INNOVATIONS IN INTERDISCIPLINARY TEACHING

Edited by Carolyn Haynes

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CHAPTER

Writing in Interdisciplinary Courses

Coaching Integrative Thinking

Marcia Bundy Seabury

INTRODUCTION: WAC AND IDS

Imagine an interdisciplinary arts course composed of students from engineering, business, education, the health professions, and various arts and sciences, all enrolled to meet a general education requirement. Many of them have never been to an opera, a symphony concert, or an art museum. Their team of instructors, faculty from art, music, and literature, assigns them not only to make forays into firsthand experiences with the arts but to write about them and draw connections, as they gain an understanding of the European-wide cultural movement known as Romanticism. Indeed the students write continually as they process weekly multimedia experiences of revolution, nature, and individualism.

Interdisciplinary study for students across a university shares a related heritage with writing across the curriculum: Both can trace their roots to ancient times but took on increased importance in American higher education during the 1970s and 1980s in response to widespread concerns about fragmentation of the curriculum and limitations of students’ ability to think and express themselves. Some universities have explicitly linked these directions of change: at my own, for example, all baccalaureate students are required to take at least four interdisciplinary courses, each of
which explicitly works to develop two or more “essential skills” such as written communication.

Now, twenty to thirty years later, both writing across the curriculum (WAC) and interdisciplinary studies (IDS) have proven themselves durable features of the American higher education scene. Among multiple indicators of their continued importance, a recent Boyer report (1998) criticizes the fragmentation of undergraduate education at America’s research universities and includes among its ten key recommendations “remove barriers to interdisciplinary education,” specifically including lower-division courses as well as study in the major, and “link communication skills with course work.”

But despite juxtaposition of these movements in programs, recommendations, and widespread individual courses, and despite the growing literatures of both WAC and IDS, there has been little discussion of intersections between the movements and what these might mean for strengthening undergraduate education. The literature of the former has often ignored the latter. Publications, conference presentations, and bibliographical entries frequently refer to WAC as an interdisciplinary movement, but typically meant is that its concerns are important within multiple disciplines. Writing becomes more central within diverse courses, faculty across the disciplines share concerns and ideas about writing, but discourse that crosses those disciplines is likely not on the agenda. While Elaine Maimon argues the importance of the A for “across” in WAC, entailing “forming conceptually interrelated communities” (“Teaching” 390–91), and Joseph Harris urges that students learn to deal with conflicting “claims and interests that extend beyond the borders of their own safe houses, neighborhoods, disciplines, or communities” (124), WAC research and practice still usually assume students are working within one of the prevailing divisions of knowledge.

The literature of IDS can hardly ignore writing, for the kinds of goals typically cited for interdisciplinary education such as building students’ integrative thinking cannot be adequately practiced or assessed through short-answer tests and end-of-semester term papers. Articles tend to contain passing mention of student projects for particular interdisciplinary courses rather than reflective commentary on interdisciplinary teaching and learning in relation to composition theory and practice. Numerous articles explore the interface between composition and another discipline (e.g., see Fiscella and Kimmel). Faculty members describe paired composition and engineering courses, or a single course integrating principles of composition and biology, possibly team taught. These articles and teaching arrangements do not address writing within a wide variety of courses that feature multiple
disciplinary perspectives on a common topic. One article that does so (Haynes) focuses on a four-year sequence of writing courses ushering students into the discourse community of interdisciplinary studies. Also needed is further analysis of what is possible within the time frame of a semester and with students and faculty having “homes” in the disciplines.

This chapter offers some thoughts about such writing-intensive courses, focusing on general education as the largest category of interdisciplinary courses now being taught in this country (Edwards, “Are”). “Writing intensive” designates the central assumptions of the writing across the curriculum movement: not just increased quantity of writing but ongoing writing, with coaching of the process rather than simply expectations of a product; ongoing feedback from the instructor and likely from other students as well; and opportunities for revision—not just editing but genuine rethinking in response to feedback. These assumptions of frequency, coaching, and revision seem to be widely agreed upon as the essentials, as evidenced in their presence on Web pages offering guidelines for writing-intensive courses at universities across the country, as well as in my own university’s guidelines. A number of other practices typically accompany them, such as sequences of assignments, one piece building on another, and writing for varied purposes and audiences.

But writing-intensive courses that cross disciplinary boundaries obviously need to go beyond the two most frequently discussed approaches in writing-intensive courses: writing informally as a mode of discovery, to think through the issues and approaches of a particular discipline (“writing to learn”), or learning to use the accepted genres of a discipline (“writing in the disciplines”). And when practiced in combination, writing across the curriculum and interdisciplinary studies present not only related but compounded challenges. Faculty and students who engage these can reap compounded rewards as well. A flexible, fluid, recursive model for combining WAC and IDS can help students to become active thinkers drawing the fruitful connections that interdisciplinary study promises.

**CHALLENGES OF IMPLEMENTING WRITING-INTENSIVE INTERDISCIPLINARY COURSES**

**Concerns about Expertise**

Asking experienced faculty to change practices, either to incorporate writing more integrally into their courses or to explore connections across disciplines, can yield similar concerns, skepticism, even resistance—and understandable resistance at that. These practices push many faculty out-
side their relatively comfortable habits and routines. One concern is whether faculty not trained in writing or in interdisciplinary inquiry can reach those approaches with the requisite authority. Either practice may force a faculty member to learn new approaches and to make the invisible visible—that is, to consider questions of disciplinary practice that have been taken for granted: what does one prioritize, in specific, to help students see and practice some of what it means to think and write like an economist, biologist, or historian?

Indeed the challenge is greater than many faculty at first realize, since both composition/rhetoric and interdisciplinary studies have increasingly developed traditions of their own, with their own concepts, methodologies, and literatures. Faculty across the disciplines will not likely become expert in either area. The question—as Austin Doherty et al. similarly ask with regard to the literatures of intellectual skill building (182–83)—then becomes how much expertise would be necessary, pragmatically, to make a difference for students. Without some conscious awareness of the accumulated wisdom of WAC, for example, faculty incorporating writing may simply assign more of it or feel obligated to join the “grammar police”; and without awareness of the accumulated wisdom of IDS, an interdisciplinary course easily remains stuck in “serial disciplinarity,” expecting synthesis from students without offering sufficient practice and coaching.

