ASSOCIATION FOR INTEGRATIVE STUDIES
NEWSLETTER

Inside
■■■

Faculty development in interdisciplinarity
'Breaking Out of the Box' provides useful model

Marilyn J. Amey and Dennis F. Brown. (2004). *Breaking Out of the Box: Interdisciplinary Collaboration and Faculty Work*. Greenwich, Conn.: Information Age Publishing.

Reviewed by Shirley Shultz Myers, Honors Program Director and Professor of English, Gallaudet University, Washington, D.C.

Since the publication of Julie Thompson Klein's landmark *Interdisciplinarity: History, Theory, and Practice* (1990), a number of accomplished interdisciplinarians—Carolyn Haynes, Klein herself, Lisa Lattuca, William Newell, and others — have developed an ever more sophisticated understanding of the nature and consequences of the interdisciplinary process. One area we have not had much work on, however, is what faculty development in interdisciplinarity looks like. While we have excellent models of the steps of integration, we do not have much work on how people become integrators capable of moving through the steps. Now comes *Breaking Out of the Box: Interdisciplinary Collaboration and Faculty Work* by Marilyn J. Amey and Dennis F. Brown to report on a sustained, interdisciplinary study to characterize and conceptualize the "processes of interaction" of an interdisciplinary research team.

Amey and Brown studied the dynamics and development of a group comprising 10 members from five units (social work, urban affairs, business, museum arts, and university outreach in a "university-community-agency partnership" focused on providing "technical assistance and training to an inner city community council" (11). The group was itself involved in an 18-month research project to develop "the community's capacity to own and operate a community center that would provide a wide range of services and respond to future needs of the community" (147). This project, the authors point out, is an instance of Salter and Hearn's "instrumental" interdisciplinarity, a team assembled to address a practical, well-defined,

predetermined problem, here readily distinguished from "conceptual" interdisciplinarity, a concern with epistemological issues and the effort to create a new field of permanent knowledge (4).

Amey and Brown's *Breaking Out of the Box: Interdisciplinary Collaboration and Faculty Work* can be compared to Lisa Lattuca's *Creating Interdisciplinarity: Interdisciplinary Research and Teaching among College and University Faculty* (2001). Lattuca gathered reflections by interview from 38 faculty informants, from four institutions of various sizes, on their experiences of interdisciplinary work. Amey and Brown studied a single research team at one large research university. Amey and Brown also incorporated their own direct experiences into their findings: As two researchers with different disciplinary and professional backgrounds, they themselves lived a process of integration similar to what they were studying in the 10-member group. Both books analyze the impact of disciplinary and university culture, including the reward structure, on the viability of interdisciplinary work. They differ, however, in emphasis. Lattuca wanted a comprehensive look at the varieties of interdisciplinarity that faculty are enacting in practice. Amey and Brown want to provide professional development guidance, to find a reliable way to enable more fully integrative activity in the university. Lattuca provided a typology of interdisciplinary teaching and research as she found them, and established a continuum of informal to formal, from "informal communication

'Breaking Out of the Box' ...

(continued from page 1)

of ideas, such as might occur in a conversation between colleagues from different disciplines... [to] formal collaboration, such as research or teaching teams comprised of faculty from different disciplines" (abstract). Amey and Brown, on the other hand, explicitly exclude informal communication of ideas from true interdisciplinarity (6). Instead, they stress that interdisciplinarity means intellectual interaction and mutual integration, a "cognitive exchange, processing, owning, and integrating of information..." (7). While admitting that this definition may be an ideal (which I address further later), they also ground it in their understanding of the development of the team they studied. The evolution toward more integrative behavior that they observed necessitates this definition, they say, and the failure to reach full integrative activity may result from removable inhibiting factors rather than from some essential impracticality.

