Interdisciplinary Writing and the Undergraduate Experience: A Four-Year Writing Plan Proposal

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Abstract: Relying upon social process compositional theory and theories of the intellectual development of college students, Haynes' article presents a proposal for how interdisciplinary writing might be fostered in a four-year undergraduate curriculum. She argues that in order for students to gain proficiency in interdisciplinary written scholarship, they must undergo a carefully sequenced set of writing experiences which progress steadily from engagement with expressive modes to a more critical awareness of disciplinary forms to the development of integrative inquiry. Her article offers a theoretical justification for her plan as well as a series of sample writing assignments.

FROM ACADEMIC FIELDS spanning the natural sciences and social sciences to humanities and fine arts, a growing consensus has emerged that written knowledge represents more than a transparent reflection of thought. Rather than viewing writing as a set of generalizable, mechanical skills which can be taught separately from content and as a mere adjunct to a curriculum, a range of scholars are beginning to perceive the act of writing as an activity that constructs or constitutes thought. The curricular movement of "writing across the curriculum" (WAC) or "writing in the disciplines" which has gained increasing acceptance in higher education and which stresses the importance of writing in all disciplinary contexts provides evidence for this trend. Early proponents of the WAC movement have successfully persuaded faculty from diverse disciplinary fields to incorporate writing more frequently and thoughtfully in their courses, to encourage students to perceive writing as a process rather than just a product and to offer students opportunities for expressive, nonacademic forms of writing (Fulwiler and Young; C.W. Griffin). While such emphases are beneficial in establishing the importance of the student writer's voice and the authority of personal perception, as well as helping students to overcome their fear of writing and their view that writing is solely taught in English or composition classes, these albeit worthy WAC goals do not necessarily prepare students to enter into the written interchanges of their chosen disciplines. Consequently, a number of composition and rhetoric specialists have recently stressed the need to introduce students to discipline-specific variations in academic writing (Bazerman; MacDonald; Berkenkotter, Huckin and Ackerman; Fahnestock and Secor; Myers; Hansen; Dillon). Through rhetorical criticism, interviews, observations and other qualitative methods, these scholars have begun to make distinctions among the types of writing done in various disciplinary contexts in an effort to empower students to "come to know the systems of which one is part and [to] act with greater self-conscious precision and flexibility to carry forward and, if appropriate, reshape the project of one's discipline" (Bazerman 90). This serious attention to disciplinary written discourse enables students to enter into disciplines as fully empowered writers rather than as conventional followers of accepted practice.

Despite the burgeoning interest in what constitutes disciplinary forms of writing, little scholarship exists on how to usher students into the community of interdisciplinary writing. Given the recent rise in interdisciplinary written scholarship and in the numbers of interdisciplinary programs in higher education, more careful attention to the nature of interdisciplinarity and how it can be taught seems crucial if we as educators want to foster our students' academic success as well as their self-conscious awareness of the codes, conventions, assumptions and practices which regulate the interdisciplinary written community. Moreover, if we accept Charles Bazerman's assertion that "meaning is negotiated and accomplished between writer and reader across the text, each drawing on his or her understanding and experience of social, literary/linguistic, natural and psychological worlds, but does not exist within the text itself (85), then the interrelated acts of reading and writing constitute the site where the knowledge of a given (in this case interdisciplinary) discourse community gets formed, contested and communicated. Thus, by heightening our ability to understand and teach interdisciplinary writing, we better ensure the vitality of interdisciplinary studies as a scholarly community of inquiry and interchange.

This essay marks a first-stage examination of how interdisciplinary writing might be fostered in an

interdisciplinary four-year undergraduate curriculum. Drawing upon Marcia Baxter Magolda's theory of cognitive development in college students, recent social trends in compositional theory and rhetorical criticism and Julie Thompson Klein's theory of the integrative process, I argue that in order for students to gain proficiency in interdisciplinary written scholarship, they must undergo a carefully sequenced set of writing experiences which progress steadily from engagement with expressive modes to an increasingly critical awareness of and proficiency in disciplinary forms to the development of interdisciplinary scholarly inquiry. These experiences should not only be grounded in an understanding of the development of college students' ways of knowing, but they should also be tailored to the classroom's particular social, economic, cultural and educational context and to the evolving dynamics of the disciplinary fields involved.

In the following section, 1 discuss Baxter Magolda's theory, relate it to current process-oriented compositional theory and suggest that these two systems of thought can serve as a useful foundation for teaching students how to write in an interdisciplinary way. Then I propose a sequence of writing stages which spans the entire undergraduate experience and which will propel students toward interdisciplinary written inquiry.

Theoretical Foundation

By interdisciplinary writing, I have in mind writing that "critically draw[s] upon two or more disciplines and . . . lead[s] to an integration of disciplinary insights" (Newell and Green, 24-25). For undergraduates to generate such writing is no simple task. It demands that the student understand critically the differing aims, assumptions and tasks of two or more disciplines, while simultaneously possessing considerable proficiency in diverse forms of academic writing. Moreover, it calls for the development of a range of critical thinking skills fundamental to good writing and interdisciplinary inquiry: comprehension, application, analysis, synthesis and evaluation. Thus, students must be able to operate in and understand critically the limitations and strengths of at least two disciplinary fields, and they then must attempt to take the additional steps of synthesis and application—that is, creatively exploring ways in which insights from those fields can be combined or synthesized productively to respond to a real-life issue or problem. The question, then, arises as to how this ambitious goal can be achieved by undergraduate students. My answer is that it must be done gradually, sequentially, and with attention to students' developmental processes.

