

Writing as a Way of Knowing in a Cross-Disciplinary Classroom

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**Technical Report Series
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THE CENTER FOR INTERDISCIPLINARY STUDIES OF WRITING

UNIVERSITY OF MINNESOTA

227 LIND HALL

207 CHURCH STREET S.E.

MINNEAPOLIS, MN 55455

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Preface

The cross-disciplinary course “Ways of Knowing,” offered through Continuing Education at the University of Minnesota, offers a unique environment in which to observe the similarities and contrasts among writing in different disciplines. Over a 30-week period, the course exposes students to writing and readings in six different fields. Researchers Janine Hockin, Carol Miller, and P.T. Magee used the 1992-1993 “Ways of Knowing” course as a laboratory in which to examine students’ and faculty’s perceptions about the characteristics and purposes of writing in psychology, art history, biology, philosophy, biophysics, and sociology.

Projects such as this one, together with ongoing Center projects, should result in improved undergraduate writing, the Center’s primary goal. Along with colloquia, conferences, publications, and other outreach activities, the Center annually funds research projects by University of Minnesota faculty who study any of the following topics:

- characteristics of writing across the University’s curriculum;
- status reports on students’ writing ability and the University;
- the connections between writing and learning in all fields;
- the characteristics of writing beyond the academy;
- the effects of ethnicity, race, class, and gender on writing; and
- curricular reform through writing-intensive instruction.

We are pleased to present this technical report as part of the ongoing discussions about Writing In the Disciplines. One of the goals of all Center publications is to

encourage conversations about writing; we invite you to contact the Center about this publication or other Center publications and activities.

Lillian Bridwell-Bowles, Series Editor
Kim Donehower, Editor
June 1996

Introduction

“Ways of Knowing,” a three quarter Continuing Education course at the University of Minnesota, serves as the site for this project, which analyzes how students understand and acquire abilities to make use of distinctive conventions of academic writing across six disciplines. “Ways of Knowing,” led by six faculty members drawn from the humanities, sciences, and social sciences who interact together, serves approximately twenty students for a full academic year (1992-1993) to discover common and contrasting discipline-based methods of inquiry and learning.

For this study, the addition of systematic analysis of “ways of writing” as a significant and consistently embedded course component engaged students and teachers in identifying conventions of writing in different fields, considering how writing in separate fields is assessed, and discovering links between writing and learning within and across disciplines. Relevant data for the study include course syllabi and reading assignments, periodic formal and informal journal entries by all class members identifying writing issues within each discipline segment, and interviews with all faculty and with student participants.

Project goals of the writing study are: 1) to identify and assess distinct characteristics of writing within a field through examination of organizational patterns, stylistic devices, voice and audience, themes, and vocabularies of the writing of professionals within the field; 2) to analyze students’ comparative analysis of characteristics of writing in each subject area; 3) to examine students’ responses to writing in each of the six disciplines and their ability to identify discreet and common characteristics; 4) to examine students’ acquisition of discipline-specific features of

writing; and 5) to gather information from students and faculty about how writing and learning are related in each discipline and whether transfer of abilities across fields of study occurs.

The radically interdisciplinary structure and the duration of the “Ways of Knowing” course offer a unique laboratory for discovering answers to the research questions and stated goals for this writing project.

Background

The six subject areas that are the focus of the course and this writing study are: psychology, art history, biology, philosophy, biophysics, and sociology. Specific academic subfields (specialty areas) are reflected in each. Focus in psychology, for example, is in the area of social psychology, personality, and self-monitoring concepts, with an overview of both experiment and observation methods. The art history segment examines early Indian art history. Biology centers on the discovery of oncogenes; students are asked to read and analyze a series of papers published in scientific journals over a period beginning in the early seventies. The philosophy section discusses philosophical voice and subjectivity, spanning works from the early Greeks to contemporary feminist philosophers. Biophysics is a study of the structure of protein “folding” by means of computer models and hands-on model making projects. The sociology segment focused on the African-American family as viewed through various sociological lenses.

Faculty members in each segment adjust course syllabi to the shortened five-week segments and design assignments so that students will know more about the thinking of scholars in the field rather than acquiring an abbreviated overview of each discipline. In

the psychology segment, students create imaginary studies and experiment on themselves, using well-established psychological instruments. The art history segment assignments include a visit to an art museum and an observation/narrative analysis of specific works of Indian art. The “Ways of Knowing” biology section combines the reading in sequence of the technical papers leading to the discovery of oncogenes with the application of the scientific process to problem solving in an imaginary experiment. Work assignments in philosophy include writing a dialogue among several of the philosophers studied and critiquing one another’s short written assignments. Biophysics engages class members in building models of proteins using whatever creative materials students can find, and reading a range of technical and nontechnical articles and papers from the field about the structure and mechanics of proteins. The sociology segment focusing on the African-American family uses collaborative writing and group presentations by students, along with readings and response to a controversial videotape produced by Bill Moyers on the “decline” of the African-American family structure in America.

The class is limited to eighteen students who apply for admission (see application in Appendix A) and the six faculty members who both teach and participate as students in the segments they do not lead. Students in “Ways of Knowing” come to the course with strengths and weaknesses in different subject areas. Those, for example, with more previous course work in the social sciences and/or humanities feel more at ease with the segments in those subject areas, while students with stronger backgrounds in the basic sciences tend to feel more confident in biology and biophysics. The variety of intellectual

preparation makes the “playing field” rather uneven, a fact that requires attention from students and instructors throughout the year.

Students in the 1992-1993 class involved in our study appeared to fall into a fairly “traditional” profile. The majority were approximately eighteen to twenty-five years of age and were completing undergraduate degrees and/or preparing for graduate work. They are concerned with performance measured by grades (particularly the single-grade-for-the-entire-course concept embraced in “Ways of Knowing”). Students also mention the number of written assignments in each segment as a source of anxiety and want participation in weekly class discussion to be weighed more heavily in assessment. In addition to their voiced concerns about achievement and how it is assessed, students show enthusiasm for the course and the writing study, approaching both with vigor, optimism, and high expectations of themselves and faculty.

Literature Search

A literature search examined four areas of inquiry identified as the focus of the study: 1) characteristics of writing in each discipline, 2) development of individual student writing processes, 3) the benefits of writing to effective learning, and 4) a systematic comparison of writing within the disciplines.

Characteristics of Writing

Though we do not discover much in the literature that directly details characteristics of writing in different disciplines, we do find support for the idea that a student’s knowing and learning discipline-specific information is critical to good writing in that discipline. Students need to know how to analyze and imitate the reading and writing they encounter; across disciplines, the settings vary in which writing and the

processes it entails occur (Anderson, Best, Black, Hurst, Miller, 1990). Students who are new to a field may need less demanding assignments initially, which help them understand the new reading and the new language that they are being asked to learn (McCarthy, 1987). Writing assignments that focus on characteristics of specific disciplines give students an opportunity to learn particular patterns of inquiry such as observation, generalization, and problem solving techniques associated with those disciplines (Herrington, 1981).