Combining writing-intensive and interdisciplinary approaches adds new dimensions to the issue of expertise. In good writing-intensive disciplinary courses, faculty coach students to do as they do: try out the varied kinds of writing, with varied audiences and purposes, produced by a practitioner. In writing-intensive interdisciplinary courses, faculty may be coaching students to write in ways they do not write: analysis in one discipline plus analysis crossing disciplines. Clearly a team-taught course has advantages here, allowing faculty to learn directly from their colleagues, frame assignments together, and share and discuss writing samples by students and themselves.

Related to concerns about expertise are concerns about time demands on faculty from each of the approaches: Many faculty argue that they simply do not have time to read quantities of student writing, or to learn material outside their discipline plus work as part of an interdisciplinary team. Combining WAC and IDS compounds these concerns. Programs with writing-intensive interdisciplinary courses, like their counterparts in WAC or IDS more broadly, will be successful only to the extent that planners meet the concerns in theoretical, practical, and administrative ways, adapting the myriad suggestions in the professional literature of both areas to the local context (e.g., see McLeod and Sover; Newell, ed.).
Concerns about “Coverage”

A part of the breaking out of “business as usual” via WAC or IDS may be that faculty need to rethink unexplored assumptions about “coverage.” Faculty express concern that moving away from traditional models via WAC will “take time away from content and thus lower standards” (Russell, Writing 293); indeed, fear over coverage has been deemed “the most resilient enemy of WAC” (Maimon, Preface xiii), even as skeptics of IDS continue to fear that interdisciplinary courses will lack sufficient disciplinary depth. Active learning advocates have effectively critiqued the dominance of the coverage metaphor, noting that faculty’s “covering” a lot of territory may bear little correlation to what students have learned. Both WAC and IDS are premised on the assumption that they are not simply adding something to existing practice but transforming that practice. New goals and new classroom procedures come into play, as a course examines a perhaps more focused topic but students gain time to work through ideas for themselves and/or explore connections across disciplines.

In courses both writing intensive and interdisciplinary, even experienced faculty will need to cope with the time crunch posed by the demands of multiple disciplines and multiple writings: the nagging feeling that there is a lot to do and not a lot of time to do it in. Conscientious faculty are particularly vulnerable here. But if too much of this feeling gets conveyed to students, even by rushing through guidelines for an assignment, students can feel dragged on a whirlwind interdisciplinary journey more overwhelming than enlightening. Teaching teams need to be particularly vigilant about not overwhelming students, as conscientious faculty pool their separate ideas of what assignments are essential.

The Need to Coach a Process

Another example of the related challenges posed by WAC and IDS, compounded when the approaches are combined, involves the issue of coaching a process. Assignments such as those discussed later in this chapter may sometimes in and of themselves yield good results, but integrative thinking is a process that needs ongoing guidance. Assigning the process and even modeling it are not enough to help it “happen” with any sort of the frequency or depth faculty would want. Carolyn Haynes notes that the workshop approaches advocated by the process theorists of composition should help to encourage integrative thinking (36). Indeed they do, as faculty at my university have discovered over the fourteen years of our program.

The need to coach a process, definitional in WAC, needs more emphasis in IDS. The metaphor can help to balance the “presentational” language
that too often dominates (faculty work out an interdisciplinary understanding of an issue or problem and then "convey" it to students [e.g., Richards 127]). Discussions of coaching, and explicit analysis of the metaphor, have appeared numerous times in the composition literature of recent decades (some of which I survey in my own contribution, Seabury, "Sports"). The metaphor and model bring into focus that instruction in both writing and integrative thinking entails trial and error, learning by doing, the awkwardness and frustration of altering habits and stretching/playing in new ways, the need for ongoing practice, and the benefits of feedback during the process. In- and out-of-class coaching needs multiply in a writing-intensive interdisciplinary course: as James Davis notes, in an interdisciplinary course, tasks at a particular level in Bloom's taxonomy of educational objectives are typically more complex than if they were framed within a particular discipline (55). In their course evaluations, both faculty and students repeatedly single out individual conferences as especially helpful toward the goal of students’ dealing integratively with course materials and concepts. Chapter 9 in this volume discusses the complementary practice of peer review.

Criteria and models can assist the coaching process. A writing-intensive course within a discipline coaches students in their successive approximations of a disciplinary voice, as they learn acceptable evidence, tone, and argument structure. But in an interdisciplinary course, as noted previously, faculty may be feeling their way into new discourses along with students and thus may possess and provide more limited awareness of criteria for success. A team-taught format helps by allowing students to learn directly from faculty trained in diverse disciplines (albeit still often not experienced in discourses that attempt to synthesize disciplinary perspectives). Students can be encouraged or assigned to interview faculty in other disciplines, not only to gather perspectives on the issues at hand but to get specific advice on thinking and writing processes. Guest experts who work in discipline-crossing public spheres can help to define the writing challenge—for example, how they would evaluate a proposal.

Accompanying the challenge of criteria can be a lack of models. My own team has been on the lookout, not always successfully, for accessible models of the kind of interart analysis we hope for from students. We have learned to save, distribute, and discuss models of successful student writings from past semesters, although amidst the busy pace of a semester we sometimes neglect to do so.

Differences Across Sections of a Team-Taught Course

The team-taught, or at least multisectioned, structure of many interdisciplinary courses can lead to further complications, since within a teaching
team, faculty may not agree on how to handle writing in the course. Some may simply resist the demands of assigning frequent writing. Some may be comfortable assigning open-ended major projects, for example, with students writing “about” a major Romantic figure in the arts, while others object that such assignments yield occasional brilliance but more often unreflective “reporting,” not to mention downloads from the Web.