In the past three decades, a number of scholars have examined how students' ways of thinking change during the college years. William Perry interviewed male undergraduates at Harvard during the 1960s and arrived at nine developmental positions that depict intellectual and ethical development throughout the undergraduate experience. In the late 1970s, Belenky, Clinchy, Goldberger and Tarule interviewed women from diverse academic institutions and family agencies to consider how Perry's developmental scheme fit with the experiences of women. More recently, Marcia Baxter Magolda at Miami University in Ohio has focused on intellectual development in college and has included interviews with both males and female undergraduates from the first year to the year following graduation. The developmental models generated by these three studies show definite patterns and trends in the ways that students change during the college experience. Although the theorists differ somewhat in their explanations, they describe similar general patterns of developmental stages that students undergo. In this essay, I use the developmental scheme created by Baxter Magolda, because the sample upon which it was based includes both male and female students, as well as students one year after graduation, and because she relates her findings to diverse populations of students. Because Baxter Magolda's research was conducted at Miami University and thus focuses predominantly on students from ages 18 to 22, her findings and statistics may not be applicable or transferable to all college and university settings. Percentages of types of learners can vary substantially from institution to institution. Instructors will need to do their own informal assessments to determine their students' ways of learning and will need to adjust their writing instruction and expectations accordingly.

In her study, Baxter Magolda found that the majority (68%) of first-year students were in the stage of absolute knowing. Students with this perspective believe that authorities (experts, instructors) have all the answers, and that absolute answers exist in all areas of knowledge. Thus, all absolute knowers see their role as obtaining knowledge from the experts. However, males tend to take on a "mastering" pattern and adopt a more public, active approach to gaining that information, while women often assume a more "receiving" approach, preferring to listen quietly to the experts and take notes. Whether they assume a "mastering" or a "receiving" pattern, absolute learners appreciate knowledgeable professors who are also helpful and approachable. Readings should spark students' interest, be informative and thought-provoking.

By the time students in the study reach their junior year, most (83%) have entered the stage of transitional knowing. While these knowers still believe that absolute knowledge exists in some areas, they have decided that uncertainty exists in others. As in the case of absolute knowers, transitional knowers also fall into two patterns: interpersonal and impersonal. The interpersonal, transitional knowers, most of whom are women, prefer to learn by interacting and exchanging ideas with others, and they resolve uncertainty by relying on

their personal judgment. Impersonal, transitional knowers, the majority of whom are men, like to be forced to think for themselves. For them, uncertainty can be resolved via logic, research and debate. Both varieties of transitional knowers expect course assignments to call for more than the recitation of memorized information. They seek to enhance their critical thinking skills, to engage the course material, their peers and their instructor actively and to apply their learning to real-world situations. Baxter Magolda also suggests that these knowers are benefited by confronting diverse and contradictory views on a single issue and by a clear articulation and understanding of the evaluative criteria used on writing assignments.

Following the stage of transitional knowledge, students may enter the phase of independent knowing, but most (57%) in her study do not reach this stage until the year after graduation; 16 percent of seniors, however, are independent knowers. In this stage, students see knowledge as open to many interpretations and thus as uncertain. Consequently, students in this stage view themselves and their instructors as equal sources of knowledge. The two patterns of learning which emerge in this stage are: (1) the interindividual pattern (followed primarily by women) where an interchange of equally valid views (one's own and others) is valued; and (2) the individual pattern (adhered to mainly by men) where the priority is placed on expressing one's own view over listening to others'. These learners value assignments that promote independent opinions, critical thinking, peer collaboration, freedom of expression and the allowance of differing viewpoints. They prefer to see their writing as connected to their career goals and real-life experiences.

The final stage Baxter Magolda discusses, that of contextual knowing, was evident in only two percent of the seniors and twelve percent of those in their first year after graduation. Contextual knowers believe that some knowledge claims are better than others depending on the particular context. Perhaps because the sampling of these learners was so small, Baxter Magolda found no discernible learning-style patterns among her interview pool. However, she did assess that contextual learners excel when working on projects that call for students and professor to work collaboratively and interdependently and for the contextualization, integration and application of knowledge.

By outlining the changes in students' ways of knowing during their four years in college, Baxter Magolda's theory is necessarily somewhat linear. However, she underlines that students' developmental processes are neither universal, simple nor uniform but instead socially constituted (20-23). Thus, the categories of and changes in students' ways of knowing are undoubtedly more complex, flexible, individualized, nonlinear and contextually-influenced than my previous summary of the four stages might initially appear. For my purposes, what is important for educators to gain from Baxter Magolda's findings is that their expectations and assignments should be developmentally appropriate. Yet, within any given classroom setting students may be engaging in different ways of knowing; thus it is important that assignments be flexible enough to challenge and appeal to a range of learners.

Baxter Magolda's emphasis on flexibility, individuality and social construction in many ways complements the process view of compositional instruction which has gained widespread acceptance in grade schools, secondary schools and college for the past three decades. In general, this view holds that a finished piece of writing is the result of a complex process of activities and several stages of composition development. Effective writing instruction, it is argued, focuses not on the final written product but on assisting students through the various phases of prewriting, drafting, revising, editing, proofreading and presenting. Thus, both Baxter Magolda and the compositional process theorists place a strong emphasis on the individual student and his/her ongoing development which can be achieved in part through close faculty-student interaction.