Teachers provide the major key to unlock the discreet characteristics of discipline fields for students. The teacher is in effect an intellectual guide to each discipline. Only the teacher of a particular discipline knows enough about the learning processes characteristic of that field—ways in which information is collected and organized, ways in which problems are solved and questions answered—to introduce students to those processes (Knoblauch and Brannon, 1983). Teachers first need to recognize the importance of writing to the organization and maintenance of a discipline, including why disciplines explore certain subjects, what methods of inquiry are used, how the traditions of a discipline shape writing in that discipline, how individual writers represent themselves in writing, how articles and texts are read and published, and how one writer's work influences others (Faigley and Hansen, 1985).

Development of Individual Student Writing Processes

Much of the literature on the development of student writing first recognizes the enormity of the task of mastering interdisciplinary writing at the college level. In general, however, a broad review of this body of literature provides useful information about how effective writing skills within disciplines can be developed. By definition, a liberal arts

education is one in which a student must learn to try on and “master” a variety of voices and interpretive ideas. A student mimics the language of individual disciplines while both finding a personal voice and following the conventions of that subject area (Bartholomae, 1985). Many of these conventions and presuppositions, however, are not expressly articulated (McCarthy, 1987).

Theories concerning stages of writing development point to the composing process itself, described as planning or goal setting, translating, and reviewing (evaluating and revising) (Bartholomae, 1985). Another categorization includes a three-step process consisting of 1) conception—determining what is expected and how to proceed, 2) incubation—getting the facts straight and explaining the matter to oneself, and 3) production—actually committing ideas to paper for an audience (Freisinger, 1980).

In addition to working through stages of composing, students successful in writing are those who can determine what constitutes appropriate written work in each classroom—the content, structure, language, ways of thinking, and supportive evidence required in that discipline and by that teacher (McCarthy, 1987.) The successful student writer can manipulate an audience about which she or he may know very little, imagining and writing from a position of privilege, as a member of the academy would (Bartholomae, 1985). This requires an attitude of self-confidence and trust. Writers initially don’t know where they’re going but rely on the process of composing to take them somewhere and lead them to meaning and creative outcome (Fulwiler, 1986).

Teachers who foster the development of good writing don’t just dispense information and judge answers. They allow students to be actively engaged in learning

through constant use of language (Kimpston, Williams, Stockton, 1992). Good teaching in contexts of specific disciplines and learning also means that an instructor elaborates exactly what a particular discipline's conventions are and "demystifies" them by teaching them in the classroom (Bartholomae, 1985).

Additionally, most learning doesn't occur in a class itself, and teachers do not always talk about how to organize information to remember and interpret it. Students in science and math classes learn from each other before and after class (Anderson, Best, Black, Hurst, Miller, 1990). Composition students often share writing and respond to each other's work. And where collaboration in writing is not openly accepted or encouraged, it goes on in ways that are more covert (McCarthy, 1987).

Benefit of Writing to Effective Learning

It is now well established that writing is not only a complex intellectual process but also a mode of learning and of communicating what has been learned. Writing allows a student to manipulate thought, making thoughts visible, which in turn allows a writer to interact with and modify them. There is also evidence suggesting that writing is the activity that most promotes independent thought. The decision to write and the process of writing are actions: a student can't be passive and at the same time write words, sentences, and paragraphs (Fulwiler, 1986). The difference between listening, a passive activity at which students spend most of their time, and writing, which is active, is important (Weiss, 1979).

In addition to recognizing the benefit of activity versus passivity in learning, the literature supports the direct connection between writing and the amount and quality of

student learning. Writing provides connections and aids in synthesizing material. It also helps students to digest reading and translate it into personal meaning and language. Writing is part of the discovery process, which is to say that the writer defines a task, formulates and shapes ideas through drafts, and then states ideas coherently in a final written product (Herrington, 1981). The level of intellectual commitment a student has to a subject area and how well the thought processes “penetrate” a discipline are likely to improve because writing forces the mind to confront new experiences, make connections with other experiences, and find personal understanding and clarity (Knoblauch and Brannon, 1983).

Lastly, the data shows that the greatest effects on improved writing and learning occur when more time is spent on writing, reading writing, and discussing writing. It also indicates that ideas students learn by using writing are perceived as learned more clearly than ideas learned through lecture, discussion, or simply reading without writing (Weiss, 1979).

Students agree that they are judged and evaluated mainly on “products,” primary of which is independent work such as writing (Anderson, Best, Black, Hurst, Miller, 1990). They also emphasize that writing assignments must have meaningful personal and social functions if they are to be manageable and significant for that individual (McCarthy, 1987).

Comparison of Disciplines

Important to recognizing similarities and differences among disciplines is understanding the goals of writing in the basic sciences, humanities, and social sciences. In the basic sciences, for example, authors aim to represent reality and present texts that

inform readers using a uniform structure and format. Articles imply that reality is represented thoroughly and comprehensively through evidence supplied for claims. Information is assumed to be new to the audience, and the writer is most concerned with supplying support for principal claims (Rowan, 1989). In the social sciences and humanities, learning to write in a professional format may not be the only strategy employed by the instructor of a course. Teachers may have different standards to be followed in student writing: (a) teaching students to write like professionals in a discipline or (b) following a liberal arts tradition, asking students to explore questions presented by the subject matter of a course (Faigley and Hansen, 1985).

One problem for students involved in interdisciplinary writing (that is to say, all students taking a variety of course work at any given time) is a failure of students to notice, and teachers to point out, the commonalities of various disciplinary writings. Although students interpret disciplines as being totally different from each other and different from what they may have done before, most student writing assignments have several components in common if they require informational (summary and analysis) writing. Most students have their teachers as audience; and most teachers want students to display specific information but, in addition, become competent in using the thinking and language of the discipline. When students focus on new ways of thinking and writing in each setting, they fail to notice similarities with previously acquired processes, and products, and consequently, writing tasks, are more difficult for them (McCarthy, 1987).

Methods

Throughout this writing study, four methods of data collection were used: responses to informal and formal journal questions, interviews with faculty members, and interviews with three groups of students who participated in the class.

The informal journal questions (Appendix B) asked students to reflect upon each segment's progress and expectations, particularly individual writing and learning processes, as well as class work and interactions. Students were given the informal journal questions after the third week of each segment and were asked to complete their responses in class. Submissions were collected by a student volunteer, who, over the next week, compiled the group's responses into a collective summary. The summaries were returned to students the following week and a brief discussion led by the volunteer "recorder" or "synthesizer" was encouraged so that faculty and students could monitor individual and group progress through the course.

