



Evaluating Training Workshops in a Writing Across the Curriculum Program: Method and Analysis

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Introduction

Robert Morris College in Pittsburgh, Pennsylvania, is a small private college (approx. 5,000 students, 110 full-time faculty) that emphasizes undergraduate and graduate instruction in business. Its degree programs include a strong foundation in the liberal arts. Robert Morris College prides itself on its commitment to teaching. The faculty of the college tend to be student-oriented and receptive to faculty development programs and interdisciplinary interaction. In 1984, it began a comprehensive writing program based on writing-across-the-curriculum principles (Carson, 1991, Sipple, 1989). Twenty-one faculty members selected from the eleven departments of the college participated in a 45-hour series of workshops conducted during the first year by Richard E. Young of Carnegie Mellon University. During the subsequent years, Jo-Ann M. Sipple of Robert Morris College, who was then head of the Department of Communications, conducted similar workshops. In the workshops, each faculty member targeted one of his or her courses, redesigning it with the purpose of integrating writing-to-learn tasks as a means of helping students enter the discourse community of the discipline they were studying.

As the basic strategy of increasing the amount and kinds of writing students did, the program planners sought to educate faculty from every discipline in the College in WAC principles and practices. The faculty, the program planners argued, are the custodians of the educational process. It is their responsibility to transmit their disciplines, design the courses and curriculums, certify that students have learned, and so on.

Involve them directly in the educational enterprise, the planners reasoned, and substantive changes in student abilities are more likely than if the burden of change is borne solely by the curriculum, in the form of more required courses, or by the students, in the form of exit tests in writing that must be passed before graduating.

The plan was to reach all or nearly all the faculty in all the disciplines in the College by means of training workshops. The workshops had three broad educational objectives: to help the faculty understand (1) WAC principles and methods; (2) ways to incorporate the principles and methods into their teaching; and (3) the contribution of writing, not only to effective participation by students in their disciplines but to acquiring the disciplines as well ("writing to learn"). The writing-to-learn objective requires a bit more comment. Workshop participants were taught to distinguish writing to learn from writing to communicate, and they were taught how to use writing as a tool for thinking in the disciplines – in particular, how to engage students in problem-solving activities in which writing was not only a means of communicating results but an aid in engaging in what John Dewey called "reflective thinking" (1910).

One of the distinctive features of the workshops was the recognition of the close relationship between WAC pedagogy and course design. The approach to writing across the curriculum at Robert Morris was described by a team of external evaluators from Writing Program Administrators in 1985 as "structural" (Sipple and Stenberg, 1990, p. 183): rather than asking the workshop participants to simply incorporate writing tasks into existing courses, they were asked to combine their disciplinary expertise with their newly acquired knowledge of writing research in rethinking and restructuring an existing course. This conception for the workshops was prompted by early reports of disruptive effects of WAC pedagogy on the teaching of existing courses (e.g., Graham, 1983-84). If WAC methods are simply grafted on to well-established courses, the result can be increased work loads for both students and teachers. Such practices can also result in basic disharmonies among the educational activities and even the objectives of the course, as when a write-to-learn pedagogy is incorporated in a course designed essentially to convey an ordered body of information. In cases such as this, the teacher may feel that the work load has become more burdensome or that the course has lost its coherence and, as a consequence, may become disenchanted with WAC. Those who persist in the face of such difficulties, may, as Joan Graham reports (pp. 2 X-22), begin

redesigning the course. The linkage of WAC principles with course design in the workshops was an effort to by-pass this often frustrating and costly evolutionary process. It made the primary activity of the workshops the redesign of courses that the participants were already teaching in order to incorporate WAC assumptions and methods.

The strong emphasis in the workshops on the analysis of educational means and ends in the redesigning of courses was based on methods of course design developed by Ralph Tyler (1950) and Algo Henderson (1965). The methods entail the analysis of course objectives, analysis of methods and materials that could be used in achieving the objectives, and preparation of a syllabus of instruction based on the outcomes of these analyses. The intensive efforts in the workshops resulted in exemplary course plans that exploited writing-to-learn activities to achieve course objectives. In a similar way each faculty member also prepared a plan for evaluating the course to ensure that writing-to-learn activities were both integrated and effective. In the subsequent semester the participants implemented the plans in their classrooms.

Activities in the workshops, then, focused on helping faculty

- reformulate their course objectives to include writing-to-learn concerns;
- use writing as a means to attain course goals, rather than as an end in itself; and
- develop course plans, assignments, and plans for evaluation that took into account the importance of writing in helping students to learn (Sipple, 1989).

The ultimate goal of the program was the creation of a campus-wide environment that nurtured student literacy in the majority of classrooms and over the four years of the baccalaureate. (For a description of the fully developed program, see Sipple and Stenberg, 1990.) The program had a number of other attractions, among them its relatively low cost, ease of management, increased sophistication in faculty teaching, diffusion of responsibility for literacy beyond the English Department, and increased sense of collegiality among the faculty.

The proposal for the program at Robert Morris (called “Writing Across the Business Disciplines,” or “WABD”) specified that the entire program be evaluated three times, beginning in 1986.¹ The discussion that follows reports on one part of the evaluation project – the effort to evaluate the effectiveness of the faculty workshops in encouraging and

helping participants to integrate writing-to-learn activities into their courses. (For a summary of the entire evaluation project, see Sipple, 1989.) Because of the program's reliance on a faculty-oriented strategy, determining whether the workshops for the faculty actually fulfilled their function was crucial. If the workshops were effective, the program had a good chance of succeeding; if they were ineffective, it was quite likely to fail. Below we discuss in detail both the outcomes of the evaluations and the method we used to conduct them. The protocol/interview method used in the project is, we believe, at least as significant a contribution to research on writing across the curriculum as the specific results of the project.

