

4 Writing in Academic Classrooms

We have seen in the previous chapter that the classrooms of the seven collaborating teachers were governed by somewhat different central concerns, ranging from leading students to understand the principles underlying inquiry in a scientific discipline to introducing them to the traditional organizing features of English language and literature. In studying the writing activities that could foster subject-area goals within these classrooms, we found that they were similarly varied. Simple activities like freewriting exercises or journal keeping were used in different ways by each teacher; more extensive or complicated assignments took their structures and goals from the contexts in which they occurred.

In this chapter we will examine the ways in which writing was successfully incorporated into the classrooms of the collaborating teachers. These include activities that the teachers were already using before the project began, as well as new activities introduced in the course of the research. The focus in the chapter will be on understanding the success of these activities — the principles underlying effective practice. In the following chapter, we will revisit these classrooms from a different vantage point, examining the interaction of these activities with the teachers' goals — including the circumstances in which a change in writing activities was but a symptom of a much more fundamental redefinition of teaching and learning.

Although the activities in these seven classrooms took many different forms, these forms served a limited number of functions:

1. To draw on relevant knowledge and experience in preparation for new activities
2. To consolidate and review new information and experiences
3. To reformulate and extend knowledge

All three are general pedagogical functions rather than unique functions of writing, but each provides a context within which writing activities can often find a comfortable home. Depending on the teachers' purposes, all three can be used primarily to evaluate students' knowl-

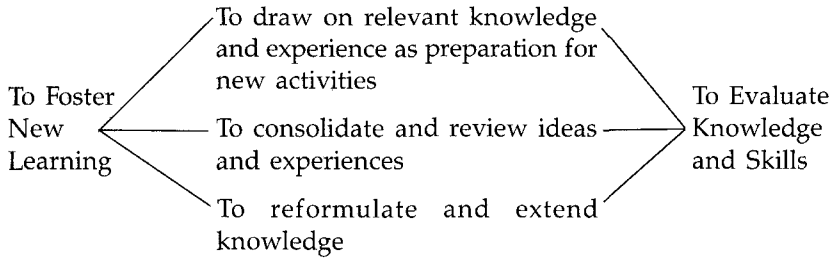


Figure 3. Purposes of writing in the classroom.

edge and skills or primarily to foster the development of new learning (see figure 3).

Writing to Draw on Relevant Knowledge

Classroom activities must begin somewhere, and most teachers develop their own favorite routines for stimulating students' interests, assessing (or reminding them of) what they already know, and focusing their attention in an appropriate direction. These are functions that appropriately structured writing tasks can fulfill — but only if the teachers believe that the students have relevant prior knowledge to draw upon in their writing.

When our collaborating teachers believed the students knew too little about the subject, they turned to lecture or demonstrations, rather than to student writing, as a way to begin. As we have seen, Kathryn Moss construed chemistry as a formal body of knowledge about which her students knew nothing. Given that belief, writing did not make sense as a preparatory activity at the beginning of a unit of study. During her participation in the project, she tried a freewriting activity before her students began a unit, but since she did not see evidence of the knowledge she sought, she never used that kind of activity again. She did develop a series of review-writing activities as preparation for quizzes, and these worked well for her because they were introduced at a point where students had some formal knowledge of chemistry on which they could draw.

In contrast, Janet Bush used freewriting activities (she called them "five-minute writing") to prepare her students even when they had little or no knowledge about a new topic. Although the students had trouble with such activities when they first encountered them, over time they learned to ask better questions — questions that helped

them frame the new unit of work. The first such assignment dealt with crayfish:

What do you know about crayfish? Write anything you can about crayfish, without worrying about the form of what you say. You can write a poem, you can write about nightmares involving crayfish, or you can write about what you'd like to know about crayfish.

Students were told that they had to keep writing for five minutes — even if all they did was write “I don't know anything about crayfish” over and over again. When we asked her what she had written for this assignment, Margaret, one of the case-study students, said she had written “just that I had never actually seen one. . . . I gathered from class what phylum they were from and all that stuff; that's about all I knew.”

As they grew more familiar with this type of writing assignment, the students grew better at responding to it, learning to relate their comments to the more general context of biological study. Thus in response to a later assignment at the beginning of a unit on vertebrates, Margaret wrote: “What are vertebrates? Are they different from animals without backbones, because we've been doing invertebrates? What is their digestive system and nervous system like that are any different?” Although she had few answers, Margaret had begun to learn the kinds of questions she could profitably ask.

If Bush's use of preparatory writing helped students focus on relevant questions to frame their studies, Jack Graves saw such writing as primarily motivational. He described his use of assignments of this sort rather casually during our initial interview in November:

I suppose you need to generate a little interest before you have them read literature. It's a natural thing for an English teacher to fall back on. It may not be in a history class or a biology class, but for an English teacher to say “Take out your pencil and address yourself to this idea,” that's not unusual.

As we studied Graves's classroom, his initial casual comment turned out to be a very accurate reflection of his use of writing of this sort. Earlier in the year, for example, he had asked his students to complete an impromptu theme (he called it a “freewrite”) on the topic of tattoos, before studying a poem about them. He was particularly pleased with this assignment, because it tapped into something the students felt strongly about initially. Students “can do very well on anything which is kind of an emotive, an immediate response. And then their writing is not phony at all. . . . Where the authentic voice gets lost is when writing about literature.”

For Graves, the purpose of such preparatory writing was to stimulate students' interest; it was not an integral part of the literary study that followed. In his work on the project, he tried to use similar early writing activities as a lead-up to the final, formal essays that culminated each unit of study in his class. He was comfortable with such activities, though they never gained a very high priority among the competing demands for classroom time. For him, the study of literature involved students in both a "journey out of themselves" and a "journey in." The journey out of themselves involved coming to understand the relationships among ideas within a text, ideas that were broader and more important than students' individual experiences, but the journey in was dependent upon students' own ideas and experiences. Graves viewed the "journey in" that preparatory writing provided as secondary to the "journey out" that was at the heart of literary studies.

This differentiation was also evident in the collaboratively developed writing activities for a unit on *Great Expectations*; the activities began with a freewriting focusing on the question, "What should a good parent provide a child?" The freewriting began as a way to help students bring their personal experiences to bear on their reactions to Pip's early life, at the beginning of the novel. It was also meant as a lead-in to a second writing assignment, on Joe and Mrs. Joe as parents.