Formal journal questions (Appendix C) focused specifically on writing in and across the disciplines. Questions were intended to streamline thinking to reveal answers to our study's pertinent issues: students' perceptions of characteristics of writing in a particular discipline, development of individual writing processes, connections between writing and learning, and comparisons of writing across disciplines. The formal journal questions were distributed during the third or fourth week of each section, completed by students outside of class time, and returned to the project's principal investigator or research assistant the fifth week of that segment.

An interview with each faculty member was conducted by the research assistant toward the end of, or following completion of, a segment. Faculty schedules generally

determined when the interview took place. Interview questions for faculty (Appendix D) were about disciplinary qualities of writing and pedagogical concerns relating to each subject area. Faculty were asked to discuss representative themes, methods, and stylistic features in their disciplines, what kinds of writing assignments were usually asked of students in those disciplines, the purpose of and qualities assessed in student writing, how discipline-specific writing was taught, and how the written performance of students in “Ways of Knowing” was assessed. Time allowed for each faculty interview was thirty minutes, but faculty members often had much to say about the topics, and flexibility to allow more interview time was critical.

Student interviews occurred at the end of the course and study, and involved recruiting student volunteer participants. Six students who actively participated in the writing study over the course of the year were chosen for student interviews. To facilitate and broaden discussion, students were paired so that three interviews involving six students with the research assistant as interviewer were completed. Student interview questions (Appendix E) concerned themselves with the student’s personal view of disciplinary writing. Students attempted to compare and contrast representative features of writing in the disciplines, discussed the development of their writing processes, reflected upon connections they may or may not have seen between writing and learning in the discipline, and assessed their own written performance in “Ways of Knowing.” As in the faculty interviews, a strict thirty-minute time limit did not allow the kind of free-flowing discussion necessary for a complete interview, and we adjusted accordingly so that students felt open to discussing broader issues, such as class interactions and teaching styles, which indirectly affected their writing.

Analysis

Analysis of the responses to the informal journal entries was driven in large part by the organization of information in each segment by the student volunteer collator/reporter. The informal journal question was intended to be open-ended, and, therefore, analysis included as many of the student comments about the subject matter, teaching, learning, and class interactions as possible. Each of the reporters, however, did include specific comments on how students were progressing with the writing in each discipline. Those comments were assembled and themes that occurred repeatedly were noted.

Formal journal question responses were examined in the categories of interest to the study: characteristics of a discipline, individual writing processes, increased understanding of subject matter through writing, and comparisons of the disciplines. In each category, ideas and themes that students repeatedly voiced in their responses were identified. Also noted were student reflections in each category that might be particularly insightful to questions raised in the writing project.

Though faculty members responded to the questions shown in Appendix D, analysis centered on several themes apparent in every interview: changes in disciplinary writing in each field, collaboration versus competition in scholarly writing, personal writing techniques and problems unique to each discipline, evaluation of student writing in the “Ways of Knowing” course, and reasons for teaching disciplinary writing by means of different pedagogies employed at the undergraduate and graduate levels. Answers appear unedited and are merely placed within these categories emerging as themes.

Analysis of the student interviews focused on the themes recurring throughout the interview and not necessarily on specific responses to questions generated in Appendix E. These themes were: student levels of confidence in their writing, the number and difficulty of writing assignments, risks and pressures involved in writing, and assessment of written performance. There was also some analysis of the means of comparison employed by students in thinking about the variety of disciplines. Additionally, students discussed the successes and failures of various pedagogical approaches. Again, in terms of analysis, answers were placed within these categories emerging as repeated themes.

Results

From Combined Informal and Formal Journal Entries

Characteristics of Writing

In describing characteristics of writing in each of the six disciplines comprising “Ways of Knowing,” students responded largely to the issues of format, language, vocabulary, voice, and audience. The psychology section in “Ways of Knowing,” concentrated in the subfield of social psychology and personality, appeared to students to intermingle personal, creative, theoretical perspectives with statistical, empirical, experimental results. Students reported on the writing in this segment as having an easily identifiable format (introduction, method, results, discussion), and a style both informative and persuasive. They further noticed that writers’ voice and context were posed to multiple audiences—to other professionals (with a technical and statistical slant) or to a broader, nonprofessional audience (containing more prose and being generally easier to read).

Students in the art history segment of “Ways of Knowing,” with its focus on early Indian art, were initially intimidated by the writings. They expressed concern with unfamiliar vocabulary and confusing formats and had difficulty following the logic of conflicting theories. Students concluded in their formal journal entries that the format of writing in this particular art history segment was made up of an introduction, body, and conclusion. They noticed a strong personal tone and voice by writers of articles they were assigned in the subfield, with frequent detailed descriptions of art and artifacts. Authors of the writings assigned combined “historical fact” with assumption/presumption as techniques to present arguments. Journal entries reflected student opinion that the audience to which writing was aimed in this discipline is specialized and has familiarity and expertise with historical and artistic subject matter.

The biology segment of “Ways of Knowing” examined scientific papers tracing the discovery of oncogenes over an approximately twenty-year period. Papers assigned were original scientific articles: students commented early in the informal journal writing about difficulties with scientific vocabulary and concepts, and noted prodigious amounts of effort necessary in learning correct terminology. One student commented, “A great deal of time and creativity is used in making appropriate terminology.” Students easily identified the conventional scientific format employed by authors of the papers—introduction, method, results, and discussion. Though vocabulary was specialized, material was presented in a straightforward way. Students stated in their formal journal entries that authors used logic to bring readers to results without superfluous conjecture. A strong assumption appeared to exist on the part of professional writers in biology that the audience understood scientific language well and was able to comprehend methods,

procedures, and results. Journal entries included comments such as, “The field reflects the exclusivity of its socialization process.”

Responses to philosophy in the informal journal entries showed that students’ immediate reactions were either to feel very connected to the subject as the “stuff of life,” or to express sentiments such as, “It’s fun chewing on the questions the philosopher raises, although it’s like chewing gum—lots of exercise but not too much nutrition.” A broad range of authors in philosophy was selected by the instructor for “Ways of Knowing” and students noted the variation in style. They commented that the writing format appeared to establish a foundation, and then built evidence that surrounded and supported an idea. The class had difficulty identifying a specific vocabulary or language of philosophy. They found cross-reference difficult and meaning vague and unnecessarily abstract. Thoughts were presented in a rational/concise manner. Students speculated in their journals that philosophers were writing to themselves to clarify their own thinking. The tendency, as perceived by “Ways of Knowing” students, was for a writer to “bash and replace” rather than build upon the work of predecessors, an important feature identified in the biology segment.