Many teams try to follow “best practice” recommended in the “Guide to Interdisciplinary Syllabus Preparation” (Association for Integrative Studies and Institute in Integrative Studies) by negotiating common exams and projects across sections, but sometimes agreement especially on the latter may be impossible. A result: Students who come to class accountable for what they are to have read via five-minute in-class writings as discussion starters and whose essay projects demand higher-order thinking may object that other sections are “easier.” Such differences can become divisive—for example, when one instructor requires students to attend labs and write up formal lab reports while another hopes to inspire rather than require. Even given the excellence of faculty and productive differences in teaching styles, agreement across sections on writing does help. Faculty workshops such as those discussed later increase its likelihood; a last resort may well be to allow sections to diverge rather than to sacrifice some faculty’s effective uses of writing for the sake of compromise.

**Sustaining Commitment**

As WAC and IDS programs continue beyond their early years, problems of sustaining individual faculty commitment emerge. The gravitational pull back to old modes can be strong: It is easier not to cope with the myriad problems of getting students to write good journals or researched arguments and simply abandon the project altogether; it is easier to teach what your chair asks you to teach than try to get released once again to join an interdisciplinary team and then do all the actual work of teaching the course. Both writing-intensive teaching and interdisciplinary teaching can be “invisible” service that does take some additional time and energy (even if WAC techniques and interdisciplinary collaboration help out) but receives few tangible rewards. Great satisfaction may result but not much credit.

These faculty issues often mirror larger programmatic ones. Both WAC and IDS have become widespread, as witness such surveys as Susan McLeod’s of WAC programs and Alan Edwards’s (Interdisciplinary) of interdisciplinary programs. Both now have professional associations and conferences specifically dedicated to their concerns. But the problems of sustaining the programs are similar and substantial, as one hears clearly at
such conferences. Programs in both areas are often begun with grant support but must be sustained after that money has run out, sustained as units cutting horizontally across the power structures and budgetary structures of the institution. This challenge becomes particularly acute during tough economic times, when departments are fighting hard for faculty lines if not for their very survival.

Indeed David Russell’s detailed analysis of the difficulties of sustaining WAC programs applies in many ways to IDS as well: “WAC challenges deeply held institutional attitudes toward writing, learning, and teaching: attitudes that are reinforced by the differentiated structure of knowledge and education”; “WAC efforts easily fall victim to the institutional inertia of academia’s differentiated, hierarchical structure.” He concludes that in today’s American university “there is thus no permanent defense against the slow erosion of programs [WAC or other interdepartmental] under the pressure of well-defined departmental interests” (Writing 292, 296, 298). Thus, institutions planning to implement writing-interdisciplinary courses successfully will need to pay particular heed to the multiple and similar strategies devised by WAC and IDS advocates to counter their invisibility, including categories on P&T forms to acknowledge these contributions, increased weight put on teaching portfolios in which these activities can be highlighted, summer stipends, travel funding, and other rewards and incentives. Programs encouraging such across-the-curriculum endeavors need a single locus of authority: a program director supported by a faculty committee, an independent budget, and a strong voice in broader policy and budget matters through direct reporting to an upper-level administrator.

**Addressing Pedagogical Concerns via Faculty Workshops**

One of the distinguishing features of the WAC movement, important both in creating and in sustaining a program, has been faculty workshops. These bring faculty from across a college or university together to discuss shared issues of teaching and learning rather than the more usual ones of university politics. A key to WAC has been that it involves new possibilities not just for students but for faculty as well, as a new culture of faculty as learners emerges. The workshops are typically nonhierarchical (Maïmon, “Teaching” 383–86), with faculty learning from each other. A similar process has characterized IDS, as faculty come together to discuss topics and pedagogies across the boundaries of departments and colleges.

If we learn from this shared history, we realize that institutions cannot effectively implement writing in interdisciplinary courses and maintain its importance by directive. Focused workshops can address such questions as these: What kinds of writing are we assigning in our interdisciplinary
courses? Which have worked well, which have not? What are the goals of these assignments? To what extent and how are we encouraging students to synthesize perspectives from different disciplines? How are we sequencing assignments, if at all? What kinds and extents of structure do they have? To what extent and how are we coaching the writing process? And what commonalties emerge across courses on such issues? The following section offers thoughts on some of these issues, working from the more general questions to examples of assignments.

TEACHING ISSUES AND OPTIONS

Consciously Encouraging Integration via WAC and IDS

How, asks this volume’s general editor, can we ensure that students engaged in the approaches under discussion move toward synthesis and integration? Quite simply, we can’t. As critical thinking expert Stephen Brookfield notes, “there is no standard model of facilitating critical thinking... no one way to instructional enlightenment.” It is possible to devise a variety of productive pedagogical approaches, but the kinds of thinking for which one hopes “will frequently come unexpectedly to individuals” (233, 244).

But as WAC workshop participants have discovered, increased consciousness on faculty’s part of what we are asking of students, along with going on to coach the process, can increase the chances that the desired learning will occur. Are we already conscious, given all the time we spend designing assignments? Not necessarily. Even within our own disciplines we often do not take a step back from our assignments to reflect on the kinds of thinking we are asking of students. When I told an experienced colleague I was working on a project about writing-intensive courses, she responded, “Well, that’ll be a short article. Have them write! What’s the mystery?” In workshops at my university where faculty brought in photocopies of assignments they use, some of these ran for a couple pages of intended help but confused workshop colleagues, not to mention students. Upon discussion, faculty can reflect on the kinds of thinking they hope to see, break down the skills needed to accomplish these results, and better articulate the assignment or sometimes redesign it altogether.

Similarly, faculty teaching interdisciplinary courses are more likely to become passionate about their subject matter and how much it comes to mean to their students than to take the time to step back and reflect on the kinds of integration they are asking of students, which can seem at a too-far-removed level of abstraction. Whether we are just moving from our own discipline into interdisciplinary teaching or have been doing it for...
some time, however, we would benefit from some reflection on what we are asking students to integrate and how we are helping them toward that end.