Graves introduced the freewriting on a Thursday, twenty-nine minutes into the period. As the students put away their grammar books, he wrote the question on the board. He told them to write approximately half a page, and that when they finished they could go on to their work for the next day. (In this case as in others, he used the term "freewriting" to describe an impromptu essay without a specified structure.) Most students wrote for about ten minutes and then moved on to their reading. Commenting on their involvement, Graves noted that if he were asked to write on such a topic, he would feel that he had to say something important. But he thought the students were comfortable with spontaneous writing precisely because they did not feel obliged to say things that were important. In his responses to what the students had written, he saw no need to make connections to the novel or to the substance of the follow-up assignment on Joe and Mrs. Joe.

The students in Graves's class reflected his distinction between the motivational, personal writing and the formal, text-based writing that he asked them to do. As Sandy, one of the case-study students, put it, in the freewritings "you can put your own thoughts, experience into it," whereas in the formal papers "you just write what was in the book, not really what you learned."

The freewriting assignment, then, worked because it was fully assimilated to the central concerns that governed Graves's teaching of literature. It fostered the "journey in" and "authentic voice" that he had come to expect from personal writing, stimulating interest and getting students involved before tackling the more significant work of the "journey out," a journey that would be constrained to the boundaries defined by the literary text.

Writing to Consolidate New Information

Many of the teachers found it difficult to use writing as a way to introduce new activities, because they felt that students would not know enough to have anything to write about. For these teachers, it was much easier to use writing as a way to help students review what they had learned. This review writing took a variety of forms, including log or journal writing, summarizing new material, note-taking, and study exercises. Reviewing new learning was one of the most frequent functions of writing in the participating classrooms. It played a particularly important role in the three science classes, each of which placed considerable emphasis on the learning of specific information.

The usefulness of writing in review became clear during our first year, in our work with Julian Bardolini. At the time we began our work with him, he was using note-taking and end-of-chapter study questions to serve review functions. In addition, he included some essay writing as part of end-of-unit exams. This combination of activities proved somewhat frustrating for both Bardolini and his students. He graded the end-of-chapter questions perfunctorily, and he never reviewed the notes at all. By the time students reached the unit exams, they were uncertain what he wanted. As Connie, one of the four case-study students in his class, put it in the interview cited in the previous chapter, "No one can usually fit it together."

Our collaboration with Bardolini focused on ways to help students "fit it together" by getting them to write about examination material before the in-class examination essays. The vehicle that worked best for this was the learning log, completed daily in class as a way for students to pull together in their own words what they had learned that day. At the beginning, because it was an unfamiliar activity, Bardolini introduced the log carefully. The students were given special notebooks to use for their learning logs, and wrote four questions on the inside cover as guides in responding to activities:

1. What was done?

2. What was learned?
3. What was interesting?
4. What questions remained?

On the day the notebooks were distributed, he also gave the students a page of sample entries, drawn from earlier studies of science classes (Applebee et al., 1984), as models of what their logs might contain.

When Bardolini introduced the learning logs, he ran into some initial problems. The lesson after which he had planned to introduce them ran longer than anticipated, leaving little time for the logs to be explained. This produced some confusion and frustration among the students, who were not sure what they were supposed to do or why they were supposed to do it. Explanations during later lessons, and supportive but directive comments in response to early entries, solved these problems. Bardolini had also begun by placing the log writings at the end of class, where they came in conflict with the reading of daily announcements — a ritual that had come to mean, “Class is over.” In that context, the students did not take the logs seriously; in fact, most spent the log-writing time packing up their books and talking with neighbors. He solved this problem by rearranging classroom routines, moving the daily announcements to the beginning of the class and establishing an uninterrupted period for log-writing that was clearly separate from packing-up rituals.

The nature of the logs gradually evolved during the period Bardolini worked with the project. The initial entries were very short, often no more than a few sentences. Because he had little previous experience with logs, he brought the initial sets of entries to the project team to discuss how to encourage more fully elaborated responses. The following entries from the first day of the logs are typical both of student entries and of the responses with which Bardolini began:

Student entry: Today we were lectured on nerve cells, kinds of neurons and neuron transmitters. The lecture was interesting, and I learned a lot about how we react to pain, pressure, and heat.

Teacher's response: Susie, I am glad you found the lecture on nerve cells interesting. I'd like to read more of what you learned on reaction to pain, pressure, and heat.

Student entry: We learned all about the neuron. The neuron has three parts, the dendites, the axon, the cell body.

Teacher's response: Martin, this is a good way to start. Now what you need to do is write more — much more.

Bardolini used these as models at first, though he was still struggling to convert the new activity into practical classroom routines. Some of

the students used the log as a way to vent their own frustrations with biology, and sometimes with the teacher, in a way that would not have been sanctioned in class: "Mr. Bardolini got sidetracked into talking about sex, but that seems to happen every day." Another commented, "I didn't like it at first, but I like it now because if Mr. Bardolini has done something in class I don't really like, I like putting it down here in the log." Bardolini responded well to these criticisms, even commenting at one point, "I want them to write more than 'the lecture is boring.' I want them to tell me *why* it is boring; what I can do to *improve*." In spite of this tolerance, he gradually focused the logs more and more directly on the content his students had studied. Early in the process he suggested that the students use their class notes as further material to draw upon while writing the logs, clearly foreshadowing the later evolution of this activity.

One of the difficulties with the logs was in dealing with the team's suggestion that they should not be graded. This suggestion had emerged during one of the collaborative planning sessions, prompted by the sense that ungraded logs were most likely to be treated as a learning activity rather than part of the evaluation process. Bardolini soon found this approach uncomfortable and complained that he had "no sense" of how the students were reacting to the logs, because "I've asked them to do it; they want a grade, they'll do it." Some of the students clearly shared this perception, expecting to be graded on the logs in spite of the teacher's initial assurance to the contrary. Thus Max, one of the case-study students, confided, "I get the feeling it's going to be part of our grade, writing in the log. A big part." The interview continued:

Research assistant: What gave you that feeling?

Max: Just the way he always says, "Write in your log," and he makes it mandatory.

Research assistant: Does that feeling affect the way you write in the log?