Students in “Ways of Knowing” were immediately impressed with the subject matter and teaching/learning segments in the biophysics segment. The focus of the section was on the structures of proteins, and students were asked to build their own protein models. This seemed to be a relief from the numerous writing assignments given up to this point. Of equal relief was the selection of less technical papers as well as reprints of original research. A student wrote, “The atmosphere of this section allows for more freedom in the writing, which minimizes the fear of scientific inadequacies and

even nurtures ways of knowing.” Though students observed a more simplified content and perspective in some of the works—emphasizing a summary of the current project, previous groundwork on a broad research question and then conclusions—language contained frequent use of chemical and mathematical jargon and was technical. “Ways of Knowing” students perceived the intended audience in biophysics as other scientists with a strong emphasis on methodology, even when the reading was a less technical paper or article. Comments about seeing glimpses of a scientist’s “personal process on the road to discovery” were made concerning the biophysics readings assigned, and this was an appreciated feature of representative readings in this segment.

Informal journal entries in the sociology segment mentioned the readability of articles (less jargon) and the clear voice projected by authors (having their own and obvious agendas). Attention in this discipline included in “Ways of Knowing” was on sociological perspectives on the African-American family. Writing was described as free flowing and readable. Vocabulary was characterized by students as easy to understand with ideas presented clearly and straightforwardly. As one student described it, “Sociology has been easier to read... it is an easier field to jump in with both feet.” The instructor made clear to students that the assigned readings in sociology were somewhat atypical of the field, with their focus on critiques. Selected readings reflected concern about the “sociology” of the African-American family experience.

Development of Student Writing Processes

Findings on the development of student writing processes in the specific disciplines of the course reflected both student frustration and personal discovery. Students began consideration of their writing progress in the social psychology segment

of “Ways of Knowing.” They stated the importance of writing and the risk involved in committing ideas to writing in the informal journaling. Students then either tried to imitate writing of professionals in the field or didn’t try. Those who adopted an imitative style appeared to find that it helped to clarify ideas. Some class members felt that they couldn’t imitate writing styles of professional psychologists without more background in the discipline.

The art history segment on early Indian arts lent itself, according to student journal entries, to more relaxed writing styles. “Because of personal voice and more descriptive style, I was more inclined to play with the material,” was how one class member expressed it in a journal exercise. Students noticed that authors employed conjecture to fill in gaps in information (historical, political, and economic data—all a part of art history). Perhaps this tolerance for creating theories in the discipline led students to comment in their journals about the art history writings’ more personal voice and descriptive/narrative formats. Student writing developed as the class asked and answered questions about the readings: who, what, where, when, and why.

Writing about the discovery of oncogenes in the biology section of “Ways of Knowing” proved difficult for the class. Students commented that their writing lacked creativity, they were confused about what appeared to be certain “givens in the field,” and they were concerned that they felt “no instant familiarity, no real comfort zone,” with their writing efforts. Writing seemed to progress when students allowed a longer incubation process for their thoughts about subject matter in the biology section. They stated that technical vocabulary limited their communication, and they noted willingness to write only about that which they understood. One student commented in a journal

entry, “The reading is so difficult, all I can do is to answer questions as directly as possible with some semblance of flow.”

Though the intent in the philosophy segment of “Ways of Knowing” was to give students a sense of voice in philosophical thought through the ages, students described a more personal stake in the subject. Journals demonstrated this with comments such as, “Writing in philosophy has been more of a direct assault on who I am.” “My writing does not do justice to the topic being addressed.” “This is the stuff of life.” When asked to write philosophy assignments, students said they faced contradictions in thinking. Class members more obviously began to imitate writers they read in philosophy and led readers to conclusions by writing and thinking in an ordered way. Such students seemed, on the other hand, encouraged by the work of contemporary philosophers to write in their own voices.

Students saw writing in the biophysics segment as somewhat secondary to visualizations of the complicated concepts of protein structures through their own model building and the elaborate computer graphics shown by the instructor. A student wrote, “The most important things I have learned so far in this section are how to visualize proteins. I will never think about them the same again....” Complaints similar to those expressed about the biology section of “Ways of Knowing” also emerged, however; students said they felt intellectually unequipped to imagine and knowledgeably describe the concepts addressed. Some students saw again the “just the facts” approach of writing in the basic sciences; others discussed their struggles to find their own voices in biophysics and felt their writing was without any natural “flow.” However, one comment among those in the informal journal compilation of the biophysics segment pointed to

development in writing based on the knowledge acquired in previous disciplines: "My writing is progressing in a more structured form, based on feedback from previous sections, and not trying to pattern it after what we've read in this one."

A comment in the informal journal entries for the sociology segment set the tone for student development in writing sociology. The student remarked upon the clarity of the authors' agendas that led "Ways of Knowing" class members to see the discipline as allowing personal voice. Formal journal entries in the sociology segment discussed students' feelings of "freedom" in their writing assignments due in part to the content presented by the topic of the African-American family, and in part to the nature of the writing assignments. Assignments were structured to elicit response, reaction, and critique. A comment by one student revealed a process by which the student moved from personal revelation to more polished edited versions, including supportive evidence for a position. "After more time has passed, I re-approach materials with a critical eye and look for the weak spots that either need supportive evidence or professional polish....

Providing supportive evidence is my weak spot so it has been a challenge to strive to improve this." Another student expressed a sense of appreciation for a newfound ability to write about conflicting ideas, and said that "such dialogue is necessary for truly responsible study."

Relationship Between Writing and Learning

From the outset, students agreed that a relationship existed between student writing and learning in a discipline. The informal journal entries in the psychology segment showed a consensus that writing forces contemplation, adds to growth and understanding, and develops thought. Students believed that writing in the social

psychology and personality segment encouraged reflective thinking in a way that discussions alone did not. Those students who chose to write in the prescribed form of this discipline thought it helped in understanding how the discipline functioned. They also suggested in the formal journal entries that writing for an “audience” forced greater clarity and depth of understanding—acknowledging that writing in psychology was more exact and demanding than it at first seemed.

Formal journal entries about writing/learning relationships in art history discussed student misconceptions of what art history was. A clearer definition evolved from writing about Indian art because it organized thinking so that the facts, figures, evidence, and opinion gathered formed a more complete picture of the “story.” Information coming from the fields of history, politics, religion, and economics are a part of art history. Recognizing this in the discipline’s writings allowed students to answer the question “What is an art historian and what does he or she do?”

The study of the discovery of oncogenes in the biology segment of “Ways of Knowing” was transmitted to students from a combination of difficult scientific articles and instructor clarification of the material. Both informal and formal student journal entries reflected the belief that writing helped to organize information from multiple sources. Students said that not understanding even one piece of information caused them to get lost in the material, and they stressed the need for the instructor’s “interpretive filter” to aid comprehension. Students admitted in the formal journal writing that because of the written assignments they had to complete, they invested much effort in trying to understand the oncogene discovery. Without written work to complete, they might not have labored to this extent.

