in the air, trying to get the teacher's attention. The teacher is moving around the classroom, talking to students whose hands are raised, occasionally being interrupted by other students who come to stand beside her, occasionally stopping to talk to the whole class. The noise level is high. Now the students are trying to use the information they have gathered to write their research papers.

We have described the external, observable elements of a class of eleventh grade students writing research papers—a common assignment in high schools across North America. But is there more going on than meets the eye? What is happening in terms of learning, the goal one would expect of a project such as this?

Research projects provide the opportunity for learning both skills and content (Resnick 1989). Information-gathering can provide skill development of several kinds. Students can learn to generate appropriate questions for research. They can acquire locational skills by examining a variety of information sources and formats. As they become familiar with these sources and determine how to use them, they can develop analytical skills that apply to using other, less familiar sources. Encountering information expressed in different ways and occasionally in disagreement should help students learn to deal with ambiguity. They can learn to evaluate the credibility and usefulness of information. They can learn to organize their thinking as they sort and categorize information. As they think about multiple pieces of information and determine the relationships between them, they should be learning how to synthesize that information. We also hope that as they gather and use information, they are developing an understanding of their topic (Bloom 1956).

The writing process involved in producing a research paper has the potential of providing further learning. Teachers expect students to learn to synthesize ideas into a coherent product, organize information into a logical sequence, and communicate the synthesis cogently. Throughout a project such as this, as students seek meaning in the text they encounter and make sense of the

information, they should be constructing their own understanding of the subject matter. The ideas they read and their own prior knowledge should meet in a “construction zone—a magic place where minds meet, where things are not the same to all who see them, where meanings are fluid, and where one person’s construal may preempt another’s” (White 1989, ix). Their perceptual and conceptual changes will vary from one person to another, but the project should provide opportunity for change and growth to take place. As those changes occur, student writers should gain experience in solving problems based on the personal goals they set and revise as they move through the process.

Researchers like Flower and Hayes (1980) have shown us that better writers “develop flexible goals to guide their writing processes . . . , rich enough to work from and argue about, but cheap enough to throw away” (p. 43). Poorer writers tend to spend little time planning, rushing to commit words to the page, and to hold tight to their initial formulations of a problem. (Hull 1989, 107)

Through practice in writing research papers, students should move along the continuum from novice to expert writers.

But do students really gain these understandings as they work on research projects? How do interventions by adults facilitate this learning? Are there interventions that inhibit learning or that teach something other than what they are designed to teach?

## Design and Implementation

Two naturalistic research studies observed forty-five eleventh grade students carrying out research paper assignments. One project, described in the introduction, took place in an English class in Texas in 1996. That project grew out of an earlier study in 1993 in which students in Alberta, Canada, wrote English and Social Studies research papers (McGregor 1994). The original study generated a model of student thinking during research paper writing. One element of the model showed an orientation toward process or product. An apparent connection between strong product orientation and plagiarism was observed, but further research was needed to investigate this link. The Texas study was designed to explore student information use in general and also to probe the possibilities of the link between product orientation and plagiarism.

### Students

The samples were purposefully selected to observe eleventh grade students writing research papers as part of their normal educational experience. No effort was made to control either situation in any way, but the research sites were chosen to provide as much similarity as possible. Both schools have a good reputation academically and are located in small, middleclass communities, just outside major urban areas. The student participants, though, demonstrated a range of ability levels. The Canadian students were International Baccalaureate (IB) students and the American students comprised a more heterogeneous group. The Alberta sample was selected to provide the richest data possible regarding student thinking, with the assumption that IB students describe their thinking most easily. The heterogeneous Texas sample was selected to observe a wider range of behavior.

Three teachers and two classes were involved in the Alberta study. One class was observed in both English and Social Studies and the other class observed in English only. The Texas study involved one English class of 21 students and one teacher.

In the Alberta study, students were observed and interviewed during the information collection phase of their papers. Audiotaped think-aloud protocols of their paper-writing phase were also analyzed. In the Texas study, students were observed and interviewed throughout the information collection and writing phases. In both cases, research logs, notes, and final drafts of the research papers were collected and analyzed and sources of information were examined. The first study was conducted by one researcher and the second by two.