Max: It tells me I should definitely write in it!

Later in the year Susan came to a similar conclusion: "I got a bad grade; I'm writing what he wants [now]."

We traced the continuing evolution of the learning logs in Bardolini's repertoire through interviews at the beginning and end of the next school year. During this next year, he extended the use of logs to all three of his general biology classes, convincing his department chair to purchase the necessary notebooks for all of the students (during the first year, the project had supplied the notebooks for the cooperating

class). Bardolini structured the logs around the four guide questions, asking that students respond during the last five minutes of class, or if time ran out,

... These are obligations at home for five minutes — to think about what they did that period. . . . The reason I wanted them to do this was that I feel they should get their things together that they learned. 'Cause a lot of them just come to class a week later and take a quiz or a test and never even look at their notes until they study for a test.

He began the second year still insisting that the logs were for the students' benefit and were not graded, but by the following June the activity had been fully assimilated into his general system of points. The logs were collected "two or three times each quarter," and the students received full points for doing the entries. The activity had become an expected part of the routine: "They know what they have to do and most of them accept it as a way of getting a good grade other than testing. . . . [Doing the log] could guarantee a perfect score. They love it."

A year after we finished working with Bardolini, the learning logs had become a relatively stable part of his teaching routines, and his biggest concern was how to finance them the following year if the department chair balked at the continuing expense. (At \$1.19 per bound notebook, the expenditure was not trivial.) His proposed solution was to divide the students' laboratory notebooks in half, keeping one half for the lab work and using the other half for the logs — thus having to provide two books only for students who wrote a lot.

The logs worked for Bardolini because he was able to adapt them to fit several crucial features of his teaching: (1) They served to review and reinforce difficult material on a regular basis, forcing students to review the notes that they otherwise seemed to ignore. (2) He was able to adapt them, through a system of points for completion of entries, to a general classroom economy that was evaluation-driven. (3) By collecting them only once a month or so and grading them on completion of entries, he was able to keep paper grading to a manageable level.

Review writing was also an important activity for all the other teachers we studied, in each case with its own necessary twists to help it work comfortably within each teacher's established routines. Naomi Watson, with her general concern for helping students organize and retrieve important information, included in her class routines a wide variety of review activities, ranging from study sheets focusing on particular readings to a daily journal introduced as a way to ensure

systematic "filing" of information for later reference. Kathryn Moss, who relied on regular "refresher" sessions to remind students of what they knew before exams or quizzes, switched to five-minute review writing as a way to ensure that everyone was involved. Janet Bush, with her concern with concepts in biology, used informal note-taking, scientific logs, unit exams, and freewriting exercises to ensure that students were developing the needed base of information about biology. Jack Graves, who emphasized the "right" way to put ideas together, found review writing helpful as a way to check on whether students had done their assigned homework, a checking function fulfilled quickly by written responses to short-answer questions. Bill Royer and Jane Martin also used a variety of short-answer study sheets to review social studies material, but coupled this with summary writing and other extended review-writing exercises.

Writing to Reformulate and Extend Knowledge

The third major function of writing in the case-study classrooms reflected the use of language as a tool to reorganize and reflect upon what students knew or had learned. In such writing, students were asked to explore relationships among the concepts they had studied, developing classification systems, tracing cause and effect, explaining motivation, or speculating about future developments. All seven of the participating teachers valued such functions of writing, though they differed on how such purposes could be achieved with their students — and even on whether they could be achieved at all.

For our first example of how the teachers used writing to help students reformulate new understanding, we will look at Jack Graves's class in the midst of their study of *Romeo and Juliet*.

Juliet's Decision

Graves believed that his central task as a teacher of English and literature was the "putting together of ideas." At the same time, however, he felt it was important that his students learn how "to get it right the first time," and that to emphasize fluency before correctness would therefore work against students' best interests. This pairing of concerns led him to emphasize frequent writing within a highly structured format. He prepared students carefully, he said, suggesting the organization as well as the points that needed to be emphasized in a formal essay. He expressed some ambivalence about his approach:

More often than not I'm probably telling them what to say. That's bad 'cause I guess I shouldn't do that. No, it's not, and it's something I should do more of, laying the groundwork. . . . I go in two directions here. One is that I don't want to tell them what to say. And the other is that I want to give them some direction so they don't feel lost when they have to do it.

In his teaching, Graves preferred to err on the side of giving students more rather than less direction. His assignments typically provided the class with a thesis statement (and sometimes with complete opening and closing paragraphs) and a series of points from the text that illustrated the thesis.

We can see this process at work in a unit on *Romeo and Juliet*, which he concluded with a formal essay focusing on Juliet's decision to commit suicide in act 4. In developing this assignment, he began with a small-group activity in which he asked the groups to generate a series of alternative courses of action for Juliet when her parents try to arrange her marriage to Paris after she has already secretly married Romeo. For each alternative, the groups were to generate the pluses and minuses — why she might accept or reject it. The groups were puzzled by the assignment and had made little progress by the time he stopped the activity twelve minutes later.

The following day Graves used a class discussion to finish preparing the class for this essay. The interaction is interesting as an example of how he provided the class with the arguments to incorporate into their essays. He began by asking them to look at their notes from their small-group work, and then he helped them consider the implications of the alternatives in terms of what they knew about the play:

Graves: Okay, uh, what was one of the alternatives you thought about?

Girl [reads from her notes]: She could run away and live the rest of her life with Romeo.

Graves: Okay, rather than take poison, why doesn't she just run away, straight away? All right, is there any advantage, can anyone think of any advantage of being thought dead? What's the advantage for people who do that?

Sandra: They won't suspect that you're leaving.

Graves: Right, they won't come look for you. They won't send somebody after you. Are the Capulets a powerful family?

Student: Yeah.

Graves: Yeah they have lots of servants and responsibility for this other [one word] for fear that there'll be civil war at the time. Okay, so they might not be martyrs then. Anybody disagree with that or see a problem with that?

Kathy: That they should remain with them.

Graves: Yeah, that's a pretty awful thing for a young girl. Maybe in the excitement of getting married, she's forgotten all about her family. If they knew this was going on they might miss her mother and father. Do you see any great affection between parents and child?

Girl: [a few words unclear]

Graves: No, I don't remember any place in the play that there's a tremendous amount of affection. Does Capulet address her in an affectionate way?