Writing in the philosophy segment seemed to raise questions and not necessarily provide answers, which students accepted with some struggle? Students discussed the personal nature of philosophy and how it helped them to learn more about themselves. For some, feeling the connection between the discipline and their own personal values made writing in philosophy pleasurable. For others, the perceived importance and abstraction of the inquiry provoked the opposite response, and they felt intimidated and believed their writing did not do justice to the topic being addressed. “As to understanding, that could best be described as running ahead but standing still. My understanding may have increased but not progressed.” Some students proclaimed the need for a system of writing in philosophy that required attention to the development of a thinker’s ideas: outlining the ideas, ordering them, and then abstracting from them.

As in the biology segment on the discovery of oncogenes, students expressed frustration with their lack of familiarity with vocabulary in the biophysics section on protein folding. In the informal journal entries, model building was viewed as a welcome relief from writing papers. Students again (as they did in biology) relied on the instructor’s explanations to fill in gaps in their reading. There was agreement, reflected in formal journal writing that writing in biophysics was necessary to straighten out and clarify thinking. It forced students to slow down and think carefully about the subject matter.

Writing in the sociology section, with its emphasis on the African-American family, seemed more accessible to students than writing in any other discipline (less jargon is noted). In the informal journal entries, students discussed the self-critical nature of the readings and a sense of individual author’s agendas. “This section stretched our

minds in a worthwhile and permanently altering way. It helped us to analyze the individual framework through which we interpret and act within our environments.”

Formal journals revealed students’ perceptions of this discipline’s allowing more freedom of expression in writing. Writing in sociology taught some students what “critique” was, and required analysis of individual and personal frameworks through which students could interpret and act. Students wrote that sociology didn’t ask them to “spew back the party line.”

Comparison of Writing Across Subject Areas

Analysis of formal journal entries showed that students in “Ways of Knowing” found their own unique systems for categorizing disciplines and grouping them to make comparison easier. Examples of the categorizations drawn from formal journal responses were as follows:

- Writing in psychology is exact and ordered. In art history, material is presented in a logical but not necessarily dictated order.
- Psychology breaks complex phenomena into simpler parts, while art history combines facts (art) into a coherent whole (history).
- Writing in biology, biophysics, and psychology all require fluency in vocabularies and previous specialized knowledge. The author of writing in psychology makes an effort to enhance readability with literary quotes and anecdotes. Students contrasted this with a sense of “elitism” and exclusivity in biology.

- Students perceived more effort to persuade on the part of authors in art history, sociology, psychology, and philosophy. Scientific fact and evidence are relied upon in biology and biophysics to prove a point.
- Psychology, biology, and biophysics were grouped together by students on the basis of their requiring empirical support. Art history requires historical support; philosophy requires logical support.
- Students sensed a personal involvement and voice in philosophy writers' work. Psychology and biology writers appear as objective observers. In art history, there is a perception of "this is a story about them."
- Having something to measure seems a part of all the disciplinary writing except philosophy. Philosophical writings are described as illusive.
- Writings in biology, biophysics, and psychology share a format and need for precise explanations, tables, and figures. Art history and philosophy are more ambiguous and subjective in tone.
- Regarding level of difficulty, articles in biophysics are placed between biology (indecipherable) and psychology (clear). Students cited the assignment of less technical papers and articles in biophysics as making writing and reading more understandable.
- Students agreed that their readings and writing in philosophy, sociology, and art history acknowledge the role of power and influence in the politics of knowledge. They believed that neither biophysics nor biology acknowledge anything other than objectivity.

- The importance of visuals in art history and biophysics is recognized as critical to learning in the two disciplines.
- Students saw writings in sociology (again with focus on the Black family) as being the only articles openly advocating change as part of the discipline's pedagogy. Readings in other segments retain the scientific paradigm of distances, and assumed objective observation.

Results

Faculty Interviews

Interviews with faculty members teaching “Ways of Knowing” segments revealed a number of issues of common concern across most of the disciplines. Almost every faculty member discussed the changes in writing reflected in their disciplines.

The instructor for the psychology section said that it is common for psychology authors to do two kinds of writing—technical writing for scientific journals and another category of scholarly writing intended to reach a wider audience. He stated, “Currently more journal articles use the active voice. The researcher can speak as the person who did the research rather than as a depersonalized third person.”

A conversation with the art history professor for “Ways of Knowing” pointed to art history's descriptive quality as its most unique characteristic. However, he added that “In the past three years or so, writing in art history has undergone a transformation. It has become strongly theoretical and much more jargonistic than it had previously been.”

The interview with the biology professor who focused his course segment on the discovery of oncogenes indicated that writing in his subject area has not undergone significant changes. “Every paper has an introduction, an experimental part, results and a

conclusion... all science is structured to essentially control the situation, by using a very carefully defined and specific vocabulary than is really there.” He also contrasted article writing and grant writing, saying that, “A grant is much less cut and dried and there is much more room for creativity in writing a grant proposal.... Grants are more ‘fiction’ than papers.”

The philosophy instructor for “Ways of Knowing” differentiated between traditional academic writing in her field, which she described as impersonal, and a newer view of writing that reflected her own thinking. “My writing has changed over the past few years largely in response to my concerns about issues of privilege.... The generic impersonal voice is the voice of theory, is the voice of privilege, and it’s one that I’m trying not to use. I’m trying to bring into philosophical conversation my own voice.”

Interviewing the biophysics professor for the class revealed her perception that Madison Avenue has invaded biophysics and the natural sciences. Some journals and publications are “flashier.” She thought this is good in that it brings science to nonscientists and helps attract new students, but it also concerned her. The interviewee worried that scientists may inflate findings more than they did using the old, stricter, approach to the reporting of results.

Changes ongoing in the field of sociology were illustrated by the structure of this segment of “Ways of Knowing.” Students first read material written by traditional sociologists and then moved to reading about shifts in the field. The professor accomplished this by assigning critiques, which raised hard critical questions about earlier work. She included articles by feminist sociologists, one of which, she said, “culminates in almost a new epistemology.” She intended students to “see the logic of the

discipline's unfolding... and I want them to get a sense of the tilts and turns that I've had to go through in my own research on the African-American family."

