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Guest Editors' Note

**Special Double Issue:
Washington Center's National Project
on Assessing Learning in Learning Communities**

This special edition of the *Journal of Learning Communities Research* introduces readers to the work undertaken by campus teams involved in Washington Center's National Project on Assessing Learning in Learning Communities (September 2006 to June 2008). We appreciate the willingness of the journal co-editors, Barbara Jackson and Keisha Hoerner, and the managing editor, David Thompson, to let us serve as guest editors. We can think of no better vehicle than this journal to share insights from this project with learning community practitioners across the country.

We note that this journal issue is being readied for the printers as the latest report from the Association of American Colleges and Universities' Liberal Education and America's Promise (LEAP) has just become available. In *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter*, George Kuh examines data from the National Survey of Student Engagement (NSSE), and one of the ten high-impact practices named is learning communities. As Kuh points out, while all students benefit from educational practices that encourage engagement and support deep learning, students historically underserved in higher education benefit even more from learning communities than their advantaged peers. This finding, placed alongside an earlier finding highlighted in the 2007 NSSE report, *Experiences That Matter: Enhancing Student Learning and Success*, whereby intentionally-designed integrative assignments lead to greater student engagement and deeper understanding within learning communities, underscores the critical importance of the work undertaken by campus teams involved in the national project.

This special issue features eight articles that highlight what campus teams discovered as they worked with the two core tools central to the national project practice: Veronica Boix-Mansilla and colleagues' Collaborative Assessment Protocol and Washington's Center's heuristic,

Designing Integrative and Purposeful Assignments. In the first article, *Assessing Integrative Learning: Insights from Washington Center's National Project on Assessing Learning in Learning Communities*, we describe the use of these tools in the context of the project's purpose, core assumptions, essential practices, and key findings.

In the second article, *Productive Shifts: Faculty Growth through Collaborative Assessment of Student Interdisciplinary Work*, Veronica Boix-Mansilla details the pivotal shifts between "from" and "to" in faculty thinking that occurred throughout the project.

In the third article, *Juggling and the Art of the Integrative Assignment*, Lynn Dunlap and Larry Sult from Skagit Valley College, who have taught fully-coordinated learning community pairs since 1987 (and often together), examine the impressive consequences for student learning when the design of integrative assignments is intentionally grounded in specific disciplines.

In the fourth article, *Assessing Student Work to Support Curriculum Development: An Engineering Case Study*, Kevin Saunders and colleagues from Iowa State University report on the process and results of reviewing student work from four departmental courses in the agricultural engineering curriculum where the expectations for today's engineering graduates include integrating knowledge across disciplines, applying knowledge to real-world situations, and demonstrating skills in creativity, teamwork, communication, and collaboration.

In the fifth article, *Beyond "Parallel Play": Creating a Realistic Model of Integrative Learning with Community College Freshmen*, Evelyn Burg, Marisa Klages, and Patricia Sokolski from LaGuardia Community College investigate what interdisciplinary integration might actually look like at the early stages of a community college career when students are in developmental courses.

In the sixth article, *Exploring Voice as Integration: A Direction for Assessing Student Work in Learning Communities with Composition*, Janine Graziano-King and Gabrielle Kahn from Kingsborough Community College look at the role of voice in students' writing as evidence of integration within a learning-community which links a composition course to a general education course.

In the seventh article, *Assessing Interdisciplinary Learning in Theme-Based, One-Semester Communities*, Keisha Hoerrner and colleagues report on the insights gained from examining work in theme-based learning communities to determine whether content from one discipline was evident in student work produced in another discipline.

In the final article, *Templates and Rubrics: Connecting Outcomes*,

Assignments and Assessment in Interdisciplinary Learning Communities, Maureen Pettitt and David Muga from Skagit Valley College—where learning communities have been a requirement for the transfer degree since 1993—share results when an institutional researcher and a faculty member collaborate to develop a comprehensive assessment approach where Skagit’s emphasis on integrative learning and general education “learning values” can be documented in a transparent way so that faculty and students can more easily recognize connections between disciplinary and interdisciplinary outcomes, assignments, and assessment criteria.

We expect that other issues of this journal will include articles written by faculty involved in the national project. In our view, this issue marks a turning point in learning community practitioners’ scholarship because assessing student work has become the starting-point for determining teaching and program effectiveness.

We appreciate that the colleagues’ whose work is highlighted in these pages are sharing “works-in-progress.” We want to thank them for their generosity, and they and the other participants in the national project for their pioneering efforts. For readers who measure their effectiveness as teachers in relation to student learning, we invite you to work with the core tools used in the national project—both the *Collaborative Assessment Protocol* and *Designing Integrative and Purposeful Assignments* are posted on the Washington Center website (www.evergreen.edu/washcenter) along with campus project reports and examples of integrative assignments.

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**Assessing Integrative Learning:
Insights from Washington Center's
National Project on Assessing Learning
in Learning Communities**

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Findings from a national participatory research project, which examined student work in learning communities, highlight the assignment designs that help students become more able integrative learners and thinkers.

What kind of learning do learning communities make possible? This question has been at the forefront of a two-year participatory research project initiated in September 2006 by the Washington Center for Improving the Quality of Undergraduate Education.¹ The project is the first in a series of research initiatives with campus partners where the overarching aim is explicitly ambitious: to assess and enhance students' learning in learning communities, the least-researched dimension of learning communities nationally.

The campus teams that became co-researchers in the National Project on Assessing Learning in Learning Communities include two- and four-year institutions whose learning community program—regardless of institution type or size—meets the contemporary definition of a learning community: a cohort of students enrolled in two or more classes whose experiences of learning include intentionally-designed integrative learning.²

Throughout the project, participating teams agreed to examine student work from their learning community program using a collaborative assessment protocol based on Veronica Boix-Mansilla's research on the nature of interdisciplinarity (see Appendix 1). As the project and our critical inquiry progressed, teams also agreed to refine assignments

given to students in learning communities using a heuristic developed by Washington Center's co-directors (see Appendix 2). Using these two core tools to assess and improve student learning constituted the foundational work of the project.

As Lee Shulman (1999) observed a decade ago in *Taking Learning Seriously*, "Learning flourishes when we take what we think we know and offer it as community property among fellow learners so that it can be tested, examined, challenged, and improved before we internalize it" (p.12). Teams' willingness to make sense of their own campus discoveries and puzzles in the company of colleagues from other institutions—a mix of newcomers to learning community work and veterans with over thirty years' experience—turned our collaborative inquiry into powerful communal learning.

As we review team reports and the "a-ha" moments sparked by national work sessions, findings already signal fresh understandings: a clarity about integrative as compared to interdisciplinary learning; a valuing of the varied forms and developmental stages integrative learning can take; a broadening of disciplinary knowledge to encompass fields of study; an appreciation of the disciplinary grounding required to deepen integrative assignment design; and a recognition that as faculty we need to become more precise about exactly *what* we invite students to integrate. Senior faculty also note that conversations over the two-year period—with student work as a constant touchstone—led to the most stimulating professional development in their careers.