Conceptions of writing as a process, however, vary from theorist to theorist. Scholars such as Peter Elbow, Ken Macrorie, Donald Stewart and Ann Berthoff assume what Lester Faigley has termed "an expressive view." Proponents of this view tend to believe good writing is typified by integrity, authenticity and spontaneity (529). For them, writing is "an organic, developmental process in which you start writing at the very beginning—before you know your meaning at all—and encourage your words gradually to change and evolve. Only at the end will you know what you want to say or the words you want to say it with" (Elbow, 15). These scholars contend that internalized or generalized writing plans impede the writing process and inhibit good prose. Thus, the composing process should encourage spontaneity and self-expression through such prewriting activities as freewriting and through the deferral of conscious organizational plans and editing. Another group of process theorists have taken a different tack, emphasizing the cognitive activities which undergird the writer's composing process. Relying on psychological research methodologies, cognitive psychology and even cybernetic theory, scholars such as Janet Emig, James Britton, Andrea Lunsford, Linda Flower and John Hayes investigated the mental activity of writers and found it to be nonlinear, recursive and noncontinuous. Such research has been pivotal in helping to comprehend the complex writing process, to uncover the different processes of experienced and inexperienced writers, and to formulate a theory of the composing process. Both the expressive and cognitive views of process have served to focus much needed attention on the internal processes of individual writers. A difficulty with these two

process views, however, is that by their very nature they tend to downplay the way in which writing is as much social as psychological. Writing allows us to share our thoughts and feelings with others, establishing (or in some instances dissolving) social ties. It is this social function as much as cognition that serves to determine the writing process. In addition, the very form our writing takes links us to a social, cultural or disciplinary community and tradition and serves to shape our writing process. Following this line of thinking, a number of theorists such as Patricia Bizzell, Marilyn Cooper, David Bartholomae, and Charles Bazerman have developed what Faigley calls the "social view" which is based on the founding assumption that "human language (including writing) can be understood only from the perspective of a society rather than a single individual" (Faigley, 535). Thus, for these thinkers, writing is not only a process that happens within contexts; writing and what writers do during the composing process are constitutive of a culture. Thus, while the cognitive and expressive views assume an individual writer distinct or even removed from society, the social view contends that writing is a social practice, helping to construct cultural knowledge at the same time that it is delimited by it. According to Susan Peck MacDonald, "texts are not simply epiphenomena; they help create communities ..., they act on us, they shape how we relate to each other as professionals and shape what we can and cannot do" (7-8). For the social process theorists, a writer, even when freewriting, is still following a socially-constituted, generalized form. Thus, authenticity must be understood within a specific cultural context. Moreover, cognitive process, social view theorists surmise, cannot be universalized to describe all writers; race, class, educational background, geographical region and gender, as well as one's disciplinary or professional setting, all impact one's writing process and product.

At first glance, the social process view seems most amenable to our purpose of teaching undergraduates how to write interdisciplinarily in that it focuses more pointedly than do the other two views on the presence and impact of the (inter)disciplinary context on one's thinking and writing. Indeed, social process compositional theory is clearly more compatible with interdisciplinary theory than are either of the other two process approaches. Implicit in the social view is the assumption that anyone can write for a certain discourse community if they are taught that community's agreed upon set of codes, conventions, objectives and practices. Thus, interdisciplinary thinking and writing are potentially accessible to all interested students and not something reserved for an elite few.

While the cognitive and expressive views may not be as compatible in theory with interdisciplinary inquiry, they do offer practical insights into the teaching of interdisciplinary writing. Given the two views' emphasis on the individual writer, their accepted ways of teaching writing are particularly effective for undergraduate learners who are transitional and independent knowers—whose focus is also on their own unique, independent perspectives. In addition, the approach to writing instruction which was first developed by cognitive and expressive theorists has also been adopted by social view theorists. I believe that this form of instruction—known as the workshop approach—would also work well in interdisciplinary classrooms. The workshop approach can be characterized by the following traits:

1. Frequent opportunities to practice writing in a supportive environment. According to proponents of this approach, the atmosphere in the classroom must be nonthreatening, and some of the writing should be ungraded. Frequent chances to write in-class, out-of-class, graded and ungraded papers provide venues for students to think for themselves. In addition to freewriting, in-class writing can include class notes; reading notes; observations; responses to specific text-based questions; microthemes; soapbox statements; requests for information or clarification; letters to the professor, other students, fictional characters, or authors; rebuttals; imaginary and actual dialogues; and evaluations of readings or class activities.

2. Frequent opportunities to combine reading and writing as reciprocal activities. Compositional theorists are increasingly coming to the conclusion that writing improves when it is content-driven rather than viewed as a mechanical skill or when students write solely from first-hand experience (Britton; Griffin; Gebhard; Tchudi). Rather than be divorced from course readings, writing assignments should complement them by asking students to engage directly and deeply with the texts and text-related issues.

3. Regular opportunities to confer individually with the professor to discuss work in progress. Such interaction should be done in one-on-one conferences, in informal discussions and in written comments on drafts. In any of these situations, the interchange should carry an informal and supportive tone but be specific and thoughtful in its focus and direction. Research demonstrates that students retain feedback when it is personalized (Pitzman, qtd. in Williams, 264) and when the professor responds "as a real, interested reader" and creates an ongoing dialogue with each student (Williams, 265).

4. Regular opportunities to write and receive feedback on multiple drafts and revisions of an assignment before a grade is assigned. Some studies have indicated that when comments are only given in conjunction with a grade, students tend to look at the grade and ignore the comments, thus nullifying any beneficial and

subsequent use of feedback (Sommers; Hausner; Gee). Consequently, several noted process-oriented theorists recommend that professors give challenging assignments which require students to compose several drafts. The most detailed comments should be offered on drafts submitted or shared before the final version which is then evaluated for a grade and given minimal feedback (Fulwiler).

5. Sequenced writing assignments which steadily and deliberately ask students to relate new knowledge and experience with old ones and which respond appropriately to students' ways of knowing. Rather than regard assignments as individual, isolated topics to be generated as necessity demands, many theorists believe that assignments should work together to advance course objectives and "to enlarge the students' power of thinking, organizing and expressing ideas" so that he or she can cope with a more challenging problem in future assignments (Larson, 212; see also Knefelkamp). Patricia Bizzell, however, cautions that a writing sequence specifically designed for students' maturation may not actually accelerate their development. In fact, those who accept such a view are buying into the naive belief that "we can get [students] to progress faster by forcing them to imitate more advanced positions" (452). Instead of forcing students' development, instructors should focus more pointedly on the students' own interests, thereby encouraging them to think for themselves, to grow in their confidence and to gain motivation to write. By opening up possibilities rather than being prescriptive, instructors better ensure students' development.