A second theme in the faculty interviews was collaboration vs. competition in scholarly writing. Collaborative work was strongly emphasized in psychology, biology, and biophysics. The psychology professor discussed it most from the standpoint of how advisors work with graduate students in refining a work. In biology and biophysics, most scientific papers have several collaborating authors. The biologist said, "Papers build on one another; papers taken out of context could be totally meaningless.... In biology you don't deconstruct other scientists unless you really are a total radical." The professor of biophysics basically concurred and added, "Collaboration with graduate students is absolutely essential. A paper will pass back and forth between an advisor and student many times." In contrast, the philosophy teacher for "Ways of Knowing" stated that collaborative work is virtually nonexistent in philosophy. "Writing is a way of thinking in philosophy and as such it has a history of being a solitary pursuit." She also expressed her belief that work in philosophy was much more likely to be adversarial rather than building on previous work. While the art historian and sociologist interviewed did not directly address a question concerning collaboration in their fields, they both demonstrated reliance upon it in unique ways. In describing his own personal writing process, the art history professor discussed the important role two close colleagues at other universities played in critiquing his work and providing feedback. The sociology professor almost routinely assigned collaborative written and oral projects in her sociology classes, believing this is an important learning tool for students.

An area of interest in this study of interdisciplinary writing was the kind of response we might elicit from “Ways of Knowing” faculty members concerning questions about their own personal writing techniques and problems—things that might be considered unique to each discipline. Their responses were as varied and unpredictable as their academic fields.

The psychologist described himself as a person who writes many drafts of his work and said, “I really find my thinking proceeds through my writing... sometimes I think I can’t think without writing.” As soon as an idea strikes him, he begins to write and doesn’t believe that committing his thoughts to paper early in the evolution of ideas prematurely forecloses them. He attempts to remain committed to looking again and again at drafts and thinks that for him, “Getting it down on paper shows that further development of the ideas is needed.”

The art historian also employed frequent drafts as a writing technique and said that whatever he’s written “represents my position at that particular time.” He was enthusiastic about the use of computers in writing (a theme repeated by several of the faculty), and stated that the computer as a word processor allowed him to write about something he had considered for a long time or something new which excited him. He uses his own voice, believing that as a senior scholar, he ought to be able to do this. As mentioned before, he addresses a subject as though he were expecting two close colleagues to critique the paper (which they do). Additionally, this instructor noted that his work as department chair takes much of his time, and his scholarly writing, as a result, must be completed ahead of schedule due to unforeseeable job pressures. He

stated, “This gives me time to refine ideas and, in a sense, doesn’t allow ideas to be foreclosed too soon.”

The biologist in “Ways of Knowing” discussed several issues concerning his personal writing style. He writes papers in the order in which they are read: introduction, results, and discussion. The most difficult part for him is often the introduction, and he manages this “hulk” in the following way: “I often sit down to write it, getting blocked, putting it aside and then for a day or so going around trying out introductory paragraphs in my head. When I finally hit one that seems to me to have a certain amount of panache, I’ll go in and write it down; usually, once I’ve got the first paragraph down it begins to flow.” This instructor particularly enjoys the creativity which grant writing allows, but he also described it as a real skill: “There’s a format for grants which is relatively rigid... and if you don’t write your grants in that format they get trashed.”

Besides repeating the theme of finding, and writing in, her own voice, the philosophy professor for the course discussed a personal strategy which she tried teaching students to use in their writing. She asked students to perch an imaginary figure on their typewriter or word processor and have that person give them a friendly, sympathetic, but hard time. “Often papers are not going to work because that character is insufficiently activated.”

The professor of biophysics found that her writing improved through her involvement in the grant review process, which for her began in 1979. She writes more quickly now to produce timely reviews. Along with the course’s art historian and sociologist, she expressed a belief that the use of computers in her writing raised her level of confidence. She can see her ideas on the screen and that helps her reformulate them.

This instructor's earlier writing style was one in which she took a particular idea and developed it as much as possible in one sitting. Her academic life as department chair changed that style. Her time is more fragmented, and this forced her to break an idea into pieces, writing as her schedule allows. She believes the computer facilitated her doing this. She said that using a computer permits her to "relax into writing, makes me feel as though the process is less rigorous, and gives me more confidence."

The positive influence of word processing on her writing is a theme echoed in the interview with the "Ways of Knowing" sociologist. This interviewee thought that access to a laptop computer made writing a less conscious effort. "I can do it anywhere. I can be sitting, relaxing. It's not the conscious effort of going to the office to sit in that uncomfortable chair; it really makes it like a casual activity.... There's an ease there that has really kind of freed me in some ways." The most startling revelation from "Ways of Knowing" faculty regarding personal writing habits also came from the sociology professor. She discussed the pressure of academic writing due to publication demands. Her most creative writing occurred, she believes, as a young student when she wasn't trying to make an argument, or convince a professional audience of anything. She calls academic standards in writing "the great inhibitor." She concluded, "I think that's the reason people who write very well veer away from these formal structures. The critical part is always in your mind, and you end up getting writer's block. Many people say once they went through graduate training, their writing got much worse."

Finally, there was uniform agreement among all six "Ways of Knowing" faculty on the importance of teaching writing in their disciplines. There were differences,

however, in the reasons given for teaching disciplinary writing and in expectations for undergraduates and graduate level work.

Professors of psychology and philosophy perceived the value of disciplinary writing as being essential to critical thinking and to strong engagement with the reading material. The sociologist viewed writing as a way of empowering students to come to grips with reading, and was one of several avenues for student creative impulse.

Professors of art history, biology, and biophysics in “Ways of Knowing” held to a long view of the necessity for disciplinary writing. The art historian discussed his theory that giving students experience in writing prepares them for what they will do in any job as well as providing an exercise in time management, since a good paper “cannot be researched and written the night before.” He also believed writing offers students practice in argumentation, persuasion, and decision-making. “If you can come to conclusions that are going to impact your life in areas in which you have less expertise... you can make that kind of judgment on what evidence is available at hand in a paper in my class.”

Biology and biophysics teachers in the course saw writing at the graduate level as practice for submitting grant proposals and as necessary to earn the Ph.D. Writing grants teaches students how to build scientific arguments. Writing well in science, according to the biophysicist, comes naturally when a student truly understands the subject. She also believed that collaboration on papers with other scientists and advisors builds good interpersonal skills for both student and faculty.

At least three of the six faculty in “Ways of Knowing” viewed writing assignments at the undergraduate level as learning to “speak the language” of that discipline by giving reaction and response. They expected graduate level writing to be

more in-depth, longer, and (in the case of sociology) to make use of original material. In biophysics and biology, graduate students need to write grant proposals and five or six publishable papers, and give evidence in their writing of “deep thinking.” In the natural sciences, writing publishable papers is considered a “major professional hurdle.” The biophysicist interviewed said, “After doing the work (of a research experiment)... getting the paper written is an intimidating task.”

Results

Student Interviews

From the outset in our interviews with students, there were differences in student levels of confidence about their writing skills. Generally, the students who expressed more assurance about writing were more satisfied with their work and how it was assessed than students who were less secure in their writing. Additionally, the same students whom we called “confident” found it easier to conquer writing problems and develop useful strategies than those who showed more concern over their written work.