**But Is That Always the ‘End?’**

A further question arises with the general editor’s framing challenge previously cited: Is integration and synthesis indeed the end toward which students should steadily be moving in an interdisciplinary course? “Moving toward synthesis” embodies a metaphor that deserves unpacking. It suggests a graph-like progression whereby students gradually move from lower forms of thinking on up to more holistic, abstract thinking, ending in the upper-right quadrant of the page. “Toward” involves a destination, a goal, an end. We hope students will “reach” a holistic understanding.

But as I have argued elsewhere (“Finding” 99–100), the “goal” may be _not a position but a motion:_ students’ facility with moving among levels of abstraction and generalization. Integrative thinking means not just bringing together diverse data, diverse disciplinary perspectives in order to reach an overarching synthesis but also using and testing such a synthesis in relation to the more specific and concrete. John Dewey offers some underpinnings here: He warns that educational methods priding themselves exclusively on either analysis or synthesis are “incompatible with normal operations of judgment”; abstract thinking represents “an end, not the end” of the thinking process (130, 227). As linguist S. I. Hayakawa puts it, good thinking involves the “constant interplay of higher-level and lower-level abstractions, and the constant interplay of the verbal levels with the nonverbal (‘object’) levels” (162). Composition expert Ann Berthoff similarly speaks of a natural dialectic of mind, “a dialectic of sorting and gathering, of particularizing and generalizing” (105).

Thus, as we create assignments to encourage integrative thinking, the process and goal may be to build a synthesis but may also be to apply, evaluate, or break down a synthesis. Productive interdisciplinary assignments will ask students to move among levels of abstraction and generalization in order to accomplish specific purposes.

**Sequences/Spirals**

Some of the additional questions we face when designing writing-intensive interdisciplinary courses cut to the core of both WAC and IDS. They involve finding workable balances among sometimes competing, sometimes complementary goods, balances that will vary depending on the goals of a particular course and the students and faculty in it. These issues are provocative but often lie buried beneath a faculty team’s negotiations about the selection and organization of issues and materials in an interdisciplinary
course. They are hidden as well in the aforementioned "Guide to Interdisciplinary Syllabus Preparation."

Much composition scholarship, for example, has discussed progressions of assignments, as students first attempt more basic cognitive challenges and then move on to analysis, comparison, evaluation, and so forth; in the interdisciplinary literature, Haynes likewise emphasizes progressions, which make good sense within a semester as well as over her four-year time frame. But as commonsensical as carefully sequenced writing sounds, it may not always make sense pedagogically in an interdisciplinary general education course (or disciplinary general education course either, for that matter), where many students may simply not care enough at first to bother putting much effort into learning particular kinds of disciplinary analysis. Overheard from a student trying to walk out the back door as my music colleague raised the issue of chord progressions in Beethoven: "I never listen to this kind of stuff." Faculty may need to be figurative as well as literal exit-blockers of easy outs in interdisciplinary courses. Rather than assigning students to work patiently through disciplinary discourse conventions toward integration, writing-intensive interdisciplinary courses may well need to use recursive strategies allowing students to spiral in their understanding: asking some "big questions" and trying some integration in week one and then revisiting those issues/modes along the way as they increase their awareness of the disciplinary discourses involved. Students meet related challenges again and again but with increased ability to handle them.

Spontaneity/Structure

Faculty hope that both WAC and IDS will offer students a medium for exercising their creativity, trying out ideas, and making personal connections with the subject matter at hand, at the same time that they become aware of and practice some of the genres of writing used within the academy and beyond. A tall order. But especially true of interdisciplinary thinking as composition scholars have discovered of writing, courses need to give students a mixture of opportunities by which thinking can grow. Students will cope with the complex demands of interdisciplinary courses in different ways and need multiple modes of learning and expressing learning. Thus, in a writing-intensive interdisciplinary course, many of the assignments may be more exploratory, out of which perhaps some epiphanies will emerge—or perhaps some fruitful chaos ("I thought of a wild connection, but I'm not sure if it makes sense...".). Other assignments may be more structured but "creative" as well: indeed one of the concepts faculty and students have jointly discovered in our course on creativity in the arts, as noted later, is how often creativity blossoms within limits of one sort or another.
Too much emphasis on either spontaneity or structure can inhibit the growth possible through WAC, IDS, or a combination. And one point of agreement in WAC that applies to IDS as well is that some choice along the way amid the varying topics, genres, audiences, and purposes of a course’s assignments gives students an important voice in their own learning process—especially needed in required general-education courses. In the process of assignments of various kinds, faculty can encourage or require students to follow Peter Elbow’s suggestions for “cooking” in the writing process (40–53)—allowing different, even conflicting materials into the mental “pot” together to simmer and to transform each other (e.g., by talking with people, encouraging contradictions in thinking, or freewriting and stepping back to reflect)—a metaphor and model well suited to interdisciplinary work.

Writing to Learn (in an Interdisciplinary Context)/Writing in the Disciplines (and Across)

Should writing in an interdisciplinary course focus on writing-to-learn activities, adapting to the interdisciplinary context, activities such as journal responses aimed to help students make sense of new material for themselves, to explore and discover? Or should it build more on the writing-in-the-disciplines approaches, providing practice with the modes of disciplinary discourse used to communicate with others, but going on to bring them to bear, in combination, on the subject at hand? This choice of emphasis is obviously related to the previous issue of spontaneity/structure but cannot simply be conflated with it, since some writing-to-learn exercises might be fairly structured (e.g., a guided journal) while some exercises in the genres of disciplinary/interdisciplinary discourse might be fairly open (“write an informal memo to the leader of your interdisciplinary project . . .”). Writing-to-learn has been defined as more suited to general education; learning genres, to advanced or specialized courses (Anson 773). Amid the arguments within composition studies about the relative merits of these approaches, frequently termed one of the major conflicts in the field, many scholars are objecting that the framing of the discussion has emphasized false dichotomies, the supposed poles of which are actually intertwined (e.g., Kirscht et al.; Maimon, “Teaching”; Russell, “Writing”; McLeod and Maimon). But given the time constraints of any given fourteen-week semester, priorities do need to be set. It is certainly possible to include some of both, for example both short, informal responses plus proposals to a public agency.
Coaching/Interrogating Disciplinary Discourses

