AN INTERNSHIP WITH THE OHIO EVALUATION & ASSESSMENT CENTER

By Pamela A. Marks

This report is a summary of an internship I performed with the Ohio Evaluation & Assessment Center from March 2005 through July 2005. The Center is a semi-independent organization based at Miami University in Oxford, Ohio, and conducts evaluations of education research studies. I begin this report by discussing the Center’s purpose and organizational structure, as well as my internship role. I also describe the major projects on which I worked and outline the tasks that each project required. In general, such tasks included writing, editing, and formatting evaluation reports; data analysis; and information design. To give readers an in-depth understanding of my work and the types of evaluation reports produced by the Center, I describe in detail one of these projects: the Ohio State University Teacher Quality Study. Finally, I discuss my internship experience from the perspective of a telecommuter and outline several aspects of working within a research-oriented organization.
AN INTERNSHIP WITH THE OHIO EVALUATION & ASSESSMENT CENTER

An Internship Report

Submitted to the
Faculty of Miami University
in partial fulfillment of
the requirements for the degree of
Master of Technical and Scientific Communication
Department of English
by
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2005

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I wish to thank several individuals who were instrumental to the writing and completion of this internship report. First, completion of this report would not have been possible without the assistance of the members of my committee, Jennie Dautermann, Janel Bloch, and Richard O’Connell, as they reviewed drafts of the report and made valuable suggestions from both a professional and general reader’s point of view. Also, I would like to thank my professors in the MTSC program for providing me with the knowledge and skills necessary to complete my degree and perform my internship. In addition, the staff at the Ohio Evaluation and Assessment Center were very gracious in allowing me to use samples of my work in this report and for providing me with information about the Center’s background and organizational structure. Finally, I wish to thank my husband, Neil Marks, for the wisdom and support he provided during the report-writing process.
Chapter 1: Introduction to Ohio’s Evaluation & Assessment Center and My Internship

From March 1, 2005 to July 31, 2005, I performed an internship as a Research Assistant with Ohio’s Evaluation & Assessment Center (E &A Center). I worked part-time (30 hours a week), taking several weeks off in the middle of the period during fairly quiet times in March and April. This arrangement required special approval by the MTSC program in general and my committee chair in particular, since the internship was part-time, on campus, and involved some telecommuting. The internship was appropriate to my own professional goals because it gave me experience in many aspects of technical communication: writing, editing, and graphic design. It also allowed me to work in a virtual setting (from home) part of the time; this experience allowed me to better understand the requirements (hardware, software, work habits) of an online work setting. (Being part of a remote writing team is a potential future goal of mine.)

Description of the E & A Center

The E & A Center is based at Billings Hall, Miami University. It essentially operates independently from the School of Education, although Dr. Jane Butler Kahle, as a Condit Professor in Teacher Education and head of the Center, serves as a link between the School and the Center. The Center began operation in 2002 and is a partnership between its headquarters at Miami University, the Evaluation Services Center at the University of Cincinnati (headed by Dr. Debbie Zorn), and the Applied Research center at Miami University, Middletown Campus, headed by Dr. Robert Seufert. The Center conducts evaluations of educational programs in science and mathematics at both the pre-college (K – 12) and college levels. It also develops statistically valid and reliable instruments (including measures of student achievement) that are used for conducting these evaluations. Several faculty members at universities across Ohio and the rest of the U.S. serve as affiliates for the Center. These affiliates help with training of project leaders/participants on the various evaluation instruments and assist with other evaluation and
program activities as needed. The Center maintains databases connected with the various programs it evaluates and produces scholarly papers based on its evaluation findings. Appendix A shows a current brochure for the E & A Center.

Evaluators at the E & A Center have experience in the following areas: (1) science and mathematics teaching at all pre-college and college grade levels; (2) quantitative and qualitative evaluation research; (3) creation and refining of evaluation instruments such as questionnaires, interview protocols, and student assessments; and (4) communication of evaluation results to funding agencies, clients, and the public in the form of written reports.

The Center is co-located with the *Discovery* Center, Miami University’s center for Ohio’s Systemic Initiative, *Discovery* (OSI – *Discovery*). All of the Center’s staff are involved to a greater or lesser degree with the *Discovery* Center, which began in 1991 and is supported by various grants from the Ohio Board of Regents (OBR), the Ohio Department of Education (ODE), and the National Science Foundation (NSF). The *Discovery* Center, directed by Dr. Terry McCollum, helps prepare teachers to use inquiry-based, hands-on teaching methods in mathematics and science and serves Ohio in research and reform of K-12 science and mathematics education. This Center also supports the *iDiscovery* program, which provides online learning communities where teachers can share insights about teaching practices and their experiences with *Discovery*. See Appendix B for a brochure for the *iDiscovery* program. (Appendix C shows a master copy of the E & A Center and *iDiscovery* brochures. See Chapter 2 for details).

### Organization and Culture of the E & A Center

The organization structure of the Center is headed by Dr. Jane Kahle, the Principal Investigator. Dr. Kahle also is a Condit Professor of Science Education in Miami’s School of Education in the area of Teacher Education. She directly or indirectly oversees a number of project directors (when I started there were two directors; now there is only one), the Center’s coordinator, various administrative personnel, and graduate and undergraduate students. An organization chart for the Center is shown in Figure 1.
During my internship, my place in the organization was directly below the project directors, with whom I communicated on a regular basis. However, I also interacted at various times with Dr. Kahle and the Center’s coordinator, as well as several personnel involved with Project Discovery. The project directors were responsible for analyzing project data, interacting with clients, and writing evaluation reports. My role was to assist as needed (including data analysis, editing, and writing) in the creation of these reports. I also interacted with two mentors, Dr. Kahle, and Dr. Mary Kay Kelly. Dr. Kelly, who has recently left the Center, was a project director with extensive experience in writing evaluation reports. I met with either Dr. Kahle or Dr. Kelly approximately once a week or once every two weeks to discuss evaluation reports and the writing and operating procedures at the Center.
The organizational structure of the Center and Project *Discovery* is a loosely hierarchical one. Dr. Kahle and Dr. McCollum are the heads of their respective organizations, and the project directors are directly below in rank. However, staff members, including the students, interacted freely with each other, each doing whatever was necessary to fulfill the various responsibilities of the organizations. Therefore, the culture of the Center (and Project *Discovery*) is largely informal, with each staff member taking on a variety of responsibilities as needed. “That’s not my job” is rarely a part of employees’ vocabulary. Because of such attitudes, I was able to perform a wide range of tasks and learned about many aspects of the Center’s operations. I discuss my major job responsibilities next.

**Nature of My Responsibilities and Contributions to the Center**

The basic nature of my internship role, described further in the next two chapters, was to assist in writing evaluation reports for several education projects. Producing the evaluation reports involved several types of activities, such as assisting with data analysis where needed, performing original writing and research on the background and evaluation methods for each study, and editing others’ writing. I worked closely with the project directors and Dr. Kahle in order to understand the precise nature of these activities. My work contributed to the Center largely by jumpstarting the report-writing process for several evaluations that were behind schedule. Table 1 shows the major sections for a typical evaluation report. (I have formatted the headings and tables of this internship report similarly to those of the Center’s to indicate the approximate appearance of the Center’s evaluation reports.)
Table 1. Typical Sections of an E & A Center Evaluation Report.

<table>
<thead>
<tr>
<th>Section</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover and Title Pages</td>
<td>Provides title and authorship information</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>Provides an outline of the report</td>
</tr>
<tr>
<td>Table of Tables</td>
<td>Displays a list of tables used in the report</td>
</tr>
<tr>
<td>Table of Figures</td>
<td>Displays a list of figures used in the report</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>Gives a brief summary of the entire report</td>
</tr>
<tr>
<td>Background</td>
<td>Describes the background and purpose of the study and its evaluation</td>
</tr>
<tr>
<td>Methods</td>
<td>Describes the sample, instruments, and data analyses to be used for the evaluation</td>
</tr>
<tr>
<td>Findings</td>
<td>Describes the results from the data analyses</td>
</tr>
<tr>
<td>Conclusions</td>
<td>Concisely summarizes the findings</td>
</tr>
<tr>
<td>Recommendations</td>
<td>Gives recommendations for continuation of the study into future years (if funding for such has already been granted)</td>
</tr>
<tr>
<td>References</td>
<td>Lists all works cited in the report</td>
</tr>
<tr>
<td>Table of Appendices</td>
<td>Provides a list of appendices used in the report</td>
</tr>
<tr>
<td>Appendices</td>
<td>Provides details of all statistical analyses and displays copies of all instruments used in the evaluation</td>
</tr>
</tbody>
</table>

I also needed to maintain an electronic copy of each report and ensure accurate and consistent language use throughout the report. Creating a style sheet (described in Chapter 2) and using the *American Psychological Association (APA) Publication Manual, 5th edition* (an established Center practice) proved valuable for this latter activity. Finally, I created formats for the reports, such as headings to clearly show the organization of information, in addition to tables of
contents, figures, tables, and appendices to guide the reader through the report. Through the use of styles and templates in Word for Windows, I was able to automate many of these formatting tasks to enable them to be done more easily and quickly. I used Word’s online help system when I needed assistance in creating footnotes or the table of contents and when creating and using formatting styles.

Another part of my internship role was to rewrite the language used by the data analyst, who was more skilled at statistics than at writing. I would obtain a write-up of the statistical results from the data analyst, edit it, and put it in a more understandable context for those readers who were not trained in statistics. I also recreated graphs of results in Excel to make them more consistent and readable and created tables of results to efficiently display each report’s statistics. Because of my background in statistics (my specialty area within the MTSC program), I was able to understand and describe the data analyses that were performed and to check them for accuracy. I also performed analyses on my own when necessary.

Finally, I created marketing materials (brochures) for the E & A and Discovery centers (see Appendices A and B). These brochures provided brief summaries of the roles of these organizations, the services and expertise they offer, and their contact information.