In this article, we begin by reviewing the gap in learning community research and assessment that provided the impetus for the project and shaped its purpose and method. Then, we highlight three findings that are already influencing learning community practice: the relationship between integrative and interdisciplinary curriculum; the power of examining student work collectively; and, the nature of disciplinary grounding, especially in working with first-year students.

The Learning Gap in Learning Community Research and Assessment

When the National Learning Communities Project³ published *Learning Community Research and Assessment: What We Know Now* (2003), learning community practitioners eagerly awaited the findings of the first comprehensive account of existing research studies on learning community work. The research team—Kathe Taylor, William S. Moore, Jean MacGregor, and Jerry Linblad—studied every program assessment,

institutional research report, thesis, dissertation, and national study they could find. Their conclusions confirmed what we hoped would be the case, but they also identified a sizable gap in the research literature.

The good news placed learning communities in mainstream higher education. Learning community programs, whether getting started or well-established, could be found on diverse campuses throughout the United States. The even better news was that students enrolled in learning communities—defined by the research team as a cohort taking the same classes, often with a unifying theme, and often tied to a residence life experience—stayed in school. Retention rates and academic achievement for these students compared positively with peers enrolled in stand-alone classes. These affirming results were replicated in programs geared toward entering students in developmental, college-level and honor programs, in learning communities designed to meet general education requirements or as introductions to the majors and professions, and in programs that combined curriculum and co-curriculum offerings in multiple ways.

But, as the authors pointed out, “learning community assessment and research can and should probe more deeply into the nature of learning community interventions, and the nature of their impact on the learning of students, those who serve on teaching teams, and institutions” (p. iii). In fact, most studies assessed what could easily be assessed, the quantifiable data that skirts learning—student retention, grades, grade point average, and student satisfaction. The more difficult task of assessing what students understand and know how to do, given the objectives and curriculum of particular learning community programs, was rarely present in studies let alone probed.

Similar to the challenges facing the assessment movement in higher education, the research team called on educators involved in learning community work to find ways to document and assess the actual learning students experience in learning communities. As Vincent Tinto, who led the first national study on learning communities emphasized in the preface to *Learning Community Research and Assessment: What We Know Now*, “learning community assessment needs to move toward more complex, higher-order measures to fully illuminate the powerful impact of learning communities on both students and faculty and to identify those practices that foster or hinder positive results” (p. ii). We designed the National Project on Assessing Learning in Learning Communities as a pedagogical and classroom-based research response to Taylor and her colleagues’ invitation to “move more deeply into the nature of student learning and the nature of professional development for faculty and staff members” (p. iv).

Project Overview: Defining Purpose and Expectations

As longtime teachers, we believe that the best way to figure out what students are learning is to examine student work. When thinking through our expectations for a national project founded on this premise, two questions preoccupied us: by what means could the essentially private work faculty do when they evaluate student work become the focus of collective, public examination? And, how could the kind of collaborative inquiry we envisioned embrace both the “pedagogy of substance”—Shulman’s term to describe the specific disciplinary and professional grounding which informs teaching excellence—and the more general insights which might advance national learning community practice?

With these questions in mind, we wanted to work with campuses whose learning community initiatives have been keeping pace with evolving practice—initiatives that share our “core assumptions” about learning community work and faculty development. The call for applications described those assumptions in this way:

1. Learning community work should be designed in the context of an analysis of campus facts including disaggregated student demographics, disaggregated student retention and academic achievement rates, and the identification of curricular trouble spots—courses with high drop-out rates and/or low success rates—as well as trouble spots within courses;
2. Students within learning communities need opportunities to develop and demonstrate substantive learning that draws on disciplinary and interdisciplinary understanding and is connected to problems and issues in the world;
3. Collaborative discussions about authentic assessments of student learning provide an ongoing source of learning and intellectual engagement for faculty; and
4. Learning community programs are enriched by strong scholarship of teaching and learning (SOTL) initiatives.

In brief, we sought campuses where learning communities are viewed as a means both to tackle long-standing problems in higher education such as high drop-out rates and low student achievement, and to promote deep engagement and substantive learning. We wanted project co-researchers to be knowledgeable regarding the shift in perspective from seeing learning communities as a series of models to using learning communities as an intervention strategy aimed at improving student engagement, the quality

of learning, and—as a byproduct—student persistence and retention. To participate, a campus team needed at least three faculty members currently teaching in learning communities who would be committed to exploring collaborative approaches to assessing student learning. We imagined that their discoveries would lead to broader campus conversations and faculty enrichment workshops as well as scholarly inquiry among learning community practitioners to address the learning gap in learning community research and assessment.

With no external funding and limited seed money, we posted a call for applications on the national learning communities listserv, circulated a flyer at the June 2006 National Summer Institute, and sent email to teams who had been involved in past Washington Center national and regional initiatives. We intended to limit project participation to ten teams, but within two weeks of the call going out, thirteen two-year colleges and fourteen four-year colleges successfully completed the application process. Most campuses had been involved in recent assessment projects or were gearing up for program reviews or accreditation visits; a few saw in the project a means to revitalize faculty involvement in long-standing learning community programs.

Campuses selected for the project received a modest \$500 stipend each term to support faculty meetings and complete bi-annual project reports; their institutions generously agreed to pay team members' travel, accommodation, and material costs for four national gatherings. By the end of year two, ten two-year schools and nine four-year schools were actively involved,⁴ and on the project's completion, nine schools submitted integrative assignments and thirteen submitted final reports.⁵ All schools accepted for the project had access to a member login area of the website containing resources related to the project, including the scholarly leadership provided by Veronica Boix-Mansilla as well as materials developed by Boix-Mansilla and Washington Center co-directors.

The question—what kind of learning do learning communities make possible—turned into a meaningful and revealing inquiry on campuses and at national meetings. Team commitment to developing students' abilities as integrative thinkers moved from an agreement in words to a deeper sense of what high-quality integrative learning actually involves.

Project Method: Using the Collaborative Assessment Protocol

Boix-Mansilla's 2005 *Change* article, "Assessing Student Learning at Disciplinary Crossroads" catalyzed our thinking about how we might

assess learning in learning communities. In that article, Boix-Mansilla argues for a definition of the elements of interdisciplinary work based on empirical research she did with Howard Gardner. Embedded in the definition she puts forward are four key elements: 1) interdisciplinary work is purposeful; 2) it has grounding in two or more disciplines; 3) it integrates those disciplines to achieve an insight that would not be possible without access to those disciplines; and 4) it has an element of thoughtfulness about it. Because of the strong historical association between learning communities and interdisciplinary work, we felt that the specificity of this account presented an opportunity for exploring student work across campuses in a new and focused way.