A great strength of the present study is its long-term, in-depth, direct observation of a sizable team with accessible and assessable goals. Together with their clear standard of full integration, this enabled Amey and Brown to establish both a model and its implicit professional development guide. Amey and Brown's model evolved from three years of analysis of observations and other data. They can be forgiven, therefore, for not having been involved in the project they studied from the start. They compensated for the initial six-month period without observation with "written reflections from team members, interviews and document analysis" (149). Their observation-based study, even if incomplete, thus overcomes some of the limitations inherent in the strategy of collecting retrospective anecdotal narrative. Nonetheless, researchers will want more complete longitudinal data in future studies.

Here, then (in Table 1), is the schematic of the Amey and Brown model. It has four dimensions over three stages:

The first dimension, discipline orientation, refers to the paradigm

	Stage One: Traditional	Stage Two: Transitional	Stage Three: Transformative
Discipline Orientation	Dominant	Parallel	Integrative
Knowledge Engagement	Expert	Coordinated	Collaborative
Work Orientation	Individual	Group	Team
Leadership Orientation	Top-Down	Facilitative, Inclusive	Web-like, Servant

Table 1: Interdisciplinary Collaboration Model

or lens that members use to devise solutions to problems. Development in this dimension is from seeing one's disciplinary expertise as paramount, to acceptance of the points of view and value of other disciplinary paradigms and inclusion of them, to, finally, combining disciplinary contributions into a new hybrid. The second dimension, knowledge engagement, refers to how people use knowledge and how that use creates a role in the group. The development here is from "expert," as in traditional outreach and consulting work, to "learner facilitator," who coordinates with other experts, to a full collaborator, who works with everyone involved, not just experts, and who promotes diverse views equally. The third dimension, work orientation, refers to a person's work mode vis-à-vis other people. The expert working alone on her part of a project can develop into someone that orients to the whole group and, finally, into a member of a team that has collective responsibility for the resolution of the problem. The fourth dimension, leadership orientation, "refers to the behaviors of the person administratively responsible for [the] group and its contract" (12) as she gradually moves from embodying a more traditional authority to a more facilitative role to sharing facilitation with others on the team. Leadership orientation is a particularly complex dimension when the leader wants both to lead the group toward interdisciplinarity and to participate in the dissolution of her own traditional role. The individual dimensions, as Amey and Brown acknowledge, are similar to other formulations. What's new is the

collection of these dimensions into one complementary and simultaneous whole.

In Stage One (Traditional), individuals viewed the problems at hand through their own disciplinary lens and so believed their solutions sufficient and best. In this stage, people did exchange information or communicate ideas, but listening was for opportunities to explain why their perspective was best. Leaders in this stage provide vision, goals, and clearly defined roles as well as resolve conflicts and make decisions. In Stage Two (Transitional), members focused on task completion, with work usually done independently but brought back to the group to be put together with the work of others. Here, team members began to see value in the perspectives of other disciplines, often driven by the value they see in the work of specific individuals. At the same time, they invested in critiques of each other's work. Because of group norming—a key concept—members began to take responsibility for refining and coordinating their work, for resolving conflicts, and for maintaining the group's goal and community orientation. Meetings were now not just for reporting but also for discussing and thinking. This budding sense of mutual responsibility also necessitated a transition from a more authoritarian to a more facilitative leader. Stage Three (Transformative), importantly, is not grounded in observation. The authors explain that data collection ended before the team got to this stage, so it exists more as an extrapolation and as a goal. The authors imagine, after the team moved from competing to co-existing to

complementing, if not fully integrating, that further development would lead to internal integration of others' disciplinary contributions and that a "collective cognition" would replace the need for dominance; that communication would be frequent and focused not only on solving the problem but also on cognitive learning from the other members; that leadership would "flow" throughout the team based on project and group needs; and that teams would ultimately handle their own conflicts and share responsibility for behavior, decisions, and products. They see interdisciplinary collaboration as a learning process, as did Klein in *Interdisciplinarity* when she wrote, "Since interdisciplinarians are often put in new situations, they must also know how to learn" (183).