Dr. Kahle and Dr. Kelly served as mentors during my internship. Mentoring meetings were held with one or both of these individuals. During these meetings, we would discuss the organization of the Center, the writing and editing procedures used at the Center, and the recommended standards for formats and language use within evaluation reports. We would review my writing for the current report and their suggested edits of my work. I learned a great deal about the way the Center evaluates education studies and its preferred style of writing and report organization from these meetings—particularly from the edits that were suggested. For example, Dr. Kahle and Dr. Kelly explained the importance of editing for one thing at a time (e.g., grammar, spelling, organization), displaying statistics in tables rather than in paragraph form, allowing others to read the evaluation reports before finalization (a form of user-testing), and following the guidelines from the APA Publication Manual.
I feel that I fulfilled some parts of my internship role better than I did others. I successfully performed data analyses, both quantitative and qualitative, when necessary. I also wrote and/or edited original sections for the reports, created tables and figures to display evaluation findings, created appendices, and applied proper formats to the final reports. However, partly because I began work on most of the reports near the end of each project, it took time to obtain the necessary details for writing the evaluations, and thus the information I included in early drafts was incomplete or inaccurate at times. In addition, my writing was sometimes less concise and consistent than it needed to be. However, these capabilities improved with time. For example, as I became more familiar with each study, I was able to improve my write-ups of the background and methods sections. I also started making more frequent use of the ‘Find and Replace’ option in Word to check for consistency of terms within the reports. In addition, I used Dr. Kahle’s and Dr. Kelly’s comments and edits to improve the efficiency of my writing. Moreover, I was able to increase my internship responsibilities over time in ways that were mutually beneficial for the Center and myself. For instance, in my spare time, I created a stylesheet, created written summaries for the reports, and conducted qualitative analyses of interview data; none of these duties was included in my original job description. In this way, I was able to expand my internship role and gain additional writing experience by providing extra assistance to the Center that was openly appreciated. I describe these additional activities in more detail in Chapters 2 and 3.

Organization of Report

I have organized this internship report into four chapters. The current chapter, Chapter 1, provides an introduction to my internship. Chapter 2 describes the nature of my work more fully by describing the major projects with which I assisted. Chapter 3 describes one of my internship projects (the OSU Teacher Quality Study) in detail, and Chapter 4 explains my experiences as a telecommuter and my insights from working with a research-oriented organization. The appendices at the back of this report provide examples of my internship work.
Chapter Two: My Internship Work - An Overview

In this chapter I provide an overview of the work I performed during my internship with the E & A Center. Because this work involved a number of different projects, I have organized this section by those projects: evaluations of the Physics First project, *iDiscovery*, and The Ohio State Teacher Quality Program; brochures for *iDiscovery* and the E & A Center; and a stylesheet I created as an aid to report writing. Figure 2 displays a histogram of the hours (as a percentage of total internship hours) that I spent on each project.

![Internship Projects](image)

*Figure 2.* Percentage of hours devoted to each internship project.
The first internship project on which I worked was an evaluation report for the Physics First Project, funded by the Policy Analysis and System Evaluation (PASE) Department in Hawaii. This project was the largest the Center had handled to date, requiring over five months to complete. My involvement with the project took up 269 internship hours, and the last report version I worked on was approximately 140 pages long.

The Physics First project, which has been conducted at several of Hawaii’s high schools, is a multi-year project that aims to study the effects of teaching physics first in the science sequence (physics, followed by chemistry and biology) as an alternative to teaching biology first (biology, followed by chemistry and physics). During the project, students in one Hawaiian campus were taught using the ‘physics first’ sequence and students from another campus (the control group) were taught using the traditional sequence. Evaluation goals included assessment of differences between the two campuses in terms of teaching practices, student attitudes toward science, and student achievement in science and mathematics. Math and science student achievement tests, student performance (hands-on) science tests, teacher and student interviews, and student and parent questionnaires all were used to evaluate the project.

My work for the Physics First project primarily involved writing drafts of the evaluation report. My first step in writing the report was to set up a skeleton draft based on headings and formats from a previous report I had worked on before starting my internship. This skeleton report contained title pages; automated tables of contents, tables, and figures; headings for the major sections (e.g., Background, Methods, Findings); references; and appendices. I organized this draft according to an outline developed by the project director (Dr. Kelly). To show the overall structure of this unusually complex report, I provide a Table of Contents (unfinalized) in Appendix D.

After creating this skeleton draft, I started filling in the details of the report (Background, Methods, Instruments, Findings) based on information I obtained from both the evaluation proposal and the data analysis. In addition, I created 14 appendices that displayed the various questionnaires and interview protocols used in the evaluation, as well as detailed results of all
quantitative analyses. (The Bridging Student Questionnaire is displayed in Appendix E as an example of one of the evaluation’s instruments. Modified samples of tables and graphs I created from the data are in Appendix F.)

After I completed the first draft of the report, I sent it to Dr. Kahle and the project director for review. At a meeting involving Dr. Kahle and the project director, the data analyst, a physics teacher, and myself, Dr. Kahle proposed various changes to the draft. These changes included adding information to the background and methods sections and clarifying some of the data analysis results. Because of the size of the report, responsibility for making the changes was divided among all meeting participants. I supervised this editing process, sending copies of sections needing revisions to the appropriate persons. The edited sections were then returned to me for inclusion in the main report. In addition to managing the report’s edits, I created tables for the number of respondents to the evaluation instruments, double-checked the accuracy of the statistical findings, wrote summaries of the findings, and discussed the project implications of these findings.

I faced several difficulties when writing this report; these included incomplete information about the study and its background and inexperience regarding the field of education and its conventions for writing evaluation reports. To resolve these difficulties, I used staff and mentoring meetings to improve my knowledge of the study and the evaluation processes used at the Center. I also read books on educational research (Gall, Gall, & Borg, 2003) and curricula (Posner, 2004) and read a paper co-authored by Dr. Kahle to learn about the field of education and the expected style of writing within this discipline (Kahle, Meece, & Scantlebury, 2000). I also used copies of previous evaluation reports (Kahle & Cassedy, 2004; Kelly & Kahle, 2005) on which to base my writing and formatting of the report.

After all the report sections had been revised, I printed a copy of the report for Dr. Kahle and the project director to review once more. They requested additional edits to the report, and I made these edits whenever appropriate. I also made checks for consistency of language use and printed a final copy for Dr. Kahle. I then left on vacation, during which a staff member of the Center performed other requested edits. After my vacation, I started several new projects (described
below). At the end of my internship, Dr. Kahle and the project’s reviewers from Hawaii were still making changes to the report. Upon finalization, the report will be sent to Miami’s Print Center at Gaskill Hall for printing and binding and will then be distributed to the client and other interested parties.

**The OSU Teacher Quality Evaluation Report**

Starting in mid-May, I began work on a second project, an evaluation report for *The Ohio State University Summer Institutes for Instructional Change*. This study involved short courses and follow-up sessions for Columbus-area teachers whose students were not meeting Ohio’s proficiency standards for mathematics and science achievement tests. For this study, which required 154 internship hours, I analyzed the evaluation data and wrote the final report (71 pages in length). I describe this study in Chapter 3 of this report as an in-depth example of my work.

**iDiscovery Second-Year Evaluation Report**

Starting in June, I began work on a second-year evaluation report of *iDiscovery* (*iDiscovery* and the Discovery Center are described in Chapter 1). My role for this study was to produce an evaluation report in a short period of time (approximately two months) because of an upcoming deadline of August 1, 2005. Because of formatting problems I encountered with the Physics First report drafts due to using different computer platforms (see Chapter 4), I wrote the drafts of the report in an unformatted style. The final report was then formatted by a Center staff member. This report totaled 41 pages and required 69 internship hours.

In order to maintain a sense of continuity with the first year evaluation, I based the second-year report on the first one: I stated the project goals in the same way and kept the language and overall organization the same as in the first-year report. However, to avoid redundancy, I found I needed to remove much of the background information that had been included in the first year’s report. Another issue I faced when writing the report concerned terminology: ‘facilitator,’ ‘teacher,’ ‘participant,’ and ‘teacher-participant’ were all used in various places in the proposal, sometimes interchangeably, to refer to the various types of participants, making it difficult for me to specify precise meanings for these terms. Deciding upon the desired use of such
terminology when writing the proposal would have helped resolve this issue (discussed below in Chapter 4).

After writing drafts of the background and methods sections, I sent them to Dr. Kahle for review. After making requested revisions, I added the project director’s write-up of the data analysis. I checked for consistency of language use between this write-up and the other sections of the report, added conclusions, recommendations, and an executive summary, and gave the second draft to Dr. Kahle. (I provide before and after versions of the executive summary in Appendix G.) After several additional editing rounds, the report had reached its final draft form. I then added a title page and Table of Contents to the front of the report, created appendices, using several from the first-year evaluation, and faxed the report to iDiscovery’s director for review. Because of the tight deadline for the final report, the Center’s coordinator and I worked backwards from the due date of August 1 to schedule dates for finishing the final draft and faxing it to the director, adding final formatting, sending the report to the printer, and mailing the report to the necessary parties. The schedule proved successful, and we express-mailed the report on July 28.

**iDiscovery Brochure**

At the mid-point of my internship, I was asked to recreate a brochure for the iDiscovery program. This brochure had been created previously, but needed to be redone to allow the graphics to reach the edges of the paper (allow for bleed). The printer we used for the brochure could not accommodate this feature. Therefore, it was necessary to design the brochure in a different way. Completing the brochure and arranging for the printing of 200 copies required 30.5 hours. The PDF file of the brochure is shown in Appendix B.

To create a brochure that allowed for bleed, the Center’s coordinator and I decided to create a 17 x 11 inch document that would contain an area of size 11 x 8.5 inches. A brochure could then be created that would extend to the edges of the 11 x 8.5 inch area and would simply need to be cut from the larger page. I used Adobe InDesign, a graphics design program, to set up a 17 x 11 inch master document. This master document contained three panels and included a 0.25 inch
margin around the text within each panel (see Appendix C for the master document). I created an 11 x 8.5 inch area within the center of the master document to hold the brochure’s contents. Centering the content was necessary for ensuring accurate printing on both sides of the paper. I also created crop marks (small lines) at the corners of this area so that the brochure could be cut to the proper size. Guides (non-printing lines) enabled me align all content properly within the margins and ensured that the brochure’s fold lines would be in the desired places.

After setting up the master document, I created two more pages based on the master. One page was for the outside of the brochure and the other was for the inside. I attempted to match the previous brochure as much as possible in design and color but made minor adjustments to the line spacing and size of headings for readability purposes. The graphics themselves needed to be recreated, since the previous ones were made in an old version of Adobe Photoshop and did not have good resolution. I was able to create all graphics in InDesign by using a drawing tool for circles, placing the circles in key places within the document, and then cropping them to create designs for the brochure’s corners and bottom mid-section (see Appendix B). As resources when creating the brochure, I used InDesign’s online help in addition to the reference manual *Adobe InDesign CS Classroom in a Book* (Adobe Systems Incorporated, 2004).

After creating a draft of the brochure, I exported it to PDF format and emailed it to the Print Center at Gaskill for printing. The director of *iDiscovery* requested a few minor changes to the brochure, and I then arranged for more proofs to be made to ensure accurate cutting and folding of the document. I eventually ordered 200 copies of the brochure from the Print Center for *iDiscovery* to have on hand.