Early on in conversations with Boix-Mansilla about how we might approach our collaborative assessment project, she referred us to *The Evidence Process* (2001), a publication documenting a collaborative research process undertaken by elementary teachers and researchers at Project Zero. Like us, those teachers were looking for ways to assess the effectiveness of teaching in order to improve student learning, using actual student work as the basis for collaborative conversations. As the Project Zero staff who wrote *The Evidence Process* point out, “we called this method the Evidence Process because we wanted to develop a model for teachers to assess their instructional practice that was grounded in specific artifacts of learning and teaching that come directly from the classroom—samples of student work, observations of students at work, teacher created materials, and so on. These artifacts can make student learning, and how teaching supports that learning, more visible or evident” (p. 2). Like the teachers involved in *The Evidence Process*, we decided to use a protocol to organize our conversations, and *The Evidence Process* book became one of our core readings.

Boix-Mansilla developed a targeted collaborative assessment protocol to challenge a pattern of conversation in which student learning is exclusively viewed in terms of single faculty teaching goals.⁶ The protocol, which teams used in the national project, hones in on interdisciplinary learning. Divided into three sections, the protocol begins with a set of questions designed to help teachers become attuned to each other and to the student work. By asking participants to first *notice*, then *value*, then *question* aspects of the student work being examined, the protocol helps slow down the usual rush-to-judgment that frequently happens when teachers discuss students’ work. The middle section of the protocol emphasizes each of the four elements of interdisciplinary work: *purpose*, *disciplinary grounding*, *integration*, and *thoughtfulness*. The third section invites participating teachers to reflect on implications for teaching and

learning, allowing the conversation to broaden out.

By the end of the first year, some teams found the protocol-structured conversations daunting. On several campuses, faculty were reluctant to have colleagues comment on their students' work so did not offer samples for collective examination; others did not see the value of just looking at student work, as an external assessor might do, without extensive commentary from faculty. For the majority of teams, though, following the protocol introduced a new dimension to team teaching—the *collaborative assessment* of student work. Team members' comments were grounded appropriately enough in disciplinary and/or field area expertise, but by listening to their colleagues' comments, project participants could see, and value, the multiple intersecting stages of learning that a piece of student work represents. This appreciation of students as “developing” readers, writers, and thinkers—within disciplines and across disciplines—focused collective attention on what is so difficult to recognize and assess: integrative learning.

In addition to the Collaborative Assessment Protocol, teams worked with the heuristic, Designing Purposeful and Integrative Learning. We had developed earlier versions of this heuristic once we realized a missing element in many learning community programs: assignments designed to foster integrative learning. The heuristic used in the national project invites individual faculty to answer this question: “what do you *most* want students to learn from your course, program or discipline?” Then faculty, in two's or three's, compare responses to discover if any of the aimed-for learning—the big ideas, modes of inquiry, intellectual traits, and habits of mind—are shared. With this common ground in mind, faculty design assignments tied to a public issue so students can apply what they are learning to contemporary problems or questions.⁷ Although this heuristic pre-dates Washington Center's work with Boix-Mansilla, the emphasis on planning assignments that explicitly connect learning from two or more courses, and then use that integrated learning to address an issue in the world, proved wholly compatible with the protocol.

Project Findings: Emerging Insights for Learning Community Practice

While campus practice continues to evolve in response to participation in this project and other initiatives, three important insights emerged from conversations at national project meetings, campus team reports, and colleagues' individual reflections.

The relationship between interdisciplinary and integrative learning

It is critical to define and distinguish integration and interdisciplinarity in order to achieve clarity and substance for a learning communities program.

- University of Kansas

From their inception, learning communities have been associated with rich and generative possibilities for learning, including interdisciplinary learning. The aspirations for the learning made possible in learning communities resonate with Boix-Mansilla's (2005) description of why fostering students' interdisciplinary understanding is an essential learning outcome for graduates: "Whether we try to take a stance on the stem cell research controversy, to interpret a work of art in a new medium, or to assess the reconstruction of Iraq, a deep understanding of contemporary life requires knowledge and thinking skills that transcend the traditional disciplines. Such understanding demands that we draw on multiple sources of expertise to capture multi-dimensional phenomena, to produce complex explanations, or to solve intricate problems" (p.14).

However, as early as the first project meeting, we began to wrestle with the historical link between learning communities and interdisciplinary learning, especially as we looked at student work. Our collective observations led to debates about the learning we were trying to promote through learning communities: to what extent was it interdisciplinary? Given the definition we were working with, interdisciplinary work depends upon disciplinary or field-specific grounding. We weren't sure we were seeing evidence of this grounding in students' work, especially first-year student work. At the same time, there were integrative elements in these samples of students' work which we all valued. We noticed that students were integrating personal experiences with academic modes of inquiry; they were using the "big ideas" from particular disciplines to rethink and question the meaning of their experiences; they were transferring writing skills from one class to another; they were trying out different ways of thinking in multiple class contexts; they were seeking out evidence, quotations, and ideas other than their own to make sense of questions and controversial issues; they were developing a sense of agency while discovering that their voice was one among many; they were making connections between their academic studies, work, and service learning projects, and much more.

Rather than trying to stretch the definition of interdisciplinary to encompass all forms of integration, we developed a working hypothesis that integrative learning is the larger category—involving the intentional

bringing together of two or more perspectives for a purpose, while interdisciplinary learning—integrating insights or methods from two or more disciplines, is a specialized subset of integration. We agreed that integrative learning is something to invite in all learning communities; in some cases, this integrative thinking may take the more specific form of interdisciplinary thinking.

Clarity about this distinction was an important outcome of our work. Echoing the Association of American Colleges and Universities' 2007 report from the Liberal Education and America's Promise Initiative, we also concluded that integrative thinking is a fundamental habit of mind associated with doing quality intellectual work.

The power of examining student work collectively

The most significant learning for our team: more precise design of integrated assignments; clearer, more consistent focus on student work; deeper conversations; significant shift from parallel play to real integration; more purposeful articulation of disciplinary grounding.

- LaGuardia Community College

Robust campus conversations about the kind of learning made possible in learning communities came about because we were focused on looking at students' work together. As the Iowa State team wrote in its final report, "grounding the conversation in student work turns attention to long-term, deep learning. This conversation frames assessment in relation to key artifacts and change over time."

The first section of the Collaborative Assessment Protocol is designed to help groups of teachers become attuned to one another and to the student work. The structured set of questions moves participants gently through the steps of first noticing, then valuing, and then raising questions about the work before moving on to more specific conversations. All the teams that used the protocol regularly reported that this attuning process made space for better conversations, instead of proceeding down a more usual rush-to-judgment path. The team from North Seattle Community College wrote that "the protocol prompted faculty to notice and appreciate the work before moving to a critical examination." One unanticipated result across teams was that more faculty were willing to share samples of their students' work with colleagues.