It is not news to readers of this newsletter that interdisciplinary collaboration differs significantly from the kind of work faculty usually do together. Amey and Brown can help a wider audience understand these differences. Especially important is the distinction between collaboration, as Amey and Brown use it, and cooperating—the traditional way of working together that entails working individually on a joint project and later coordinating the individual products. In contrast, collaboration includes cooperation and coordination but goes beyond them to mean a "positive interdependence" in which individuals work together in a highly conscious and interactive process. Collaboration requires mutual accountability, mutual authority to make decisions, and a means of conflict resolution. Successful collaboration means listening to learn and change; it requires interpersonal elements of trust, mutual respect, shared vision, time, open and frequent communication, and flexibility; it grows only with investment beyond completion of tasks; and it involves strong leadership though not of traditional kinds in later stages. Clearly, the sort of collaboration envisioned by Amey and Brown would embody a new, perhaps revolutionary, academic paradigm.

Here we come to a central problem for

Amey and Brown's book and for our field. Much of what they describe is a vision for a better academic world, a vision that most of the readers of this newsletter share. Their faith in this vision is based on rational and philosophical grounds, but it is not yet shared by most faculty. The goal of full interdisciplinarity in Stage Three will no doubt serve as inspiration to many of us, but it might not have the same effect on a wider audience. There is a risk of the purist version of interdisciplinarity being seen as an impossible dream, even if desirable, a Quixotic quest for the unreal and unattainable. There is a risk that the likely gains from this new paradigm will be seen as unproven and as unlikely to be worth the extensive costs of the fundamental changes required. These risks will only have been neutralized fully when we have demonstrated that the interdisciplinary approach can reliably provide greater benefits, measurably greater benefits, than those of both disciplinary and multidisciplinary approaches. For this we need more studies of instrumental interdisciplinarity like Amey and Brown's but more definitive and geared more to some kind of comparison of outcome between traditional and interdisciplinary approaches.

After having explicated their model and its empirical basis in the first part, the second part of this book addresses the four spheres that inhibit or support interdisciplinary collaboration. These are structure (or bureaucracy), culture (departments, institutions, disciplines and academic norms), intellectual modes and habits (individual cognitive development of integrative thinking), and leadership. The first two spheres—structural and cultural—rely mostly on ideas already established in interdisciplinary literature, though with certain modifications and changes in emphasis. Regarding structural inhibitors of interdisciplinary collaboration, Amey and Brown join Lattuca and others in noting the relative isolation and autonomy of many departments, including the reward structures and budgetary procedures built around the departmental structure. They discuss some of the structural requirements

for collaboration across departmental lines. They remind us that interdisciplinarity still suffers from notions of its softness (associated with lower quality) and the relative lack of well-established criteria for research and scholarship, publication, and peer review in the area. Perhaps the most important point made in this section is that interdisciplinary work takes longer than individual work. The need for time is made strongly here—remember that the authors' project took three years beyond the year of data collection—and helps underscore the support needed for integrative learning and scholarship. In order for such support to be forthcoming, however, we need more proof that this sort of work pays off. Although Amey and Brown assert with confidence that the intellectual development they saw in interdisciplinary collaboration "hold[s] the promise of expanding knowledge and its utility to societal problems" (94), others may remain doubtful at this point.

In the cultural sphere, Amey and Brown emphasize disciplinary culture (although they acknowledge other cultural influences) and how disciplines frame beliefs and behaviors such as traditions, social organizations, reward systems, professional status and dignity, and language. These disciplinary cultures promote Stage One behavior and inhibit transition to subsequent stages of interdisciplinarity. Amey and Brown also point to the role that current modes of graduate education play in perpetuating the disciplinary cultures.

The authors' major conclusion that interdisciplinary collaboration is a learning process comes out of their discussion of the intellectual sphere. Close behind this finding is the central characterization of the leader as a learner who is leading the learning of the group. To develop this new focus on learning in the study of faculty, Amey and Brown rely on work in adult education and learning theory. Indispensable to learning in interdisciplinary collaboration, they emphasize, are interpersonal relationships

and the ability to communicate paradigms and ideas. Without these vital leadership skills, no structural, cultural, or policy changes can effectively take hold.