The Approach to Evaluation

The general question asked in evaluating whether the workshops both persuaded and helped participants to integrate writing-to-learn activities into their courses was this: Did the workshops influence the participants' approaches to constructing writing assignments in ways that reflect the principles advanced in the workshops? We selected faculty writing assignments as the focus of this part of the evaluation project since they are suggestive of instructors' concerns and approaches to teaching writing. Further, the assignments created by workshop participants could be compared with those created by non-participants, with both sets of assignments being analyzed for evidence, or lack of evidence of the principles espoused in the workshops. The specific questions we asked about the assignments included: Did the participants in the workshops try to create writing assignments that promoted student learning, that helped students solve problems related to the course, that were integrated into the course structure, and that were manageable by the students?

To answer these questions, we developed what we call the "protocol/interview" assessment method. With this method, several workshop participants were asked to provide think-aloud protocols while they created a writing assignment for one of their classes. Immediately after completing this task, they were asked a series of questions about their goals in creating the assignment. Other faculty who taught comparable courses and who did not participate in the workshops were given the same tasks. Raters then examined the protocols and the answers to the interview questions to identify evidence bearing on each subject's approach to creating writing assignments. Because the subjects in the evaluation were observed while they were creating writing

assignments and were interviewed soon after, we believe that the protocol/interview method provided sensitive indices of the subjects' approaches to this educationally important task. In contrast, we believe that interviews alone, because they are not so closely tied to performance of the task, are less likely to provide useful information than protocols and interviews together.

Method

Data collection for the Robert Morris evaluation was carried out in three phases by three teams of researchers. Phase 1 was carried out in the Spring of 1986; Phase 2 in the Spring of 1987; and Phase 3 in the spring of 1989.

Subjects

The subjects in Phase 1 were nine faculty members, five who attended the workshops and four who did not. The subjects in Phase 2 were 15 faculty members, eight who attended the workshops and seven who did not. The subjects in Phase 3 were 16 faculty members, eight who attended the workshops and eight who did not. The workshop participants were chosen to provide as broad a sampling as possible of the disciplinary areas on the Robert Morris campus. Each of the non-participants was chosen because he or she was in the same discipline and taught the same course as a participant.

Procedure

The subjects were asked to think aloud, describing as fully as possible their main teaching/learning concerns while planning and composing a writing assignment for their classes. The instructions for the protocol read:

Devise one writing assignment for your course, _____ . While you are devising the assignment, describe as fully as you can your main teaching/learning concerns. Talk aloud about what is going on in your mind while you are doing the task. Write the words for the assignment which you would have typed to hand to the student.

Following the think-aloud sessions, each subject was asked six questions (Appendix A) designed to supplement the information obtained through the protocol. These questions concerned the objectives of the assignment, its use in the course, its relation to course goals, specific learning problems addressed by the assignment, and the intellectual demands it placed on the students. The protocols and the post-

protocol interviews were tape recorded and transcribed for later analysis. These transcripts together with any written text or notes produced during the protocol session and the assignments that the faculty members created constituted the data set for each subject.

Analysis

For analysis of the protocol and interview data, the raters were given the list of 19 features shown in Table 1. These features were developed and used to evaluate each complete data set, including protocol and interview transcripts, written texts and notes, and the assignments created. Some of the features focus on the nature of the assignment created, and the concerns suggested by it, while others address, more explicitly, the thinking and attitudes of faculty members while creating the assignments. Raters were asked to examine the data set for each subject to determine whether each of the 19 features was present or not.² Each data set was analyzed as a single unit; that is, all three sources of data (protocols, interviews, and writing assignments) were examined for evidence of each of the features under investigation. The raters did not know which data sets belonged to participants and which to non-participants.

1. The writing assignment is designed to do more than test student knowledge. The writing assignment is designed to promote student learning/discovery.
2. The writing assignment leads the student to solving a particular problem in achieving course objectives.
3. The writing assignment is responsive to a learning problem that the teacher has identified.
4. The teacher is aware that the writing assignment is cultivating a level of cognitive ability.
5. The writing assignment is integrated into the on-going learning process in the course.
6. The teacher has an awareness of different, varied ways of responding to student writing with a mind toward giving feedback to the student.
7. The teacher's response to student writing is integrated into the on-going process of the course.
8. The writing assignment is manageable for the student given the allotted time, constraints, and description of the writing assignment.
9. The teacher realizes that creating an assignment is a rhetorical task.
10. The teacher is concerned that students see the purpose of the writing assignment.
11. The teacher realizes that the assignment will provide him/her

- with valuable information about student learning/progress in the course.
12. The teacher has thought about the task in concrete operational terms; recognizes sub-tasks involved.
 13. The teacher is sensitive to his/her students' abilities, e.g., thinks about how students might respond to the task.
 14. The teacher is sensitive to students' abilities and plans to act on that information, e.g., by modifying assignments, providing extra guidance, etc.
 15. The teacher is sensitive to student needs, e.g., the types of writing and other skills students will need in later courses or in their careers.
 16. The teacher is sensitive to student needs and plans to act on that information, e.g., by modifying assignments, providing extra guidance, etc.
 17. The teacher is sensitive to students' attitudes towards writing.
 18. The teacher gives students a specific audience to write for.
 19. The teacher hopes that the writing assignment will help improve students' writing skills (intentionally or as a side effect).

Table 1. Features of the Protocols, Interviews and Assignments Assessed by the Raters.

In addition to these 19 features, two additional features of the writing assignments as well as the length of the protocols were assessed by the raters. These additional measures are shown in Table 2.