## Adult Intervention

Although adult intervention was not the focus or the purpose of either study, it would have been impossible to conduct the studies without observing these interventions throughout. It is important to provide some description of this area because in both studies these interventions emerged as important to the resulting student research papers and to the learning of the students. The form of adult intervention differed with each class, as would be expected, since four different teachers and two librarians were involved.

In the Alberta study, two English teachers, one Social Studies teacher, and one librarian provided various forms of assistance to students. The English teachers introduced the assignment in class, provided a brief handout describing the format and grading rubric for the project, and further discussed the format and grading. One teacher spent considerably longer discussing format than the other. Elements of form emphasized in both cases were:

- number of sources of information required
- formal report style
- length
- extra elements required, such as a table of contents

Both English classes were instructed not to copy from the reference sources but rather to use their own words instead. Topic selection in both cases took place in the classroom by drawing teacher-designed topics from a hat. The same set of topics was used in each class. Once the classes arrived in the library, both teachers answered questions when asked, but usually stayed separate from the students otherwise. One teacher wandered around occasionally, monitoring students' efforts. The other rarely did.

The Social Studies teacher assigned an introductory exercise that required use of the books needed for the research papers in order to familiarize the students with the collection in the general topic area. He introduced the assignment in class and provided a brief handout with the grading scheme and formatting instructions for the following:

- number of sources
- citation style
- length

He provided the question students were to answer, which required critical analysis of the information located and a decision based on that information. Class discussion covered the process for coming to a conclusion about the topic. This teacher discussed ideas with students when asked, monitoring their progress throughout.

The librarian in the original study spent a few minutes at the beginning of the first period in the library with each class, introducing the materials to the students as a group and explaining the value and use of some of the most important resources. She was available to answer the occasional questions students directed her way. Most of the necessary books were preselected and assembled on a book truck, although students still went to the shelves to use reference sets and several other sources. Since the writing occurred at home, no teacher or librarian interaction took place once the classes left the library.

A great deal more instruction took place on writing research papers in the Texas study. It is likely that the difference in the composition of the classes (International Baccalaureate compared with heterogeneous) meant the students had had different prior experience with research papers. The teacher introduced the topic in the Texas classroom in great detail, teaching the steps involved in writing research papers and demonstrating the major resources students would likely use. She provided extensive handouts that explained the specific requirements and grading of the paper, as well as notetaking, draft writing, formatting, quoting, citing sources, and editing. Prior to going to the library, she discussed the specific assignment requirements and notetaking in detail, but focussed primarily on correct format, such as the following:

- what to include on note cards
- number of note cards
- how to write bibliography cards
- number of bibliography cards
- deadlines for turning cards in
- content of thesis statement
- content of outline
- number of paragraphs
- number of sources to be cited
- number of parenthetical references in each section of paper
- number and length of quotes
- number of sources to be included in bibliography

Students selected topics from a list of ninety-six possibilities or were permitted to select a topic not listed. No more than two students could select the same topic.

By the time the students arrived in the library to begin their information collection they had already been introduced to the most important reference sources. Therefore the librarian simply discussed expectations for behavior in the library. The librarian was not involved with this assignment at any other time, except for one instance where she reprimanded a student for inappropriate behavior. Teacher intervention in the library during information gathering dealt with how to create note and bibliography cards. The teacher seldom intervened to advise what information was important, how to evaluate the information, or how to choose the best sources from multiple options.

Following information gathering, the Texas students spent class time writing their papers. Teacher intervention at this point was extensive. She demonstrated how to write a thesis statement and an outline, providing examples and instructing students to use her examples as format models by plugging the appropriate details into the sentence or phrase. She continually reminded them to cite sources appropriately. She provided editing instructions and exercises. Emphasis was primarily on the format of each of these elements. She helped individuals with these tasks (sometimes actually completing the task for the student), approved their thesis statements and outlines, and answered questions constantly.