The book concludes with Amey and Brown explaining how the understandings of this study can contribute to changing the academy. Three particular ideas about facilitating "interdisciplinary collaboration as a form of faculty work" that they highlight are "neutrality, rethinking academic work, and leading the learning organization" (131). Neutrality has aspects arching into all four spheres that inhibit or support interdisciplinary collaboration. Structural neutrality includes funding neutrality and neutrality of physical space—examples of such space include research and graduate school administrations; outreach or community-based administrations; and interdisciplinary offices, departments, colleges, and institutes. The difficulties in establishing such neutrality should not be underestimated, but Amey and Brown show the most passion about intellectual neutrality.

Intellectual neutrality means "a safe place to explore issues and to consider the merits of other disciplinary perspectives." It entails a willingness to make "conscious … mental models and disciplinary paradigms" and then to engage in "reciprocal learning" in which collaborators can understand each other's "basic theoretical foundations" and "methodological orientations" and even begin to speak for each other (104). The goal of dialogue is the creation of a "common language," another key feature of intellectual neutrality. These conditions of cognitive development— intellectual neutrality, dialogue, and a common language—reinforce and refine understandings about interdisciplinary collaboration in the field. Unfortunately, Amey and Brown could not describe for us the mechanisms by which to create these conditions. In fact, they concede that they are not sure these conditions can be "orchestrated or predicted by leaders or team members" (109).

Amey and Brown do have an excellent grasp of the kind of leadership needed in all three stages, and they suggest ways a leader can facilitate learning and team leadership. The leader's primary tasks are to facilitate the creation of intellectual neutrality and build trust, confidence, and commitment in order to make possible full collaboration. Whether one person can provide all the kinds of leadership needed is not clear, but the need for the learner to learn with the other collaborator-learners is apparent. Furthermore, the sources and modes of support for the leader, especially in the first stages, is a problem whose solution has not been well described.

In the last chapter, the authors return to the pivotal concept of neutrality. Institutional neutrality depends on the neutrality each individual can achieve. This "neutral self" is the interdisciplinary individual Klein described, as the authors point out. To her list, they add open-mindedness, active listening, self-reflection, and excitement about intellectual engagement (132). Can motivated individuals develop these characteristics? I think we can be optimistic, if not certain. We have discovered ways to help develop the skills and abilities to learn, to read well, and to write well in people who did not come by them growing up. Surely, we will learn to specify the mechanisms that develop interdisciplinary collaboration too. As part of that specification, I hope we will be able to integrate the ideas of Amey and Brown with those of Kohlberg and Perry and of Arthur Chickering. So that we do not talk past each other and can reach more people, some common ground incorporating these popular but differently organized theories might help in understanding how collaboration succeeds.

While the team that Amey and Brown studied did not arrive at Stage Three and new knowledge, I would argue that Amey and Brown have done so. As foundational work tends to do, this research points to many research issues that can build on this model. I believe that their new model will help me and others involved in establishing interdisciplinarity to plan our work, to shape our goals and reveal the steps needed to fulfill

them, to understand the problems we encounter, to assess our progress, and to explain the benefits of what we are trying to accomplish to our colleagues and administrators. Amey and Brown conclude with an inspiring characterization of the development toward true collaboration they saw emerge in the team they studied: It represents "a fundamental change for knowledge engagement and faculty work," a "framing" of academic work that is "thinking out of the box," giving faculty "license to be original, creative, and to learn from and with each other ... what knowledge creation and the mission of the modern university is all about" (146).

References

Haynes, Carolyn, Ed. (2002). *Innovations in Interdisciplinary Teaching*. Westport, CT: Oryx Press/American Council on Education.

Klein, Julie Thompson. (1990). *Interdisciplinarity: History, Theory, and Practice*. Detroit, MI: Wayne State University Press.

Klein, Julie Thompson. (1996). *Crossing Boundaries: Knowledge, Disciplinarities, and Interdisciplinarities*. Charlottesville: University of Virginia Press.

Lattuca, Lisa. (2001). *Creating Interdisciplinarity: Interdisciplinary Research and Teaching Among College and University Faculty*. Nashville: Vanderbilt University Press.