The issue of whether faculty should be guiding students to learn academic discourses and/or to interrogate them, raised in WAC scholarship, is fundamental to IDS. It involves both theoretical stances and practical complications. The coaching metaphor discussed earlier, which sounds unproblematic in conception although always challenging in practice, could imply the underlying assumption that there is a "game" or games, with established "rules," in which the novice is invited to participate. But this conception of academic discourse has been called into question in the composition literature as falsely suggesting that disciplines are closed, static, and monolithic and as encouraging in students "both conformity and submission" (Spellmayer 266). A response that comes naturally to me from my work with Goya, Beethoven, Wordsworth, and other Romantics (and that Maimon has also made repeatedly with regard to WAC) is that effective rebels typically do not spring ex nihilo; they have learned the conventions and then employ, modify, or move beyond them for their own purposes. Charles Bazerman argues that explicitly "teaching students the rhetoric of disciplines . . . holds what is taught up for inspection," which can enlighten rather than oppress.

The juxtaposition of disciplines in interdisciplinary study goes a long way toward helping students to see a discipline as offering ways of seeing, not the way. Much interdisciplinary literature includes as axiomatic that students need to go on to become conscious of and explore similarities and differences, assumptions, limitations of various disciplinary perspectives: to "problematize" the disciplines. But how much is it possible to do in a semester of general education with students inexperienced in the disciplinary discourses at hand? Some, indeed. Following class readings, guest speakers, and debates on hunger in a particular region, students write a policy recommendation in which they juxtapose and weigh perspectives on economic development, concerns about maintaining the local culture, and more. At a recent writing-across-the-curriculum conference, however, an experienced humanities professor claimed he was lucky just to get students to discover and write with clarity about some common threads across the course readings. Even that can involve looking critically at disciplines. In the Romanticism course, students discuss and then write about ways in which feminist perspectives reveal aspects of specific works across the arts that have been overlooked by more traditional modes of disciplinary analysis.

Sample Assignments

This final section offers some examples of productive kinds of interdisciplinary assignments, focusing particularly on ones encouraging the motion
among levels of abstraction and generalization that characterizes effective thinking within and across disciplines.

William Newell's overview of the interdisciplinary literature ("Professionalizing") distinguishes four techniques of achieving synthesis: dialectical thinking (working with conflicting perspectives, resulting either in a nonresolved dialectic or a reconciliation of the differing paradigms), metaphorical thinking, building a metalanguage (agreeing on a vocabulary going beyond that of the everyday), and developing a common ground. The related list here of productive kinds of interdisciplinary student writing includes references to approaches Newell cites but also adds several other important ways students can work with integrative thinking, since that does not always involve building a synthesis. It may, for example, involve taking holistic understanding built during the course and communicating it to others, applying it in new situations, or critiquing it. I will draw on work by colleagues at my university (Seabury, ed.). In their chapters on how interdisciplinary courses help to build students' integrative skills, a number of them discuss writing assignments. What does looking across these examples, plus some others from colleagues in our program, reveal about kinds of integration and synthesis we might ask of our students?

First, I should perhaps say the obvious that many effective assignments in interdisciplinary courses may be discipline centered. The results may later become part of other assignments featuring synthesis. Our course on "Epidemics and AIDS" is rigorous enough in laboratory science to meet a four-credit requirement, but instead of analyzing cells as a scientific exercise, students do it in relation to a major social problem. They distinguish serum from a person with an immunodeficiency from normal and control samples and summarize their results in a traditional lab report. In another of the course's labs, within the discipline of epidemiology, students chart the spread of an epidemic. A subsequent project, discussed later, integrates knowledge built in these and other disciplinary writing assignments as students communicate the many-faceted understanding they have gained.

But to say the obvious about the use of single-discipline assignments is also to say that many interdisciplinary courses simply select from assignments typically given in the constituent disciplines. The following are among the wide range of possibilities for interdisciplinary assignments encouraging students to practice integrative thinking.

1. Action/reflection. Active learning, in Charles Bonwell and James Eison's widely quoted definition, entails students "doing things and thinking about the things they are doing" (2), an apt place to begin this discussion. These assignments start with action, doing something new in relation to the issue or problem in focus: students in a hunger course work in a soup
kitchen; students in a course asking “What Is School?” tutor in an after-school program. As they reflect on what they have experienced, whether in journals, letters to the editor, or various kinds of academic analysis, they can be encouraged to make connections with class discussions and readings. Thus, many students enter naturally into integrative thinking: The firsthand experience helps to break down one-dimensional views about causes for hunger or poor performance in school. Students begin to realize the complexity of the problems and may connect psychological, sociological, economic, health, and other factors.

Assignments can specifically ask students to discuss the new experience in relation to course concepts. In a course on “Creativity: The Dynamics of Artistic Expression,” students go to a performance, exhibit, or other “live” art and then write a critical paper about it that incorporates principles from at least two course workshops. In a course on “Sources of Power,” students use the university as their lab: they meet with guests from various parts of the university community and write about the discussions in terms of analytical frameworks such as Dennis Wrong’s “forms of power” and Peter Bachrach and Morten Baratz’s “nondecision-making.”

2. Reconstructive. These assignments ask students to assimilate new material into their evolving understanding: to reconstrue the more concrete, the more abstract, and their evolving connections. Students not only add new insights but also readjust their understanding, re-seeing what has come before. As Arthur Applebee discusses in Curriculum as Conversation, this process is key to critical thinking (77). Journals are a frequent mode for encouraging this thinking, as students puzzle through new data, methods, and concepts and then look back at what light they shed on earlier learning. Students in the “Creativity” course, in a workshop with one of the university’s leading artists, are asked to use only three shapes for a design. In their journals they often express resistance to the limits: if the course is about creativity, why can’t they do whatever they want? Questioning of the guest presenter has led to discussion of the new issue of the role of limits in creative processes: the generative tension found across the disciplines between structure and freedom. Students have then reflected in their journals on whether/how limits have played a role in previous workshops focusing on other disciplines.