Girl: [a few words]

Graves: Yeah, when she comes back to her parents and tells them she's going to marry Paris. He calls her "my headstrong" and I think he's sort of teasing. How do you expect a relationship between a father and a daughter to look?

Girl: Close.

Graves: Real close. This is a matter, a truism. Girls get closer to their fathers. Okay, uh, so that's, that's interesting. And then what would she do? Where would they live? Do you think that Romeo's parents would support them?

Girl: No.

Graves: Can Romeo support himself?

Girls: No. Maybe.

Graves: How do you think a boy with a rich family got along in those days?

Girl: Got all his parents' money.

Graves: Exactly. He inherited it. In England the oldest son inherited all the property. And Romeo was the youngest son.

The discussion took five minutes to this point, and by then Graves had led students through the problems that would develop if Juliet were to elope with Romeo. The teacher then led the class through two similar explorations of the consequences of other alternatives that Juliet could have chosen. Finally, he brought them back to the paper that was due the next day:

Graves: Okay, I want you to begin, now we've got to think of some way, some beginning paragraph to include as many of these ideas as we can. How do we want to start out? What can we say as a preview? Now we've been talking about topic sentences or topic statements, statements that are going to tell the reader, uh, what to expect in the paper. So what is the reader gonna expect in your paper? Now I want you to come up with it. I've been giving it to you all along. Now I want you to come up with something. [pauses for one second] Well, what would . . . you don't need to come up with something that everyone could use. This is just going to be everyone's idea.

Sandy: [unclear]

Graves: Yeah, what she could have done instead, or why she did what she did do and why she did that. Do you think that's important to include in the paper?

Carolyn: Yeah.

Graves: Okay, I think it's important, yeah, because it's going to reinforce what you know about the play. So, how are we going to include what she actually did along with some of the things she might have done.

Nat: "Juliet has many options to take."

Graves: Okay. I like the word "options." That's a nice word. At what point are we at now? We're at the end of the play. We have to locate it in the action, the plot of the play. What point is she at in her options?

Girl: [unclear]

Graves: Okay, so, I think the important thing there is, that's good, we have to locate that in the plot. "After her father insisted that she do [aside to student, 'What?'] marry Paris, Juliet has several options." Okay, does that strike you as a way to, a way to go?

Girl: Yeah.

Graves: All right, fine.

At this point the students had a topic sentence and three well-developed examples to use for their rough drafts, which were due the following day.

Reflecting on this assignment a week later, Graves was pleased with the way it had helped the students understand the play. It was "a good assignment in that they were focused on the difficulty of the decision and it made them use their imagination, made them look into the different characters and see how they would have perceived different, alternate decisions." Sandy, one of the case-study students, agreed, commenting that writing about "the advantages and disadvantages of what she — Juliet — could have done gives you an idea of why she took the drug."

Create-an-Animal

Jack Graves's lesson on *Romeo and Juliet* is a good example of how a writing assignment and the activities that surround it can be used to reformulate and extend students' understanding of particular content, in this case of a literary text. For the next example, we will turn to Janet Bush's biology class and consider an assignment designed to move the students beyond the material they had studied to a point at which they could apply its underlying principles in new contexts. This assignment developed out of a collaborative planning session in which

one of the team members suggested that the students might be asked to design their own creatures, drawing on their recent studies of organ systems and the evolutionary scale. Bush was pleased with the suggestion and fleshed out the particulars to fit with her general goals for the unit.

In its final form, the assignment took two days of class activity. On the first day, she provided a general overview of life processes and life systems, bringing together information that students had previously studied in separate units. She followed this with a problem-solving activity that focused on various life processes in the evolution of species and asked students to propose alternative solutions to those that nature had evolved. Students recorded their solutions in charts that she collected.

On the following day, she returned the charts with her comments and led the students into the writing activity itself: "Design an animal to live on land. Start with a chordate that lives in the water and decide what you have to do to get it to live on land." The students were required to discuss at least four organ systems (students could choose which) and to explain why they created the various features.

When a student asked how to start the paper, Bush kept the analytic task foremost: "I want my animal to look this way because. . ." She suggested that students might want to include sketches of their new animals, along with explanations of their features and of the advantages these features might provide.

She was very pleased with this assignment and found that it brought a good response in all four of her biology classes. In her comments at the end of the project, she focused on this task as an example of the kind of writing she would like to emphasize more in the future:

Assignments like the Create-an-Animal worked, worked really well — the kids really like it — and that's the most sophisticated level in Bloom's taxonomy . . . so I have to . . . I want to sit down and look at the different units that I teach and see if there isn't some more writing that I can incorporate at the evaluative level — after I've given the kids the groundwork.

Groundwork for the task was important: "It required them to take all their background knowledge — over a month's worth of stuff — and apply it to create a new thing." Bush also noted that students responded well to such tasks; of the things she asked them to do, it was "the stuff that they rankled about least."

The Create-an-Animal assignment was a relatively easy extension of the activities already well under way in Bush's biology classes. She placed a high value on teaching students to think creatively in science

and was already using writing as an important tool in that process. The "What If" formula underlying the assignment is a powerful one, however, and is easily adapted to other topics and subject areas.

Practicing Conclusions

The process of drafting and revision can also be used as a powerful tool for helping students extend what they are learning. Kathryn Moss used it as she developed writing activities for her chemistry class. As we saw in the previous chapter, she was enthusiastic about the general idea of writing in science, but she was less than optimistic about the likelihood of success in chemistry class. One of the assignments that worked well in her class focused on students' problems in writing lab reports and was closely tied to her original goals. During our initial interview with Moss in November, she had commented on the problems that students had with formulating conclusions for their lab reports:

Moss: They tend to wander, pulling everything in but the kitchen sink and not being very discriminating, and I think that's precisely the point of the synthesis of the lab, and for some kids I never quite get it across.

Research assistant: When you say "not right" do you mean they're just missing the point of the lab?"

Moss: They'll say, "You mix x with y and you get a precipitate"; that's not a conclusion. That's not a conclusion by my definition. I'm not getting that across even though I will sometimes read students' conclusions anonymously or make them up — or have the students make them up — and say in retrospect, "What do you think about this?" and they'll all laugh and say, "Aw, well. . . ." But some of them do equally foolish things to the point where some conclusions are gibberish. . . . And yet I consider that a very important part of the course and of the lab and of teaching the kids some scientific skills.