Lattuca, Lisa. (2003). Creating Interdisciplinarity: Grounded Definitions from College and University Faculty. *History of Intellectual Culture, 3*(1). Retrieved April 6, 2006, from http://www. ucalgary.ca/hic/website/2003vol3no1/ articles/2003%20pdf/lattucapdf.pdf.

Newell, William H., Ed. (1998). *Interdisciplinarity: Essays from the Literature*. New York: The College Board.

Salter, Liora, and Allison Hearn, Eds. (1997). *Outside the Lines: Issues in Interdisciplinary Research*. Montreal: McGill-Queen's University Press. ■ ■ ■

Swimming the sea of The GoodWork® site

Interdisciplinary Studies Project focuses on research and teaching

The Good Work in Interdisciplinary Contexts Project from Project Zero, Harvard Graduate School of Education

An Essay by Stephanie deLusé, Interdisciplinary Studies Program, Arizona State University

Project Zero, at the Harvard Graduate School of Education, was founded by philosopher Nelson Goodman in 1967 and directed by him until 1972, co-directed by Howard Gardner and David Perkins for the next 28 years, and directed by Steve Seidel since 2000. It is a multi-faceted research group whose initial focus was to advance knowledge about arts education and how various symbol systems relate to thinking. At the time, the collective knew "zero" about these matters, hence the name. As you would suspect from its being housed in the School of Education, most of the projects do pertain to different aspects of learning but there is somewhat less emphasis on strictly arts education in recent years. While still figuring prominently there are as many studies that consider aspects of thinking, understanding, multiple intelligences and assessment. Many of these would pertain to teaching in the classroom while others consider larger program issues, such as how schools should be run and the like.

The multi-faceted research group has grown wide and deep in these nearly 40 years and you will find a sea of projects detailed on their Web site (http://www.pz.harvard.edu/) which I was charged to review. Indeed, there are so many projects available there that it would require a dissertation to review the entire site. After much swimming in this sea, one project stood out to me as different from the others and also caught my eye as I had heard some in the AIS circles mention it before. That is, The GoodWork® Project, co-directed by Howard Gardner, Mihaly Csikszentmihalyi, and William Damon. I critically reviewed this parent project, diving into the details of one of its eight sub-inquiry lines, namely The Interdisciplinary Studies Project. (Each line is in itself a multi-faceted project.) The present review, however, is a quick, non-critical tour of what may be of interest for you to visit on their Web site.

Besides perusing the site for links to the various content or process projects that may relate to your own research or teaching, permit me to draw your attention to the Interdisciplinary Studies Project a.k.a. Good Work in Interdisciplinary Contexts. To offer a thimble's worth of background, the parent project, GoodWork®, is concerned with studying what facilitates or impedes work that is of high quality, socially responsible and meaningful (this final facet—meaningfulness—was not part of their original definition of "good work" but has been added more recently as it emerged from the data). They do this by interviewing exemplars at the top of their game in many professions as well as "dedicated young professionals" and others who might shed insight on different angles of good work. The interest in social responsibility did not surface in their interviews of those in interdisciplinary contexts though the focus on high quality remained.

The Interdisciplinary Studies Project focused on two primary areas: research and teaching. To better understand quality in interdisciplinary research they interviewed investigators from five innovative interdisciplinary labs: the MIT Media Lab, the Santa Fe Institute, the Center for Integration of Medicine and Innovative Technology, the Research in Experimental Designs group, and the Arts-Science Laboratory. Reports from the latter two labs are not available for download but the data are included in two reports that look across the five sets of interviews. One of those reports is "Building Bridges Across Disciplines: Organizational and Individual Qualities of Exemplary Interdisciplinary Work" (Boix-Mansilla, Dillon, & Middlebrooks, 2000) which, beyond what the title promises, offers that they observed

three strategies that their subjects used to blend or pull from different disciplines: *seamless* or *fluid integration, translation,* and *explicit integration* drawing on skill with analogical thinking, common language and metadisciplinary views. While this was a start at considering matters of integration, they outlined that more work needed to be done to better understand borrowing, integration, and standards in interdisciplinary work. They began to address this with "Assessing Interdisciplinary Work at the Frontier: An Empirical Exploration of 'Symptoms of Quality' (Boix-Mansilla & Gardner, 2003) where they discuss integration in terms of assessment, proposing a framework where *consistency, balance* and *effectiveness* are the three "core epistemic symptoms" (p. 2).