6. Writing assignments which, when possible, relate to students' interests, career or beyond-school goals. This objective can be achieved by offering a choice of writing assignments or by specifying, an approach to a topic but allowing a choice of subject matter. Alternatively, professors can encourage students to write in real-world forms rather than producing generic "papers" (see Tchudi, 31-32, for examples). Writing a press release, a case study or a letter-to-the-editor can often spark a student's interest more than a book summary. Moreover, by allowing students to write to their interests rather than to the instructor's, their writing will be unique and thus more interesting to read. Such an approach can help an instructor avoid receiving a batch of identical, generic papers.

7. *Opportunities to practice a variety of rhetorical strategies aimed at different audiences.* As David Bartholomae has suggested, an inadequate understanding of one's academic or nonacademic audience can create writing blocks or other difficulties for students. Thus, professors need to explain the rhetoric maintained and operated in the discourse community for which the student is asked to write as well as the concept of audience. At times, writers must address a specific audience who form a defined and bodily presence that requires its discourse to have certain characteristics. At other times, writers need to invoke or construct an audience because they cannot know their audience directly. Thus, they must provide cues for the reader, cues which help to define the reader's role (Ede and Lunsford).

8. Opportunities for collaborative learning, including peer review and small writing groups. Joanne Kurfiss affirms that collaboration is particularly valuable in a heterogeneous classroom of knowers because a student comprehends and seeks to emulate a level of cognitive maturity one level above her own (569). Moreover, collaboration reinforces the idea that writing is a social process and that processes vary from person to person and context to context. However, it is crucial to realize that collaboration is neither easy nor straightforward for students to achieve; instructors must take time and effort teaching students how to cooperate effectively.

9. *A reduction in the amount of direct instruction on grammar and mechanics.* In her 1982 study, Nancy Sommers found that when comments on a paper address both "higher-order" concerns (knowledge of subject matter, logic, organization and argument) and "lower-order" concerns (mechanics, grammar, spelling), students paid attention only to lower-order issues. Because they often involve a "right-or-wrong" answer, lower-order concerns are much easier to remedy than higher-order ones. In addition, compositional scholars have found that instructors' lower-order comments are often ineffective. Abbreviations such as AWK or AMB are not only confusing and vague, but they don't help the student understand how to avoid that problem in the future (Williams, 264).

The workshop form of pedagogy affirms some of (he larger recommendations for future educational practice that Baxter Magolda, based on her interviews, makes. According to her data, students learn best and are able to develop cognitively when faculty are approachable, helpful and interactive with students, when students are encouraged to be active in the classroom and to collaborate, connect and relate with one another and when evaluative criteria are made clear. Such practices, along with validating students' voices through the exchange of written and verbal communication, are accentuated in the process-orienled, workshop approach. Moreover, as I will attempt to demonstrate in the following section, the workshop approach coupled with and undergirded by Baxter Magolda's developmental theory can serve as an appropriate foundation for teaching interdisciplinary writing in the undergraduate classroom.

What follows is a list of sequenced stages, skills, objectives and assignments designed to enhance

integrative thinking, learning and writing in the undergraduate curriculum. Each of the first six stages is intended to approximate the writing done in one semester-long course, while the last stage is meant to span two semesters. Thus, taken in full and given that collectively they address all four of Baxter Magolda's developmental ways of knowing, these seven stages could cover the entire four-year undergraduate experience. However, since all interdisciplinary instructors operate in unique contexts with differing students, objectives, circumstances and constraints, they should feel free to adjust, modify, expand or reject these suggestions as needed. Depending on one's context and particular needs, each stage could last longer than a semester; or, alternatively, two or three stages might be compressed and covered in one semester-long course.

Moreover, interdisciplinary scholarship involves a complex and interlinking web of complex thinking, writing and research skills. Consequently, these skills cannot be easily taught in isolation or all at once. Thus, while at each stage instructors may want to highlight and focus pointedly on only a few skills (in an effort to make the learning process more manageable and more congruent with most students' ways of knowing), it is imperative that they make students aware that the integrative process in neither prescriptive, linear, fixed, closed nor teleological. Indeed, as in the process of creating a handmade quilt, while students at each stage may focus on learning how to create various stitches and knots together, the larger aim of and opportunity for piecing together a full quilt of their own designing should not be ignored. In other words, over the course of the semester, assignments should be flexible enough to ensure that those who are ready to engage in more complex forms of reasoning and synthesis be allowed to do so. Even more importantly, at every given stage, instructors should spend time discussing openly the aims of that stage as well as the aims of stages yet to be encountered. In doing so, instructors help students to avoid becoming complacent in their writing abilities and to realize that interdisciplinary written inquiry is a never-ending process of new challenges, rewards and struggles. Thus, rather than serving as a recipe for how to teach interdisciplinary writing, I hope that the following sequence will mark a beginning of a new and invigorating dialogue about what constitutes interdisciplinary writing and interdisciplinary writing instruction.

Stage I—Reading and Writing for Interdisciplinarians

This stage stresses proficiency in college-level study, reading and writing skills. New in college, students in this stage can benefit from guidance in time management techniques (e.g., creating semester-long calendars with exam and assignment due dates; keeping weekly study schedules and "to do" lists; locating appropriate places to read and write) and from frequent opportunities to express themselves in writing. Writing assignments in this stage (as in all stages) should gradually increase in length and complexity, adding enough novelty to make each new task intriguing and enough challenge to encourage students' cognitive and writing development. Most process theorists suggest that students begin with narration and description, then move to definition and summary, and end with more analytical assignments. Thus, students advance steadily from more expressive writing where they engage with familiar experiences and views to writing which requires them to delve into the views and experiences of others. James Williams, however, has argued that true narration—because it asks students to write on an implicit level—is in many ways more demanding than other expository forms of writing and should be taught later in the term. Thus, instructors may want to delay assigning narratives and begin with descriptions or journal writing. In any case, the emphasis in this stage should be on acquiring fluency and practice in the interrelated actions of writing and reading and on offering opportunities for cognitive and writing development, by encouraging gradual movement away from the familiar (Dewey, 202-203).