**E & A Center Brochure**

After I created the *iDiscovery* brochure, Dr. Kahle asked if I could make a brochure for the E & A Center. Because no previous brochure existed, I created my own design, using part of the same layout of the *iDiscovery* brochure. Because I already had a similar document set up in InDesign for *iDiscovery*, the new brochure took less time to create (12.5 hours for two drafts). I started with the E & A logo, which needed to be placed sideways on the front cover because of
its size. I also used the logo in various places as a repetitive and decorative theme to the brochure. I used the E & A website (Ohio Evaluation and Assessment Center, retrieved June 9, 2005) to obtain information about the Center, its staff, and its previous and current projects. In addition, I used blue colors to match part of the website’s appearance. For the inside of the brochure, I copied the image of Ohio from the logo and expanded it to fill the inside and then made the image transparent so that the text would show through. Where possible, I used the features of contrast, alignment, proximity, and repetition found in The Non-Designer’s Design Book (Williams, 2004) when making the brochure.

Dr. Kahle and Dr. Kelly both edited the brochure and sent it to the E & A Center’s partner, the Evaluation Services Center at UC (the Evaluation Services Center, or ESC, is also featured in the brochure). See Appendix A for the most current copy of the brochure.

Creating A Stylesheet – An Independent Project

To assist myself in writing the evaluation reports, I created a stylesheet to help ensure accuracy and consistency in my writing and editing. The stylesheet took 25 hours to design, complete, and partially revise.

I had the idea for the stylesheet midway through editing the Physics First report in response to discussions about various revisions to the report and frequent referrals to the APA manual. I realized that a stylesheet, written specifically for E & A Center evaluation reports, would help keep my writing more consistent and in accordance with the existing writing styles and preferences of the Center; these styles and preferences included the APA writing standards (APA Publication Manual, 5th edition).

I had created a stylesheet while in the MTSC program and had seen examples of several others. I had not seen two stylesheets that looked exactly alike; each one seemed made for the particular situation in which it would be used. Therefore, I used my MTSC stylesheet as an initial guide but tailored it to a format I thought would be easy to use during my internship. I included the following types of content: writing or formatting issues, such as the rounding of p-values; a
standard of use regarding each issue (round all p-values to three decimal places), and an example of correct usage (p = 0.009). I placed each type of content in a separate column of the stylesheet for easy reference. Also, I organized the stylesheet by type of issue (e.g., language use, punctuation, spelling, use of numbers, etc.). Samples of pages from the stylesheet are in Appendix H.

Dr. Kelly and Dr. Kahle reviewed the stylesheet and made some edits and suggestions, but reacted favorably to it and indicated that other personnel at the Center could use such a guide when writing. After I make final changes, I will distribute the stylesheet to those who wish to make use of it (using a bound or stapled copy or an electronic version on the server), keeping in mind that it will need periodic updates.

**Summary**

In summary, my internship involved several types of projects that allowed me to gain experience with many of the potential roles of technical communicators. These experiences included original writing; editing; report formatting; designing and displaying information when producing tables and figures for the reports and when creating the brochures; using rhetoric; (particularly *logos*), when writing evaluations; and developing a stylesheet to help ensure consistent and accurate language use when writing the reports. Therefore, because of the large variety of tasks I performed, my internship has had a major impact on my development as a technical communicator.
Chapter Three: Evaluation of *The OSU Summer Institutes for Instructional Change*

In this section, I describe *The Ohio State Summer Institutes for Instructional Change* (or OSU Teacher Quality Study) in greater detail. The evaluation report I helped write for this study was the last work I performed during my internship and was the project to which I contributed the greatest amount of original work.

The Central Division of the West/Central Center for Excellence in Science and Mathematics Education (EXCEL), based at OSU, conducted the OSU Teacher Quality Study. This study involved a number of teaching institutes funded by the Ohio Board of Regents (OBR). The institutes were intended for teachers (grades 4 through 12) at schools in the Columbus area whose students were not meeting the necessary achievement levels on Ohio’s science and mathematics proficiency tests. The project’s goals included increasing science or mathematics content knowledge for teachers, improving teaching practices (making them more hands-on, inquiry-based), and increasing teachers’ science and mathematics pedagogical content knowledge (defined as teachers’ abilities to use a variety of teaching methods as appropriate for a given situation or group of students). The E & A Center assessed the success of the project through teacher and student questionnaires, classroom observations, and teacher interviews.

The teaching institutes were designed to help teachers master the above skills by taking two-week courses in physical science, geology, algebra, or inquiry-based teaching. Teachers could enroll in up to two courses of their choice. The algebra and geology courses were held in Summer 2004, while the physical science and inquiry institutes were held during the 2004-2005 school year. The teachers were to implement course learnings in one of their classes during the 2004-2005 school year. After the summer courses, follow-up sessions were held to allow teachers to discuss what they learned during the summer and to try out different kinds of lesson
plans and receive feedback about them from other participants. (Follow-up sessions were not available for teachers enrolled in courses during the academic year.)

For this project, I performed data analyses and wrote the evaluation report. The data were obtained from both quantitative (teacher and student questionnaires) and qualitative (classroom observations and teacher interviews) instruments. To write the report, I composed project background, methods, and findings sections, conclusions, references, and appendices. In addition, Dr. Kahle wrote an executive summary to highlight some issues the Center encountered with the project’s execution. My initial draft of the report went through several rounds of edits with the project director and Dr. Kahle; after editing, the report was finalized and sent in electronic and hardcopy form to the client. Below I describe how I performed each part of this evaluation process.

**Data Analysis**

I performed both the quantitative and qualitative analyses for the evaluation report and used tables and graphs to display the analysis results in the main report and appendices, as described below.

**Quantitative Analyses**

Two questionnaires were used to measure changes in teaching practices. These questionnaires were created by trained researchers at the E & A Center and included the E & A Center Teacher Questionnaire (TQ) and the E & A Center Student Questionnaire (SQ). The TQ was administered to all the teachers before and after they attended the institutes and included items on classroom activities, teachers’ views on science and mathematics, and teachers’ ideas about how to improve student learning in science and mathematics. Teachers also were asked how important they felt each item was for good teaching practices. The SQ was administered to students in selected classrooms of the teacher-participants. The SQ included items on teacher and student classroom activities, students’ and peers’ attitudes toward science and mathematics, and parental involvement in the students’ education.
I began data analysis on the TQ by importing the questionnaire data from an Excel spreadsheet to SAS (Version 6.12), a statistical programming language. To refresh my knowledge of SAS programming, I referred to a book written by Dilorio (1991). This book provided examples of many of the procedures described below. Appendix I includes portions of a SAS program I wrote to analyze the TQ data.

My first step in running SAS on the questionnaire data was to conduct a check for outliers using the ‘Proc Univariate’ SAS procedure. Proc Univariate displays the five largest and five smallest values for each numerical variable in a dataset, so that one can detect any data that are unusually large or small. By using this procedure, I found several items for which inappropriate responses had been entered (a ‘5’ where the maximum allowed value was ‘4’). To check for unusual values for the qualitative variables, I calculated frequencies for all variables using the ‘Proc Freq’ procedure. I sent a list of all outliers to the project director, who sent them to the client for correction.

After the TQ data had been corrected, I modified the SAS program to include formats for the data codes (e.g., ‘1’ = ‘Physical Science’) and wrote label statements for the variable names, which, in SAS 6.12, are limited to an often-unintelligible eight characters. I then performed paired t-tests on the pre- and post-questionnaire items by taking differences between the pre and post items for each teacher. Next, I used Proc Univariate to test the mean of these differences for each of the 86 items on the TQ. I was interested in whether each mean was equal to ‘0’; if not, a significant difference existed between the pre and post responses for that item. I also calculated means and standard deviations for each pre and post response item using the ‘Proc Means’ procedure in SAS.

I initiated data analysis for the SQ in the same manner as for the TQ: I conducted a check for outliers and performed frequencies on all variables. However, the SQ was only used as a check on teachers’ responses to the TQ, so I examined both questionnaires (the SQ and post-institute TQ) for similarly-worded items. I found eight comparable items and, using ‘Proc T-Test’ in SAS, tested for differences between students’ and teachers’ responses by using regular (non-
paired) t-tests to compare the two groups for each item. In addition, I obtained means and standard deviations for all items on the SQ using Proc Means.

**Qualitative Analysis**

In addition to the quantitative analysis, I performed an analysis of the qualitative data by summarizing the teacher interview responses and classroom observations. For the interviews, 10 teachers (out of a possible 59) provided responses to a teacher interview protocol developed by the E & A Center. Trained interviewers were not available, so the teachers simply wrote out their answers to the interview questions. To process the responses, I first read through the completed interview forms to get an overview of the types of responses teachers gave to the questions. I then examined the responses for common themes across all interviewees (and exceptions to these themes), and described each theme, along with supporting quotes. Because of my lack of experience in analyzing interview data, I followed the approach taken in the Physics First report described above (Kahle & Kelly, 2005). An example of the way I made use of interview responses regarding changes in teachers’ science and mathematics content knowledge is shown in Appendix J.

I processed the classroom observations using the Reformed Teaching Observation Protocol (RTOP); this protocol was developed by the Arizona Collaborative for Excellence in Preparing Teachers (ACEPT) (Piburn & Sawada, 2001). The RTOP is administered by trained classroom observers; at least two observers are needed for each classroom to provide a measure of inter-rater reliability. Because of a lack of trained observers for this study, I used responses to the RTOP mainly for descriptive purposes. The classroom observers used the RTOP instrument to assign numbers measuring the innovativeness of 25 different teaching practices. To obtain an overall RTOP score for each teacher, I added the scores for these 25 practices, averaging the scores when more than one observer was available. A high RTOP score indicated that the teacher used innovative teaching practices to a large extent. All the RTOP scores were obtained from mathematics middle-school teachers; therefore, I calculated the mean of these scores and compared this mean to a middle-school math norm determined by ACEPT. However, because only post-institute RTOP data were obtained, I was unable to ascribe the results to the project with confidence.
I wrote the evaluation report in APA style using Word for Windows 2003. To obtain easy access to the E & A Center’s standard formats and page layouts for evaluation reports, I used an outdated draft of the Physics First report. I removed all material from this draft except major section headings, table and figure captions, TOC formats, title pages, and references. I then wrote the various report sections using information obtained from the project proposal, the project director, and the client (through emails and phone calls). For example, I obtained knowledge of the project’s goals and instruments from the proposal, but checked this information with the project director, who was aware of some goals and instruments that were no longer relevant to the project. And, through exchanges with the client, I learned of several invalid classroom observations and became aware of the timeframes involved for the four courses and for administration of the teacher and student questionnaires.