20. Quality of the writing assignment rated on a scale of 1 (low) to 4 (high):
 - 1 = Low quality: confusing, purposeless, not integrated into course goals, etc.
 - 4 = High quality: well thought out and articulated, fits into course, helpful, etc.
21. Breadth of teacher's view of writing rated on a scale of 1 to 4:
 - 1 = Restricted view: writing equals grammar, correctness; writing takes place after thinking; writing is thought of in terms of number of pages; etc.
 - 2 = Larger view: writing is a medium for thinking and learning; writing is an occasion for exploration; etc.
22. Protocol length (number of transcript lines).

Table 2. Additional Measures Assessed by the Raters.

Results and Discussion

The results of each of the three phases of the evaluation suggest that the protocol-interview method was a reliable and sensitive measure for determining the effects of the WABD workshops on participants' attitudes and on their approaches to constructing writing assignments. More specifically, the method, in this case, revealed that participants constructed assignments in ways that reflected the principles advanced in the workshops. Participants were more likely than non-participants to create writing assignments that promote learning or discovery (Feature 1), that solve a problem in achieving course objectives (Feature 2), that respond to students' learning difficulties (Feature 3), that take students' abilities and plans into account (Feature 14), and that are integrated into the on-going learning process in the course (Feature 5). Further, participants were more likely than non-participants to view writing assignments as cultivating cognitive abilities (Feature 4) and less likely to view them as a means for improving students' writing skills (Feature 19).

Table 3 shows the numbers of participants and non-participants in each phase of the study who exhibited each of the 19 traits listed in Table 1.³ To analyze the results of these features, we used Fisher Exact tests (Siegal and Castellan, 1988, p, 103) to assess the significance of the observed differences between participants and non-participants for each feature and each phase. These significance levels for features 1 through 5, 14 and 19 for each phase of the evaluation are shown in Table 4. Then, using the inverse chi-square method (Hedges and Olkin, 1985, p. 37), we combined the significance levels for the three phases to obtain an overall significance level for each feature. Significant differences at or beyond the .05 level were found for the seven features presented in Table 4; these significance levels are shown in the right-hand column of the table.

To analyze the results for the features addressing assignment quality, instructors' views of writing, and protocol length (Table 2), we conducted three 3X2 analyses of variance in which the independent variables were phase and participation. The analysis of variance of assignment quality revealed significant differences among phases ($F=5.139$, $df=2$ $p=.012$) but no significant difference due to participation and no interaction between phases and participation. Analysis of variance of instructors' views of writing revealed a significant difference due to participation ($F=6.358$, $df=1$, $p=.017$) but no differences among phases and no interaction between phase and participation.

Finally, analysis of variance of protocol length revealed a marginally significant difference due to participation ($F=3.27$, $df=1$, $p=.08$) but no differences due to phase or to the interaction of phase and participation.

The Effects of the Workshops on Participants

Those who participated in the workshops were volunteers: they were not randomly selected. Thus, there is a possibility that when they entered the workshops they already possessed the attitudes, abilities, and educational values that the workshops were designed to cultivate. This would, of course, provide an alternative explanation for our results and call into question the explanation we have offered in this study.

It seems to us unreasonable to prefer this explanation to the one we have offered. First of all, there is no evidence that any of the participants entered the workshops with the knowledge, attitudes and abilities that the workshops were designed to develop—that is, there is no evidence that they were already knowledgeable about WAC and skillful in the application of its principles. There is, though, clear evidence that the participants brought with them a strong commitment to teaching and to improving their own performance as teachers, along with a great deal of classroom experience; those who directed the workshops testify to that. But a strong interest in good teaching is obviously not equivalent to a knowledge of WAC principles and an ability to use them in teaching; in fact, it is not necessarily even consistent with them. Consider, for example, that the specific form one participant's commitment to good teaching took appeared to be inconsistent with the writing-to-learn principles and methods being presented in the workshops. His rather authoritarian, teacher-centered approach clashed with an approach that seeks to involve students more fully in the learning process. Such conflicts are not uncommon in WAC workshops, as Deborah Swanson-Owens has shown in "Identifying Natural Sources of Resistance: A Case Study of Implementing Writing Across the Curriculum" (1986).

But suppose the participants brought with them something more than a strong interest in good teaching. Suppose they brought a predisposition toward the attitudes and abilities the workshops were designed to develop. Such a predisposition would still not be sufficient to explain their behavior in the subsequent evaluation studies. Like a strong commitment to teaching, a predisposition is in no way equivalent to the specific principles being presented in the workshops or the ability to make use of them in the classroom; it is at most merely consistent with them. Even individuals who were predisposed to this sort of thinking and behaving could conceivably come away from the workshops with

	Phase 1		Phase 2		Phase 3	
	(total participants =5	(total non-participants =4	(total participants =8	(total non-participants =7	(total participants =8	(total non-participants =8
	No. of workshop participants exhibiting feature	No. of non-participants exhibiting feature	No. of workshop participants exhibiting feature	No. of non-participants exhibiting feature	No. of workshop participants exhibiting feature	No. of non-participants exhibiting feature
1. Assgn. promotes student learning	5	1	7	4	7	4
2. Assgn. leads student to solve problem in achieving course objectives	4	1	8	3	4	4
3. Assgn. is responsive to a learning problem	4	2	6	3	5	1
4. Teacher is aware that the assgn. is cultivating cognitive ability	4	3	4	3	5	1
5. Assgn. is integrated into the ongoing learning process in the course	5	2	6	2	7	4
6. Teacher is aware of different ways of responding to student writing	0	0	1	1	1	0
7. Teacher response is integrated into the on-going process of the course	0	0	0	0	0	0
8. Assgn. is manageable	0	1	7	5	1	0
9. Teacher realizes that creating assgn. is a rhetorical task	2	0	3	2	0	0