Teams also agreed that the focus on student work led to productive conversations about program outcomes and assignment design, and frequently these conversations led to changes in practice. For example, LaGuardia Community College noted in its final report that "professional

development has been the most powerful effect of the project for us. It has helped us...increase the energy within teams, demand a ‘product’ in terms of student work, and enabled us to reflect more carefully on the product.” The team from Iowa State University likewise wrote that “the process (of looking at student work using the protocol) offers a way to think about how to design learning experiences that align with intended learning outcomes.” The Temple University team wrote that they “all agreed that using the protocol has helped us better see what we’re asking students, as well as not asking students to do; not only to look at *what* we were teaching but *how* we were teaching; reflect on improvements to current assignments, i.e. more specific directions so students clearly understood what was expected and what skills were needed.”

The importance of disciplinary grounding

In working with colleagues, we have become evangelists for understanding disciplines as the basis for integration. A learning community team should begin by grappling with the types of disciplinary knowledge they would like students to gain...

- Cerritos Community College

The most surprising insight emerging from this study was the importance of articulating much more precisely what exactly we want students to integrate: what *in particular* are students bringing forward to integrate, synthesize, and use to address a question or issue? The Collaborative Assessment Protocol led to this insight, because evidence of interdisciplinary or integrative work depends upon evidence of disciplinary or field-specific grounding. We discovered that disciplinary grounding needed to be more explicit in our assignment designs. As the team from Kingsborough Community College wrote, “purposeful integration requires both depth and breadth—depth from rootedness within a discipline—and breadth from the act of drawing connections across disciplines in order to see the bigger picture. Without disciplinary grounding, true integration cannot be realized.”

This question of disciplinary grounding became particularly vexing in the context of learning communities for beginning students—many of us puzzled over what it means, in the words of the LaGuardia Community College team, “to define disciplinary grounding in basic skills so that it is visible/discussable in student work.” As the Skagit Valley College team put it, how do we “describe and assess disciplinary grounding for courses with significant skill components, i.e., writing, speech, math, and reading? Since a significant proportion of our learning communities include a composition

component, we would like to learn more about how this can be done and whether the integration is best understood as interdisciplinary.”

The term “disciplinary grounding” appears in the second section of the protocol, and at a second national meeting in spring 2007, Boix-Mansilla introduced project participants to a framework for describing disciplinarity. We broke into disciplinary and subject area groups, and used this framework to develop tentative descriptions of how we understood our disciplines and areas.⁸ In *Teaching for Understanding* (1998), Boix-Mansilla and Howard Gardner’s chapter on “What are the Qualities of Understanding?” describes four dimensions of disciplinary understanding: *knowledge*; *methods*; *purposes*; and *forms* with reference to case studies in specific disciplines. Within each dimension, expectations for naïve, novice, apprentice, and master learners are detailed (see Table One: Four Dimensions of Disciplinary and Field Expertise and Their Features).

The question of disciplinary grounding in the context of beginning level courses, especially in the areas of reading and writing, remained perplexing, perhaps because we approached the concept of disciplines from many different perspectives. Being attentive to what people with expertise know and can do—articulating expectations for master learners—has been particularly useful in situations where teachers have specialized field-expertise, but not necessarily formal disciplinary training (for instance, within developmental education or English language learning; this is also the case for many who teach reading and writing courses). Teachers in other fields and disciplines occasionally have a similar experience: while they have an understanding of what expert practitioners in their fields do, because of evolutions in their fields, they are less comfortable giving an account of the “discipline.”

Not surprisingly, we discovered that campus conversations have been especially productive when faculty worked through the question of what expertise in disciplinary or field-specific practice entails by focusing on the following four question prompts:

- *What an expert in the area knows*: Are we introducing students to the ideas that are central for us in our work in this field?
- *What an expert in the area does*: Are we asking students—even beginning students—to use the methods we use, framed in an appropriate, developmental way?
- *Why an expert does these things*: Are we creating possibilities for students’ work to be purposeful in the ways that our own work in this area is purposeful?

Table One: Four Dimensions of Disciplinary and Field Expertise and Their Features

Knowledge	Methods	Purposes	Forms
<p><i>A. Transformed intuitive beliefs</i> To what degree do students' performances show that warranted theories and concepts in the domain have transformed students' intuitive beliefs?</p>	<p><i>A. Healthy skepticism</i> To what degree do students display a healthy skepticism toward their own beliefs and toward knowledge from such sources as their textbooks, people's opinions, and messages in the media?</p>	<p><i>A. Awareness of the purpose of knowledge</i> To what degree do students see essential questions, purposes, and interests that drive inquiry in the domain?</p>	<p><i>A. Mastery of performance genres</i> To what degree do students display mastery of the genres of performances they engage in, such as writing reports, giving presentations, or preparing the stage for a play?</p>
<p><i>B. Coherent and rich conceptual webs</i> To what degree are students able to reason within richly organized conceptual webs, moving flexibly between details and overviews, examples and generalizations?</p>	<p><i>B. Building knowledge in the domain</i> To what degree do students use strategies, methods, techniques, and procedures similar to those used by professionals in the domain to build reliable knowledge?</p>	<p><i>B. Uses of knowledge</i> To what degree do students recognize a variety of possible uses of what they learn? To what degree do students consider the consequences of using their knowledge?</p>	<p><i>B. Effective use of symbol systems</i> To what degree do students explore different symbol systems to represent their knowledge in effective and creative ways—for example, by using analogies and metaphors, colors and shapes, or movements?</p>
	<p><i>C. Validating knowledge in the domain</i> Are truth, goodness, and beauty dependent on authoritative assertions, or rather on publicly agreed-upon criteria such as using systematic methods, providing rational arguments, weaving coherent explanations, and negotiating meaning through careful dialogue?</p>	<p><i>C. Ownership and autonomy</i> To what degree do students evidence ownership and the autonomy to use what they know? To what degree have students developed a personal position around what they learn?</p>	<p><i>C. Consideration of audience and context</i> To what degree do students' performances show an awareness of the audience, such as the audience's interests, needs, ages, expertise, or cultural backgrounds? To what degree do they show awareness of the context of the communication?</p>

From: Boix-Mansilla, V. & H. Gardner. (1998). "What are the qualities of understanding?" In *Teaching for Understanding*, M. Stone Wiske (ed). San Francisco: Jossey-Bass.

- *How an expert makes their work known to others: Are we introducing students to a range of forms or “genres” for making their work public?*

This shift in focus from disciplines as entities to expert practice in those fields is critical because the grounding for integrative assignments depends on this analysis. We want to make sure that the assignments students get in learning communities, especially in their first experiences of college, introduce them to the actual work of disciplines and fields. Too often, instructors inherit curricular “artifacts”—assignments, readings, projects—leading to a scrapbook approach to course design with few opportunities to redesign courses so that assignments introduce students to the evolving work of an area in the context of real-world issues and questions.