In both studies, teachers and librarians assumed that students knew how to use information without assistance. They provided intervention on locational and formatting problems, but seldom on how to use the information once it was located. None discussed how to select appropriate information from sources, how to evaluate information for usefulness, how to reconcile conflicting information from various sources, or why quoting other writers might be useful or appropriate. No data were gathered to indicate whether or not this discussion had taken place on previous occasions. It is possible that the IB students of the first study were expected to be capable of carrying out that task independently. In the second study, the emphasis on format of notecards, bibliography cards, citations, and quotes dominated instruction, and though it was not specifically stated in the written objectives of the project, correct format and the elimination of plagiarism were clearly the focus of the assignment.

## Discussion of Observations

Since it was possible for observation to extend through the entire library research project including the writing phase, and since teacher intervention was more extensive throughout the Texas study, this paper will deal with observations primarily from that study, with some comparison between cases. Although each study incorporated both quantitative and qualitative data analysis, this discussion is based chiefly on quantitative analysis.

A finding from the original study—an apparent connection between a process/product orientation of a particular student and the way in which that student used information—was investigated further in the second study. All students in the Alberta study demonstrated an orientation toward the format of the end product rather than the process of gathering and synthesizing information for the content. Students were concerned about making their product fit the mold they envisioned based on prior experience and the instructions for the assignment. Those students who demonstrated little or no awareness of processes such as seeking meaning, making sense, or learning tended to exhibit a strong desire to make the final product “look good” or “sound right.” These same students tended to copy a great deal from the original sources of information rather than paraphrase the information or synthesize the ideas. On the other hand, the students who demonstrated involvement in processes of seeking meaning, making sense, or learning did not copy from their sources. They synthesized, summarized, and paraphrased the information. The apparent relationship between the product/process orientation and the tendency to copy provoked questions regarding whether this was a chance connection or the nature of the relationship.

Students in the Alberta study received very little direction related to copying or plagiarism other than an early admonition not to do it. In the Texas study, however, the teacher constantly reminded students not to plagiarize and instructed them on how to quote and cite properly. She

required them to copy all information word-for-word from the original sources to their note cards, which they handed in with their final papers and which she said she would check for plagiarism. It was impossible to know whether this strong emphasis on proper citation was due to the teacher's awareness of the researchers' interest or because it was an integral part of this teacher's instruction. The reason was irrelevant, since in either case students received instruction and coaching in avoiding copying and citing according to an accepted style. This element provided an unexpected opportunity to analyze the effects of such instruction.

The amount of copying was determined in both studies by comparing the students' final papers with the original sources listed in their bibliographies. Categories of copying were devised and described in the first study (see appendix A) and applied again to the second study. Portions of papers copied word-for-word were labeled E, portions copied very closely but with minor word or tense changes were labeled D, and portions copied with more extensive word changes but without altering the original sentence and paragraph patterns were labeled C. The amount of copying in each category was then determined and calculated as a percentage of the total paper. When students copied by changing some of the words but leaving the sentence and/or paragraph patterns intact (category C), it was assumed that they were attempting to paraphrase, albeit ineffectively. Blatant copying with little or no change (D or E) was interpreted as more indicative of an inability or an unwillingness to avoid plagiarism. Each paper was assigned a level, determined by the percentage of D and E copying. Papers ranged from type 1, which contained no copying to type 5, which contained 50 percent copying or more. Table 1 compares the amount of copying at the D and E levels in each of the English classes in the two studies. Only the English classes are compared, since the topics in both cases required reporting historical information. The decision-making requirement in the Social Studies assignment may have resulted in different thought processes and information-use strategies, rendering it less comparable to the English papers.

**Table 1**  
**Comparison of Copying Scores at D and E Level,**  
**English Classes, 1993 and 1996**

	English 1993 (Alberta study)	English 1996 (Texas study)
	% D and E	% D and E
<b>Type 1 (no copying)</b>	31.3	50
<b>Type 2 (less than 15%)</b>	21.9	40
<b>Type 3 (15-29%)</b>	15.6	0
<b>Type 4 (30-49%)</b>	12.5	5
<b>Type 5 (50% or more)</b>	18.8	5

Definitions of D and E are given in Appendix A.