When writing the Methods section of the report, I first described the sample as thoroughly, yet as efficiently, as possible. Because long paragraphs of numbers and percentages can be difficult to process for the reader, I ran frequencies on several variables from the teacher and student questionnaires (e.g., sex, ethnic background, institute course taken, and subject areas currently teaching). I then created tables based on these frequencies so that information about the participants could be seen at a glance. I organized the remainder of the section by the project’s goals. To explain the nature and purpose of the instruments used to evaluate these goals, I reviewed the teacher and student questionnaires, the interview protocol, and the RTOP. This review helped me to determine the number and nature of the items/questions contained in these instruments in order to know what kinds of evaluation questions (e.g., extent of changes in teaching practices) each instrument could answer. Last, I briefly described the analyses performed on the data obtained from each instrument.

To write the Findings section, I described the results from each instrument, again organized by project goals. For example, I explained how the data analyses supported or failed to support each goal. I used figures, tables of means and significance results, and interview quotes to summarize the results as efficiently as possible. In addition, I used heading to set off the different goal sections from each other.
I followed up the Findings section by writing conclusive summaries for each goal and by including a brief reference section and appendices. Since the appendices of evaluation reports are often produced as a separate step in the writing process, I will discuss the process I used to create them.

**Appendices**

I created seven appendices for the evaluation report. These appendices displayed the instruments used for the evaluation (the teacher and student questionnaires, the interview protocol, and the RTOP items) and provided details of all statistical analyses.

I used several methods of displaying the evaluation instruments within the appendix. For example, to produce a list of the RTOP items, I used such a list from an appendix of a previous evaluation report (Kelly & Kahle, 2005). However, for the interview protocol, no electronic copy was in existence; therefore, I created this particular appendix using a written copy of the protocol. In addition, I was not able to insert Macintosh versions of the questionnaires without assistance from the E & A Center coordinator. This difficulty stemmed from differences in computer platforms and software versions (to be described in further detail in Chapter 4 of this report). In brief, because I used my home PC to do my writing, I sometimes had difficulties when trying to insert tables created on a Macintosh. The difference in the PC and Macintosh platforms and software versions often made these tables unreadable to my PC. To solve this difficulty, I asked the Center’s coordinator, a Macintosh user, to insert these questionnaires into the appendices before finalization of the report.

To display the various statistical results, I created tables of pre- and post-institute means, t-values, and p-values for the teacher and student questionnaire items. Also, I created a table of teacher and student background information (grade levels, degrees earned, etc.) to provide additional information about the participants in the study.
Finally, I ordered and numbered the appendices and created an automated table of appendices (similar to a Table of Contents) to precede the actual appendices.

**Editing and Final Production**

As with all Center evaluation reports, the OSU Teacher Quality report went through several rounds of edits before finalization. For the first report draft, I wrote the background and methods sections and emailed them to Dr. Kahle to review. She made hardcopy edits and returned them to me to incorporate into the report if appropriate. For example, she informed me that it was necessary to give proper credit to the creators of all instruments used in an evaluation: the E & A Center created the questionnaires and interview protocol and needed to be recognized for this. Also, the RTOP items were derived by two individuals at ACEPT (Piburn & Sawada, 2001). Therefore, I cited the ACEPT organization and these individuals in my first referral to the RTOP.

After completing a second draft of the report, I emailed a copy to the project director. After she had reviewed the report for accuracy, she gave it to Dr. Kahle for a second round of edits. (Approximately one to two weeks were necessary to review each draft.) After all necessary edits had been made to the report, an electronic copy was sent to a reviewer at OSU. The reviewer had one week to submit comments or changes concerning the draft. As the reviewer made no changes to the report, the Center’s coordinator and I made a few final formatting changes, created a PDF file from the report, and sent the file to Miami’s Print Center at Gaskill for printing and binding. Copies of the printed report were then sent to the project’s Principal Investigator and other interested parties. The final report was 71 pages long; including 5 pages of front matter, 33 appendix pages, and 33 pages for the report itself.

**Summary and Project Insights**

The OSU Teacher Quality study was beneficial to my internship and my development as a technical communicator in several ways. First, the study helped me expand my internship role due to the number of new tasks I needed to perform. For example, for the first time during my internship, I wrote SAS programs and conducted statistical analyses. Performing statistical analyses enable me to better understanding the procedures the Center used to analyze
quantitative data (performing a check for outliers, calculating frequencies on all data, and running statistical tests).

I also analyzed qualitative data (interviews and RTOP data), which I had not previously had the opportunity to do. Learning to analyze interview data was especially useful, because it gave me practice in evaluating interviewee responses as either supporting or failing to support the project’s goals. Also, analysis of RTOP data gave me a better understanding of how the RTOP instrument is used in classroom observations to assess teaching practices.

In addition, I was responsible for all of the report writing, as opposed to just writing particular sections or editing the writing of others. Writing the report from beginning to end helped me to see how the various parts of an evaluation report work together and required me to use results from the various data analyses to tell a story about the project and the ways that its goals were and were not met.

Finally, I had the opportunity to interact with the client through email and phone calls to discuss data issues. These interactions with the client were valuable because they helped me to learn about the kinds of information (such as dates of data collection and sample sizes) that an evaluator needs to obtain from project personnel. They also helped me understand the possible causes of poor-quality data (e.g., incorrect data entry) and the deleterious effect that poor-quality data can have on an accurate evaluation.

This project helped give me confidence in producing a complete evaluation report, from the data analysis to the report writing process and the creation of appendices. I feel that my ability to perform future evaluations, or parts of ones, has been greatly increased and that the tasks I performed for this study have increased my capabilities both as an evaluator and as a technical communicator.
Chapter Four: Reflections on Telecommuting and Working In a Research-Oriented Organization

In this chapter, I discuss my experiences with telecommuting and working for an organization involved in evaluating educational research. This section will hopefully prove informative to technical communicators who have not worked under these conditions. Since collaboration with others was a key aspect in my ability to write successful evaluation reports, I will highlight throughout this chapter the importance of working well with others.

The Telecommuting Experience

As mentioned at the beginning of this report, the lack of office space at the Center’s location in Billings Hall made it necessary for me to work from home much of the time. This telecommuting experience, while efficient and convenient in many respects, also led to several issues that were hard to resolve. In this section, I describe my telecommuting experience and its advantages and disadvantages.

As a telecommuter, I performed most of my work (writing, editing, data analysis, information design) from home using my own computer, a Dell PC. I worked at Billings whenever I needed to meet with Dr. Kahle, my mentor, the project directors, or others at the Center. Such meetings required approximately three hours a week. I enjoyed getting a chance to talk with the others at the Center and tried to get to know them so that they would view me as part of their organization. At the beginning of my internship, I would work at Billings once or twice a week (whenever there was a spare computer available due to someone being out of the office). At these times, I would use a Macintosh (the standard computer platform at the Center). I was given a USB device that I used to transfer files from my PC to computers at Billings and vice versa. I did not use Zip
disks for this purpose after damaging one of mine during a file transfer attempt. The USB device, with its lack of moving parts, seemed safer to use.

The main difficulty I faced when working on a report using two different computer platforms was the appearance of the document and the incompatibility of software (mainly Word); these issues made it difficult to collaborate and share documents with other staff members. (Sharing documents with other workers was an especially important aspect of the Kamehameha study, as discussed in Chapter 2.) First, the line spacing within documents was different depending on which platform I was using. This variation in spacing caused tables and other sections of the report to break in unexpected places as I switched from one platform to the other. Also, using a different Macintosh each time I was at Billings was problematic because the document would sometimes be paginated differently depending on the computer being used, despite identical page layout settings. Also, when creating PDFs on certain of the Macintoshes (to send final reports to the print center), I sometimes encountered formatting problems. (The Center uses Tahoma font in the report, but for one PDF the font came out as Times. When I recreated the PDF on my home PC, the font came out as expected.) Second, incompatibilities between platforms and the software used for these platforms caused many tables to take on an unacceptable appearance when copying a Macintosh table into a PC document. Many tables were too large to fit into my PC documents and took on a very strange appearance that made the tables unusable. In some cases, I was able to recreate the tables from scratch; in other cases, I asked a staff member at Billings to save my PC file as a Mac file and insert the table into the Mac file. In any case, all documents needed to be converted to a Macintosh format before finalization and printing.

One way I resolved these platform incompatibilities was to create a PDF file for any document whose appearance (for example, line spacing and formatting) I wanted to preserve. This process also made for a smaller electronic file that was easier to transfer by email. The Center did provide a Mac G4 laptop that I could use at work, given available space, or at home. In this way, I would be able to use the same platform and physical computer at home or at work. More importantly, I would be using the same platform as the others at the Center. However, I cannot report on the impact of a laptop on my work, since I received the computer at the end of my internship. My expectation is that having the laptop will make my work more convenient and
efficient because I will be able to work from anywhere, insert parts of other Mac documents into my own documents, and share files more easily with others at the Center. I will also be able to store my work on the laptop’s hard drive instead of using USB devices to transfer files from one computer to another. Therefore, the use of a Macintosh laptop seems to be the best short-term solution to resolving the hardware and software incompatibilities I experienced during my internship.

Besides hardware and software issues, the other major difficulty I sometimes experienced due to telecommuting was a deficiency in communication/collaboration between the Center’s staff and myself. Because I knew very little about evaluating education reports or working with granting agencies and became involved in projects after they had begun, I was often writing and editing evaluation reports without a clear understanding of either the project or the process of conducting evaluations and writing evaluation reports. Also, without being able to communicate face-to-face with Dr. Kahle or the project directors on a regular basis, I was not always able to obtain information or have questions answered in a timely manner. I used email and phone calls to communicate with the Center, but emails were not always answered immediately or completely. Some of my questions could have been answered by documents residing on the Center’s server; however, I did not obtain access to the server until after my internship. At times, I needed to delay my work on a particular report because I did not have the correct information at the right time. Thus, the lack of immediacy in communicating with others at the Center sometimes made it difficult to complete my work in a timely manner and with a minimum of frustration.

It is interesting to note that the telecommuting issues I faced and their solutions corresponded reasonably well with research findings I had uncovered during Fall 2004 while doing a literature review on virtual organizations in my organizational communication class (COM 619). This review revealed several principles that members of these organizations frequently use to work together successfully. Even though the Center cannot be considered a virtual organization (an organization whose members usually work and communicate at a distance), I often worked apart from the Center’s other personnel; therefore, my situation was comparable to those I encountered in my literature review. For the 33 articles I reviewed, the top three principles for working with virtual teams were the following: (1) use appropriate technologies (e.g., the availability of
compatible hardware and software, electronic means of communication, etc.), (2) create communication protocols (i.e., how often and in what way to communicate with other workers), and (3) communicate face-to-face occasionally. These principles address the major issues I faced while conducting my internship as a telecommuter.