An easy way to promote this development and progression away from the familiar and parochial is through reading. Students in this stage may need to be taught how to read effectively. Assisting them in creating an appropriate context for reading a particular text, grasping its basic meaning, annotating it properly (without overmarking it), taking notes on it, and discerning between main points and side issues can be time well spent. Learning to comprehend and respond thoughtfully to texts are crucial skills for interdisciplinarians whose work is often textual and textually demanding. Readings in this stage should be topical, relevant (at least initially) to students' lives and interests, and represent a range of genres and disciplinary modes. Such a range will help students become more comfortable operating in a variety of discourses and modes of expression.

The dual focus in this stage on expressive forms of writing and on content-based reading is significant. Given that most of the students in this stage are absolute learners, the readings provide them with "expert" viewpoints and thus satisfy their desire to learn from an authority. Yet, the expressive writing opportunities invite them to begin identifying and validating their own voices and opinions, thus helping them to progress into a more transitional way of knowing.

As a means of making this stage (as well as other stages) more concrete, a short summary of student and professor learning objectives and a list of possible assignments are provided below:

Student Objectives:

To explore and discover one's voice or voices in nonacademic and academic writing;

To gain fluency and confidence as a writer;

To gain a more self-conscious awareness of one's writing process (e.g., the stages of writing, one's particular struggles and strengths, the different process of writing for different contexts);

To improve one's reading and note-taking skills (by identifying a text's purpose, audience, claims, warrants and by taking accurate notes);

To react and respond thoughtfully to course readings;

To gain practice in fundamental writing skills of paraphrase, summary, definition and description.

Professor Objectives:

To demonstrate helpfulness;

To interact personally with students through one-on-one conferences, written feedback and informal discussions;

To demonstrate knowledge of the course's subject matter;

To participate in some of the course assignments as a way of creating a more relational classroom;

To discuss openly his/her own writing process, struggles and concerns.

Possible Assignments:

journals:

    expressive (consists of freewriting on any topic, reflections, thoughts)

    dialogic (consists of informal dialogues with course texts, issues, the professor or other students)

    academic (consists of responses to questions about course readings; questions call alternatively for inductive reasoning, deductive reasoning, synthesis or reflection

descriptions

summaries

definitions, informational pamphlets, fact sheets, glossaries, lexicons question-and-answer columns

charts, diagrams, flowcharts

dialogues (imaginary or real)

letters

    to editor

    to classmates or professor

    to authorities (politicians, officials, experts)

commentaries

memoirs, biographical sketches

personal essay, exemplification

narratives

peer reviews or responses to other classmates' writing

self-evaluation on progress made in the course

Stage II—Introduction to Critical Analysis and Disciplinary Writing

In this stage, students build on the proficiency in reading and expressive writing fostered in stage I, develop an ability to analyze in a variety of ways, and begin to understand the objectives and practices of two to three disciplinary written communities. Students thus move further away from focusing on their personal experience to gaining an understanding of the collective experience of the culture as represented by organized disciplines. Such a move entails learning how to identify one's own position vis-à-vis those expressed in disciplinary texts. Because this stage marks students' introduction to disciplinaiy writing and thinking, the number of disciplines explored should be limited to two or three. The limited number allows absolute learners to feel they have gained some mastery over the material. Moreover, it helps to foster the development of reading skills. While in the previous stage, students focused on their comprehension of and basic response to texts, in this stage, they concentrate on discerning the basic discursive conventions and practices of tbe disciplines introduced. Time should be spent helping students identify the rhetorical components of the disciplines and disciplinary texts addressed: their purposes, methods of presentation and organization; audiences; types of evidence; key concepts; and distinctive writing styles. Readings, when possible, should connect to students' lives and interests, but more importantly, should offer a clear glimpse into the selected disciplinary fields.

As in the earlier stage, writing assignments should work in conjunction with the readings. Early assignments should call for students to understand and investigate closely various disciplinary texts using one or more forms of analysis: exemplification, close textual reading of a passage, or rhetorical analysis of a text

(examining its purpose, audience, structure, evidence and style). Later assignments should invite them to engage in more complex cognitive processes and analysis such as comparison/contrast and evaluation. This push toward analysis forces students to move beyond memorization and summary and thus to progress toward a more transitional way of knowing. Educational theorists such as Baxter Magolda and John Dewey have cautioned that an overemphasis on the mindless acquisition of information and skills leads to the stultification of a student's learning and development. Students tend to excel when they are allowed opportunities for directed forms of exploration, for expressing their voices and for engaging in reflective thinking—or, the "active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it" (Dewey, 6)—all of which can be accomplished through analytical writing. Furthermore, the ability to analyze disciplinary texts and to compare texts from various disciplines is essential for interdisciplinarians. Interdisciplinarity is founded on a clear knowledge of the distinctive qualities of, as well as the similarities and differences among, the disciplines.

Student Objectives:

To gain a basic understanding of the thinking and writing done in two or three disciplines;

To gain practice in a variety of forms of analysis on various disciplinary texts:

exemplification of a textual passage or claim;

close textual analysis of a passage;

rhetorical analysis of a text (examine purpose/thesis, audience, structure, evidence, style);

comparison/contrast of two texts;

evaluation of a text or texts.

Professor Objectives:

To facilitate positive and meaningful interactions with students and between students;

To validate and encourage students' voices and viewpoints;

To demystify various forms of analysis;

To spark students' interest in and understanding of the disciplines introduced.