Assessing the four dimensions of disciplinarity is a precursor to designing integrative or interdisciplinary assignments, and teams recognized the importance of this. As the team from North Seattle Community College wrote, “we grew intellectually from (Boix- Mansilla’s) understanding of how interdisciplinary knowledge for students stems from an initial grounding of students in disciplinary language and modes of thinking.” Teams also recognized the challenge presented by this approach. As the LaGuardia Community College team observed, there is “tension between ‘disciplinary grounding’ and integration pieces in our work... when to emphasize one or the other—it sometimes feels like pulling in opposing directions.”

The challenge for helping learning communities achieve their promised integrative learning lies exactly here, in balancing the importance of disciplinary or field-specific grounding with the power of integrating ideas and approaches to address a substantive issue. Without grounding, integrative assignments too often lack substance; without integration, disciplinary or field-specific grounding too often lacks genuine purpose. Embracing this approach to designing and assessing quality learning in learning communities has been transformative for most teams.

Conclusion

The effect on our thinking has been enormous. Probably the most important insights are: (1) interdisciplinary integration needs to be grounded in the disciplines, which means that it is necessary to reinforce those specific aspects of knowledge and thinking skills relevant to the integration; (2) interdisciplinary work succeeds when it is purposeful, which has meant for us rethinking how to find connections between specific classes—they should serve to solve

a specific problem rather than making connections as an abstract intellectual exercise; and (3) the best way to understand what's going on with our students is to do focused responses to student work using a protocol that guides attention to specific evidence of integration.

- Cerritos final team report

The Cerritos team gave voice to the experiences of many participating teams. From its inception, the National Project on Assessing Learning in Learning Communities was intended to address the gap in our collective understanding about the kind of learning that learning communities make possible.

The project has yielded richer results than we ever imagined, not the least of which is a shared conceptual framework and a common vocabulary for improving our collective practice. Our understanding of learning community practice evolved through this project because our conversations have been grounded in systematic assessments of students' work. To return to K. Patricia Cross's analogy: assessment has served as the zipper connecting teaching and learning in learning communities.⁹ We are grateful to our colleagues across the country, and to all of our students, for working with us to help learning community practice take a qualitative step forward.

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Appendix A

COLLABORATIVE ASSESSMENT PROTOCOL FOR STUDENT WORK

The purpose of this protocol is to provide opportunities for teachers to discuss pieces of students' work and notice integration and opportunities for growth. The protocol can be used to assess and support students, to advance professional development, and to reflect about assignment design.

I. GETTING ACQUAINTED—GENERAL ASSESSMENT

1. Introducing the work:

Presenting teacher shares minimal information about the work, avoiding value description—e.g., stating the course and the level, whether it is initial or advanced, and the assignment.

2. Clarifying specific goal:

The group makes sure that the goals for the conversation are clear. For instance, are we seeking to examine the degree to which a piece represents integrative or interdisciplinary understanding? Are we trying to diagnose opportunities for growth in an initial or developing piece?

3. Looking at the work:

In silence, individuals read or observe the work brought in.

4. Pointing out:

The group points out any aspect of the work noticed, withholding judgment about quality or comments about taste.

5. Valuing the work:

Group members share general qualities of the work that they appreciate (e.g., student shows strong personal voice, paper is clearly composed, student uses primary sources, provocative use of imagery).

6. Raising questions:

Once everyone has a chance to describe appreciated qualities in a work, the group is asked to raise questions and concerns that have come up. Participants are reminded that not all questions will be answered. Questions open up the work and make the group's thinking visible.

II. ZOOMING IN—TARGETING ASSESSMENT

OF INTEGRATIVE/INTERDISCIPLINARY UNDERSTANDING

7. Discerning the purpose of the work:

Based on their reading (observations, etc.) of the work *and* their knowledge of the assignment (see #1 above), group members

describe what they view as the purpose of the work, pointing to the evidence in the work that makes them say so.

Optional: Once the group agrees on the inferred purpose or purposes of the work, they can discuss the degree to which this purpose lends itself to or embodies integration or interdisciplinary work. Is there something in the purpose that invites students to make that integrative step?

8. Revealing disciplinary grounding:

Group members describe what they view as the disciplinary insights/modes of thinking or ability areas that seem to be informing this work, pointing to the evidence in the work that makes them say so.

Focusing on one discipline or ability area at a time, the group discusses these questions:

- Are the particular disciplinary insights/modes of thinking selected appropriate to inform the purpose of the work? Does it make sense to bring them to bear upon the issue?
- To what extent is the student able to use disciplinary insights/modes of thinking or ability areas in accurate and/or effective ways?
- What suggestions might we offer to this student to deepen or develop his or her use of disciplinary insights or ability areas in the context of this work?

9. Revealing integrations:

Group members describe what they view as overarching integrations of disciplinary perspectives attempted by the student, pointing to the evidence in the work that makes them say so. How is the student bringing things together—for instance, is the student offering a complex explanation, an aesthetic synthesis, a contextualization, a pragmatic solution, or some other product based on integration?

(Note: The form of the integration may be signaled in the assignment itself; the focus here is on what the work itself does. The inferred purpose of these things—the initial assignment and the student’s work—may be the same, or they may not.) Once the group has gained a sense of *how* the disciplinary insights seem to be coming together, group members discuss:

To what extent does the integration appear to enrich, enlarge, or deepen the student's understanding of the issue under study?

(One way to get at this is by asking what would have happened to students' understanding if discipline x had not been brought in.)

What suggestions might we offer to this student to deepen or develop the integrative or interdisciplinary nature of the work?

10. Assessing thoughtfulness:

Group members describe what they view as student's reflections about the nature of his or her work and learning (e.g., comments on the relevance of the work, the limitations of single disciplines, limitations of the work itself). Participants are asked to point to the evidence in the work that makes them say so.

Once the group has gained a sense of the reflective stance taken in the work, the group discusses how student reflections reveal a developing ability to do interdisciplinary work.

What suggestions might we offer to this student to deepen the reflective stance he or she takes?

III. STEPPING BACK

11. Hearing from the presenting teacher:

After listening without intervening, the presenting faculty adds her or his perspective on the general and targeted assessment comments. He or she may or may not choose to address particular questions raised or clarify aspects of context.

12. Implications for teaching:

By examining students' work in this way, what have you learned about designing assignments that invite integrative or interdisciplinary learning?