Table 1 shows that blatant copying (D and E) was somewhat less in the Texas study, probably due to the many reminders to avoid plagiarism and the emphasis placed on proper citation. Only 10 percent of the papers in the Texas study were type 4 and 5 (30 percent or more of the paper contained information copied almost word-for-word). In the Alberta study, 31 percent of the papers were type 4 and 5. It would appear that the teacher emphasis on avoiding plagiarism was effective with many students, since the amount of blatant copying was considerably less.

## Analysis of Errors

Traditionally, cognitive developmentalists have delved into thought processes by observing errors in written and spoken language. Through observing these behavioral errors, a means of identifying patterns in the development of cognition emerges (Piaget 1964; Ferreiro and Teberosky 1974). Based on this tradition, errors in the students' attempts to cite and paraphrase were analyzed in order to identify possible patterns in their thinking.

## Citation Errors

An interesting phenomenon emerged in the 1996 research papers that did not exist in the 1993 papers. A large number of papers contained D and E categories of copying followed by parenthetical references, seemingly making them legitimate citations. Analysis showed that these portions of the paper were incorrectly cited in a number of different ways. Many included exact copies of the original text, cited, but without quotation marks. Others were very similar to the original, again cited and without quotation marks. To be correctly cited, these portions should either have been exactly the same as the source and enclosed in quotation marks, or paraphrased so that they were significantly different, including sentence patterning, with the source of the idea cited. Instead, they were a hybrid of the two—a token attempt or no attempt at paraphrasing followed by a parenthetical reference that indicated the students were very aware of the need to cite. Students may have omitted quotation marks from the exact quotes in these portions because they had already reached the limit of two long exact quotes allowed in the paper.

Other citational errors were found in the same sections. Citing the wrong source entirely was a common error. In some instances the correct source was included in the bibliography, and in others it was not listed at all. In other instances students combined two sources and cited a third. Incorrect citations also appeared amid consecutive citations of the correct source. Students making this error may have been concerned that they had cited the same source too often and changed a citation to give the appearance of using additional sources.

Students also cited the correct source incorrectly. Errors of this type included citations to the wrong page, combining two sources and citing one or the other but not both, or citing only a portion of a quote but including more than that portion.

Errors were found within the quotations themselves. Errors included misspelling from the original source to the note card, then reproducing the same misspelling in the paper. In some cases, words were completely changed from the source to the paper. Some examples of this error were these: “dissection” became “direction,” “absurd” became “observed,” “guilt” became “quilt,” “hilly” became “chilly,” “best” became “worst,” and “envy” became “entry.”

## Paraphrasing Errors

Both the 1993 and the 1996 students had difficulty with the concept of paraphrasing. Paraphrasing was not defined for the Alberta students in 1993, while the teacher in Texas in 1996 defined paraphrasing as expressing “the thoughts of someone else in your own words”(teacher handout). The Texas students were informed that their own writing is distinctive and individual. This implies that sentence patterns, too, would be distinctive and not a replica of the patterns in the original source. Poorly paraphrased segments, labeled as category C on the copying scale, were considered to be copied, since they followed the original sentence patterns closely, with some word and phrase changes. These portions seemed to represent an effort to comply with expectations at some level, although not at the level of effectively expressing an idea in their own words.

Students in the Texas study received direct instruction in paraphrasing in the form of a handout. Guidelines included statements such as:

- a paraphrase often includes your interpretation of complicated phrases and ideas
- never use a word of which you do not know the exact meaning when paraphrasing
- make sure you understand the ideas in the passage
- look up any unfamiliar words or phrases
- turn the card over and try to write from memory the main idea that is expressed on the card. (Handout given to students in 1996 class)

Reproducing the original author’s sentence patterns, but replacing some words with synonyms and shifting the position of some phrases, probably indicates that the student was still looking at the original sentence. This reproduction does not show understanding of complicated phrases and ideas, let alone interpreting them. Sometimes the word replacement involved simplification of the original word, which might indicate that the student understood that word. Often, however, the replacement word was just as complicated as the original, and the synonyms were thesaurus-like, not necessarily appropriate for the particular context.