Despite the above difficulties, telecommuting offered its share of advantages. I was able to work at any time of the day or week, and this flexibility enabled me to meet deadlines more easily. It was also quieter at home, and I was able to concentrate better and was more productive as a result. Since I possessed the necessary software and hardware to work at home and the ability to create PDF files, I had the capability to accomplish my work at a distance and communicate and/or transfer my results to others (with the exception of occasional hardware and software incompatibilities).

Based on my internship experience, telecommuting seems a viable option for those who live far from their place of work or whose workplaces have limited space as long as certain conditions are met, especially the occurrence of regular face-to-face meetings with coworkers. Such meetings enable one to (usually) obtain immediate answers to questions pertaining to one’s work and allow all those involved in a project to sit down together at the same time and discuss project issues. Such discussions often raise and/or provide solutions to project issues because of the informal, spontaneous nature of conversations that tend to take place when people are in the physical presence of one another. In contrast, when people communicate through the use of email, or through teleconferences, discussions are usually briefer and less spontaneous because of the greater effort involved with composing written messages or with conversing with a group of people through the speaker of a phone. In addition, collaboration between the telecommuter and regular staff members is made easier when there exist adequate computer capabilities for converting and transferring electronic files and when there are no (or very few) software and hardware incompatibilities between the home and the workplace. Finally, the more knowledge the telecommuter has regarding the field s/he is working in and the organization’s working processes, the easier it will be to work independently when necessary.
Working for a Research-Oriented Organization

My experiences with working for a grant-supported organization that evaluates educational research may not be common for some technical communicators, so in this section I plan to discuss insights obtained from my internship regarding this type of work. Such insights include knowledge of what to include and not include in an evaluation report, correct and consistent language use within the reports, giving recognition to granting agencies and developers of evaluation instruments, the importance of having accurate data to analyze and knowledge of the specific analyses performed, the importance of summary information to evaluation reports, and the importance of collaboration between writers and editors. The importance of collaboration between the report writer and staff members in general is highlighted throughout this section.

One of the key things I learned from writing the evaluation reports was the importance of providing enough information from the evaluation’s methods and findings to assess the extent of the project’s success and to make recommendations regarding any further implementations of the project. Thus, although many documents of technical communicators are designed to help the reader perform some task (such as instruction manuals or help files), evaluation reports need to be written to inform readers of the evaluation’s goals, the reliability/validity of the evaluation instruments and what the instruments measure, and the representativeness of the study participants’ responses. I therefore learned to provide samples of each instrument in the appendix, to state their statistical reliability, and to provide the number of respondents for each instrument to help readers determine the representativeness of those responses. In addition, I needed to provide information on each project’s background, goals, and methods. I found study proposals and websites useful in this regard, as well as discussions and collaboration with other Center personnel involved with the study. An audience analysis would have been useful for focusing my writing, but I usually did not have enough information about my audience to conduct an effective analysis. Also, the audience information that was available was sometimes revised part-way through the evaluation process. I therefore took a conservative approach when writing, assuming a minimally-informed audience that would need concise but detailed information about the study and its evaluation. I applied this approach to the explanation of statistical concepts as well: Statistical findings need to be more fully explained to a general audience than to one possessing a background in or knowledge of statistics. Since I was often
unsure of my audience’s background, I used a semi-conservative approach, using common statistical terms (p-value, mean, standard deviation, etc.) without going into detailed explanations of these terms.

A good evaluation report also requires one to use a particular style of writing. I found it necessary to use a somewhat formal, scientific language style written in the third person for the Center’s reports. This type of language helps to convey an impartial, dispassionate approach to the evaluation process. I also learned to accurately and succinctly state the facts throughout each report and to not make judgments regarding the report’s findings. Such judgments are ultimately left to each project’s investigators and funding agencies. However, I was able to make several recommendations based on the findings in case the project had a chance of being continued the following year. (If the project was not to be funded for another year, I typically excluded the Recommendations section.) I also found it necessary to state the goals of each evaluation very clearly, using the language of the project’s proposal (although changes to the goals and proposal sometimes occurred during the life of each project).

The writing style I used for the evaluation reports is both similar to and different from that typically used in the MTSC program. As a MTSC student, I was encouraged to write clearly, accurately, and concisely while keeping my audience in mind. These writing requirements correspond well with the writing style I used for my internship. However, the writing I did in the MTSC program was often more reader-centered and informal than that used in the evaluation reports. Even though I kept my audience in mind when writing each report, I needed to use technical statistical terms and precise language in order to accurately describe the evaluation and its results. And, as discussed above, my audiences were often less clear during my internship than during the MTSC program, where I was able to address my writing to specific clients. All technical communicators must deal with audience analysis issues; however, these usually involve writing for multiple audiences as opposed to being uncertain of the nature of one’s readers. For these reasons, my internship writings were more oriented toward the evaluation details than to the readers. I feel that this difference in writing styles benefits evaluation reports in that the reports are technically accurate and provide the necessary details for those who must make decisions based on the reports. However, the reports may frequently sound very formal and
stilted for many readers; a better-defined audience could enable the writing of reports that are more reader-friendly.

Consistency of language terms and formats was also of high importance to the Center’s evaluation reports. For example, the Center used standardized formats to give its reports an organized and consistent appearance. It was thus necessary for me to be able to use templates and styles in Word in order to apply these formats. I also used Word to create footers containing the report title and page number for every page of each report. In addition, I needed to ensure consistency of terms, language use, formatting, and use of APA style throughout the report. I used the stylesheet described in Chapter 2 to help me maintain such consistency. Another method I used to help ensure consistency within the reports was to perform a search and replace in Word as an efficient way to discover any inconsistencies in my writing. Finally, I recommend collaboration between project members in the form of upfront planning and before the evaluation begins as a way to obtain agreement among all parties as to the terms and conventions to be used in a report. Because my participation in the evaluations usually came near the end of the project, I was not able to encourage such initial planning among the Center’s personnel. However, such planning can help ensure that correct goals are measured, that correct instruments are used to measure these goals, and that correct terms are used consistently throughout the report (names of sample and comparison groups, terms for participants, and so on). This type of consistency helps readers to avoid confusion regarding the meanings of specific terms and words and lends an air of uniformity and cohesion to the report.

Giving recognition to granting agencies (such as the Ohio Board of Regents (OBR) or the National Science Foundation (NSF)) and information sources is another important element of evaluation reports. I provided recognition to granting agencies in the background section of each report and when describing specific assessment measures such agencies required as part of the evaluation. I also needed to include the names of these agencies when creating marketing materials (such as the E & A Center brochure). In addition, I learned that references and citations play an important part in evaluation reports, not just in research studies. Background information is always needed, especially in a first-year report, and this information often comes from sources that need to be cited and referenced. And when referring to proposals, the Principal Investigator
of the study needs to be cited. Finally, it was important to give the names of the developers (usually the E & A Center) of all instruments used in an evaluation. Such recognition provides useful information to readers who may have questions about an evaluation’s instruments or background. Providing names of qualified individuals involved with a project also gives that project and its evaluation a greater sense of credibility (or ethos) than they might otherwise have.

Successful collaboration with the Center’s clients (and Principal Investigators for the projects) also was important for producing effective evaluations. For example, having access to complete, accurate, and timely data was essential to the writing of high-quality evaluation reports. On occasion, our clients would provide the Center with incomplete or inaccurate data, or the data would arrive in an untimely way. In these cases, we needed to make multiple requests to obtain the data we needed, a situation that delayed the evaluations to a certain extent. At times, our evaluations were not as complete as originally planned because of data that was never obtained. From this experience, I learned that a project’s evaluation can only be as good as the quality of the available data. Technical communicators who also serve as project managers can help maximize the quality of an evaluation’s data by communicating regularly with clients, reminding them of deadlines and of any gaps or inaccuracies in project data, such as I did with outlying data values for the OSU Teacher Quality study (see Chapter 3).

In addition to having access to accurate data, I found that familiarity with data analysis methods was helpful when writing the findings of evaluation reports. Regardless of whether or not I performed the analyses for a given evaluation, such knowledge helped me to understand how the data were used to evaluate the project and to communicate and work with the data analyst to ensure that accurate statistical information was being provided that would help assess each project’s goals. This understanding helped me when writing each report’s methods and data analysis sections and when explaining the evaluation’s findings. I also used a knowledge of statistics when checking the quality of data in the OSU Teacher Quality study.

This internship also taught me about the usefulness of summaries to evaluation reports. The Center made use of several kinds of summaries in such reports: an overall summary of findings,
additional summaries after major sections (for complex reports such as Physics First), and an executive summary that encompassed the background of the study, the basic methods used to evaluate the project, and the overall findings. These summaries, the executive summary in particular, are sometimes the only parts of a report that people have the time to read, so it is important that the summaries be both detailed and concise. In addition, the Center uses project summaries in some of its marketing materials (e.g., its brochure) and on its website; here again, comprehensiveness, combined with conciseness, is desirable: Such materials are an efficient way to provide information to people who are interested in the Center; this information thus helps the Center to effectively market its services.

Finally, I learned that technical writers and project managers can act as collaborators on a report to maximize its quality and accuracy. I therefore found it necessary to carefully review others’ edits to my work to ensure the edits made sense and did not alter my intended meaning. For example, during my work on the OSU Teacher Quality study, Dr. Kahle made a number of edits to one of the last drafts of the final report. I reviewed these edits and, during a meeting, I commented that some of her requested changes would lessen the accuracy of what I had written or did not correspond to APA conventions. I provided explanations for each of my concerns, which helped her to understand the logic underlying my writing. Dr. Kahle ultimately reversed her decision on approximately half of her edits; for the other edits, she explained her own logic behind them, and her explanations helped me to accept the edits.

In summary, from my internship I learned that collaboration among the technical communicator, the project manager, other staff members, and the client is necessary when conducting high-quality evaluations of education research. Giving proper credit to others when writing evaluation reports, composing summaries of pertinent information, and using a proper writing style also are essential to writing effective evaluation reports. I hope these insights may prove useful to others beginning to embark on a career in science writing.
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Appendix A
E & A Center Brochure

Below is the outside of the E & A Center brochure.