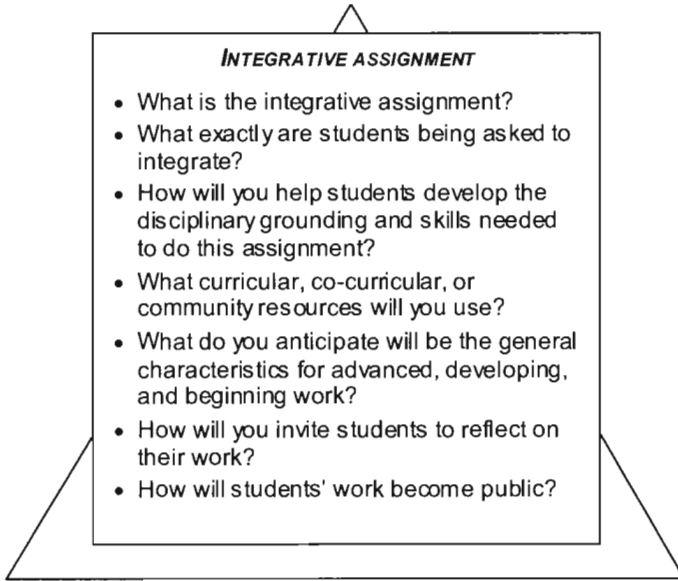
13. Reflecting on protocol:

It is always helpful to leave time at the end to revisit the process and the protocol, considering what was helpful in the conference structure and what was frustrating.

Appendix B

DESIGNING PURPOSEFUL AND INTEGRATIVE LEARNING

TEACHING THE CONTEMPORARY: WHAT IS THE PUBLIC ISSUE OR QUESTION?



DISCIPLINARY GROUNDING/ AREAS OF EXPERTISE

What do you most want students to learn from your course, program, or discipline?

"Big ideas," modes of inquiry, intellectual traits, habits of mind

POSSIBILITIES FOR CONNECTIONS

What curricular, co-curricular, and community resources will you use?

Books, films, community events, local experts, speakers, field trips, etc.

Developed by Emily Lardner and Gillies Malnarich, co-directors, The Washington Center for Improving the Quality of Undergraduate Education

Note: The expression "Teaching the Contemporary" was used by Veronica Boix-Mansilla at the National Project's March 2007 retreat.

Endnotes

- 1 Washington Center is a public service center of the Evergreen State College's academic division. We work with two- and four-year postsecondary institutions in Washington State and across the country to establish and strengthen learning community programs aimed at improving student academic achievement.
- 2 "Experiences that Matter." National Survey of Student Engagement 2007 Annual Report. Retrieved from <http://nsse.iub.edu/index.cfm>.
- 3 The National Learning Communities Project (2000-04), funded in part by The Pew Charitable Trusts, published a nine-title monograph series on learning communities by institution type and focus of work.
- 4 Participating two-year campuses included: Broward Community College, Cerritos College, Chandler-Gilbert Community College, Everett Community College, Garrett College, Holyoke Community College, Kingsborough Community College, LaGuardia Community College, Skagit Valley College, and Yakima Valley Community College. Four-year campuses included: Clayton State University, College of Charleston, Iowa State University, Kennesaw State University, Sacramento State University, Temple University, University of Kansas, University of Washington- Bothell, and Westminster College.
- 5 These assignments are available at <http://www.evergreen.edu/washcenter/project.asp?pid=78>.
- 6 See Boix-Mansilla's article, "Productive Shifts: Faculty Growth through Collaborative Assessment of Student Interdisciplinary Work," in this journal issue.
- 7 In a Washington Center Occasional Paper (Malnarich and Lardner, 2003) we describe in detail the assumptions behind our design; from its inception, the heuristic has been based on the premise that "what a student knows and can do" is a more accurate reflection of what is learned than a focus on what a teacher does.
- 8 These notes are available at <http://www.evergreen.edu/washcenter/project.asp?pid=78>.
- 9 Cross used this analogy in a speech presented to the conference on *Transforming Campuses into Learning Communities*, University of Miami, January 9, 1998.

Productive Shifts: Faculty Growth through Collaborative Assessment of Student Interdisciplinary Work

Veronica Boix-Mansilla
Harvard Graduate School of Education

Faculty inquiry focused on student work can lead to conceptual changes in how we think about assessment, disciplinary expertise, and interdisciplinary learning—revealing the promise of learning communities for students and faculty alike.

In the scholarship of teaching and learning, few experiences are more energizing than the timely encounter between a novel idea and a group of faculty ready to experiment with, appropriate, and expand such idea advancing new knowledge that is firmly grounded in practice. In the same vein, few collective efforts are more rewarding than those that invite us to inquire and revisit our beliefs, better to prepare students for today's changing world. Such was the nature of the collaboration that brought twenty seven college faculty teams, Gillies Malnarich, Emily Lardner, and me together, as described in the opening pages of this special issue. In these comments, I draw on our shared insights feeling grateful for the commitment with which our group embarked in a joint experimentation. I outline productive shifts in faculty thinking that emerged from our sustained attention to the assessment of student interdisciplinary learning.

Setting the Stage

Like many of my colleagues traveling from distant cities nationwide, I arrived at our first Washington Center meeting in Seattle wondering what might become of the series of presentations and conversations about student interdisciplinary learning that Emily, Gillies and I had envisioned. My

research group at the Harvard Graduate School of Education had advanced a definition of interdisciplinary understanding and an empirically based model for its assessment that I was eager to share. I was also delighted with the prospect of learning about how our findings would meet what Lee Shulman calls “the eclecticism of practice.”

Interdisciplinary understanding, we had posited, is

... the capacity to integrate knowledge and modes of thinking from two or more disciplines in order to produce a cognitive advancement—to explain phenomena, fashion products, solve problems, in ways that would have been unviable through single disciplinary means.

The scarcity of research-based knowledge about the assessment of interdisciplinary student work had led interdisciplinarity expert Julie Thomson Klein rightfully to dub assessment the *Achilles Heel* of interdisciplinary education. Recognizing the crucial role of assessment in shaping learning, instruction and program evaluation we viewed it as a powerful window into faculty values and student minds. Assessment practices reveal our enacted theories about the purpose of education, we recognized. If we are to prepare our students to conduct quality interdisciplinary work we must uncover markers of quality toward which to direct our instruction. Identifying such relevant markers at the various involved institutions required a collective investigation in each campus. Faculty teams agreed to focus their attention on shared analysis of interdisciplinary student work setting the initial direction for our work together.

Scholarly and Actionable Knowledge

Supporting faculty inquiry requires more than clear theoretical principles and research findings. Early in our collaboration we detected the need to re-represent research-based findings in actionable form—to embed research insights in usable tools for reflective practice. To meet this need, I devised the targeted collaborative assessment protocol — i.e. a series of guidelines for a structured conversation to analyze student work (see Appendix A in opening paper, p. 16 of this issue). The protocol built, on the one hand, on collaborative assessment conference designs developed at Harvard Project Zero. On the other, it focused on quality criteria for interdisciplinary learning identified in our research.

For two years, faculty at different campuses gathered around samples of student work to examine their more and less obvious qualities, reveal their strengths, consider the learning challenges they illustrated. Once generally acquainted with a sample of student work, faculty exchanged

their interpretations by considering core elements of interdisciplinary understanding: They discerned the *purpose* that the student pursues in the piece of work examined; the ways in which two or more areas of expertise and *disciplines* informed the work, the ways in which different forms of expertise were *integrated*, and the *reflections* each student shared about the nature and limitations of his or her work. At each turn in the discussion, faculty offered evidence for their interpretations, pointing to particular aspects of the work. They valued the student's accomplishment and made recommendations for the student to improve less developed aspects.