Possible Assignments:

interviews with various experts and practitioners from various disciplinary or professional communities;

analytical essays of various disciplinary texts (articles, textbooks, pamphlets, course syllabi) and using

various forms of analysis:

exemplification or illustration;

close-textual analysis;

rhetorical analysis;

comparison/contrast;

evaluation (critical review, commentary);

imaginary dialogues between two different disciplinary thinkers;

simple questionnaires, surveys or direct observations of disciplinary practitioners;

annotated bibliography on a certain topic, taking an assigned disciplinary or multi-disciplinary

perspective;

progress report or self-evaluation on one's understanding of various disciplines and one's awareness of

one's writing process.

Stage III—Learning and Writing in the Disciplines

Students in stage II were introduced to several disciplines and given basic tools for exploring, understanding and analyzing them. That stage's emphasis on analysis encouraged students to think from an outsider's perspective and ask such important questions as: What are the unique features of this discipline, and how do they compare with those of another discipline? By contrast, stage III asks students to adopt several different disciplinarians' perspectives and to write "insider" academic prose. Thus, it sparks the development of a deeper awareness of disciplinary world views by inviting students (through writing) to participate directly in the construction of these world views. Students then no longer are solely thinking and writing *about* a given discipline; in this stage they are thinking and writing as disciplinarians and are hence involved in the very constitution of the disciplines.

This stage differs from the disciplinary writing typically done in disciplinary courses. Whereas disciplinary courses initiate students into one discourse community, this stage ushers them into two or three disciplines. Thus, students explicitly cultivate both an insider's and an outsider's perspective and engage in dialectical and comparative thinking. Early writing assignments should require students to conduct research and write as would the practitioners of the disciplinary fields introduced. For example, if literature were selected as one of the disciplines to be investigated, students should be asked to read primary and secondary

sources and write critical analyses of them. If biology were a chosen field, students would write lab reports based on their inquiries. Later assignments, however, should invite students to adopt a more "pluridisciplinary" approach—that is, to compare and contrast disciplines without necessarily integrating them. Students would be asked to reflect on how the thinking and research done in the selected disciplines relate to and differ from one another. While integration—that is, the ability to synthesize the disciplines—can and should be encouraged, it need not be an expectation. The absolute and transitional learners who typically comprise this stage may not yet possess the relativistic perspective necessary for reasoning synthetically. However, a frank and self-conscious discussion of this goal (as well as the open invitation to meet it) would be advisable and beneficial in facilitating student development.

Because students in this stage should write a wide variety of papers in various disciplinary forms and for various audiences, the paper load can become heavy; moreover, because the writing demands are more diverse than in most courses, students will probably find that they have considerable difficulty with certain forms of writing but are much stronger in others. One way of responding to these two difficulties is through the use of portfolios. Portfolio grading has been found to be highly reliable. While students write many papers, they only select what they deem their best work for evaluation. Professors then read the entire portfolio and calculate an average score for the entire portfolio. Included in that portfolio as a required element should be a self-reflective essay which asks students to reflect on the differences and similarities of the disciplines studied and to chart their own process of understanding those disciplines. In the suggested assignments below, a "class portfolio" (which can be published and given a title) is also listed as an option. A portion of each student's grade would be reserved for their participation and submission in that project.

Student Objectives:
   To enter into two or three disciplinary discourse communities by
         a) studying and analyzing good models of disciplinary writing in those disciplines;
         b) adopting an "insider's" perspective by writing in disciplinary modes;
   To analyze ways that disciplines get defined by insiders and outsiders;
   To compare and contrast disciplines;
   To read contradictory viewpoints on a single, focused issue
         a) from two or three thinkers from the same discipline;
         b) from two or three thinkers from different disciplines;
   To write in a variety of disciplinary forms and for a variety of disciplinary audiences;
   To create a portfolio of different disciplinary forms of writing.

Professor Objectives:
   To explain and demystify the various forms of writing used frequently in the disciplines addressed in the
         course;
   To assist students in gaining an appreciation for and critical awareness of the objectives and practices of
         two or three disciplines;
   To participate actively along with the students in the study and knowledge-making of two or three
         disciplines;
   To encourage students' active involvement in disciplinary work;
   To facilitate peer collaboration and collaborative learning.

Possible Assignments:
   Individual portfolio of real-world and disciplinary forms of writing on a course-related topic. Portfolios
         might include any combination of the following:
      position paper (argument following the norms of a certain discipline)
      analytical essay
      empirical essay
      comparison/contrast essay
      lab report
      naturalist essay
      letters (to editor, politician, expert, etc.)
      editorial
      critical review (of film, book, article, event, performance)
      poster
      commercial, advertisement (radio, magazine)
      feature article for popular magazine
      short story

poem

one-act play

required reflective essay (evaluating the student's process of understanding the differences between the disciplines studied)

self-evaluation

Class Collaborative Portfolio (would include entries submitted by students from their individual portfolios; class members would select, compile and edit it)

Stage IV—Introduction to Interdisciplinary Writing

Whereas stage III asked students to participate in and then compare and contrast various disciplines, stage IV invites them to examine critically interdisciplinary writing and to compare and contrast that with disciplinary writing. Thus, this constitutes the first stage where integration is addressed and investigated directly. As in all other stages, the readings should be topical, relating to a real-life problem or issue. The reading list should also include discipline-specific texts (deriving from two or three fields) as well as self-consciously interdisciplinary texts; and both the disciplinary and interdisciplinary texts should address the course-related problem or issue. Writing assignments then should aid students in critically exploring the merits and shortcomings of the disciplinary and interdisciplinary approaches to the course topic. For example, students may "translate" disciplinary knowledge for a nondisciplinary audience or for an audience of another discipline. Or, they may analyze both disciplinary and interdisciplinary texts and then compare and contrast them. The goal of this stage is to initiate students, through analysis of texts, into the world of integrative thinking and to make them aware of the differences between interdisciplinary and disciplinary thinking. Models of interdisciplinary writing are set forth to be explored, critiqued, evaluated and compared to disciplinary models.