That is the extent of the work they offer that addresses matters of integration in research. The reader may wish to compare these approaches with, say, what Burger and Kamber (2003) offer in the context of transdisciplinarity and with the strategies Newell (2006) mentions for "creating common ground." Those interested in qualities of interdisciplinary individuals or organizational qualities that support interdisciplinary work will be interested, beyond the report that addresses this (Boix-Mansilla et al., 2000), in comparing the individual lab reports (Dillon, 2001; Dillon 2001a; Dillon 2001b) with, for instance, Klein's comments on characteristics of people (1990) and of institutions (2005). And Dillon's (2001) description of the MIT Media Lab mentions matters that, to my eyes, relate to the topics brought up in the Benson (1982) and Newell (1983) interchange, when, for instance, interviewees discussed issues of depth versus breadth in the education of the students in their lab.

In terms of their work on interdisciplinary

6

teaching, there are two similar pieces on strategies for interdisciplinary teaching (Nikitina & Boix-Mansilla, 2003; and Nikitina, 2002 which later appears as Nikitina, 2006). The strategies are sometimes given different names but are *Essentializing* (a.k.a. *Conceptualizing*), *Contextualizing*, and *Problem-Centering* (a.k.a. *Problem-Solving*). These strategies emerged primarily from their research of the Illinois Mathematics and Sciences Academy, but also from their consideration of a number of other high school and undergraduate programs. Essentializing reduces content to core constructs—they offer linearity, change, and scale as examples—that can then be considered internal to a discipline (but in different sub-fields like algebra and geometry) or between disciplines considering what those concepts look like and are called in, for instance, disciplines such as physics, biology, geology, history, sociology, psychology, etc.

While *Essentializing* encourages transfer of learning by seeing connections amongst or between concepts that may have seemed previously unrelated, *Contextualizing* emphasizes external integration by placing the disciplinary concepts in terms of any number of contexts including historical, cultural, philosophical, epistemological, and methodological. One might use a broad question to set the stage for this, for instance, "Why did scientific thinking develop in Western Europe, and how was that related to Greek philosophy, revealed religion, and political circumstances up until the 17th-18th century? Why is it necessary to understand St. Augustine to understand Isaac Newton?" (Nikitina & Boix-Mansilla, 2003, p.12). This strategy, in addition to broadening perspectives, may increase the possibility of students making more meaningful, personal connections to the material.

Problem-Centering, as the name implies, presents students with real world issues that one could begin to consider from multiple disciplinary entry points. Unlike the abstract conceptualizing or broad contemplation of the previous strategies, *Problem-Centering's* narrow focus invites

consideration of several disciplinary inputs. As opposed to building a deeper foundation in more than one discipline, however, it invites a broader, if shallower, appreciation through borrowing just what is necessary to apply to the situation. Depending on the course and the problem or issue chosen, the goal may be to construct a better understanding but in the classes that might, for instance, deeply and variously engage the same issue all term, they may wrap up with some solution-oriented result proposed or acted upon like, for example, proposing a legislative change. Building a course, or even an assignment, around any of these strategies can require much thinking and experimentation. Considering adoption of one or more strategies in terms of a sequence of courses or a larger curriculum would be more challenging still but any use of these strategies and the pedagogical tools they would require to help students make more and better connections is to be lauded.