Learning to run the protocol was not simple. The conversation is purposeful, paced, and structured resulting in slightly awkward exchanges. Identifying markers of "integration" presents important demands. As the papers in this issue suggest, the protocol process was adapted to meet various assessment purposes and contexts. Some groups used the protocol to inform grading and program evaluation, others to adjust assignment designs, others as an opportunity to begin meaningful faculty collaborations on campuses. Some opted for using questions and probes selectively, others chose to include students as collaborators in the assessment process. In the most generative cases, a sustained and collaborative reflection about student learning raised new questions and invited pivotal changes in faculty and students' conceptions of assessment, interdisciplinarity, teaching and learning, and the purpose of education in the 21st century.

Productive Shifts

How did faculty expand, reinterpret, adjust, and reconsider initially familiar ideas? Faculty's growing capacity to assess student interdisciplinary work was punctuated by productive shifts in thinking, which we sought to document over time. I frame them below as shifts between two views "from" and "to". They embody pivotal shifts in faculty professional development.

Changing views about assessment

From: Assessment as a tool to control *whether* students have *acquired* course information

To: Assessment as a tool to find out *how* students are *making sense* of course *concepts, habits of mind* *competencies and connections*

From: Assessment as generally *assigning a grade* to a sample of student work

To: Assessment as an act of *evidence-based interpretation* to inform student learning

From: Assessment as a *private act*

To: Assessment as also *collaborative and public*

From: Assessment as a post hoc commentary on student learning

To: Assessment as an integral reflective dimension of learning

From: Assessing a single final product

To: Assessing a final product in the context of a series of sources of evidence of student developing understanding

Changing views of disciplinary expertise

From: Disciplines as *stable and bounded* collections of *findings and skills*

To : Disciplines as *dynamic* and ever-changing *intellectual and practical* enterprises

From: Disciplinary knowledge as an instructional *end in itself*

To: Disciplines as *lenses* through which students understand the world in an informed way

From: A concern with distinguishing disciplines from one another

To: An emphasis on distinguishing *disciplinary expertise from simple common sense*

From: Disciplinary expertise as cumulatively acquired

To: Disciplinary expertise as requiring that students transform early beliefs and make new sense of the problems under study

From: Disciplines as purely socio-political structures of power

To: Disciplines as both social and epistemological entities provisionally fit to inform particular kinds of problems or phenomena

Changing views of interdisciplinary learning

From: Viewing interdisciplinary learning as an end in itself

To: Viewing interdisciplinary learning as a means to build deep and broad understanding of relevant public issues

From: Viewing interdisciplinary student work as unrelated to disciplines

To: Viewing interdisciplinary student work as directly informed by expertise in the disciplines and established fields of knowledge

From: “Naming” disciplinary connections apparently made in interdisciplinary student work

To: Identifying the particular disciplinary concepts, skills and modes of thinking present in the work.

From: Valuing students’ explicit references to interdisciplinary work

To: Valuing students’ demonstrated capacity to carry out interdisciplinary work—whether explicitly labeled as such or not

From: Valuing students’ focus on a general “theme” to which multiple disciplines speak often in a parallel fashion

To: Valuing students’ articulation of a multifaceted topic that demands the integration of disciplinary forms of expertise

From: Having a general sense of a sample of student work as interdisciplinary

To: Becoming able to articulate what makes a sample of work interdisciplinary considering the topic addressed, the approach selected, the disciplines informing the work, the ways in which integration yields new insights, and the reflective qualities of the work

The conceptual changes outlined above punctuated the process of faculty inquiry. They appeared in the form of discovery moments in informal conversations, as the resolution of an assessment puzzle, plans for further actions or in the form of emerging questions. They represent understanding on the part of individuals or small groups, but not collective shifts in thinking—as participating individuals exhibited different points of departure and personal pathways for inquiry and growth. Furthermore,

these productive shifts do not always entail an abandonment of faculty's initial positions but a shift in the center of gravity of their focus and thoughts. Taken together, however, these conceptual changes speak to the generativity of our assessment enterprise and the promise of learning communities for students and faculty alike.

Assessment as Collaborative Inquiry

In the current political environment, any discussion of quality assessment of student learning is delicate. Transformed into items on standardized assessment instruments, even our best intended quality descriptors risk losing the rich meanings with which they emerged, if applied massively and unreflectively. The collaborative assessment process described in this issue, militates against oversimplification by creating a structure where genuine inquiry about student learning can take place. When faculty engage in evidence-based deliberations about learning processes and outcomes, they are better prepared to inform their students' progress. Perhaps most consequentially, however, they establish a public procedure to re-calibrate teaching and learning values and expectations on campus. At a time when rapidly changing societies impose increasing new demands on higher education (from nurturing global citizens, to developing 21st century skills), interdisciplinary collaborative assessment conferences may become much needed pockets of intelligent deliberation, where focused discussions about student learning give room to a broader consideration of the purpose of education in the 21st century. For that opportunity... my colleagues in this project and I were thankful.

Juggling and the Art of the Integrative Assignment

Lynn Dunlap and Larry Sult
Skagit Valley College

This paper describes how explicit assignment criteria for interdisciplinary integration and ample practice helped students improve their mastery and integration of individual disciplines.

It is truly a challenge to stay on the edge of discomfort where your awareness is required to keep the pattern flowing or to successfully complete the difficult move. . . . With a beginner's mind you feel every catch with every finger because nothing is familiar (Finnigan, 1993).

Introduction

Learning has much in common with juggling. Both are dynamic activities grounded in the present and require the simultaneous manipulation and integration of multiple objects (or concepts and processes) into a purposeful pattern. The juggling analogy seems even more applicable when we talk about learning interdisciplinary integration. In our learning communities, which combine introductory courses, many students have been able to learn about a single field of study and apply their insights to real-world situations. However, when using two fields of study in an analysis, many students seem like novice jugglers, able to control only one discipline at a time. They will focus on one field, referring only briefly to the second. A few begin to “juggle” both disciplines at once, but as they attempt what we think of as the third “ball”—integrating both into a meaningful “product”—often the analysis collapses. Many seem unable to take the leap of faith that jugglers must take to keep not one, not two, but three objects in the air at the same time.

To understand how to help our students, we studied samples of their work during our participation in the Washington Center's National Project on Assessing Learning in Learning Communities. Using an assessment framework proposed by Boix-Mansilla and Dawes (2004), we asked three questions: whether students' work was grounded in disciplinary insights, whether it "leveraged" that disciplinary knowledge to develop new understanding, and whether it was purposeful and critically aware. Our analysis reaffirmed for us the complex nature of integration. As Boix-Mansilla and Dawes note, to integrate requires not just possessing disciplinary knowledge but deploying it, "moving flexibly among theories, examples, concepts, and findings" (p. 3). We also realized that our students were learning to juggle the content, methods, and forms of two new disciplines at the same time they were learning to juggle the two together. Like any juggler, to become adept, they needed to learn the fundamentals, and they needed lots and lots of practice.