In a wide variety of interdisciplinary courses and assignments, as students write about what connections they see in themes and techniques with works studied earlier, they gradually build a concept. The process of developing a synthesis thus is not necessarily a late-in-the-semester result of earlier stages of developing disciplinary thinking. It can begin from week one, as students in my own course, for example, write what similarities they
note among a particular Romantic poem, painting, and musical composition. Similar comparative assignments later in the semester may show greater sophistication, but the integrative thinking begins from the outset. This process of reconstrual may also lead students to unbuild concepts. As they see images of nature in works by Turner and Mary Shelley, they may write about the limitations of their generalizations about Romantic views of nature built on the basis of Constable and Wordsworth.

These assignments particularly demand the coaching discussed earlier. Repeated urgings often do not suffice to get students to comment and connect rather than simply report. Models, collaborative in-class experiments, conferences, and multiple drafts ("how does this relate to . . .") help to provide the needed nudge, especially for the less motivated.

3. Application of a synthesis. Students can take a discipline-crossing concept or method with which they have worked in class and explore it in writing within a new realm. Students thus search for and develop a new range of applicability of the concept or method. Amid all the discussion in the composition literature about differences among the disciplinary discourse communities students enter as they traverse a university, it is worth remembering Barbara Walvoord and Lucille McCarthy's classroom research, which revealed that across the disciplines they studied "students were asked to apply discipline-based categories, concepts, or methods to new data and new situations"; the teachers "had, with Peter Elbow (1986), that what constitutes 'real learning' is the ability to apply discipline-based concepts to a wide range of situations and to relate those concepts to the students' own knowledge and experience" (7, 8). This approach is likewise effective in an interdisciplinary classroom, helping students to apply interdisciplinary categories, concepts, or methods to new data and new situations and relate those concepts to their own experience.

The new field of applicability may well be within students' intended major; thus, they have the opportunity to link general education with the major. In a course on "Seeing Through Symmetry," students write a project, due in several stages throughout the semester, in which they apply what they have learned about symmetry to another field, ranging from the stock market to metaphysics to music. Such a process may lead not just to application of known categories but to discovery of new ones: new aspects of the concept, seeing the concept in unpredicted ways. In the "Creativity" course, some students elect the option to write an essay based on an interview with someone in their intended field about whether and how creativity functions within it. Students see that creativity in the arts unexpectedly connects with the activities of practicing professionals in engineering or marketing.
4. Creation of a product embodying a synthesis, with accompanying comment. Students can create a product that embodies a synthesis: for example, of materials from multiple disciplines concerning a particular culture under study, or a multimedia work of art. Nonverbal modes of learning and expressing learning are primary here, deserving of a chapter in themselves, but students can also build writing and thinking skills as they put into words some comment about the kind of synthesis they have attempted. In a course on "Ethnic Roots and Urban Arts," students create various squares to be displayed in the class's ethnic arts quilt, based on an early "Ethnic Me" assignment and then on reactions to specific African American and Puerto Rican readings and experiences, and also compose a commentary for the class about these squares. In the "Creativity" course, students work individually or as a group on a final creative artistic project integrating at least two disciplines, embodying a particular thematic idea, and synthesizing ideas explored in earlier workshops and journal entries, then write a commentary on what they have done.

5. Written communication of a synthesis. As a course proceeds, students gradually increase their holistic understanding of the issue or problem at hand and can communicate that understanding to others, making it into something new. In the "Epidemics and AIDS" course, students study scientific, psychosocial, ethical, and cultural aspects of AIDS. In a laboratory assignment in the second half of the course, they engage in some kind of public activity such as conducting a public health campaign to teach others within the university community or beyond about AIDS, high-risk behaviors, and/or discrimination. Students have created pamphlets and distributed them to middle-school children, created a book (text, pictures, production) for grade-school children, and published editorials in the campus newspaper. In the process of conveying the integrative understanding they have built, they need to consider not just what to convey, drawing on multiple disciplinary perspectives, but how to convey it, considering issues of age level, possible constraints from school or parents, techniques of persuasion, and so forth. These projects also may integrate general education with students' major (e.g., in education, communication, the arts).

In the "What Is School?" course, students may write letters to the editor or to their local school board taking a position on issues currently in public discussion, such as school vouchers or ability grouping—issues on which insights from multiple disciplines can be brought to bear and on which thoughtful argument from citizens and taxpayers is important at varying levels of expertise. Many of our courses assign such letters and may give extra credit when students mail them and even get them published (which does happen with good frequency).
6. "Zoom lens/wide-angle lens." These assignments guide students to look closely at a phenomenon using a particular disciplinary approach, then pull back to put what they have seen in relationship to other phenomena and/or approaches. The integrative thinking is built on first looking closely. Thus, these assignments structure in movement among levels of abstraction and generalization. They block the easy outs of "dead-level abstracting," a term Hayakawa borrows from Wendell Johnson (Hayakawa 161): skimming over the landscape without engaging closely with anything in it, or looking only at the details and losing sight of the larger picture. In our "Romanticism" course, such assignments may include a guided analysis of a painting, using techniques practiced in class, and then commentary and connections.

7. Eclectic data gathering/eclectic data given. These assignments pose a question (or ask students to construct such a question) that meets Julie Thompson Klein and William Newell's definition of the root of interdisciplinary inquiry: It "is too broad or complex to be dealt with adequately by a single discipline or profession" (393). Students thus must draw on materials of multiple kinds in order to address the question. One section of a course in our "Discovering America" series is taught in the university's Museum of American Political Life, where students are surrounded by a rich variety of primary materials to use for their projects. These projects—for example, a transcript of an imaginary debate between a variety of key figures on slavery or on the role of women, or, moving outside museum sources, exploration of the relation between data on juvenile delinquency during the 1950s and Hollywood portrayals—lead students to draw on materials ranging from political tracts, social essays, and memoirs to cartoons, popular fiction, film, and advertising.