10. Teacher is concerned that students see purpose of assign.	2	0	2	1	1
11. Teacher realizes assign. will provide info about student learning and progress	2	1	4	0	0
12. Teacher has thought about task in operational terms	5	3	2	7	6
13. Teacher is sensitive to students' abilities	5	3	3	2	1
14. Teacher is sensitive to students' abilities and plans to act on that info	5	1	2	0	1
15. Teacher is sensitive to student needs	4	2	3	4	4
16. Teacher is sensitive to student needs and plans to act on that info	4	2	1	5	2
17. Teacher is sensitive to students' attitudes toward writing	2	0	1	6	2
18. Teacher gives students specific audience to write for	2	2	0	6	1
19. Teacher hopes assign. will improve students' writing skills	0	3	4	4	2
20. Quality of writing assign.	2.95	2.81	1	3.0	2.6
21. Breadth of teacher's view of writing	3.1	1.9	6	3.0	2.1
22. Protocol length (transcript lines)	90.7	59.0	85	122.4	69.6

Table 3. Results for All Three Phases of the Evaluation.

Feature Number	Phase 1	Phase 2	Phase 3	All Phases
1. Assgn. promotes student learning	.0476	.2051	.0962	.01
2. Assgn. leads student to solve problem in achieving course objectives	.1587	.0256	.4079	.01
3. Assgn. is responsive to a learning problem	.3571	.1958	.0490	.02
4. Teacher is aware that the assgn. is cultivating cognitive ability	.5556	.3807	.0490	.05
5. Assgn. is integrated into the ongoing learning process in the course	.1667	.0914	.0962	.01
14. Teacher is sensitive to students' abilities and plans to act on that info	.0476	.2000	.5000	.02
19. Teacher hopes assgn. will improve students' writing skills	.0476	.1958	.4406	.02

Table 4. Significance Levels for Each Phase and for All Three Phases Combined for Features 1 through 5, 14 and 19.

little deep understanding of the principles and little ability to use them effectively in their teaching. The correspondence between the particular principles that were taught, which are not part of the general lore of teaching, and the participants' subsequent actions in the evaluation study, where they were using WAC principles with considerable skill and thoughtfulness, is simply too strong to explain by an exceptional commitment to teaching or a general predisposition toward WAC principles. It seems to us that the most reasonable explanation for the results of the study is that the participants learned what they had been taught.

More specifically, the results from the WABD evaluation suggest that the workshop participants generally viewed writing as a means of promoting learning and were more likely than non-participants to integrate writing assignments and learning objectives with their overall course objectives. Also, the results suggest that workshop participants conceive of and implement writing-to-learn in ways which tend to be more elaborate and sophisticated than those of non-participants. For example, participants frequently used writing in their courses to help students to understand course concepts, to apply theoretical principles, and to analyze information. These uses of writing correspond to levels two, three, and four in Bloom's Taxonomy of Educational Objectives (1977). In contrast, non-participants tended to use writing in their courses to test student recall or understanding of course concepts (Bloom's levels one and two). Figure 1 presents excerpts from the data sets of participants which exhibit their concerns with student learning along with the features from the coding scheme which they demonstrate.

Feature 1: *The writing assignment is designed to do more than test student knowledge. The writing assignment is designed to promote student learning/discovery.*

- "I use [the writing assignment] as the basis of discussion."
- "So, I will stress that their journal can be their source book."
- "Now what I would want students to do is to recognize where their personality profile is in terms of the DIS&C [a personality measure] and be able to see how that impacts their preferred style of dealing with conflict. . . . If students can recognize it, they can then begin to work through some strategies of how they might change and practice some of the other styles."

Feature 2: *The writing assignment leads the student to solving a particular problem in achieving course objective(s).*

- “[written class observations] will be very important because in order for them to evaluate their own project or the presentations of other groups, they will have to have exact observations of what. . . went on in each group presentation.”
- “The function of this writing assignment is to get them to think about how they would apply a model of a particular sampling design to actual reality. . . .”

Feature 3: *The writing assignment is responsive to the learning problem that the teacher has identified.*

- “For some students, for example, who don’t catch on, it seems as if the software package is just beyond them. Each command seems separate and unto itself. And no connections or relationships are made among them. . . . And I have asked them to draw a chart that shows their logical interpretation of the software package.”
- “I am not sure that students really understand the impact of their personality on their ability to deal with conflict, and as a way of getting them to understand this, I would like to come up with a writing assignment.”

Feature 4: *The teacher is aware that the writing assignment is cultivating a level of cognitive ability.*

- 1 “Instead I’m getting to what I perceive as the higher level of learning which would have to do with analysis and evaluation of the situation as well as application.”

Feature 5: *The writing assignment is integrated into the on-going learning process in the course.*

- “This is to tie their ... writing directly with the material that we’re going over in class, which would be relating management objectives and philosophy with actual problems or situations that may be occurring within their work situation.”
- 1 “So the concept of the journal with their written comments and evaluations will be important at the beginning for them to see the connection between the writing that they do in their journal and the speaking activities that we’re going to have.”

- 1 “Well. I would use this probably early in the course as kind of an addition to and different approach to the overall course. . . . But by bringing it in early, I’m not just focusing on the mundane facts which are usually covered early in most courses. Instead I’m getting to what I perceive as the higher level of learning which would have to do with analysis and evaluation of the situation as well as application.”

Figure 1. Excerpts from Participant Data Sets Exhibiting Concerns with Student Learning.