Skillful paraphrasing (category B) requires making sense of what is read. An attempt to paraphrase, but poorly done (C), indicates that students tried to carry out a requirement of not plagiarizing, but might not have attempted to make sense of the whole idea or understood it well enough to express it their own way. Citing (D and E\*), but barely attempting to paraphrase, takes even less thought and indicates simply carrying out a requirement or possibly an expectation that paraphrasing wouldn’t be assessed. Logically incorporating that original text into the paper may require some making sense of the idea, just as effective incorporation of a properly cited quotation requires sense-making, but very often the incorporation of such text was not effectively done. Connections and transitions from one sentence to the next were missing. A change from one source to another was very obvious, because different voices were used.

## What Do the Errors Mean?

What can we learn about student thinking from these errors or error patterns? Can we make assumptions about what these errors might indicate? We cannot make absolute judgments and arrive at specific findings, but several interesting issues emerge, following a logical progression. What do the errors suggest about (1) whether students look for meaning in information, (2) whether they use that meaning to make sense, and (3) whether they construct their own understanding of that information?

Although some of these errors were likely typographical (hilly to chilly, guilt to quilt), others seem to indicate that meaning was not important. At the moment the word was changed, whether in transcribing from source to note card or from note card to paper, the student likely was not trying to incorporate the idea into his or her existing mental model of the topic. When the replacement word was a different part of speech or unrelated in meaning, there could be little making sense going on, either during notetaking or writing.

Almost half the Texas students put little effort into really making sense of their topic. They showed a lot of product-orientation, but in a more defined and directed sense than students in the first study. Their attention to citation of ideas, whether accurate or inaccurate, indicated that they were more aware of the format of that product element than the first group, probably because the interventions from the teacher emphasized this point so heavily. This was part of the teacher's goal—to make them aware of the need to cite words and ideas of others. She was successful in making them aware of that. Less than 5 percent of the aggregate total of their papers was copied without citation, compared with 22 percent in the Alberta study. She was less successful in getting them to cite accurately.

Seeking meaning leads to making sense, which in turn leads to constructing one's own understanding. Resnick states that “to learn about something, to come to understand it, is, in current cognitive science parlance, to construct a mental model” (1989, 4). Vosniadou and Brewer describe levels of change in developing mental models:

Accretion refers to change that occurs through the gradual accumulation of factual information within existing schemata. Tuning describes the evolutionary changes in the categories used for interpreting information. . . . Restructuring refers to changes in knowledge that involve the creation of new structures. (1987, 52)

An immature, inaccurate mental model can become more accurate and more sophisticated as understanding is constructed.

A prime concern coming out of the Texas study was how much students actually changed their mental models of either the topic they were studying or the procedure for using information from outside sources—how much they constructed their own understanding of their topic or the procedure. They spent a great deal of time and effort simply scribing—copying or nearly copying words and sentences from an original source to a note card and then from a note card to a paper. Some of this scribing led to legitimate copying, in the form of quoting appropriately from the source. Most of it led to inappropriate copying or plagiarism. The activity of scribing seems unlikely to lead to accretion, tuning, or restructuring. Perhaps minimal accretion occurs through copying words from one place to another, but the permanence of any factual information accumulated that way is suspect. Did new understanding really develop? Did the mental model really change? Since the students were not available for interviewing after some time had lapsed, it is impossible to know to what degree they actually constructed a personal understanding of their topic. If the intent of the assignment was strictly procedural—to teach students how to cite—even the mental model of that procedure was not well constructed, as indicated by the number and kinds of citational errors.

Students copied extensively, sometimes legitimately as in quoting from the original source and attempting to cite appropriately (according to an accepted style, as defined by the teacher), and

sometimes unacceptably, by plagiarizing with no attempt to cite. Table 2 indicates the number of students in the Texas study that copied in those two ways combined. The kind of copying in this table is different from the kind of copying referred to in Table 1, since Table 2 combines the appropriate quoting and citing with the inappropriate plagiarism. Any attempt to cite, whether it followed the prescribed style or not, was considered an attempt to cite, while lack of any indication of a source for the copied information was considered plagiarized. Since both required copying word for word, or very close to it, from the original source, both were seen as involving a scribing type of task.