What we refer to as confidence manifested itself in the following way: the confident student writers in “Ways of Knowing” made a decision to try to grasp ideas and broad concepts and write in their own voices. They did not feel an obligation to perform as writers in the specific disciplines might. Consequently, they were less frustrated with the results of their writing than the students who tried and failed to mimic a sociologist, art historian, etc. As one student said, “It’s not necessarily so cut and dried to read a piece and know all of these standards that go along with it; you can read it and follow it but not necessarily know that you have to have a certain structure, what the unwritten rules are.” Strategies employed by the confident “Ways of Knowing” class members to overcome

writing difficulties ranged from asking lots of questions of the faculty member responsible for the section to forming study groups to discuss difficult subject matter. The need to understand and be clear in writing was not lost on these students; they simply didn't allow themselves to become bogged down in vocabulary or the complications of studying a specific subfield, i.e., Indian art history.

Though almost all of the students we interviewed were most comfortable in subject areas in which they had prior knowledge, again, the more confident group perceived unfamiliar ground as a challenge, not an obstacle. From this group, the following student statement nicely represents their thinking: "I probably would disagree with many classmates that there was a real push to what I would call 'dumb down' the reading, and I think that would be a mistake in any of the course work. It's really good for people to have to grope and stretch. It's uncomfortable, but provided whatever comes out is supported by the professor, I think that's what is important." Contrast this with the following statements from students who, during the interviews, displayed less confidence in their writing: "When you're less familiar with the material, [writing] feels a lot bigger than it is." Another student discussed the idea of needing to find a frame before she could write in a subject area. "I found that the more confused I was either with the subject matter or with my ability to frame an issue, the more difficult it was to write."

Our conversations with students about relationships between writing and learning again reflected their confidence levels and reasserted the primacy of the link. Self-assured students viewed the number and difficulty of writing assignments as important to learning the subject matter. Less confident class members saw the writing assignments as a burden and pressure. Examples of statements from the first category of students were as follows:

“Usually you don’t know what you want to say until you’ve written it...writing about things has definitely increased my understanding in most of the disciplines.” “Writing was most beneficial in disciplines that were hardest for me, like biology and biophysics, because it forced me to put ideas together more thoughtfully and carefully.” “I find it very helpful to get my thoughts in order and to really analyze when I’m doing the reading... I think it forces me to read the assignments in depth rather than gloss over them.” Another student discussed the idea of assimilating knowledge by being required to write, and having to do this frequently with set time lines enhanced the learning process.

Two students who admitted to struggling with writing perceived the writing assignments as a risk and a pressure: “It’s very risky because you’re committing something to paper about something that you really don’t yet have a good understanding of; maybe it’s the fear of being wrong.” This student fell behind in class papers because she felt she lacked understanding and clarity. “At some point I refuse to write just to write, it has to be meaningful or I don’t want to do it.” The student who felt pressured expressed it this way: “There were only two occasions when I didn’t have to write a paper. So this was a weekly process for me and I never felt rested.”

We asked students in our interviews to articulate orally the ideas they considered significant in their formal journal entries concerning discipline specific characterization and identification. Each student seemed to decide on a particular and singular means of comparison, which was then carried through in analyzing most of the segments. For example, one student focused on vocabulary as a means of comparison; another considered how accessible each discipline was; a third centered on writing formats and audience; another on the logic of each discipline’s structure and arguments. But no matter

what means of comparison students chose, they did seem to find grouping disciplines useful in better understanding expectations for writing both within and across disciplines.

In addition to earlier discussion of student confidence levels and their effects on writing, it appeared from the interviews that different pedagogies used by instructors also influenced the “fear factor” expressed in our conversations with “Ways of Knowing” class members. Students seemed to agree that fear of being wrong or of doing less than perfect work shut down class discussion and affected written performance. While one of our interviewees believed that she doesn’t really know what she wants to say until she’s written it, another student expressed the thought that being afraid of being wrong makes her unable to commit ideas to paper. Writing assignments presented to students in a way that led them to think a wrong answer would produce a bad grade inhibited student performance. Student perception that they were rewarded only for written assignments, and not for participation in class discussion, also served to constrict thinking and expression.

Discussion

When we began the project concerning disciplinary writing and writing across the disciplines, we believed that students who were able to identify discreet and common characteristics of writing in a particular discipline would have a better chance of writing well in that discipline. The study confirms this theory as revealed in our student interviews. Demystifying disciplinary conventions encouraged students to take risks in their writing in a specific subject area and raised student confidence levels. Higher intellectual self-confidence led students to more easily find their own voices and to more willingly accept criticism intended to improve their writing skills.

Second, identifying specific characteristics in disciplinary writing seemed to be related to students' deciding whether the subject matter meant a lot or very little to them. In some cases, then, the connection between their own values and the subject helped their written expression in the field. In other cases, the difficulty and allusiveness of thinking in a discipline hindered students' written work. These students believed they would not be able to engage adequately in the dialogue of a particular subject.

A third and important relationship between identifying disciplinary characteristics and student writing related to students' progress in their writing skills and how what was learned in one subject contributed to improved written performance in other disciplines. For example, suggestions given to students about clarity, organization, and brevity in the basic sciences appeared to serve students equally well in the social sciences.

The comparative aspects of writing across disciplines were of great interest to us from the inception of this study. Both in the student interviews and in their journal entries, we noticed students choosing a focal point for comparison, which they applied across disciplines. Disciplinary accessibility, vocabularies, structure, and audience are examples of writing features, which students then used as "anchors" of familiarity as they moved from one discipline to another.

Students also discovered "keys" which unlocked both reading and writing in a discipline. Often the "keys" were obvious and important concepts automatically understood by the course instructor but not directly made apparent to the students. Students would frequently stumble upon the ideas a few weeks into the discipline, either through their own efforts or by the course instructor's discussing them, and would then find writing in the discipline much easier. "Keys" in biology and biophysics, for example,

were access to scientific vocabulary and reliance on visual aids (diagrams, tables, computer models). “Keys” in art history, as another illustration, were questions of who, what, when, where, and why. These, along with acknowledgment of the interdisciplinary nature of some disciplines like art history, unlocked the subject to a number of students who at first found it obscure and unrelated to other kinds of knowledge. Faculty members might strongly consider revealing to students disciplinary characteristics which are to them both obvious and important in the first few classes of a course in order to help students better understand and communicate in that subject.

It is also unlikely that faculty members routinely point out to students how what is taught and expected in a particular course is similar to what another discipline is teaching and looking for in student work. Though the academy in general tends to focus more on disciplinary autonomy rather than on linkages, students benefit from knowing what, if any, material expectations can be applied in required writing across their courses. Most faculty, regardless of discipline, look for writing that is clear, grammatically acceptable, well organized, original, and which demonstrates improved skills and comprehension over the course of instruction.