Faculty and Staff

E & A Center and Evaluation Services Center full-time staff include:

* Jane Butler Kahle, Ph.D., Project Investigator (MU)
* William J. Boone, Ph.D., Project Investigator (MU)
* DeAnne Zon, B.Ed., Director (UC)
* Ina DeLoreah Johnson, Ph.D., Co-PI (MU)
* Helen Meyer, Ph.D., Co-PI (UC)
* Amy E. Cassidy, Ph.D., Senior Researcher/Project Director (MU)
* Catharine V. Maltbie, B.Ed., Senior Researcher/Project Director (UC)

Universities of State and National Affiliates:

* City University of New York (Graduate Center)
* Cleveland State University
* The Ohio State University
* University of Dayton
* University of Delaware
* University of North Carolina
* University of Pennsylvania
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A collaboration between Miami University and the University of Cincinnati.

Providing high quality evaluation and research for programs and projects in science and mathematics education.
**Appendix A (cont.)**

Below is the inside of the E & A Center brochure.

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**Ohio Evaluation & Assessment Center**

Ohio's Evaluation & Assessment Center for Mathematics and Science Education is a partnership between Miami University and the Evaluation Services Center at the University of Cincinnati. The Center, located at Miami University, provides high-quality evaluation and research for programs and projects in science and mathematics education and in educational reform.

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<thead>
<tr>
<th>Expertise</th>
<th>Special Features</th>
<th>Selected Projects</th>
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<tr>
<td>Evaluators at the E &amp; A Center and Evaluation Services Center have expertise in the following areas.</td>
<td>The Center provides the following additional features.</td>
<td>Listed below are several of the Center's current projects.</td>
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<tr>
<td>- Science and mathematics instruction (preK - 20)</td>
<td>- Involves, as needed, affiliated faculty with expertise in specific areas from numerous universities within Ohio and across the country</td>
<td>- iDiscovery: Reform that Works</td>
</tr>
<tr>
<td>- Qualitative and quantitative evaluation and research</td>
<td>- Maintains a repository of valid and reliable instruments to assess progress in mathematics and science education reform (including student achievement)</td>
<td>- Physics First Evaluation, Nanotechnology Schools</td>
</tr>
<tr>
<td>- Web-based instruction and assessment</td>
<td>- Maintains several large databases, allowing comparisons with similar groups as appropriate</td>
<td>- The Mathematics Science Partnership in New York City (MEAP/VC), City University of New York</td>
</tr>
<tr>
<td>- Redesign and development of assessment instruments</td>
<td>- Effectively disseminates evaluation and research findings through both scholarly and popular venues</td>
<td>- Science Teacher Institute, University of Pennsylvania (SLIP)</td>
</tr>
<tr>
<td>- Translation of research and evaluation findings for policy makers and the general public</td>
<td></td>
<td>- Evaluation and Needs Assessment, Ohio Resource Center for Mathematics, Science, and Reading</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evaluation, Developing a Corporate Feedback System for Use in Curriculum Reform, University of Cincinnati</td>
</tr>
</tbody>
</table>

[http://ohioeval.muohio.edu](http://ohioeval.muohio.edu)
Appendix B
iDiscovery Brochure

Below is the outside of the iDiscovery brochure.

What is Discovery?

Discovery is a collaborative statewide systemic reform initiative originally funded in 1991 by the National Science Foundation. Since its inception it has successfully served thousands of Ohio teachers and their students. It strives to improve science and mathematics education by

* fostering face-to-face professional development seminars and workshops for educators
* focusing on mathematics and science content, and problem-solving/inquiry-instructional strategies
* sustaining professional development in the critical implementation phase

What is Project Dragonfly?

Project Dragonfly is an inquiry-based science education initiative centered at the School of Interdisciplinary Studies at Miami University. It has reached millions of children, parents, and teachers since its inception in 1994 through

* Dragonfly, the first national magazine to feature real investigations by children
* Dragonfly Workshops, Web-based, inquiry-driven learning communities for professional development
* Dragonfly QUEST, a national badge program for the Boys & Girls Clubs of America
* Dragonfly TV, a national PBS television series featuring real kids doing real science
* Earth Expeditions, a partnership with The Cincinnati Zoo & Botanical Gardens, offering educator workshops at the Zoo and at conservation sites around the world

Contact Information

Terry McCollum
The Discovery Center
Miami University
Oxford, Ohio 45056

(513) 529-1086 Office
(513) 529-2110 Fax
iDiscovery@muohio.edu

www.iDiscovery.org

Support for iDiscovery is provided by a grant under the federally funded Improving Teacher Quality Program, administered by the Ohio Board of Regents.
Appendix B (cont.)

Below is the inside of the iDiscovery brochure.

What is iDiscovery?

iDiscovery provides Web-based learning communities that support professionals as they strive to implement strategies and techniques learned during Discovery Institutes and Workshops.

- iDiscovery supports teachers’ use of:
  - inquiry- & problem-solving-based instruction
  - effective teaching and learning practices
  - standards-based instruction
- iDiscovery improves students’ engagement in mathematical and scientific practice
- iDiscovery reaches out to Ohio’s underserved areas, including urban districts and rural Appalachia, where face-to-face follow-up can be difficult

Goals

The goal of iDiscovery is to support the implementation of strategies and ideas learned during face-to-face workshops and institutes.

- Extend exposure to key concepts and approaches
- Provide additional knowledge on an as-needed, just-in-time basis
- Provide on-going emotional support

Workshop Features

About 15 participants form each Web-based learning community to:

- explore Web resources, including Ohio Resource Center for Mathematics, Science, and Reading
- discuss relevant readings, & lesson plans
- develop, share, & discuss implemented lesson plans

Web-Based Learning Community

The collaborative Web platform used by iDiscovery was created by Miami University’s Project Dragonfly and has a proven record of supporting the implementation of workshop experiences in the classroom.

- The site is easy to use and intuitive so that participants do not need computer or Web experience
- Participants work from a home or school computer on their own schedule
- Participants collaborate with each other and with facilitators in a seminar-style discussion while implementing reform initiatives

www.iDiscovery.org
Appendix C
Brochure 17 x 11 Inch Master Page

Brochure master page showing 11 x 8.5 inch brochure area with ¼ inch margin (partially in dark blue) for text, crop marks, columns, and guide lines.
Appendix D  
Table of Contents: Kamehameha Physics First Report

Below is a partial table of contents for the Kamehameha Physics First project.

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>2</td>
</tr>
<tr>
<td>Kamehameha Schools</td>
<td>3</td>
</tr>
<tr>
<td>Physics First Program</td>
<td>4</td>
</tr>
<tr>
<td>Ninth Grade Conceptual Physics Course</td>
<td>5</td>
</tr>
<tr>
<td>Long-Term Evaluation Goals</td>
<td>6</td>
</tr>
<tr>
<td>Evaluation Questions</td>
<td>7</td>
</tr>
<tr>
<td>Methods &amp; Materials</td>
<td>8</td>
</tr>
<tr>
<td>Evaluation Design</td>
<td>9</td>
</tr>
<tr>
<td>Sample and Comparison Groups</td>
<td>10</td>
</tr>
<tr>
<td>Instruments</td>
<td>11</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>21</td>
</tr>
<tr>
<td>Findings: Teaching Practices</td>
<td>23</td>
</tr>
<tr>
<td>Constructivist Learning Environment Survey (CLES)</td>
<td>23</td>
</tr>
<tr>
<td>Bridging Student Questionnaire - Science (BSQ)</td>
<td>30</td>
</tr>
<tr>
<td>Teacher and Student Interviews</td>
<td>36</td>
</tr>
<tr>
<td>Findings: Student Attitudes and Persistence in Science and Mathematics</td>
<td>47</td>
</tr>
<tr>
<td>Kamehameha Schools (KS) Attitude Survey</td>
<td>47</td>
</tr>
<tr>
<td>Parent Questionnaire</td>
<td>49</td>
</tr>
<tr>
<td>Findings: Student Achievement</td>
<td>54</td>
</tr>
<tr>
<td>ITED and CTP Achievement Tests</td>
<td>54</td>
</tr>
<tr>
<td>TIMSS Performance Assessments</td>
<td>60</td>
</tr>
<tr>
<td>Summary of Results</td>
<td>77</td>
</tr>
<tr>
<td>Implications &amp; Conclusions</td>
<td>81</td>
</tr>
<tr>
<td>Implications for First-Year Evaluation Questions</td>
<td>81</td>
</tr>
<tr>
<td>Conclusions</td>
<td>85</td>
</tr>
<tr>
<td>Recommendations &amp; Next Steps</td>
<td>87</td>
</tr>
<tr>
<td>References</td>
<td>88</td>
</tr>
<tr>
<td>Appendices</td>
<td>90</td>
</tr>
<tr>
<td>Appendix A. Questions for the Long-Term Evaluation of Physics First</td>
<td>91</td>
</tr>
<tr>
<td>Appendix B. Constructivist Learning Environment Survey (CLES)</td>
<td>92</td>
</tr>
<tr>
<td>Appendix C. Constructivist Learning Environment Survey (CLES) Results</td>
<td>98</td>
</tr>
<tr>
<td>Appendix D. Student Questionnaire - Science (BSQ)</td>
<td>101</td>
</tr>
<tr>
<td>Appendix E. Student Questionnaire - Science (BSQ) Results</td>
<td>104</td>
</tr>
<tr>
<td>Appendix F. Classroom Observation Protocol</td>
<td>108</td>
</tr>
<tr>
<td>Appendix G. Interview Protocol: Physics Teachers</td>
<td>111</td>
</tr>
<tr>
<td>Appendix H. Interview Protocol: Non-Physics Teachers</td>
<td>114</td>
</tr>
<tr>
<td>Appendix I. Kamehameha Schools (KS) Attitude Survey</td>
<td>116</td>
</tr>
<tr>
<td>Appendix J. Kamehameha Schools (KS) Attitude Survey Results</td>
<td>119</td>
</tr>
</tbody>
</table>
Appendix E
E & A Center Bridging Student Questionnaire

This is a sample questionnaire developed by the E & A Center that is frequently used by the Center to obtain information from students enrolled in science.

DIRECTIONS

We need your opinion about science and this science class. This is not a test. There are no right or wrong answers. Your opinion is important! For each question, circle the answer that best matches your expectations or experiences.

How to Answer:

For each item, circle the answer that best reflects how often this happens in your science class.

Sample Item:

In this science class, my teacher ...

<table>
<thead>
<tr>
<th></th>
<th>Almost Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. gives me homework.</td>
<td>AN Se So O</td>
<td>VO</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remember to answer ALL items!

In this science class, I...

1. do science problems from textbooks.
2. do science problems in small groups.
3. do lab activities.
4. use a calculator.
5. use a computer.
6. write a few sentences about how I solved a science problem.
7. do science projects.
8. do worksheets.
9. learn that there are different solutions to science problems.  
10. talk with my classmates about how to solve problems.  
11. repeat experiments to check results.  
12. have a say in deciding what activities I do.  
13. learn from my classmates.  
14. use information to support my answers.  
15. am encouraged to apply science to my after-school activities.  
16. learn science facts by using worksheets.  
17. memorize science facts so that I can do well on tests.