Although Moss felt that good conclusions should be limited to no more than two sentences, these two sentences were a critical part of reformulating and interpreting students' observations during the lab work.

In March, Moss returned to this problem and developed activities to help students write better conclusions. She began with an assignment sheet on practice conclusions, which she introduced with an analogy: In an article, the conclusion is the bottom line about which one asks, "Do I believe it?" In chemistry, the conclusion plays a similar role, providing a bottom line that should summarize what one can believe as a result of the experiment.

During the following week, when the assignment sheet was due, she continued with the work on conclusions. During the class, she developed several concepts relating to rates of reactions and then had students write quantitative statements about the relationships of rates of reactions in their current experiments. For the next twenty-six minutes she took the statements the students produced and worked with them on an overhead, helping the class revise them until the language was clear and the relationships were correctly stated. Then she asked the class to write practice conclusions for the lab.

In responding to the practice conclusions, Moss underlined flawed parts and occasionally wrote "good," but (as she noted) the process was very rapid. She was relieved that she did not need to make corrections, except for the occasional spelling error.

Two weeks later, she gave a second practice conclusion exercise. During our final interview with her, she described what happened:

The writing assignment was done with the same constraints and rules as the first on practice conclusion writing. . . . I told them there were about two minutes left in the class period and if they'd do a practice conclusion, I would read it and give them feedback tomorrow and then time in class to fix up their conclusions in their notebooks if it was appropriate. And I told them that it would not be evaluated — that I didn't care whether they did it or not but that it was an opportunity for me to give them a little help in advance. . . . This was one of the most difficult labs that we do . . . and of the nineteen or twenty students that were there, fourteen submitted a practice conclusion with lots of scratched-out words and what not, and at least twelve of them remained after the bell rang working quietly — almost oblivious to the fact that the class was over. And I was taken aback that they were willing to do that.

Again, she found that she could read the practice conclusions quickly ("It took me minutes") and could see their answers evolving, as well as where they went a bit astray.

The case-study students found the practice conclusions helpful in different ways. Henry, who found conclusion-writing difficult, felt that Moss's work in class had been generally helpful, although he was unable to articulate the form the help had taken. Gina, who felt she understood the conclusions to begin with, thought the problem was semantic rather than conceptual. After the work in class, she concluded, "It's just how you word it. Most kids are probably putting in the right wording [now]."

The sequence of "practice conclusions" that Moss developed represented a form of draft-plus-revision before students recorded the

final draft in their lab notebooks. Treating the conclusions as “practice” helped her focus on the content (which she saw as part of her job as a teacher of science) rather than the form (the job of the English teacher in her mind) and made them easy to review before returning to the students.

Impromptu Writing

In addition to formally structured assignments, many of the teachers used impromptu writing to encourage students to think about and reformulate material they were studying. Naomi Watson, who scheduled guest speakers at regular intervals, asked the students to write brief reaction papers after each talk. Jane Martin, who usually structured her assignments very thoroughly, began to use end-of-lesson assignments to help students make connections for themselves. Thus after a game that emphasized cooperation — and the penalties for everyone if people failed to cooperate — she passed out paper and announced:

Now we are going to try to pull this together. We have just played a game. You have [also just] read a piece on life in a kibbutz. Write me two good paragraphs putting together the message of the game we played and the message of the article. Be sure to use examples from the article.

Although she still provided a certain amount of structure here (emphasizing two paragraphs and examples from the article), Martin treated this as an exploratory piece, allowing only ten minutes and marking the papers with a check or check-plus, rather than a grade. This brief writing activity helped the students draw out a set of connections that had been implicit in her planning but never brought to their attention.

In science, Janet Bush made similar use of impromptu responses in her five-minute format. After a film entitled *Hemo the Magnificent*, she gave her students very specific writing instructions:

1. What are the important points of *Hemo the Magnificent*?
2. What's the secret of sea water? Why does it have anything to do with blood?

While the first question served a simple reviewing function, the second forced the students to draw out relationships for themselves. Bush assured the students that they would receive full credit for making a sincere attempt, and in fact all received five points.

Evaluating Student Learning

The evaluation of student learning is a central pedagogical function in most classrooms, and those in our study were no exception. Most of the writing assignments the collaborating teachers ordinarily gave were designed in part to evaluate what students knew or had learned. When combined with the three pedagogical functions of writing we have been discussing so far in this chapter (preparing for new activities, reviewing, and extending concepts), evaluation takes very familiar forms: evaluation in preparing for new activities serves to *diagnose* student needs; evaluation in review writing serves to *assess* what students have learned; and evaluation in the context of writing to extend concepts reflects students' ability to *apply* what they know. Thus one of the teachers' persistent concerns as they developed new assignments for their classes was how these assignments should be evaluated. This concern had two components: what would constitute "good" work, and how to keep paper grading within reasonable limits. Without satisfactory answers to these two concerns, even our most enthusiastic teacher-collaborators quickly became uneasy. Like the activities themselves, the evaluative procedures varied from classroom to classroom. In turn, as we will see in the following brief accounts of each classroom, the evaluative procedures played a central and even controlling role in determining which writing activities would work best.

Julian Bardolini: Writing on the Point System

The classroom economy in Bardolini's class was driven by a point system. Every task that students were asked to do was given a point value, and final grades were based on the cumulative points earned during the grading period. We have already seen how this classroom economy interacted with the learning logs that eventually became a continuing part of his repertoire. At the beginning of the project, he tried to divorce the learning logs from the point system, emphasizing the value of the logs for their own sake. While fine in theory, in practice this approach made both teacher and students uncomfortable. The learning logs were not fully institutionalized until the following year, when they gained their own point value. Bardolini kept the consequent grading under control by collecting the logs only once a month and assigning points for completion of the activity rather than from a close or careful reading of the substance.

Other writing activities in his class also collected points — and the only activities that worked were those for which the points could be

clearly defined. He was most comfortable when he could develop a "template" for the writing he assigned, a rubric that would give credit for particular items of information that could be expected at a given point in the writing. Speculative and open-ended assignments never worked well in his classroom, in large part because Bardolini could not predict what would come where in the responses — and hence could not develop a satisfactory rubric for them.