The title we assigned this study, “Writing as a Way of Knowing in a Cross-Disciplinary Classroom,” is indicative of our confidence that the project would confirm a relationship between writing and learning. In part, a significant body of literature on the subject has already been collected, and it reinforced our hypothesis. But the interplay between learning to write in a discipline and learning the content of that discipline was not clear to us at the outset. What we discovered was that teaching strategies developed to facilitate student success in grasping disciplinary subject matter need to be applied

carefully and directly to the writing students undertake in a discipline if that writing is to improve.

Specifically, confidence levels had a direct effect on how students felt about writing in any particular discipline. Those students who made an effort to grasp concepts and commit them to writing in their own voices were more satisfied with the result than students struggling to prematurely imitate professionals and subsequently frustrated by the perception that their writing came up short of expectation. Students who felt more confident were challenged by the number of writing assignments throughout the course. They thought of writing as an important tool intimately connected to grasping disciplinary content. Less confident class members viewed the writing as a pressure that required them to take uncomfortable intellectual risks by committing ideas to paper. Their belief that in order to write they had to understand completely was in opposition to that of more self-assured students who thought that writing would help them clarify and learn new material.

Faculty response to student confidence levels often reinforced what class members already thought about themselves; thus, student perception of a negative response by a faculty member created less self-confidence in students who already lacked confidence, but was viewed as helpful by students who were more secure. Faculty criticism of less confident writers tended to inhibit and silence them; they simply didn't want to be wrong. Other students used the criticism to deepen their thinking and clarify their writing. Even the confident writer, however, needed the criticism to provide clear guidance and direction. Comments that were made without giving students some sense of

encouragement and direction were generally less helpful in improving written performance.

Faculty members expressed their views of the importance of disciplinary writing in our interviews—but not necessarily to students—throughout “Ways of Knowing.” In hindsight, this no doubt would have been very useful to class members’ understanding of the expectations and purposes for writing in a specific discipline. Overall, faculty members geared writing assignments for undergraduates to help them “speak the language of that discipline” and reach for the more in-depth thinking valued in the subject area. Graduate level writing was distinct and aimed at providing longer term benefits to the students’ career aspirations by giving them practice in learning to write and secure grants and in producing publishable papers. Understanding more about the specific features, expectations, and purposes of writing in each field could be reassuring to all students at the beginning of a course.

The writing grant from the Center for Interdisciplinary Studies of Writing provided an excellent opportunity to examine our ideas on disciplinary characteristics and correlations between writing and learning. “Ways of Knowing” was a unique laboratory for the study—a course very representative of an undergraduate student’s range of liberal education classes in any given quarter or more. The informal and formal journal entries, along with faculty and student interviews, elicited more data than can be interpreted within the confines of our original study goals. Further examination of the data could lead to new insights beyond this project in teaching and learning to write in and across the disciplines.

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APPENDICES

Appendix A Application for 1992-1993 "Ways of Knowing" Course

Appendix B Informal Student Journal Question

Appendix C Formal Student Journal Question

Appendix D Faculty Interview Questions

Appendix E Student Interview Questions

APPENDIX A
APPLICATION
"WAYS OF KNOWING" 1992-1993

The "Ways of Knowing" class will require a high level of both analytical and communication skills. This application provides a structured way for you to introduce yourself and demonstrate your pertinent skills. After reviewing the applications, the "Ways of Knowing" faculty may request interviews with prospective students.

Because enrollment for "Ways of Knowing" is limited, return this application as soon as possible. Mail or deliver the completed application to Susan Henderson in 202 Wesbrook Hall. (Wesbrook Hall is located directly west of Northrup Auditorium.)

Name:

Address:

Day phone:

Evening phone:

PLEASE CONFINE YOUR ANSWERS TO THE SPACES PROVIDED

1. Why do you want to take this course?

2. What are your intellectual interests?

3. Do you like to participate in class discussions?

4. What is your writing experience in an academic, professional, and/or personal context? How would you describe your strengths and weaknesses as a writer?

5. What is your major or possible major(s)? Why?

Appendix B
INFORMAL JOURNAL QUESTION
(GENERAL WRITING THEME FOR 3RD WEEK)

Brainstorm, summarize briefly what you think are the most important things you have learned thus far in the _____ (discipline inserted) section; reflect informally on your own learning and writing process in this discipline, and how you feel about the work and interactions of the class.

Appendix C
FORMAL JOURNAL QUESTION
(RETURNED TO RESEARCH ASSISTANT
5TH WEEK OF EACH SECTION)

Journal Entry Questions (Discipline)
Due Back by (Date)

1. Having read some examples of writing in this discipline, can you identify any “characteristics” (e.g., organizational patterns or methods, basic assumptions about purpose or audience, stylistic devices), which seem representative?

2. How would you describe your own writing process in completing assignments for this segment of the course? In what ways, if at all, does your writing reflect the writing you’ve read by professionals in the field?

3. Would you say the writing in this segment of the source (either that you’ve read by professionals in the field or that you’ve done yourself) has increased your understanding of the subject matter? If so, how?

4. How would you compare, if at all, writing in this discipline (discipline inserted) with writing in the Psychology, Art History, Biology, Philosophy, Biophysics, and/or Sociology sections represented in “Ways of Knowing?”

Appendix D

FACULTY INTERVIEW QUESTIONS

1. Given your experience in your discipline, what “features” of professional writing in your subject area (e.g., organizational patterns, methodologies, themes and purposes, stylistic conventions) might you identify as representative?
2. What, in your opinion, are some representative features of the readings you’ve assigned for your segment of “Ways of Knowing?”
3. Do you routinely make writing assignments in the classes you teach? If so, how many? What might you ask students to do?
4. If student writing is a component of the courses you teach, what purpose(s) do you intend that writing to accomplish?
5. What qualities or characteristics do you look for (and reward) in student writing in your discipline?
6. What methods, if any, do you use to teach students about discipline-specific writing in your field?
7. From a general perspective, how would you assess students’ written performance in your segment of “Ways of Knowing?”

Appendix E
STUDENT INTERVIEW QUESTIONS

1. How would you compare/contrast the representative features of writing and reading in each of the sections of “Ways of Knowing?”

2. Can you compare/contrast your own writing process in completing assignments for the different disciplines represented in the course?

3. Would you say that the writing throughout the course (either that you’ve read by professionals or that you’ve done yourself) has increased your understanding of the different subjects?

4. How would you assess your own written performance in “Ways of Knowing?”

5. How do you feel about class interactions throughout the course? Did you notice changes along the way? Did these seem more related to disciplinary differences or teaching style?