**Table 2**  
**Level of Copying:**  
**Both Appropriate and Unacceptable**  
**(Texas study)**

% of total paper copied	% of students
15-29	10
30-49	5
50-74	70
75-100	15

One of the goals of the assignment was to teach students to quote and cite appropriately. This fact must be considered in all discussion of the scribing activity. The teacher probably did not intend, however, for students to simply string together a series of quotes and call it a research paper. Table 2 shows that 70 percent of the Texas students copied, either legitimately by quoting or illegitimately by plagiarizing, between 50 and 75 percent of their papers and another 15 percent copied, in the same manner, more than 75 percent of their papers. These numbers seem to indicate minimal constructing of students' own understandings. Based on the way in which scribed portions of the papers were incorporated into the context of the surrounding text, it is likely that the mental models of both the subject matter and the procedural knowledge of appropriate citation were inadequately developed.

## Speculations and Further Research

In the Alberta study, teacher intervention relating generally to use of information, and specifically to avoiding plagiarism, was minimal. Based on the high degree of copying demonstrated by those students, the questions arose of why students copy and whether or not that tendency is related in any way to the level of process awareness. Are students who demonstrate processes of seeking meaning and making sense less likely to plagiarize? By extension, if there is a relationship between a lack of process orientation and the tendency to copy, it would seem that teacher intervention could make a difference to the situation. But what kind of intervention would make a difference? Because of the 1996 teacher's emphasis on avoiding plagiarism, the opportunity to explore a particular kind of intervention emerged. It appears, based on the primarily quantitative analysis of data from that study, that emphasizing avoiding plagiarism and

appropriate citation does not eliminate the behavior, but modifies it to some extent. Whether the modification is beneficial to student learning is debatable. If this was the first time that a teacher had intervened in this way, perhaps students made a beginning in a long, slow process of developing an awareness of appropriate ways to use other writers' ideas. Further qualitative analysis of these data and of other data gathered through interviews and research logs in the Texas study may yield other observations.

In neither the Alberta nor the Texas study were librarians greatly involved in the library research projects. For the benefit of all information users, perhaps librarians could initiate improved communication and collaboration designed to enhance learning. Modification of long-standing educational practices could lead to students' constructing a better model of both subject matter and information use. As suggested by Pitts in a 1994 study of high school learners/information users, "careful, but not intrusive, monitoring of individual student progress throughout the unit will be necessary if the teachers involved are to provide appropriate expert support for the new learning and to identify problems and provide mediation" (Pitts 1994, 384).

New questions launch further exploration. How do teachers intervene effectively to increase learning of both topic and procedure beyond simple compliance with a requirement? How can librarians make a difference? If librarians and teachers work more closely together to mediate in the library research experience, can student learning improve? Could increased or different collaboration between teachers and librarians have an impact on information use? Do different assignment demands lead to different behaviors? What motivates students to copy? Further research related to these questions can expand our understanding of the construction of meaning and the development of mental models of information use.

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## Web Links

1. Purdue University's On-Line Writing Laboratory has an excellent resource page on writing research papers. The page includes information on citation, paraphrasing and plagiarism, and the research process. The page is available at <http://owl.english.purdue.edu/Files/Research-Papers.html>.

The ERIC Clearinghouse on Reading, English, and Communication at [www.indiana.edu/~eric\\_rec](http://www.indiana.edu/~eric_rec) has a variety of research and practice-based resources on writing in the classroom.

2. The Library at Cornell University has put together a useful set of questions to help students evaluate the appropriateness and usefulness of information sources. The questions can be found at [www.library.cornell.edu/okuref/research/skill26.htm](http://www.library.cornell.edu/okuref/research/skill26.htm). The page also has links to information about conducting library research.

Widener University's Library has made available a thorough set of criteria to help students evaluate various sorts of web pages, including advocacy pages and news pages. The librarians have expanded on traditional notions of accuracy, authority, and currency to apply them more directly to web pages. These resources are available from: [www.science.widener.edu/~withers/webeval.htm](http://www.science.widener.edu/~withers/webeval.htm).