The writing assignments created by the subjects, and the goals underlying them, offer further support that workshop participants differed from non-participants in their approaches to and conceptions of the functions of writing in their courses. Participants generally created writing tasks requiring uses of knowledge different from those asked for in the assignments created by non-participants. For example, participants’ assignments often asked students to communicate information to other individuals, with the goal of helping the students acquire a better understanding of the information. In Figure 2 we present summaries of assignments created by both participants and non-participants. (Ah names are pseudonyms.) In the selections presented, three of the non-participants (Ina, Eric, and Bob) created exam questions or questions designed to test students’ knowledge of course concepts. In contrast, all of the assignments created by the participants ask students to show their understanding (Cas), to respond to various audiences and situations (Norm and Mark), to apply their knowledge (Ann and Renee), or to use and become familiar with the language and sources of their disciplines (Gabe and Jane).


Writing Assignments Created by Participants:

Cas **Lotus Function Chart** - students are asked to draw a picture representing their understanding of the logic structure of Lotus.

Norm **Flex-time Case Study** - a timed assignment in which students develop strategies in response to conflict and different personalities.

Gabe **Demographic Profile of a City** - students are asked to find and to familiarize themselves with sources of demographic information.

Renee *Application of Accounting Calculations* - students are asked to determine the role of an accountant in creating a bottom line, maximizing profit, etc.

Jane *Chapter Summaries*  - students are asked to read chapters and to write summaries of the chapters to assist them in learning the language of their discipline.

Ann *Statistics Questions* - students are asked to write questions that can be solved using distributions that pose problems for them.

Mark *AIDS Case Study* - students act as human resource managers and must discuss how they would handle the situation of an AIDS rumor in front of the president and board of directors of the company.

Writing Assignments Created by Non-Participants:

Deb *Data Base Description* - students are asked to write a description of how they would set up a spread sheet or data base.

Kate *Observation and Response* - students are asked to observe and write a paper on their verbal communication process.

Les *Marketing Plan* - students act as marketing consultants and design a marketing program for a product.

Ina *Exam Question* - students are asked to write a journal entry for given transactions and to state and discuss the general accounting principle that governs the recording of the transaction.

Eric *Exam Question* - students are asked to write an essay explaining how to set up a good system of control for cash.

Bob *Hypothesis Testing Problem* - students are given parameters and asked to explain what they mean.

Tim *Interview and Summary* - students are asked to interview people involved in personnel and to summarize the interview responses.

Figure 2. Summaries of Writing Assignments Created by Participants and Non-Participants.

The protocols and interview responses reveal the concerns and assumptions underlying these assignments. Specifically, these data indicate the different ideas participants and non-participants have about how to use these writing assignments and about the role of writing in their courses. In particular, many of the participants mentioned their concerns with using their assignments to encourage student learning (Feature 1 in the protocol coding scheme) (see Figure 3). For example, Cas, the instructor who created the Lotus function chart assignment, was concerned that students develop a chart that would be meaningful to them and that would help them understand the program. Jane, the instructor who asked students to write chapter summaries, said that she wanted students to begin understanding the language of their disciplines. Also, Mark, the instructor who constructed the case study asking students to handle an AIDS rumor, wanted students to think about the complexity of the problem.

Cas: Lotus Function Chart Assignment

“I was not looking for neatness particularly or having a wonderfully drawn, visually captivating chart. What I wanted them to have was a chart that was understandable and meaningful mostly to them. . . . It was for them, to help them in their understanding.”

Jane: Chapter Summaries

“ . . . they start learning to understand their discipline’s language because there’s a certain communication that goes on in accounting and the more they read it, the more they sit down and think what are they telling me, and then they get a little bit better at that in understanding their own discipline.”

Mark: AIDS Case Study

“I also want students to understand that there is often not a right or wrong answer, that the world is gray and not black and white, that they have to manage a lot of different values and ambiguities. . . . I’m looking for the beginnings of thinking. . . . So I’m not looking for a very polished or finished end project. What I’m looking for is really just the beginnings of thinking about the problem.”

Figure 3. Concerns Expressed with Using Assignments to Encourage Student Learning.

The protocol segments in Figure 3 suggest that workshop participants created assignments to help students understand and master difficult course content, to apply classroom theory, to learn the language of their disciplines, and to explore problems. Participants also tended to distinguish themselves from non-participants by showing a greater concern with using assignments to address learning problems (see Figure 4). For example, Cas, the instructor who created the Lotus function chart assignment, indicated that she was trying to address the problems students have using the software. Similarly, Norm, who created the flex-time case study, was concerned with problems that students have understanding key concepts in his course.

Cas: *Lotus Function Chart*

“For some students, for example, who don’t catch on, it seems as if the software package is just beyond them. Each command seems separate and unto itself. And no connections or relationships are made among them. . . , And I have asked them to draw a chart that shows their logical interpretation of the software package.”

Norm: *Flex-time Case Study*

“I am not sure that students really understand the impact of their personality on their ability to deal with conflict, and as a way of getting them to understand this I would like to come up with a writing assignment.”

**Figure 4. Concerns with Using Assignments
to Address Learning Problems.**

While some instructors created assignments to address specific learning problems, others tied their assignments to course objectives, another strategy emphasized in the training workshops (see Figure 5). For example, Jane, the instructor who asked students to write summaries, addressed the stages of learning covered by the assignment and related the assignment to a more basic objective of her course: building a framework to help students when they solve applications problems.

Jane: *Chapter Summaries*

“And the summaries aren’t really taking them all that far in the learning process, but it’s to get them through maybe one of my first several stages which would be getting to understand their discipline, the rules, and the terminology, and so on. The next step, of course, would be to get them familiar with all of that and

... and also emphasize what the authors are saying about the cases and the problems and so on and applying that all together - start solving problems. . . . That's what the summaries are for - to build the basic framework to get them through or at least introduce them to applications problems."

Figure 5. Concerns with Tying Assignments
to Course Objectives.

