STUDENTS AS RESEARCHERS

Jennifer Watson, a high school English teacher in Kalispell, did a series of small studies with high school sophomores as part of a unit on writing scientific papers (Santa and Watson, in press). She asked students to collect data on themselves and then use these data for practice in writing a scientific paper. She began by teaching her students about CRISS theory. She gave short demonstrations and lectures about how background knowledge, organization, discussion, and writing influence learning. Then she began the study which lasted for about two weeks.

Jennifer chose five reading selections, each about two pages in length, on topics related to an upcoming assignment, the novel *To Kill A Mockingbird*. The first day, students collected baseline data where they read an article without any background information or pre-reading information. After reading the article, Jennifer collected it, and then the following day, gave each student a blank sheet of paper where they wrote down all of the information they could remember. Students checked their work by comparing their recall with the article, graphing their performance, and writing personal reactions to the experiment in journals.

After completing this control sequence, Jennifer conducted a series of four strategy investigations using the remaining four articles. She followed the same procedures for collecting baseline data except that students did much more than just read the articles. In the first strategy, students did a KWL (Donna Ogle's Know, Want to know, Learn strategy) before reading the article. As with the control study, she collected the article and had students do a free recall the following day. They again graphed their results and responded in their journals. For the second strategy study, students brain-stormed, underlined major points, and wrote study questions. For the third strategy, they did concept mapping and for the fourth, they did either a concept map or study questions followed by small group discussions using either their concept maps or study questions. Not everyone performed the same.

Students then examined their own performances and came to conclusions about which study strategies seemed to work best for them individually. They also discussed each strategy based on what they knew about learning principles. They talked about how each procedure worked for generating background knowledge and for encouraging learners to be organized, metacognitive, and active. Students then used their own data to write a scientific paper. Having students write about their strategies not only gave them ingredients for their papers, but it helped them internalize personal learning systems.

Most found that they recalled more when they had opportunities not only to organize information, but to discuss what they were learning with other students. For example, one student wrote:

> *I did best on the article about Harper Lee. I really found the discussion important. It worked well for me to organize the topics into a map and then talk about these topics in my group. My worst score came with the first article. I have to do more than just read something to remember.*