Jack Graves: Putting the Parts Together

As an English teacher, Graves had a good sense of what he was looking for in students' writing and was less concerned about the paper load that resulted; he perceived teaching students to write to be part of his job. As he described them in his initial interview with us, his goals for writing activities were broad: "having [the students] develop the skills, writing skills, being able to punctuate, to spell correctly, being able to illustrate by example or illustration, anecdote, some general statements, the ability to be interesting." He made regular use of peer editing groups to improve the mechanical aspects of students' writing before it was turned in; second drafts, a regular part of most assignments, focused on correcting mechanical errors the editing groups had caught. All assignments in his classes were graded and returned the following day, with separate grades for content and grammar.

In his classes, content was defined in practice as the development of a correct interpretation of the texts being read. One of the major values he saw in formal writing was that it helped students "decode" the language of the text and put it back together properly. The new assignments that worked best in Graves's classes were therefore those that let him judge the students' emerging interpretations. Assignments that led in other directions, such as the personal writing that preceded *Great Expectations*, were treated as motivational and never played a major role in his classroom.

Naomi Watson: Grading for Participation

In Watson's survival skills class, writing was a tool in constant use: it was the way that information was recorded and filed away until it might be needed. Writing in one form or another was required every day, and she was conscientious about checking this work: "I'm not going to correct everything but if I don't collect them they feel it's not important, so whenever, whatever it is, they just turn it in." Like Julian Bardolini, Watson assigned points for this work, requiring the students

to keep logs in which they recorded the points "so they can see how they're progressing." Unlike Bardolini, however, she was very casual about the way points were assigned:

Well, I have to admit it's very quick. It's whether or not they're complete. And whether or not they've gotten the gist of the lesson. And I'll tell them, "Hey, I'll spot check a lot. There may be a question on an evaluation sheet and that's it. And that's how you've gotten your points for that day."

Given the frequency with which she looked at student work, she kept the assignments simple and short, usually less than a page so that she could capture the gist of a response by scanning it quickly.

Watson's approach to evaluation was highlighted in one of the first assignments she developed during the project. The assignment began as part of a unit on banking; she was going to give the students an inaccurate bank statement and ask them to draft a letter to the bank pointing out the error and asking for a correction. As she worked with this task, she transformed it into a letter of complaint about a defective product. She used this letter as the end-of-semester examination, spending the first half hour taking the students through a worksheet on consumer rights and a model letter of complaint. Students then spent fifteen minutes to half an hour on the letter for the exam. In discussing the exam later, Watson said she had told the students that the letters would be graded as acceptable or unacceptable, "And so that's really pretty much the way I checked them." In looking through the exam papers, she made a special point of one by a girl who was a "poor student in lots of ways but she really came through on this assignment. . . . [For] a lot of this, all you had to do was almost copy what I said, but on the other hand, she did that."

Watson's approach to evaluation made it relatively simple for her to introduce new activities, as long as the writing that resulted would be relatively short and the students would at least be able to make an attempt at the task.

Janet Bush: Differentiated Evaluation

Of all of the teachers from subjects other than English, Bush had given the most thought to writing activities before the project began. To facilitate the different types of activities she assigned, she had two different approaches to evaluation: a credit-no-credit point system for brief assignments such as lab notebooks or logs related to work in progress and a regular grading system for summary writing at the end of a unit. Her major problem in evaluating writing was time, a problem

that surfaced in our first interview with her. When asked about her interests in writing in biology, she replied:

My first preference is to give them essay tests, [but] I almost exclusively don't do it any more because I have thirty-five kids in the classroom and my first concern as a teacher is to give them immediate feedback. When they take a test, I want to give the test back the next day and go over it and I can't do it [using essay tests] with thirty-five kids in each class.

She also noted that when she gave a writing assignment, she felt "compelled to correct spelling and grammar."

Bush expressed similar problems with time in her use of logs as a way for students to keep track of their observations over a period of several weeks, synthesizing personal reactions with their records of what they had seen. Although she valued this activity and reduced the amount of grading by giving points for just completing the logs, she used logs for only three weeks of the year: "I can't justify incorporating [any more than that] in biology, because I have so much other material to cover."

She was comfortable evaluating open-ended material and had well-rehearsed procedures for dealing with work in progress as well. It was relatively easy for her to develop new writing activities, but only as long as paper-grading time could be kept to a minimum. In the assignments she developed during the project, this meant focusing on the content of the students' writing rather than the spelling and grammar and keeping the overall length of any assignment relatively short.

Kathryn Moss: Quizzes and Extra Credit

Moss's evaluation system was similar to Bush's — in-class writing was treated as a quiz and graded; homework and extra-credit assignments were worth points for completion. Also like Bush, Moss felt obligated to correct any work that she collected. She described this in her final interview with us:

I was always hung up on the fact that if I made somebody write something down then I was obligated to play science teacher and English teacher and whatever — that I could not allow anything to be returned to them that did not have points on it and that did not have comments regarding grammar and spelling because I didn't want anyone to think that I accepted misspelled words and bad grammar, that I didn't know better.

Although we only gradually became aware of it, this attitude played a significant role in the success of the activities Moss developed during

the project. For example, she found it difficult to work with freewriting activities in which students explored new material in class. Although she tried such writing on several occasions, in each case she found it awkward to deal with the papers. As a result, she simply threw some assignments away.

The activities that were successful worked in part because they were easily adapted to Moss's evaluation routines. She had little trouble with more formal writing given for extra credit or homework (simply awarding points for its completion) or with writing completed in class but not collected (the series of review-writing activities that became a permanent part of her teaching repertoire). She also had little trouble with the practice conclusions discussed earlier, which she did collect and read but treated as drafts to be incorporated into the final versions of the lab reports, rather than as work that had to be separately evaluated. Her success with the practice conclusions led her to rethink the need to correct mechanical errors on work in progress:

I've decided that that isn't really important; . . . if the students are trying to write their thoughts down, they can't do both things at once — in one shot — and that as long as we all agree ahead of time it's okay if it's not said in the best form and if it's not grammatically clear or if the spelling is a little off. We're really interacting in ideas and we're not going to worry about those other things.