In contrast to the learning concerns participants had in creating writing tasks, non-participants' assignments tended to focus on expanding or testing student knowledge (see Figure 6). Many of the non-participants also articulated concerns with developing student writing ability, conceived of as principally a matter of grammatical correctness and nearness. For example, the writing assignment of one non-participant (Tim), who asked students to write summaries of interviews with personnel managers, provided students with an opportunity to see how the theory that they were learning in class translates into practice in the world of work. However, Tim's comments suggest that his emphasis on neatness and mechanical correctness superseded his concern with having students explore ideas. Similar conceptions of writing were expressed by other non-participants who created writing assignments to test students' knowledge. For these instructors (i.e., Ina) classroom writing functions primarily to test students' comprehension of course content.

Tim: Interview and Summary

"In essence, my grade is based upon the number of spelling errors, the number of punctuation errors, neatness, and questions that were skipped, the quality and the depth of the student questions, and the depth of response to all questions, the detail on the summary sheet, and any additional comments that I find as I read through this.... It's to expand their knowledge, yes, but it's also to give them a little work on their writing. . . . I mean they have to be careful when I tell them I'm going to check their spelling and their punctuation. . . . And typing errors and spelling errors just jump right out and hit me right in the face. . . . And I tell them. . . . that I am emphasizing both the content and the spelling and the punctuation. So it's not just content It's the things that surround content. We're looking for correct punctuation. We're looking for not having crossovers and strikeovers on words. We're looking for them to prepare a sound report is what it amounts to."

Ina: Exam Question

“I’d like to test whether the student knows when and how to write a general journal entry or entries for various business transactions. So they would have to know what it accounts to debit and credit, what amounts to use and also, very importantly, should they have a transaction for various dates. . . . So, step one, I am seeing if they know how to write the entries, which is basic accounting, and step two is more testing of theory. Can they relate to me in writing what concept or theory they are using and why? And that would be a major section of the examination.”

In the post-protocol interview, Ina expressed an interest in using this task to categorize students for purposes of grading: “I wanted some way of testing to see who, as I said, to weed out who really understands the concepts behind what we are doing and that is why I decided to. . . . Let’s say that it separates the A’s from the B’s. I believe that to get an A you have to be exceptional, and I would have to find out who those exceptional people are. And I think this is one way of doing it,”

Figure 6: Focus on Expanding or Testing Student Knowledge.

Several of the non-participant data sets contained statements similar to those quoted in Figure 6. However, a few of the non-participants also exhibited an interest in goals similar to those espoused in the WABD workshops. The data sets of these individuals contained statements expressing an understanding of how writing might contribute to achieving these goals (see Figure 7). Statements such as Deb’s (below) suggest something important for WAC directors: that is, one use of an evaluation might well be the identification of instructors who have a predisposition toward WAC principles and who might well be potential leaders in the program.

Deb: Database Description

“The most important thing is for the students to understand the decision-making process and in order to understand the decision-making process they have to be able to formulate a problem. They have to take that problem that they formulate and put it into either Lotus or DBase in such a way that the computer comes up with the right answer that will help them to make a decision. . . . I would like to use it so that the students would understand the process that we are going to go through

and maybe by writing it down they'd be better able to do the process itself."

Figure 7. Non-participant Statement Exhibiting an Interest in WABD Goals.

The Value of the Protocol/Interview Method

The results attained from our use of the protocol/interview method to evaluate the WABD program suggest that think-aloud protocols can be a reliable and sensitive measure for assessing other programmatic goals for WAC where changes in attitude and applications of principles are at issue. Besides the comparisons between groups, the protocol/interview method, as has already been suggested, can reveal important characteristics of individual teachers. The results of the WABD study suggest that certain workshop participants disagreed with workshop objectives and that certain courses taught by participants may have had goals for which WAC principles are less relevant. For example, one workshop participant demonstrated evidence of only two of 19 features, while three non-participants demonstrated many of the desired features.

The protocol/interview method may also shed light on the instructional objectives and practices of particular disciplines and on how writing-to-learn activities can be integrated with them. For example, in the WABD evaluation, teachers in psychology and sports management tended to make greater use of workshop instruction than teachers in business applications. In this study at least, the assignments in business applications typically were information- or skill-oriented, perhaps making it more difficult to construct writing assignments designed to promote learning or reflective thought. Such differences, of course, may be the result of the smallness of the population being studied; but they may also be the result of distinctive differences in the nature and practices of the disciplinary communities. (For discussions of such differences, see, e.g., Bazerman, 1988; McCloskey, 1985; Myers, 1985, 1990; Nelson, Megill, and McCluskey, 1987; White, 1985). If so, the protocol/interview method may be of use in studying the discourse of disciplinary communities and how their conventions are acquired and used.

Finally, the protocol/interview method can help program directors identify existing or potential problems in implementing a WAC program subsequent to the faculty workshops. Although most of the data from the Robert Morris evaluation indicated positive outcomes for the WABD workshops, the interview responses also helped program direc-

tors identify some weaknesses (see Figure 8, below). In particular, several participants expressed concerns in the interviews about the amount of time required to incorporate writing-to-learn activities into their classes. For example, Cas, the instructor who created the Lotus function chart assignment, said that she was troubled by the amount of class time write-to-learn activities require. Some participants also raised questions about the overall effectiveness of such activities, and they talked about the difficulty of determining how much students learn from these activities. The expectations of students, at times incompatible with educational innovation, may compromise the effectiveness of instruction and remind teachers that success and failure in the classroom are not wholly under their control (see Renee's second statement in Figure 8). Finally, one instructor, Gabe, suggested interviewing students directly to overcome some of these problems and to solicit their version of the story. Teachers' reports of what they are doing in their classrooms, he argued, are not always consistent with student perceptions of what is being done. Therefore, students, he contends, should be asked directly about the effectiveness of writing-to-learn activities. It should be noted that the Robert Morris evaluation project did in fact incorporate student responses by means of surveys and interviews. However, a study of the data from that part of the project is outside the scope of this paper.