Or such a course and its writing assignments may be structured in the form of case studies. Another "Discovering America" instructor has been composing a series of cases for students built on key decision points in American history. He describes his case exhibits as including "primary materials (diplomatic correspondence, presidential and cabinet member memoirs, committee reports, decrypted radio transmissions, participant recall, and so on), cartographic aids, and other resources (demographic, military, cultural, anthropological, sociological, scientific, and economic charts, diagrams, and tabular data calculations and summaries)" (Canedy 197). Using a carefully constructed approach to the case study drawn from its roots in business schools, he choreographs students' work with the materials he has assembled, as they work not just toward an understanding of complexity but toward decision-point.
Dialectical thinking such as Newell describes comes into play throughout both approaches described here, as students deal with the diverse data. In the former examples, the end point may often be a focus on differences; in the latter, a decision based on weighing and reconciling as far as possible the diverse perspectives.

8. Playing with metaphor. These assignments ask students to make leaps: not to build a concept by successive abstraction and generalization, not to move stepwise toward synthesis, but to try out the unexpected, play with figurative language, make discoveries. Students leap across disciplinary materials, methods, concepts, and see what happens. The importance of seeing likenesses where no likeness was perceived before has been affirmed by poets and scientists alike; given the eloquence and provocativeness of their comments, I include a few here. As Robert Frost puts it,

I have wanted in late years to go further and further in making metaphor the whole of thinking... We still ask [students] in college to think... but we seldom tell them what thinking means; we seldom tell that it is just putting this and that together; it is just saying one thing in terms of another. To tell them is to set their feet on the first rung of a ladder the top of which sticks through the sky (332, 336)

Scientist Jacob Bronowski comments,

A man becomes creative, whether he is an artist or a scientist, when he finds a new unity in the variety of nature. He does so by finding a likeness between things which were not thought alike before, and this gives him a sense at the same time of richness and of understanding. The creative mind is a mind that looks for unexpected likenesses. This is not a mechanical procedure, and I believe that it engages the whole personality in science as in the arts... To my mind, it is a mistake to think of creative activity as something unusual. I hold that the creative activity is normal to all living things. Creation is the finding of order in what was disorderly. (12, 16)

Composition expert Peter Elbow discusses in detail the metaphor complex as an “ideal strategy for inventing concepts”:

It is mostly poets and children who are given to saying that things remind them of seemingly unrelated things and they don’t know why... [People have] been taught too often that it’s cuckoo to think two apparently unrelated things are the same and not know how or why—they’ve stopped doing it... Therefore, when most people think of metaphor, they think of traditional metaphors... [that don’t] tell us anything we didn’t know... But the capacity is in us all... and the more unexpected and difficult-to-explain the feeling, the greater the
payload... [It's] wild, idiosyncratic, and nonlogical quality... But to get the benefit of this basic capacity, a person must practice it, learn to develop trust in it... The qualities of play and fooling around must be helped to flourish. (25–30)

Faculty can encourage metaphoric thinking in journals, design a variety of course-specific experiments in metaphor, and provide models; students take it from there and frequently enjoy it. A simple example I have used is to ask students to write in response to the prompts: "What is a teacher like? What is a student like?" For the "What Is School?" course, in preparation for guest workshop leaders from multiple disciplines, course members can share results from this experiment and explore underlying assumptions within the metaphors they have chosen: from the realm of the arts (teacher as performer, as conductor, or as potter, molding students?); sports (teacher as coach?); religion (teacher as missionary?); horticulture (teacher as planter of seeds, and as nurturer of a process?); business (teacher as boss, or teacher as seller, student as consumer?); or perhaps jurisprudence (teacher as judge and jury combined?). Obviously the implications for students of their previously unexplored metaphors are enormous, as they grapple with the multidimensional course focus and with their own attitudes toward school.

Or students may talk about two or more things in terms of a third thing, as they take an excursion in interdisciplinarity. The travel metaphor here is deliberate: Students in recent offerings of the "Creativity" course have tried a writing assignment discussing their course 'journey': "What kind of journey has it been for you so far? What have the various stops along the way been like?" Thus they are challenged to integrate and conceptualize multiple experiences in terms of something else. As preparation for this assignment, students engage in a class workshop on metaphorical thinking and explore the extended metaphor in Frost's poem "Mother to Son" ("Life for me ain't been no crystal stair... ").

9. Translation. Assignments can ask students to take a work in one discipline and try it out in another. As students in a course on "Literature and Film of Other Cultures" learn more about both literary and film techniques, they may write about how a particular story could be filmed. As students in the "Romanticism" course study Frankenstein, they discover that their paperback does not look like that of the student next to them as editions have changed and apparently so fast that the caption on the inside cover of the newer edition still identifies the previous image. They consider what resonances particular choices set up and then write a memo to a publisher recommending a Romantic painting for the cover of a "Rime of the Ancient Mariner" edition and arguing their choice.
10. Asking good questions. An appropriate note on which to close this list is question asking; frequent and in writing as well as aloud. Disciplines entail modes of inquiry, interdisciplinary study entails modes of inquiry, and inquiry means question asking. An instructor of two of our courses dealing with unfamiliar cultures plus multiple genres finds “thinking aloud” about the concerns of the courses to be essential for students to cope with their multifaceted nature. The questions—written in five minutes at the beginning or end of class, in an e-mail, or perhaps explored more fully in a journal—encourage students to put into words their struggles and queries and efforts to connect. The questions can then feed into class discussion and perhaps further writings. What kinds of questions are we engendering in students through all of our innovative interdisciplinary courses (that they may well be too unsure to ask in class)? Further, what kinds of questions do the disciplines involved ask, in relation to the subject matter at hand?

How do these questions compare? And here is a question for the instructors: Do we always want students to come to synthesis or do we also want them to ask good—and often messy—questions, and explore how others’ questions are framed?