Jane Martin: Getting It Right

Martin's major concern in her social studies class was that the students should be successful at what they did. She sought to ensure this by providing a highly structured working environment for them, one where right answers would be clear and students could easily succeed. At the beginning of the project, more than 90 percent of the written work in her classroom involved worksheet activities (true-false, matching, and fill-in-the-blank exercises) in which the students did not have to compose extended text at all. Grading for such exercises was simple, since each response was either right or wrong.

Longer assignments were given letter grades, but even in these Martin kept the standards for success simple. One of the collaboratively developed assignments in her class, for example, evolved as part of a unit on India. She asked her students to write a letter to a friend after a trip there:

Imagine you have been on an all-expense paid, unchaperoned trip to India. You saw sights, heard sounds, and did things that thrilled your innermost soul. . . . As a good friend, you are going

to write me a letter telling me about all the things you have experienced. Be original, be clever. Make me wish I were there instead of you.

Martin structured this assignment to ensure the students' success: the letter format was familiar, and the assignment invited narrative storytelling rather than analysis and argument. Her evaluative criteria were simple, too: she counted the number of items that were specifically Indian and based her letter grades on the totals.

Her writing assignments, then, worked well as long as the form and content were clear and the right answer could be kept sharply in focus. As assignments became more open-ended, her discomfort grew — although, as we will see in the next chapter, over the course of the project she came to value such assignments more and struggled to find ways to evaluate them.

Bill Royer: Keeping to the Task

Of the seven teachers, Royer had the least clearly articulated set of criteria for evaluating student work. In discussing his teaching during his initial interview with us, he voiced concerns with fundamental concepts rather than collections of facts:

I will choose questions that I think get at certain issues to see if they've read enough in the chapter to understand the concept. I've always been a person in the social studies who is not concerned with dates and this kind of thing — but more with the cause and effect relationships — why things happen as they happen. On the Civil War final, for example, will be the obvious question, "Could the Civil War have been avoided?"

Despite these concerns, Royer's actual grading practices emphasized completion of the work assigned. Students usually received a grade on a twenty-point scale, with few comments beyond an occasional "good." Long answers tended to get higher grades, almost irrespective of content. The few criteria that he did use consistently were isolated rules of good writing that were easy to apply to student work. He would not accept papers that began, "In this paper I am going to write about . . ." for example, insisting instead on "some kind of hypothesis statement at the beginning." Nor would he accept papers that strayed off topic: "No matter how much you write, if you don't address the specific issues, you don't get credit."

All work was graded in class, however, and this proved to be a significant factor in the kinds of writing that functioned well in his class. He was uncomfortable with assignments that were meant as

work in progress rather than as finished products for evaluation. As he put it in our last interview with him, "When you say it's a check-off assignment, the kids say, 'Oh, okay,' and you get a laid-back attitude and you have to guard against that sort of thing."

The Thinking That Writing Evokes

During the second year of the study, we also gathered think-aloud protocols from the case-study students as they completed their regular classroom assignments. Forty-seven protocols were collected in all, sampling the variety of activities in the six classrooms. These protocols provided another view of the writing activities and allowed us to ask whether the students' approaches to the tasks in fact led to the kinds of thinking implicit in our characterization of the tasks as "preparatory," "review," and "reformulation."

To examine this, we used Langer's (1986a, 1986b) system of protocol analysis, involving segmentation of the protocols into communication units and categorizing each communication unit to reflect the kinds of manipulation and the specific concerns of the writer at that time. The categories we used are listed in table 4; Appendix 1 summarizes the procedures for applying the scoring system.

A number of categories in Langer's system reflect different aspects of the writers' focus on conceptual relationships and structure within the body of information being dealt with, versus a more narrow focus on specific items of content. Comments categorized as *hypothesizing* reflect the writers' predictions about the tasks they are immersed in; such comments imply a sense of the structure of the whole and also imply a process of building relationships among the ideas being developed. *Questioning*, in contrast, reflects a less structured approach without the clear sense of direction that hypotheses embody. *Meta-comments* include statements about the process as a whole; in the protocols from the present study, they tended to reflect puzzlement about the task. *Using schemata* involves simple statements drawn from the students' knowledge of subject-area content or personal experience. *Other operations* combine a variety of low-frequency functions, including citing evidence, making assumptions, validating previous hypotheses, evaluating, and reading from related materials. We also categorized each statement as *global* (pointed toward the text or process as a whole) or *local* (pointed toward specific parts of the evolving text or process of writing it).

The results from these analyses, for the assignments that were used as preparatory activities, for review, and for reformulation and extension

Table 4

Characteristics of Think-Aloud Protocols by Purpose of Writing

	Preparation (<i>n</i> = 10)	Review		Reformu- lation (<i>n</i> = 18)
		Restricted (<i>n</i> = 5)	Summary (<i>n</i> = 14)	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Communication units	39.7 (25.7)	42.6 (17.9)	35.7 (44.4)	45.5 (34.2)
Units occurring before writing (%)	9.4 (12.7)	6.7 (6.9)	9.4 (18.8)	24.3 (29.4)
Reasoning operations (%)				
Hypothesizing	6.9 (7.6)	3.3 (3.6)	3.0 (3.7)	15.8 (14.5)
Questioning	15.9 (15.8)	9.1 (6.4)	16.7 (13.4)	7.8 (5.7)
Making metacomments	10.2 (9.7)	12.3 (8.9)	4.4 (5.7)	4.2 (4.4)
Reading own writing	7.7 (10.6)	0 —	5.0 (7.1)	5.4 (7.5)
Using schema:				
Content	48.6 (15.8)	58.3 (9.3)	59.7 (19.0)	50.5 (20.2)
Personal	8.4 (14.7)	9.3 (9.4)	2.5 (4.7)	0.1 (0.6)
Other operations	2.2 (2.6)	7.6 (8.1)	8.8 (12.1)	16.2 (20.8)
Global (versus local) comments (%)	2.9 (5.1)	2.9 (3.4)	7.8 (15.5)	12.0 (21.5)

of new ideas, are summarized in table 4. Review writing is subdivided into (1) restricted writing activities in which students responded to two or more specific questions and (2) summary tasks that stemmed from a single broad prompt (for example, "Write everything you can remember about vertebrates").