In any case, how does one assess interdisciplinary student work? There are two reports that address this (Boix-Mansilla & Dawes, 2004; & Boix-Mansilla, 2004 which appears again later as Boix-Mansilla, 2005). These pieces convey the belief that students should, or at least preferably would, do more than possess knowledge; they should be able to demonstrate understanding or using the knowledge. To do this they proposed the framework of *disciplinary grounding, integrative leverage* and *critical awareness* with criteria on assessing students' knowledge bases and integration skills. Of these articles, the co-authored piece "Toward a Framework for Assessing Students' Interdisciplinary Work," is more complete and offers something that is quite rare in the GoodWork® reports—a literature review. This is one of the few pieces that acknowledges work in interdisciplinary studies is going on elsewhere outside their world by making reference to Klein, Newell, Stowe, Haynes, Seabury and others.

Other papers that pertain to interdisciplinary teaching include an invited chapter called, "On Disciplinary Lenses and Interdisciplinary Work" (Boix-Mansilla, Miller, & Gardner, 1998, 2000) offering

how exemplary teachers have handled content on obedience to authority and eugenics in an interdisciplinary manner, and Miller and Boix-Mansilla's (2004) "Thinking Across Perspectives and Disciplines" offering ideas on senses of perspective, cognitive bridges, and degrees of integration. This second piece may be of interest to those interested in Newell's comments on integrative learning (1999) or in general discussions on the use of various sorts of perspectives versus strict disciplinary bodies of knowledge.

It is interesting to note that, whether considering their work on interdisciplinary teaching or research, there is nothing in the GoodWork®'s Interdisciplinary Studies Project approximating the explicit kind of steps or processes we have seen, for instance, discussed by Klein (1990), Newell (2001) or Szostak (2002). While they propose a framework for assessing interdisciplinary work, they do not propose steps to do it, per se. The frameworks they propose emerged from the data collected from practitioners thus, assuming the interviewers probed for such information, it would appear that the exemplary interdisciplinary lab faculty and researchers do not use, at least not consciously perhaps, a routine or set of steps but may, instead, approach matters more in keeping, at least at first blush, with Mackey (2001, 2002).

In the end, there are several reports that dovetail with, or extend what is offered by, the AIS literature that I've read and I appreciate that they collected primary data and grounded their reports in that data. Yet the near total absence of grounding in disciplinary or interdisciplinary literature left me feeling like I'd been to two different planets: the Project Zero GoodWork® planet of interdisciplinarity and the AIS planet of interdisciplinarity as, with rare exception, there is no cross-fertilization. Their own work is not interdisciplinary despite their topic and little of their work has been published in peer-reviewed journals, let alone the AIS journal that would seem an excellent outlet for some of the pieces I mentioned in this review. The GoodWork® Project appears to have ambitions for a primarily popular

audience, but at least the sub-inquiry line for the Interdisciplinary Studies Project would benefit from, and simultaneously benefit others by, publishing more than the internally edited Project Reports on their Web site. This is far more common in their world than is the rare invited chapter or peer-reviewed article they list. I invite these scholars to both try their hand at doing interdisciplinary research or teaching, rather than simply reporting on it, and to engage the academy by contributing more frequently to the body of peer-reviewed scholarship.

References

Benson, T. C. (1982). Five arguments against interdisciplinary studies. *Issues in Integrative Studies*, *1*, 38-48.

Boix-Mansilla, V. (2004, August). Assessing student work at disciplinary crossroads, GoodWork® Project Series Report, Number 33, 19p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Boix-Mansilla, V. (2005). Assessing student work at disciplinary crossroads, *Change, 37*(1), p14-21.

Boix-Mansilla, V. & Dawes, E. (2004). Toward a framework for assessing students' interdisciplinary work. GoodWork® Project Series Report, 43 p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Boix-Mansilla, V., Dillon, D., & Middlebrooks, K. (2000). Building bridges across disciplines: Organizational and individual qualities of exemplary interdisciplinary work. GoodWork® Project Series Report. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Boix-Mansilla, V. & Gardner, H. (2003). Assessing interdisciplinary work at the frontier: An empirical exploration of "symptoms of quality." GoodWork® Project Series Report, Number 26, 13 p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Boix-Mansilla, V., Miller, W. C., & Gardner, H. (1998, 2000). On Disciplinary lenses and interdisciplinary work. In Samual S. Wineburg, Pamela Grossman (Eds.), *Interdisciplinary curriculum: Challenges to implementation.* Teachers College Press, New York, 2000. Retrieved April 1, 2006 from http://www.pz.harvard.edu/interdisciplinary/publications.html

Burger, P. & Kamber, R. (2003). Cognitive integration in transdisciplinary science: Knowledge as a key notion. *Issues in Integrative Studies, 21*, 43-73.