CONCLUSION: HOW ELSE?

After thirty years of working with student writing, and over a third of that time with interdisciplinary studies as well, I am tempted to end this chapter with a simple “how else?” How else can you teach a good interdisciplinary course than by having students write? How else can you help students to become active players in interdisciplinary inquiry instead of passive absorbers of supposedly fascinating interdisciplinary insights? But let’s have a little dose of reality here. The very structure of the interdisciplinary program in which I teach modifies that message: The courses may focus on oral rather than written communication, and on other skills such as social interaction. Many of the courses rely heavily on a rich variety of group presentations, debates, role plays, and so forth to encourage integrative thinking. Other essays in this volume persuasively discuss integration and synthesis achieved through other modes.

Writing does form a key part of the approaches many of those essays describe, though, such as technology-assisted learning. Writing will be a key learning strategy in most interdisciplinary courses. In one of the founding documents of the WAC movement, “Writing as a Mode of Learning,” Janet Emig argues the differences between written and spoken language and advocates the learning that takes place only through struggling to put ideas into written form. She cites the work of Vygotsky, Luria, and Bruner indi-
cating that “higher cognitive functions, such as analysis and synthesis, seem to develop most fully only with the support system of verbal language—particularly, it seems, of written language” (122). And Berthoff reminds us that “one of the best ways to teach your subject is by teaching writing,” “the chief means of making meanings and thus of laying hold on the speculative instruments of one discipline or another” (113, 123)—statements true of interdisciplinary work as of disciplinary. She argues persuasively for seeing writing not as a separable “component” in a course occupied with other business but as central to that business.

Writing-intensive interdisciplinary courses, while often stretching both faculty and students beyond their comfort zones, yield student thinking that impels faculty in my hallway to call out to each other to share it, whether an excerpt from a student journal or course commentary or a major project. Considering the wide variety of approaches they describe, and the wider variety of courses to which this teaching approach applies, I should close with Christine Farris and Raymond Smith’s reminder about writing-intensive teaching: “the way to keep writing tied to thinking and learning and to changes in teaching is to deal with it as locally and as discipline- and professor-specifically as possible” (85). But amid the enormous variety are some common goals. If we fully engage the challenges of writing-intensive interdisciplinary teaching from the beginning of students’ college careers, by the time they enter their majors we know that they have already struggled explicitly, within particular courses, with the complementary and conflicting demands of diverse disciplinary discourses, rather than struggle remaining implicit and unexplored as they negotiate the demands of different courses. Students will have worked through, in writing, complex issues of their society, from hunger to power to the role of the arts, issues too important be relegated to “experts.” And they will often have directly engaged—for example, through letters to the editor or to senators and representatives—the challenge of entering the realm of informed public debate about those vital issues.

NOTES

1. Other designated “essential skills” in our program include oral communication, critical thinking and problem solving, values identification and responsible decision making, social interaction, and responsibility for civic life.

2. Among the handful of articles explicitly focusing on writing in interdisciplinary courses, beyond those mentioned in the text, are: Cooper, with examples from a graduate rhetoric course; Minock, focusing on using rhetorical concepts during establishment of WAC in an interdisciplinary program; and my own
("Writing," revisited with a more interdisciplinary second half as "Finding"), dealing with a general education context. Davis's discussion of interdisciplinary outcomes (55-58) could easily become the basis for useful writing assignments. Some recent articles discussing metaphors for teaching and learning, while not centering on issues of interdisciplinarity, offer useful insights: Clark advocates conceiving of rhetoric as travel, while Kleinsasser et al. advocate teacher as border-crosser, part of which may entail crossing disciplinary borders.

3. For an overview of assumptions and issues of writing-intensive teaching, see Farris and Smith; for comment on the particular challenges of writing-intensive teaching in general education, see Thaiss. Writing-intensive interdisciplinary courses today employ many techniques of collaborative learning and technology-assisted learning such as peer critiques, group projects, student e-mails with peers and faculty, and online discussions, but since these issues form the focus of chapter 5 in this volume, I concentrate elsewhere for this occasion. Another aspect of this topic is how writing-intensive interdisciplinary courses differ according to their position and sequence within students' undergraduate education. Is a course closely related to students' major or not? Are the students first-years or seniors? In the interdisciplinary teaching my colleagues and I do, we have found that nonmajors typically are equally at sea writing about a painting and a symphony whether they are freshmen or seniors; thus, for this occasion I assume students who are novices to the disciplines at hand, regardless of the students' level. Writing in an upper-level interdisciplinary course related to students' major would entail other assumptions: that students have developed some awareness of the discourse of their field and are now putting that discourse in conversation with other discourses on a topic of common concern, a rhetorical situation that likewise much deserves further attention.

4. And Walvoord's list of dangers to WAC similarly echoes IDS at every item: "lack of full institutional support, the high cost of some WAC programs, the compartmentalized structure of academia, counterproductive attitudes and assumptions about writing and learning in the university, research and service demands on faculty, faculty workload, the faculty reward system, current emphasis on quantification and testing in the academy, lack of an appropriate theoretical and research base for WAC, and leader retirement or burnout" (58). This article warrants close study for the light it sheds on challenges and strategies for IDS.

5. A series I helped to organize at our university a few years ago drew twenty-five people—a good percentage of the sixty full-time faculty teaching in the program, given multiple conflicting meetings of departments and colleges. Many claimed their sense of being ill-equipped to teach writing in interdisciplinary courses brought them to the workshops.

6. Williams uses this graph/quadrant image to discuss prevailing models of the progression of student thinking by theorists such as Piaget, Perry, and Kohlberg, and argues the advantages of alternative metaphors, in particular that of community.

8. Cf. Postman on such question asking as basic to study of any discipline (153-56) and basic as well to interdisciplinary study. Postman also offers support for metaphor as basic to study of a discipline—all the more so to interdisciplinary study.

WORKS CITED


Writing in Interdisciplinary Courses