<table>
<thead>
<tr>
<th></th>
<th>AN</th>
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<td>17</td>
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</table>

In this science class, my teacher...

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<thead>
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<th></th>
<th>AN</th>
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<td>23</td>
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</tbody>
</table>

Almost Never  
Seldom  
Sometimes  
Often  
Very Often

Your opinion is important!

When I take science tests, I...

<table>
<thead>
<tr>
<th></th>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
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<tr>
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<td>31</td>
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</tr>
</tbody>
</table>

42
32. select true or false.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

33. select an answer from a list.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

34. interpret graphs.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

**My friends...**

35. talk about science outside of class.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

36. discuss things they have learned in science class.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

37. make fun of people who like science.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

38. work on science projects.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

39. think science is for boys.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

40. enjoy doing science-related activities outside of class.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

41. are interested in science.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

42. make fun of people who get good grades in science.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

43. think science is dumb.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

**At least one adult in my home...**

44. makes me do my science homework.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

45. asks about what I am learning in science class.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

46. helps me with my science homework.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

47. helps me work on my science projects.

<table>
<thead>
<tr>
<th>AN</th>
<th>Se</th>
<th>So</th>
<th>O</th>
<th>VO</th>
</tr>
</thead>
</table>

**In the future, I expect to ...**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>48. take no more science courses in high school after this year.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>49. take 1-2 more years of science courses in high school.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>50. take four years of science courses in high school.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>51. take science courses in college.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>52. major in a science discipline in college.</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>53. pursue a science-related career.</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

I don’t plan to go to college.

Thank You for Completing this Questionnaire!
Appendix F  
Sample Kamehameha Tables and Figure

Below I show examples of the types of tables and figures I created to display results of the Kamehameha study. The information has been modified for confidentiality purposes.

Table A1. Study Participants by Cohort and Academic Year.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Cohort 1 (Class of ‘06)</th>
<th>Cohort 2 (Class of ‘07)</th>
<th>Cohort 3 (Class of ‘08)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>9th Grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physics (Campus 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biology (Campus 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-04</td>
<td>10th Grade</td>
<td>9th Grade</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chemistry (Camp. 1&amp;2)</td>
<td>Physics (Campus 2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biology (Campus 1)</td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>11th Grade</td>
<td>10th Grade</td>
<td>9th Grade</td>
</tr>
<tr>
<td></td>
<td>Physics (Campus 1)</td>
<td>Chemistry (Camp. 1&amp;2)</td>
<td>Physics (Campus 2)</td>
</tr>
<tr>
<td></td>
<td>Biology (Campus 2)</td>
<td></td>
<td>Biology (Campus 1)</td>
</tr>
</tbody>
</table>
Appendix F (cont.)

Table A2  Comparison of Frequency of Teaching/Learning Activities in Biology (Campus 1) and Physics (Campus 2) Classrooms.

<table>
<thead>
<tr>
<th>In this classroom, the teacher . . .</th>
<th>Mean Scores (SD)</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9th Grade Biology</td>
<td>9th Grade Physics</td>
</tr>
<tr>
<td>. . . asks questions that have more than one answer (open-ended questions) ***</td>
<td>4.23 (0.81)</td>
<td>3.49 (0.99)</td>
</tr>
<tr>
<td>. . . encourages students to ask questions ***</td>
<td>4.70 (0.51)</td>
<td>3.74 (1.17)</td>
</tr>
<tr>
<td>. . . lets students work at their own pace</td>
<td>3.91 (0.65)</td>
<td>3.87 (0.94)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In this classroom, students . . .</th>
<th>Mean Scores (SD)</th>
<th>P - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>. . . use technology (calculators) ***</td>
<td>3.67 (0.87)</td>
<td>3.04 (1.40)</td>
</tr>
<tr>
<td>. . . use technology (computers) ***</td>
<td>3.67 (0.87)</td>
<td>2.17 (1.12)</td>
</tr>
<tr>
<td>. . . repeat experiments to check results</td>
<td>2.89 (1.06)</td>
<td>2.86 (1.21)</td>
</tr>
</tbody>
</table>
Appendix F (cont.)

Figure A1. ITED and CTP scores for Cohort 2.
* p < 0.05.
Appendix G
iDiscovery Report Edits: Example

The following is an Executive Summary that I wrote for the iDiscovery evaluation report. I have provided both an unformatted version (before Dr. Kahle edited my writing) and also the final formatted version, after editing. For confidentiality reasons, I have not provided any conclusions.

Executive Summary
Through Teacher Quality Improvement (TQI) funds, OBR is supporting a second and third year of iDiscovery. Ohio’s Evaluation & Assessment Center for Mathematics and Science Education (E & A Center) has provided the first- and second-year evaluations of iDiscovery (2003-2004 and 2004-2005). The purpose of the evaluations is to ascertain the extent to which iDiscovery affects science and mathematics teachers’ science and mathematics instruction. Specifically, the evaluations assessed the extent to which the following project goals are met.

1. Enhanced sustainability of participants’ professional development;
2. Increased collaboration and communication among science and mathematics educators; and
3. Increased knowledge of and access to standards-based instructional resources and online materials by participants.

Evaluation of the second year of iDiscovery used the following measures and instruments: iDiscovery registration records, the iDiscovery Pre- and Post-Institute Questionnaire, questionnaire items developed by the OBR, and the iDiscovery Learning Community Scoring Rubric. These measures and instruments enabled an assessment of iDiscovery participation rates, an assessment of the quality of the online learning communities, the frequency and extent to which teacher-participants in the learning communities share their new knowledge and skills with others in their buildings or districts, and an assessment of teacher-participants’ science and mathematics instruction as well as their use of the Ohio Resource Center for Mathematics, Science, and Reading’s (ORC) website.
Executive Summary

Through Teacher Quality Improvement (TQI) funds, OBR is supporting a second and third year of iDiscovery. Ohio’s Evaluation & Assessment Center for Mathematics and Science Education (E & A Center) has provided the first- and second-year evaluations of iDiscovery (2003-2004 and 2004-2005). The purpose of the evaluations is to ascertain the extent to which iDiscovery affects science and mathematics teachers’ science and mathematics instruction. Specifically, the evaluations assessed the extent to which the following project goals are met.

1. Enhanced sustainability of participants’ professional development;

2. Increased collaboration and communication among science and mathematics educators; and

3. Increased knowledge of and access to standards-based instructional resources and online materials by participants.

The evaluation of the second year of iDiscovery used the following measures and instruments: iDiscovery registration records, the iDiscovery Pre- and Post-Institute Questionnaire, questionnaire items developed by the OBR, and the iDiscovery Learning Community Scoring Rubric. These measures and instruments enabled an assessment of, assessed iDiscovery participation rates, an assessment of the quality of the online learning communities, the frequency and extent to which teacher-participants in the learning communities shared their new knowledge and skills with others in their buildings or districts, and, an assessment of teacher-participants’ science and mathematics instruction, as well as and their use of the Ohio Resource Center for Mathematics, Science, and Reading’s (ORC) website.
Appendix H
Style Sheet: Excerpts

Below are excerpts from the style sheet I developed for the E & A Center.

<table>
<thead>
<tr>
<th>Style issue</th>
<th>Preferred use</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Word usage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(general)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>that/which</td>
<td>Use <em>that</em> within a restrictive clause; otherwise, use <em>which</em>.</td>
<td>The scores <em>that</em> were obtained from the math students were excellent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>while/since</td>
<td>Use <em>while</em> and <em>since</em> only when making references to time. Otherwise, use terms such as <em>although, because, etc.</em></td>
<td>The girls took the science test <em>while</em> the boys took the math test. Ever <em>since</em> taking the practice test, the students felt more confident. <em>Although</em> the reading scores were acceptable, they were not as high as the science scores.</td>
</tr>
<tr>
<td>enrolled in/taking (a class)</td>
<td>enrolled in</td>
<td>The students were <em>enrolled in</em> Physics 100.</td>
</tr>
<tr>
<td>mean/average</td>
<td>mean</td>
<td>The <em>mean</em> mathematics score for girls was 4.5.</td>
</tr>
<tr>
<td>percent/percentage</td>
<td>percentage (unless specifying a particular number)</td>
<td>The <em>percentage</em> of students taking social studies was high. Boys made up 53% of the students in the course.</td>
</tr>
<tr>
<td>item/question (of an instrument)</td>
<td>item</td>
<td>Teachers responded to each <em>item</em> of the RTOP.</td>
</tr>
</tbody>
</table>
### Appendix H (cont.)

#### Numbers

| Numbers < 10 | Write out in words. | The students completed **five** assignments. |
| Numbers => 10 | Use numerals. | The BSQ was administered to **11** students. |

#### Beginning of sentences

| Denote the number by a word, not a numeral. | **Ten** students participated in the study. |

#### Leading zeros

| Place a leading zero before numbers between 1 and -1. | **p** = **0.015** |

#### Large numbers

| Use a comma to set off units of a thousand. | The number of students exceeded **2,500**. |

#### Math/stat information

| Use numerals. | **5%**; the **3rd percentile**; **6 times** as many |

#### Abbreviations

#### Latin abbreviations

| i.e. = *that is* | The comparison group (**i.e.**, students enrolled in the traditional science sequence) consisted of **200** students. |
| e.g. = *for example* | The test covered many aspects of writing ability, *for example*, grammar, spelling, and the use of logical arguments. |

| Use commas after these terms/abbreviations. Only use the abbreviated form inside parentheses. |

#### Percent vs. %

| Use percent with words; % with numbers | **Nine percent**; **100%** |

#### Acronyms

| Abbreviations of acronyms frequently used in reports (write out for first use). | **BSQ** (Bridging Student Questionnaire) |
| **ITED** (Iowa Test of Educational Development) |
| **NEOCEx** (Northeast Ohio Center of Excellence) |
| **RTOP** (Reformed Teaching Observation Protocol) |
### Statistics

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Girls ((n = 20)) comprised 40% of the study participants ((N = 50)).</th>
</tr>
</thead>
<tbody>
<tr>
<td>p-values</td>
<td>(p = 0.229)</td>
</tr>
<tr>
<td>Equal signs</td>
<td>(p = 0.001)</td>
</tr>
</tbody>
</table>

### Punctuation

<table>
<thead>
<tr>
<th>Periods</th>
<th>The chapter’s title was “Education in History.” (See Table 2.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The chapter’s title was not considered appropriate.</td>
<td></td>
</tr>
<tr>
<td>Table 2 shows the test results. Students in Group A scored higher than did students in Group B.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commas/ semicolons</th>
<th>The chapter’s title, “Education in History,” was not considered appropriate.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place commas inside quotation marks.</td>
<td></td>
</tr>
<tr>
<td>Use a comma before the last item in a series.</td>
<td></td>
</tr>
<tr>
<td>Use a comma to set off an exact, but not inexact, date.</td>
<td></td>
</tr>
<tr>
<td>Use a semicolon to separate items that contain commas.</td>
<td></td>
</tr>
<tr>
<td>The test was intended for students in the first, second, and third grades.</td>
<td></td>
</tr>
<tr>
<td>January 25, 2003, was the intended day.</td>
<td></td>
</tr>
<tr>
<td>or January 2003 was the intended day.</td>
<td></td>
</tr>
<tr>
<td>The dates included January 25, 2003; March 5, 2003; and June 30, 2003.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix I

SAS Program Used to Analyze the OSU Teacher Data

Below is the SAS program I wrote to analyze the response frequency data for the OSU Teacher Quality study.