Cas:

"If a professor is going to incorporate write-to-learn activities in a course, time definitely has to be allotted to those activities. And in a way content has to be sacrificed. What I mean by that is, perhaps, as much content can't be covered in a course if one is going to incorporate write-to-learn activity because you have a given amount of time and you have to prioritize how to use that time in your courses. . . . I would liked to have been able to spend more time looking at and discussing the write-to-learn activities with the students. . . ."

Renee:

One problem that I've had is really concluding whether or not it had a pedagogical benefit. I don't know. . . . I would say my experience with it this semester has been mixed. It helped me. . . it helped me address some of these issues. On the other hand, whether it's effective or not is going to be dependent on the student, and as far as I can tell, without being able to pinpoint what creates learning, I am not sure these students perform any better than any other student that I have ever had in Accounting 101 over the past twelve years."

“The outcome is not really clear cut. . . . I don’t know, and that bothers me that I don’t know. . . . The only thing I can say for sure is that it’s helped me as an instructor to be perhaps a bit more interesting or motivated or energetic. . . . But I must say that I’ve been a bit disappointed. Students try to get a recipe. They try to get at what they think I want rather than how they really should respond . . . and my feeling is it hasn’t really been completely successful, although I must say I am still in the learning processes.”

Gab:

“I worry about whether or not what we are saying is actually being done. . . . It’s equally important to find out, maybe interview a couple of students who may have a class that has these projects involved and see what they say. What is their perception?”

Figure 8. Concerns Raised About Implementing Write-to-Learn Activities.

All of the responses in Figure 8 suggest potential areas of concern with regard to application of workshop principles. However, they also demonstrate another benefit of using the protocol/interview method for evaluation: directors can obtain not only evidence of a workshop’s overall effectiveness but also valuable information concerning the experiences of individual participants after they have begun trying out the principles of the program. Similarly, the protocol/interview method could also be used to monitor workshop participants’ development and change over time. More specifically, it could be used to assess how participants change in their approaches to constructing and administering writing assignments. Program directors could use data from protocols and interviews to identify what Swanson-Owens calls “natural sources of resistance” (1986), and what Fulwiler refers to as “translation and follow-up problems” (1984). Workshops can successfully introduce participants to writing-to-learn principles and strategies, but they can not guarantee that participants will use them in their classrooms successfully. The inevitability of such problems also suggests the importance of follow-up mechanisms that encourage feedback and advice (Fulwiler, 1984). Such mechanisms may include anything from monthly lunches and newsletters to substantial research and evaluation projects, like the one at Robert Morris (Weiss and Peich, 1980).

Refining the Method

Although the protocol/interview method yielded positive results and useful outcomes in the WABD evaluation project, we learned through the process of employing it that it could have been more effective had the design been somewhat different. In particular, we believe that the raters would have found it easier to make the judgments required of them if we had asked them to judge just four or five features rather than 19. We also believe that the coding schemes we used could have been better designed. In response to coding difficulties, one of the authors conducted a pilot study using just four of the 19 features in Table 1 (features 1, 2, 3 and 5, which consistently yielded meaningful results through each phase of the evaluation), and features 20, 21 and 22 from Table 2. (Her revised coding scheme appears in Appendix B.) Inter-rater reliability in the pilot study was found to be 96% - much higher than the reliabilities observed above. This higher reliability may well have been the result of the greater simplicity of the revised coding scheme, since it seems reasonable to assume that the raters could understand the seven features more easily than the original 22. Further, the results of this simpler instrument are consistent with those of the WABD evaluation. The three phases of the evaluation allowed for the progressive refinement in the design of the instrument. Directors of WAC programs should be alert to occasions for refining methods or for inventing new ones.

Figure 9 presents a comparison of the mean raw scores of participants and non-participants on the four features of the revised coding scheme. Differences in the mean raw scores of number of T-units exhibiting evidence of Features 1 (learning versus testing) and 3 (response to a learning problem) approached statistical significance ($p = .102$; $p = .088$). Differences in the raw scores for Features 2 (tied to course objectives) and 5 (integrated into the on-going learning process of the course) were not statistically significant ($p = .296$; $p = .357$); however, the small sample size may have influenced these results. Finally, although these features taken separately are not statistically significant, taken together they constitute a pattern of difference which is significant ($p = .040$).

Significant differences were also obtained in this second analysis for the mean ratings of instructors' views of writing: participants were rated higher on average than non-participants (3 versus 2.1; $p = .055$). Differences in the ratings on quality and in the mean lengths of protocols and numbers of T-units were not statistically significant; however,

participants generally did rate higher than non-participants on quality of assignments created (3 versus 2.6), and they tended to talk more in response to questions than non-participants (122.4 average lines versus 69.6; 75.9 average T-units versus 48.1).