Dillon, Dan. (2001, January). Interdisciplinary Research and Education: Preliminary perspectives from the MIT Media Laboratory. GoodWork® Project Series Report, Number 13, 45p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Dillon, D. (2001a, October). A review of CIMIT: An interdisciplinary, inter-institutional enterprise. GoodWork® Project Series Report, Number 23, 38p. Retrieved April 12, 2006 from http://www.goodworkproject.org/papers.htm

Dillon, D. (2001b, October). A review of the Santa Fe Institute: Institutional and individual qualities of expert interdisciplinary work. GoodWork® Project Series Report, Number 22, 38p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Klein, J. T. (1990). *Interdisciplinarity: History, Theory, and Practice.* Detroit: Wayne State Press.

Klein, J. T. (2005). *Humanities, Culture, and Interdisciplinarity: The changing American Academy*. Albany, NY: State University of New York Press.

Newell. W. H. (1983). The case for interdisciplinary studies: Response to professor Benson's five arguments. *Issues in Integrative Studies, 2*, 1-19.

Newell, W. H. (1999). The promise of integrative learning. *About Campus*, May-June, 17-23.

Newell, W.H. (2001). A theory of interdisciplinary studies. *Issues in Integrative Studies, 19*, 1-25.

Newell, W.H. (2006). Decision making in interdisciplinary studies. In G. Morçol (Ed.) *Handbook of decision making.* 28 p. New York: Marcel-Dekker.

Nikitina, S.& Boix-Mansilla, V. (2003, March). Three strategies for Interdisciplinary Math and Science Teaching: A case of the Illinois Mathematics and Science Academy. GoodWork® Project Series Report, Number 21, 21p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/ebookstore/index.cfm

Nikitina, S. (2002). Three strategies for interdisciplinary teaching: contextualizing, conceptualizing, and problem-solving, GoodWork® Project Series Report, 34 p.

Nikitina, S. (2006). Three strategies for interdisciplinary teaching: contextualizing, conceptualizing, and problem-centring (sic) *Journal of Curriculum Studies*, *38*(3) 251-271.

Mackey, J. L. (2001). Another approach to interdisciplinary studies. *Issues in Integrative Studies, 19*, 59-70.

Mackey, J. L. (2002). Rules are not the way to do interdisciplinarity: A response to Szostak. *Issues in Integrative Studies, 20*, 123-129.

Miller, M. & Boix-Mansilla, V. (2004, March). Thinking across perspectives and disciplines. GoodWork® Project Series Report, Number 27, 16p. Retrieved April 1, 2006 from http://www.pz.harvard.edu/interdisciplinary/pubfour.html

Szostak, R. (2002). How to do interdisciplinarity: Integrating the debate. *Issues in Integrative Studies, 20*, 103-122.

■■■

28th Annual Conference of the Association for Integrative Studies

October 5-8, 2006, Atlanta, Georgia
Hosted by Emory University
and Oxford College of Emory University

Bridge-Building: Connecting Hearts and Minds,
Arts and Sciences, Teaching and Research,
Academy and Community

CONFERENCE INFORMATION:

Conference website: www.ais.oxford.emory.edu
Conference e-mail: AIS2006@learnlink.emory.edu

Please send questions to the conference email address listed above. Someone will respond as quickly as possible. Should a question require a phone call, please call Melissa Shrader, Administrative Assistant in Humanities, Oxford College of Emory University, Oxford, GA 30054; phone: 770-784-8466; e-mail: mshrade@learnlink.emory.edu.

Association for Integrative Studies
School of Interdisciplinary Studies
Miami University
Oxford, OH 45056

Non-Profit Org
U.S. Postage Paid
Miami University