By studying models of interdisciplinary writing and comparing a wide range of disciplinary and interdisciplinary texts, students in this stage are encouraged to develop into more relativistic, independent thinkers and to begin understanding the role of (disciplinary) context in shaping one's world view. Hopefully, they will also come to understand the benefits as well as the limitations of each text's perspective on the topic and will begin to speculate on way the disciplines can be even better combined than in existing interdisciplinary texts. By doing so, students are prompted to perform complex cognitive and writing processes of comparison, analysis, synthesis, evaluation and application.

Student Objectives:

To analyze critically the limitations and benefits of a variety of disciplinary texts on a certain topic;

To read, analyze and evaluate interdisciplinary texts on that same topic;

To compare and contrast disciplinary and interdisciplinary perspectives on the topic;

To "translate" disciplinary knowledge for a nondisciplinary audience or for an audience of another discipline;

To integrate knowledge gained from a variety of disciplines on a given topic.

Professor Objectives:

To initiate students into the codes, conventions, objectives and practices of interdisciplinary writing;

To encourage a free exchange of verbal and written ideas;

To help students understand the differences between disciplinary and interdisciplinary writing;

To introduce topics which interest the students and which allow them to teach each other and the professor something.

Possible Assignments:

analytical essays which examine

a) a disciplinary journal, article, internet list conversation (in terms of its assumptions, inclusions, practices, language, organization, etc.;

b) an interdisciplinary article, journal, internet list conversation flowchart, diagram or chart analyzing how a given text is interdisciplinary;

cartoons about disciplinary and/or interdisciplinary articles;

student handbook created by the class informing incoming college students about how to study, write for and succeed in various disciplines;

literature review incorporating sources from at least two disciplines;

disciplinary essay which is then revised for an audience of a different discipline or a nondisciplinary audience (e.g., lab report revised into a children's science article; empirical essay revised into a personal narrative);

popular article based on knowledge gleaned from one or two academic-disciplines;

comparison/contrast essay comparing disciplinary and interdisciplinary texts.

Stage V—Interdisciplinary Methodology and Concept-Driven Inquiry

In the first four stages, students have concentrated predominantly on texts and textual inquiry. As Susan Peck MacDonald has recently discovered in her study of academic disciplines, text-driven written inquiry tends to be more interpretive than explanatory, focusing initially on the particular in order to arrive at a larger generalization or conclusion. This form of inquiry is often characteristic of the more diffuse academic disciplines. "Diffuse" academic fields, according to Stephen Toulmin, are characterized by an "absence of a clearly defined, generally agreed reservoir of disciplinary problems, so that conceptual innovations within them face no consistent critical tests and lack any continual rational direction" (22); the humanities and some of the "softer" social sciences tend to fall into this category. The harder social sciences and natural sciences, by contrast, tend to be "compact," or characterized by "a sufficiently agreed goal or ideal, in terms of which common outstanding problems can be identified" (22). Moreover, these compact fields tend to be conceptually—rather than textually— driven, explanatory rather than interpretive. Given their concern with generating universal explanations for a select few problems, practitioners from compact fields tend to begin with a general claim and then locate particulars to prove it. Thus, understanding how to conduct acceptable concept-driven research becomes crucial for interdisciplinarians seeking to span the compact fields.

While various research skills have been introduced in previous stages, they are explored, practiced and combined more fully and self-consciously in stage V. This focus on "compact" research methodology is particularly effective for upper division courses where most of the students are transitional and independent learners and are thus interested in pursuing their own independent inquiries and in exchanging differing views. After studying various methodologies, students in this stage would be asked to identify a course-related problem which interests them and attempt to respond to it (in a 20 to 30-page paper) using two different research methods. Assigned readings in this stage should accomplish two objectives: to familiarize students with two to three research methods and to offer models of writing using one and then later two different research methods which students can study and evaluate. Special attention should be paid to examining the appropriate purpose and situation for each methodology, thereby prompting students to think more contextually. Moreover, the amount of assigned readings in stage V should not be as extensive as in previous stages because the focus should be on the students' own research and fieldwork experience. Under close instructor supervision, students should design and conduct their own inquiries, following a process-oriented approach such as that offered by John Dewey: the statement of a problem or puzzling phenomenon; further observation and exploration; the formation of a hypothesis or possible solution; the testing or proving of the idea by using it as a guide to new inquiries (203).

In her study of undergraduate students, Baxter Magolda found that independent and contextual knowers respond and develop more fully in an atmosphere of collegiality, where students and faculty work together in a common pursuit of knowledge. Thus, students in stages V-VII work best in a seminar workshop setting; or, if a small class size is not feasible, they can be divided into small, closely supervised writing groups where they can discuss and provide feedback on each other's writing/research process and drafts. Another possibility for large classes is to assign collaborative research projects, where students work together in groups of three or four. However, in this case, care should be taken to ensure that group members are allowed to pursue topics of interest and are held accountable for individual responsibilities.

Student Objectives:

To gain practice in and a critical awareness of two or three research methods (e.g., ethnography, surveys, questionnaires, interviews, protocols, case studies, scientific method, quantitative analysis, etc.);

To compare and contrast different research methods and analyze their purposes within disciplinary and interdisciplinary scholarship;

To utilize two different research methods to investigate a problem, question, issue of their own choosing.

Professor Objectives:

To familiarize students with a variety of research methods;

To respect and encourage their inquiries;

To foster a collegial community of researchers;

To be patient with the inevitable frustrations and difficulties students will face in their first lengthy research project;

Possible Assignments:

evaluation of a research method and how it suits a certain discipline or type of problem;

comparison/contrast essay examining different research methods;

concept-driven research paper, meaningfully incorporating two research methods;

self-evaluation, personal reflective essay.