3. For an extensive bibliography of literature on mental models and conceptual change, see [www.cbl.leeds.ac.uk/~paul/mentalmodsrefs.html](http://www.cbl.leeds.ac.uk/~paul/mentalmodsrefs.html).

## Appendix A: Categories of Copying

**A** No copying.

**B** Paraphrasing, doesn't closely resemble original.

**C** Paraphrasing, can easily recognize original pattern of sentences and paragraphs, but many words have been changed.

**D** Copying, with phrases rearranged, omitted, some words added. Occasional synonyms used.

**E** Copied word-for-word for the most part. May involve some omissions, slight rearranging, minimal changing of tenses, minimal use of synonyms.

### Examples of Copying

#### Category C

As it appeared in the original source:

The urban workers of France were a tiny minority compared with the nation's great masses of peasants. Yet their influence during the Revolution would be tremendous—out of all proportion to their numbers. (Banfield, Susan. 1989. *The rights of man, the reign of terror: The story of the French revolution*. New York: Lippincott, 16.)

As it appeared in a student's paper:

The urban workers of France also formed part of the third Estate. They were a tiny minority alongside the nation's great mass of peasants, yet they had tremendous influence during the Revolution.

#### Category D

As it appeared in the original source:

The Scottish witches associated, so it was believed, with evil spirits which appeared in the form of animals. Macbeth's witches also associate with evil spirits which appear in the form of cats and toads. (Winstanley, Lilian. 1922. *Macbeth, King Lear and contemporary history*. London: Cambridge University Press, 114.)

As it appeared in a student's paper:

Witches were believed to associated (sic) with evil spirits which appeared in the form of animals. *Macbeth's* witches associate with evil spirits in the form of cats and toads.

## Category E

As it appeared in the original source:

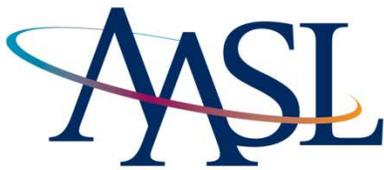
In the church a number of staging conventions evolved that were to remain in use throughout the Middle Ages. The acting space was divided into two parts: the *mansions* and the *platea*. The mansions (also called stations, seats, or *sedes*) were simple scenic devices for indicating the location of incidents. For example, a throne might be used to suggest the residence of Pilate. Each place was represented by a different mansion, and all remained in view throughout the play.

Since the action could not be performed in the limited space provided by the typical mansion, the actors used as much of the adjacent floor area as they needed. Often the same space was used in many different scenes. This generalized acting area was called the *platea* (or sometimes the *place* or *playne*). Thus, a series of mansions was arranged around a neutral playing space, and the performers moved from one mansion to another as the action demanded. (Brockett, Oscar. 1974. *The theatre: An introduction*. 3rd ed. New York: Holt, Rinehart, & Winston, 119.)

As it appeared in a student's paper:

A number of staging conventions evolved in the church that were to remain in use throughout the Middle Ages. The acting space was divided into two parts: the mansions and the platea. The mansions (also called stations, seats, or sedes) were simple scenic devices for indicating the location of incidents. For example, to suggest the residence of Pilate a throne might be used. Each place was represented by a different mansion and all remained in view throughout the play. However, since the action could not be performed in the limited space provided by the typical mansions, the actors used as much of the adjacent floor as they needed. Often the same space was used in many different scenes and this generalized area was called the platea (or sometimes the place or playne). This series of mansions arranged around a neutral playing space provided the 'stage' and the performers moved from one mansion to another as the action demanded.

**School Library Media Research** (ISSN: 1523-4320) is the successor to *School Library Media Quarterly Online* and the predecessor to *School Library Research*, an official journal of the American Association of School Librarians. The purpose of *School Library Media Research* is to promote and publish high quality original research concerning the management, implementation, and evaluation of school library programs. The journal also emphasizes research on instructional theory, teaching methods, and critical issues relevant to the school library profession. Visit the [website](#) for more information.



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