****************************************;
*                                      *
* OSU.SAS                              *
*                                      *
* THIS PROGRAM READS AND ANALYZES THE  *
* OSU TEACHER QUALITY DATA             *
*                                      *
*                                      *
* SAS VERSION: 6.12                    *
*                                      *
* DATE: 6/6/05                         *
*                                      *
* AUTHOR: PAM MARKS                    *
*                                      *
*                                      *
**************************************;

*** SET UP FORMATS FOR VALUES OF THE VARIABLES ***;

proc format;
  VALUE RATEFMT 1 = 'almost never' 2 = 'seldom' 3 = 'sometimes' 4 = 'often' 5 = 'very often';
  VALUE IMPFMT 1 = 'very unimpt' 2 = 'unimpt' 3 = 'impt' 4 = 'very impt';
  VALUE CRSEFMT 1 = 'physical science' 2 = 'algebraic reasoning' 3 = 'inq. and process skills' 4 = 'geology';
  VALUE CLTYPFMT 1 = '3' 2 = '4,5,6' 3 = '7,8,9' 4 = '10,11,12';
  VALUE SUBJFMT 1 = 'biology' 2 = 'gen. science' 3 = 'chemistry' 4 = 'physics' 5 = 'earth science' 6 = 'integrated science' 7 = 'gen. elementary science' 8 = 'science - other' 9 = 'gen. math' 10 = 'pre-algebra' 11 = 'applied math' 12 = 'algebra 1' 13 = 'geometry' 14 = 'math - other' 15 = 'integrated math';
  VALUE $SUB2FMT 'ALGE' = 'algebra, geometry' 'APMAL' = 'applied math, algebra' 'GMPA' = 'general math, pre-algebra' 'PSES' = 'physical science, earth science' 'SPED' = 'special ed';
  VALUE CHARFMT 1 = 'remedial' 2 = 'mixed ability' 3 = 'honors' 4 = 'other';
  VALUE $CHAR2FMT 'SC3' = 'self-contained class other' 'SpEd' = 'special ed.';
  VALUE GENDFMT 1 = 'female' 2 = 'male';
  VALUE TRACEFMT 1 = 'African American' 2 = 'American Indian/Alaskan Native' 3 = 'Appalachian' 4 = 'Asian/Pacific Islander' 5 = 'Hispanic' 6 = 'White non-Hispanic';
  VALUE GRTCHFMT 1 = 'K - 3' 2 = '4 - 6' 3 = '7 - 9' 4 = '10 - 12' 5 = 'K - 8' 6 = '7 - 12' 7 = '9 - 12' 8 = '1 - 8';
  VALUE CERTFMT 1 = 'K - 3' 2 = '4 - 6' 3 = '7 - 9' 4 = '10 - 12' 5 = '9 - 12' 6 = '7 - 9' 7 = '9 - 12' 8 = '1 - 8' 9 = 'K - 12' 10 = '4 - 9';
  VALUE DEGFMT 1 = 'Bachelor's' 2 = 'Masters' 3 = 'Masters+30' 4 = 'Doctorate';
  VALUE $CERT2FMT 'COM' = 'computer science' 'other' = 'other' 'ReadK12' = 'Reading, K-12' 'SpEd' = 'Special Ed.' 'ss' = 'social sciences';
  VALUE CHNGFMT 1 = 'teaching practices' 2 = 'proficiency scores' 3 = 'enrollment' 4 = 'professional dev.' 5 = 'curriculum' 6 = 'other' 7 = 'reading and math programs' 8 = 'accountability' 9 = 'practices/enrollment/time' 10 = 'more teacher interactions' 11 = 'equipment/materials' 12 = 'teaching practices/accountability';
  VALUE CHNG2FMT 1 = 'much worse' 2 = 'a little worse' 3 = 'no change' 4 = 'much better' 5 = 'a little better' 6 = 'not been here long enough';
  VALUE CAUSEFMT 1 = 'teaching practices' 2 = 'state policy' 3 = 'professional develop.' 4 = 'new faculty' 5 = 'school behavior policy' 7 = 'no child left behind' 8 = 'more time' 9 = 'less time' 10 = 'school district policy' 11 = 'reading program' 12 = 'funding' 13 = 'emphasis on proficiency tests';
RUN;
*** CREATE TEMPORARY DATASET FROM PERMANENT DATASET ***;
LIBNAME IN "C:\Documents and Settings\Pam\Desktop\Pam";
DATA OSUTQ; SET IN.OSUTQ;
RUN;

*** CHECK DATA FOR OUTLIERS ***;
PROC UNIVARIATE DATA=OSUTQ;
RUN;

*** OBTAIN FREQUENCIES FOR ALL VARIABLES ***;
PROC FREQ DATA=OSUTQ;
RUN;

*** OBTAIN DIFFERENCES FOR TEACHER QUESTIONNAIRE ***;
*** FREQUENCY RESPONSE SCALE ***;
data in.diff; set osutq;
ARRSEATD = ARRSEATA - ARRSEAA2;
OPENQSTD = OPENQSTA - OPENQA2;
SUPEVIAD = SUPEVIDA - SUPEVIA2;
STUQSTD = STUQSTAA - STUQSTAA2;
OWNPACED = OWNPACAA - OWNPACA2;
EXPLOTHD = EXPLOTHA - EXPLOTHA2;
ALTEXPD = ALTEXPA7 - ALTEXPA2;
ZOOTRIPD = ZOOTRIPA - ZOOTRPA2;
MATSCID = MATSCIA9 - MATSCIA2;
DISCUSSD = DISCUSSA - DISCUSSA2;
MUESTRPD = MUESTRPA - MUESTRPA2;
HISTD = HISTA12 - HISTA2;
NONTRADD = ASSTRADA - NONTRAAS2;
JUSTIFYD = JUSTIFYA1 - JUSTIFYA2;
DEBATED = DEBTEA2 - DEBTEA2;
REPEXPD = REPEXPA3 - REPEXPA2;
MULTIPAD = MULTIPA4 - MULTIPA2;
ALTEXPD = ALTEXPLA - ALTEXA2;
DSGTESTD = DSGTESTA - DSGTESA2;
CONSULTD = CONSULTA - CONSULA2;
TALKD = TALKA8 - TALKA2;
TECHD = TECHA9 - TECHA2;
LITERD = LITERA10 - LITERA2;
REALWLDD = REALWLDA - REALWLDA2;
SUBJND = SUBJKNA1 - SUBJKNA2;
DISAGKND = DISAGKNA - DISAGKNA2;
LAWCHND = LAWCHNGA - LAWCHNA2;
KNREVD = KNREVAA4 - KNREVAA2;
UNRESD = UNRESA5 - UNRESA2;
TESTEDED = TESTEDA6 - TESTEDA2;
REFIND = REFINTHA - REFINTA2;
EMPEVD = EMPEVDA8 - EMPEVA2;
WAYSD = WAYSKNA9 - WAYSKNA2;
PDSCHRD = PDSCHR - PDSCHR2;
TCMATSDD = TCMATES - TCMATRS2;
FLEXRDF = FLEXSCHR - FLEXSCHR2;
PROFRD = PROFTSR - PROFTSR2;
EQUIPRD = EQUIPR - EQUIPR2;
TIMEND = TIMER - TIMER2;
Appendix I (cont.)

PSCURRD = PSCURRR - PSCURR2;
MODCURRD = MODCURRR - MODCURR2;
PFOTVRD = PFOTVR - PFOTVR2;
ALTASSRD = ALTASSR - ALTASSR2;
RUN;

*** RUN T-TESTS ON FREQUENCY RESPONSE SCALE ***;

PROC UNIVARIATE DATA=IN.DIFF;
VAR ARRSEATD OPENQSTD SUPEVIAD STUQSTD OWNPACED EXPLOTHD ALTEXPD ZOOTRIPD MATSCID
   DISCUSSD MUESTRPD HISTD NONTRADD JUSTIFYD DEBATED REPEXPD MULTIPAD ALTEXP DSGTESTD
   CONSULTD TALKD TECHD LITERD REALWD SUBJKNW DISAGKNW LAWCHND KNREVD UNRESED TESTEDED
   REFIND EMPEVD WAYSD PDSCHRD TCHMATRD FLEXRD PROFRD EQUIPRD TIMERD PSCURRD MODCURRD
   PFOTVRD ALTASSRD;
RUN;
Appendix J
Sample Interview Results for the OSU Teacher Quality Study

The following is an excerpt from the interview findings section of the OSU Teacher Quality Study. Although the results have been slightly altered to help maintain the study's confidentiality, they illustrate the way in which the Center evaluates and displays responses to interviews.

Interview Findings: Changes in Teachers’ Content Knowledge
In general, teachers felt that their content knowledge increased after participation in the institutes. They also had more confidence in their ability to teach in that subject area, as indicated by the following comments.

I didn’t realize until I took the pre-test how much I didn’t understand . . . I was also surprised by some of the misconceptions that I held until the instructor helped me to better understand the concepts (Teacher 3, p. 1).

I had very little previous knowledge of the subject area. . . I really did get some useful knowledge (Teacher 2, p. 1-2).

I knew nothing about this area of science going into this class. I feel that I have learned even more content knowledge than I needed – this has made me a more confident educator (Teacher 4, p. 1).

I felt okay about my knowledge, but after the institute I gained more confidence in my subject area (Teacher 9, p. 1).

My knowledge is much, much better, and I feel more comfortable teaching this subject (Teacher 8, p. 2).

However, some teachers were not entirely satisfied with their post-institute level of content knowledge.

. . . I could still benefit from further professional development in several areas (Teacher 2, p. 2).

My content knowledge still does not meet my needs (Teacher 8, p. 2).