Stage VI—Interdisciplinary Theory and Text-Driven Inquiry

Whereas methodology tends to be the focus of the more compact disciplinary fields, theory often is foregrounded in diffuse disciplines. Stage VI provides students with the opportunity to read, explore, analyze, compare, combine and use theoretical writings which are inherently integrative (e.g., Marxism, structuralism, feminism, deconstruction) as well as theoretical writings which explicitly address interdisciplinarity and interdisciplinary scholarship (e.g., Klein, Casey, Newell). In addition, students will utilize two or more theories to interpret a text, a set of related texts or a textual issue of their own choosing. Stage VI, then, involves acquiring theoretical knowledge, conducting text-based (library or archival) research and integrating the theory and research into a unified written project. While they will use the inherently interdisciplinary theories to interpret texts, students can use theoretical writings which self-consciously discuss interdisciplinarity either to interpret a text or textual issue or to assist them in becoming more self-conscious about their own process of interdisciplinary inquiry. As in stage V, assigned readings in this stage should be relatively brief both because theoretical texts tend to be difficult to comprehend and because this focus of the stage should be on the student's research. It is, however, crucial that the theoretical readings are carefully discussed in class and that students feel comfortable using them. Writing assignments should ask students to demonstrate a clear understanding of a theory, to compare and contrast two theories, to pursue an interdisciplinary, text-driven and theoretically informed project and to reflect self-consciously (using explicit theories in interdisciplinary scholarship) on the merits and shortcomings of their own inquiries.

As in the previous stage, students in this stage are given opportunities for confronting contradictory views, for engaging in independent inquiries, and for perceiving the role of context in the construction of theoretical thought. According to Baxter Magolda, such opportunities can induce cognitive development. With close instructor supervision and peer review, students may excel at their own pace and learn from others who may have ways of knowing different from their own. Moreover, in contrast to stage V, they are presented the opportunity to launch a more particularistic, interpretive and text-driven inquiry. Thus, by the end of stages V and VI, students should be well prepared to embark on an extended interdisciplinary inquiry which can be concept- or text-driven, theoretically and methodologically sophisticated and individually constructed and executed.

Student Objectives:
  To read, study, analyze, compare and evaluate theoretical models of integration;
  To read, study, analyze, compare and evaluate theoretical writings which explicitly address interdisciplinary scholarship;
  To analyze primary sources using theory;
  To conduct a text-driven inquiry (18-25 pages) which utilizes a theoretical perspective and incorporates primary and secondary sources.

Professor Objectives:
  To treat students as equals and valued members of the workshop;
  To establish a collegial rapport and relationship with the student; to serve as a coach rather than an expert;
  To demystify the theoretical models addressed and provide opportunities for applying them to texts.

Possible Assignments:
  evaluations of a theory or theories;
  comparison/contrast essay examining two theories;
  analytical essay utilizing a theoretical model to examine a text;
  text-driven research paper, incorporating theory as well as primary and secondary sources;
  personal essay, comparing a theory of interdisciplinary inquiry with the student's own experience;
  peer review of another's research project which discusses its level of integration.

Stage VII—Interdisciplinary Capstone Project

This stage serves as the culmination of the interdisciplinary undergraduate experience. Students are given the opportunity to utilize and apply the knowledge and abilities accrued in the previous six stages into an extended year-long project. The project should require students to integrate in a self-conscious and critical manner two or more disciplines in order to respond to or solve a question, topic, issue or problem of their own choosing. Depending on the nature of the topic, projects should display a meaningful use of theory and/ or methodology. While projects can and should vary greatly from student to student, all of them should cover most (if not all) of the steps Julie Thompson Klein specifies are part of the integrative process: defining the

topic; determining all knowledge needs; developing an integrative framework and questions to be asked: specifying a study to be undertaken; gathering information; resolving disciplinary conflicts; evaluating; integrating; and concluding (188-89). The sequence of the steps and the depth with which they are covered will differ from project to project.

While attention to students' individual writing processes is important in each stage of the undergraduate curriculum, it is essential in this final stage, where students are embarking on uncharted compositional territory and are undertaking highly individualized projects. Students should meet weekly with their project advisors, participate actively in small writing groups (which should also be closely monitored), receive frequent written feedback from the advisors and peer reviewers on all phases of the project (e.g., proposal, annotated bibliography, literature review, drafts and final versions), and present portions of their findings to a public audience. Such collaboration (and feedback exchange) helps to create a collegial atmosphere, where faculty and students become interdependent and mutually supportive. It also encourages independent knowers to become more conscious of divergent views and thus to grow as learners; and it helps contextual knowers flourish. Moreover, it reinforces the idea that writing is not a solitary activity and does not involve a single, fixed and universal process. Instead, this project impels students to locate and utilize a multiplicity of resources which are not self-derived and to engage continuously in active collaboration with other texts, other students, faculty, librarians, personal experience, methods, theories, fieldwork, technology, physical facilities and material objects. No student at this stage could perceive the processes of writing and interdisciplinary inquiry as distinct, simple, mechanical or prescriptive. Through this year-long project, students are empowered as interdisciplinarians to pursue the knowledge they seek and to communicate their findings with others.

Conclusion

My goal in creating an interdisciplinary writing plan for a four-year curriculum is to prompt educators to perceive the interrelated acts of writing and reading as constructing interdisciplinary knowledge. Accepting this assumption derived from social process compositional theorists means that faculty must see writing as integral to the learning which happens in their courses and must consequently perceive writing assignments as something more than isolated tasks designed to test students' ability to comprehend course texts or their ability to construct grammatically sound paragraphs. The more carefully the writing experiences are designed and implemented, the greater the potential for learning. Meaningful writing experiences respond to students' developmental levels, are carefully sequenced to increase in cognitive and rhetorical complexity, build on a workshop learning environment and move students progressively through the steps of the integrative process. My hope is that these plans will spark an ongoing dialogue about the place of writing in the interdisciplinary classroom which will thereby serve to enliven and enrich interdisciplinary education and scholarship.

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