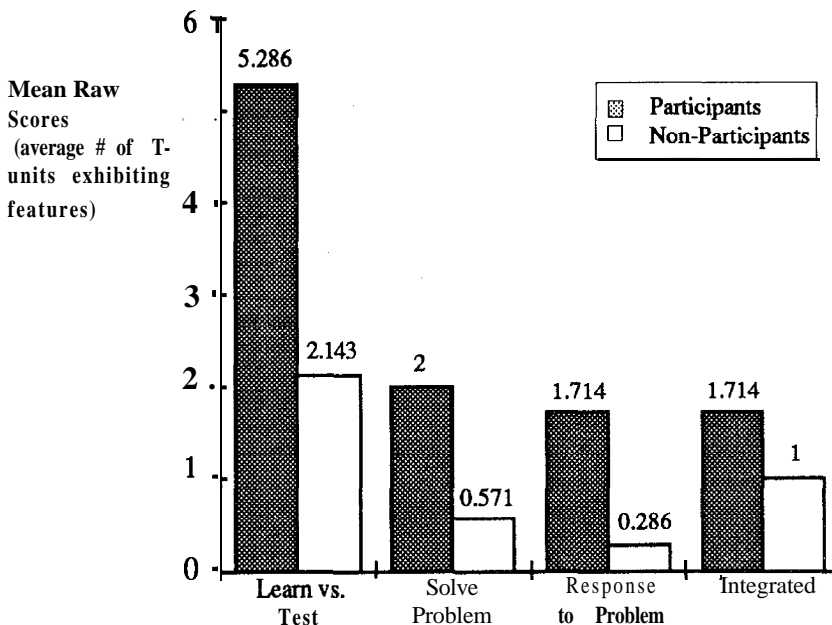


Figure 9. Comparison of Mean Raw Scores of Participants and Non-Participants

Summary and Conclusions

The protocol/interview method proved to be a useful tool for evaluating the faculty workshops offered as part of the Writing Across the Business Disciplines program at Robert Morris College. Combining protocols with post-protocol interviews for evaluation purposes allowed program directors to determine in some detail how the workshops affected the teaching and attitudes of the participants. The method revealed that faculty who had participated in the WABD training workshops differed significantly from non-participants on measures of attitude and teaching behavior. Participants typically viewed writing assignments as a powerful means for encouraging student learning, rather than as only a means for testing content knowledge or improving writing skills. And they were more likely than non-participants to

develop assignments that furthered the learning objectives of their courses and that were integrated into the course structure.

The protocols and interviews conducted in this evaluation provided the program directors with valuable information about the views of faculty on student writing, attitudes and needs and about their approaches to the design of writing assignments. Such information would not have been so readily available through other, more conventional assessment methods used in isolation, such as surveys, classroom observations, student evaluations, or close analyses of assignments and student papers – methods which were used to evaluate other components of the WABD program. The protocol/interview method complemented and clarified data obtained from these other sources. Those who Planned the WABD evaluation project, as a general principle of design, devised multiple, complementary methods keyed to the distinctive features and educational objectives of the various components of the program.

The evaluation described here was tailored to Robert Morris College and to the distinctive features of the WABD program. Because of this, it may not be applicable without modification to other WAC programs. However, we believe that the general principles we relied on and some of the particular features developed for this project have broad applicability. The general principles include the use of multiple measures, the use of complementary measures, the use of the most appropriate and sensitive measures, even if they are unconventional, and, finally, the customizing of measures for the situation at hand. Two other features of the project are also notable. The protocol/interview method has, we believe, considerable utility in evaluation projects, especially where changes in attitudes and applications of principles are at issue. In addition, our engagement in this project over a number of years reflects our belief that if we are to understand how well WAC programs are working, we must spend much more time on the development and application of effective assessment tools than has been the case in the past.

Notes

1. The three evaluations were conducted by John Ackerman, now of the University of Utah, Nancy Penrose, now of North Carolina State University, and Ann Blakelee, now of the University of Illinois at Urbana-Champaign.

2. In Phase 2, the raters were asked to rate an additional five features. Here, we confine ourselves to reporting results for just the 19 features, which were used for all three phases.

3. The reliability with which these and the other traits were rated was assessed in Phase 2 by having a second rater independently rate four of the data sets. (Reliability was not assessed in Phase 1.) Average agreement between the raters over all 19 traits in Phase 2 was 67%. Reliability was assessed in Phase 3 by having a second rater independently rate two data sets. Average agreement between the raters over all 19 traits in this phase was 69%. For the traits listed in Table 2, Pearson product-moment correlations were calculated to determine reliability. In phase 2, the correlation between the independent ratings for quality of assignment was .816 and for breadth of instructor's view of writing, .548. The corresponding correlations for Phase 3 were .665 and .547.

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Appendix A

Post-Protocol Interview Questions

1. What do you think I asked you to do?
2. Why did you do what you did in devising this particular writing assignment?
3. Do you see this writing assignment related to your course goals? What are some of your course goals? How is the assignment related to your course goals?
4. What is the function of this writing assignment? How would you use it in the course?
5. Do you see this assignment as a response to a learning problem which you have either already identified or anticipate?
6. How complex are the intellectual demands of this assignment? Would you say that this is a simple task or a complex task? Is there a cognitive or behavioral level that you are looking for in this assignment?
7. [Ad hoc questions to expand on problematic responses and to check the reliability of responses.]

Appendix B
Revised Coding Scheme

1. The writing assignment is designed to do more than test student knowledge. The writing assignment is designed to promote student learning/discovery.
2. The writing assignment leads the student to solving a particular problem in achieving course objectives.
3. The writing assignment is responsive to a learning problem that the teacher has identified,
4. The writing assignment is integrated into the on-going learning process in the course,
5. Quality of the writing assignment rated on a scale of 1 (low) to 4 (high):

1 =	Low quality: confusing, purposeless, not integrated into course goals, etc.
4 =	High quality: well thought out and articulated, fits into course, helpful, etc.
6. Breadth of teacher's view of writing rated on a scale of 1 to 4:

1 =	Restricted view: writing equals grammar, correctness; writing takes place after thinking; writing is thought of in terms of number of pages; etc.
4 =	Larger view: writing is a medium for thinking and learning; writing is an occasion for exploration; etc.
7. Protocol length (number of transcript lines).
8. Number of T-units (number of main clauses plus their modifiers).