The four types of tasks led to writings of similar average lengths and to similar average numbers of communication units in the protocols. However, some interesting differences in the types of comments included in the protocols reflected differences in what the students were led to do in response to the various tasks.

Looking at patterns across categories, we can see that activities meant to help students reformulate and extend concepts led to the most concern with structure and relationships among ideas, while the review-writing tasks led to the least concern. Hypothesizing, for example, was most frequent in reformulation activities (16 percent of the units) and least frequent in the two review-writing activities (3 percent). Conversely, questioning was least frequent in reformulation (8 percent of the units) and most frequent in summary-writing and preparatory activities (16 to 17 percent).

Concern with a sense of the whole is also reflected in the proportion of the comments that writers made before actually beginning to write. Reformulation seems to have required considerably more thinking before writing (fully 24 percent of the protocol comments, compared with 7 to 9 percent for the other activities).

Patterns for global versus local comments were consistent with these trends, indicating that the writing activities categorized as demanding extension and reformulation did in fact lead to more concern with larger units than is apparent in the other tasks. Review activities, in contrast, led to a greater focus on specific content and less on global concerns, relying on the original material to give shape and coherence. Preparatory activities led to a more diffuse pattern, with considerable questioning and metacommentary and some drawing on personal experience.

Discussion

What kinds of writing "work" in academic classrooms? We found that this question cannot be answered at the level of particular writing activities. Each of the classrooms developed its own unique configuration of writing assignments, a configuration that reflected the individual teacher's subject-specific goals, general constructs of teaching, and methods of evaluation. At the level of the broader functions that writing can serve, however, the answer is easier. The types of activities that we observed in each of the classrooms are summarized in table 5. Writing to review and writing to reformulate and extend ideas and experiences found some place in each of the classrooms; preparatory writing, either to motivate students or to draw on their prior knowledge, found a place when the teachers believed that the students knew enough about the topic to write at all.

Writing to evaluate learning was also universal, though what that meant in practice took different forms in each of the seven classrooms. In each class, evaluation was tied very closely to the teacher's central concerns, and changes in writing activities (including the introduction of some writing activities reflecting work in progress) were shaped by how well those activities could be accommodated to the evaluation system. Activities that could not be accommodated to the evaluation system either failed in their initial introduction or were quietly dropped from the teacher's repertoire.

Our examination of think-aloud protocols gathered while students were completing these activities suggests that in fact the preparatory,

Table 5

Writing Activities Used by the Seven Teachers

Teacher	Pedagogical Function		
	Preparatory	Review	Reformulation
Graves	Impromptu writing	Study sheets	Impromptu essays Formal essays
Watson	Freewriting	Freewriting Study sheets Letters Daily journals Note-taking	Reaction papers Study sheets Letters
Martin	Personal experience Freewriting	Study sheets Freewriting Letters Journals ^a Summaries Note-taking Personal reaction ^a	Impromptu essays Formula paper Letters Unit papers
Royer	Freewriting ^a	Summaries Study sheets Daily logs ^a	Formal essays Outline of argument Project work Reaction papers
Moss	Review writing Freewriting ^a	Review writing Freewriting ^a Journals ^a Note-taking	"What if . . ." papers Practice conclusions
Bush	Freewriting Impromptu writing	Unit essays Impromptu writing Informal notes Scientific logs	Unit essays Impromptu essays "What if . . ." papers
Bardolini	—	Note-taking Learning logs Essay exams Lab reports Restricted writing	Focused logs ^a Learning logs ^a Extended essays ^a

^a Activities perceived as unsuccessful by the teacher.

review, and reformulation activities did lead to different patterns of thinking about the material. Writing to reformulate led to a greater concern with structure and with relationships among ideas, whereas review writing led to more emphasis on the particular content.

Although we have focused on patterns in individual classrooms, the results are consistent with our earlier findings of subject-area differences in the goals and nature of effective writing activities. In the science classes, the writing activities that the teachers developed most easily were those that seemed likely to reinforce learning of a broad base of factual information — a base that the teachers perceived as necessary for more sophisticated inquiry. Two of the science teachers (Bush and Moss) also successfully developed writing activities that emphasized such inquiry, once the necessary base of information was in place. Although Bardolini said that he valued such inquiry, he was never able to incorporate it successfully into his classroom routines.

The English and social studies teachers, on the other hand, began with a greater emphasis on underlying concepts. It was easier for them to develop new writing activities that emphasized reformulation and extension of previous learning. In these activities, the emphasis was on the structure of the argument more than on the specific information — though accuracy in supplying the supporting detail was still critical to successful performance.

In our thinking about the successful activities, one of the themes that has emerged is the process of reinterpretation and reconstruction that the teachers went through before presenting a new activity to their classes. The collaboration with the project team provided new ideas and new perspectives on old approaches, which the teachers then had to claim ownership for in a process of transformation and elaboration. Often, the activities we observed in the classroom bore little resemblance to the activity that had taken initial shape in our joint planning sessions. Conversely, when the teachers did take other people's activities ready-made, the activities were likely to fail. It seemed that when the teachers understood and believed in an activity, they were comfortable modifying it to achieve their own goals. When they did not fully understand or accept it, on the other hand, they were less able to mold it to suit their own purposes.

Certain generic activities proved especially attractive and adaptable, being redefined by each teacher even if the label remained the same. Freewriting was one such activity, emerging in one or another classroom as a preparatory activity, a way to review and rehearse previous learning or a way to reformulate and extend new ideas. (In several of the classrooms, freewriting was defined to include any less-formal or impromptu writing; the label may have served to sanction the lack of structure in otherwise highly structured learning environments.) Journals or learning logs were similarly flexible, becoming whatever each

teacher wanted to make of them. Flexibility seemed desirable rather than problematic; such activities worked because they were easily adapted to differing contexts of teaching and learning.

At the same time, this very flexibility contributed to a growing terminological confusion: freewriting was not freewriting, and journals were not journals were not journals. This led to a situation in which it was very easy for us to misunderstand the teachers and for them to misunderstand one another — all enthusiastically supporting differing concepts of learning that coexisted under the same label. This terminological confusion is not specific to the project but reflects the wide variety of interpretations that have developed in the general field of writing. The differences serve to remind us of the variation in course-specific and teacher-specific goals. Different ways of thinking undergird our professional agendas and are reflected in the nature of the writing assignments that work best in each class.