As a result, we made several simple—and, in retrospect, rather obvious—shifts in emphasis in assignment design and classroom practices. The following sections describe what we learned from our students' work, the modifications we made, and the results we saw as students began to acquire and apply the skills of juggling to the art of producing a truly integrative analysis.

Early Iterations

As faculty at Skagit Valley College, a small two-year college in the state of Washington, we began teaching learning communities in 1987. Since 1993, when the college started to require at least three learning communities as part of the general education requirements for transfer degrees, we have each taught at least two a year. Our learning communities, like most at the college, pair two introductory-level courses and enroll a cohort of up to 54 students; we use a single syllabus, fully integrate subject matter and major assignments, and collaborate on evaluating student work.

Because the college offers a wide range of learning community combinations, from which students select any three in any sequence at any point in their progression toward the degree, our class composition is mixed. Students may be just starting college or in their final term; they may have placed in precollege composition or have completed two college-level composition courses. In addition, because most of the courses we teach have no prerequisites, students have seldom previously taken a college course in our disciplines.

We initially combined political science and film studies with two basic notions in mind. First, we felt the combination would reinforce disciplinary subject matter and skills. We reasoned that films would provide case studies for understanding political philosophy while knowledge of political theories would provide a thematic lens for understanding how films construct meaning—or rather, multiple meanings. We also theorized that the combination would facilitate exploration of difficult and complex issues. Experience had taught us that directly confronting contentious issues often resulted in defensiveness or retrenchment for many students. Using films as texts for testing out ideas would allow us to “traverse obliquely” toward our goals.

In addition to microthemes and essay exams, we required that students participate in fishbowl panels. (See Baloche, Mauger, Willis, Filinuk, & Michalsky (1993) for a brief description of fishbowl panels.) This centerpiece assignment fulfilled several functions. It reinforced the premise that politics is a social behavior and that understanding films is a cultural process. Also, because panels provided the first “public” discussion of films in the second half of the quarter, they reinforced the course’s core values of student autonomy and collaboration and served as students’ entry into the academic discourse with its diverse perspectives, respectful dialogue, and well-reasoned arguments. Not insignificantly, the panels also gave us an opportunity to learn how well students were managing disciplinary vocabulary and analytical frameworks.

In fishbowl panels, four to six students discuss a film with each other while the rest of the class observes and takes notes. (See Bean, Drenk, & Lee (1982) for an explanation of these short, focused writing exercises.) Because panels “jump-start” the class’s examination of the issues raised by the film, discussions are expected to be exploratory, informal, and brief—only 15 minutes—but coherent and well informed. Students are expected to analyze the film in terms of the current unit of study and to support their analyses with cinematic evidence, not just narrative details. The discussions should also demonstrate their ability to work with others—both in preparation for the panel and during the discussion itself—to explore diverse perspectives.

Following the panel, two volunteers facilitate a question and answer session for the remainder of the hour. Facilitators ask for questions of clarification prior to opening the discussion and then ensure that ideas are fully explored before new ones are posed. The direction of large group discussions varies. Sometimes class members request clarification or additional evidence from panelists. Sometimes they propose alternative readings. To maintain student autonomy, faculty refrain from participating;

if we do have questions or contributions, we request acknowledgement by the student facilitators.

Panelists receive a group grade. Each member also completes a separate self-assessment of his or her preparation, participation, and analysis. For the past two years, DVD copies of the presentations were placed on reserve in the library for students to review.

In general, this learning community produced much of what we hoped in terms of student learning. Students' panels and writing suggested that pairing our courses helped reinforce disciplinary concepts and the ability to develop arguments. The fishbowl panels have been particularly successful. Students were energized by the experience of collaborating with each other and taking responsibility for the film discussions, which were, for the most part, focused and relevant. They applied political concepts and described, sometimes in sophisticated detail, how cinematic strategies are deployed in each film. They frequently offered sensitive interpretations. Equally important, they were willing to consider alternative perspectives on films they found challenging, like Spike Lee's *Do the Right Thing* (1989) and Neil Jordan's *The Crying Game* (1992). For example, after a particularly intense struggle with whether to refer to Dil, the transgender character in Jordan's film, as male or female, the class reviewed its understanding of political philosophy and cinema and determined that whatever their personal beliefs, members should—and would—honor Dil's self-identification as a woman.

Despite these successes, the discussions sporadically achieved what we considered effective interdisciplinary integration. Most panels provided only rudimentary integration. For instance, they could identify a relevant political perspective and describe how cinematic strategies conveyed it, but might neglect to define and explain that perspective. Or they might offer an interesting analysis of the political dynamics evident in a film, but then not provide sufficient convincing cinematic support. Often groups seemed hesitant—or unable—to venture much beyond the concepts and vocabulary from the earliest units. In feedback, we frequently noted to panelists that their interpretations were defensible but were not sufficiently defended.

Realizing that our assignment could more carefully delineate criteria for interdisciplinary integration, in winter 2007 we piloted a tentative revision with encouraging results. More panels than before cited a range of cinematic strategies, defined the political thinking underlying their analyses, and identified the individual political thinkers whose ideas they applied. Some panelists tested multiple perspectives for a single film and articulated their awareness of the difficulty inherent in determining a

“correct” position. For example, one panel provided both a Lockean and a Machiavellian analysis of the rule of the Taliban as portrayed in Barmak’s *Osama* (2003). They also pointed out that while they were haunted by the film and personally rejected the Taliban’s actions, their use of the two disciplines at least provided reasoning that could explain the Taliban’s position and also helped them recognize the distinctions the film makes between the perspectives of Muslim men in general, as opposed to those of the Taliban.

These panels persuaded us that with clear and precise criteria students in introductory courses could manage thoughtful interdisciplinary analyses of challenging concepts. We realized that students’ reliance on concepts from early units probably reflected their greater confidence in the material they had been practicing the longest. As we prepared for a new learning community, we agreed that in addition to making our panel criteria even more precise we would be more explicit about *how* experts use disciplinary expertise to develop meaningful analyses and would provide more opportunities for practice. The next sections describe these changes and the results.

Breakthrough Design

When first approaching these two subjects it seemed to be relatively impossible to integrate them. That is what intrigued me to take this learning community.

(Note: All student comments are from reflective essays, cited with permission and without corrections.)

Our new learning community, *Sacred Space/Sacred Time/Silver Screen*, uses *Philosophy of Religion* and *Introduction to Film* to explore ways of understanding the nature and portrayal of spiritual experiences in different religions and cultures. As with past combinations, our expectation was that learning disciplinary vocabulary and analytical frameworks was not an end but a means to address a larger question: How can we understand diverse religious perspectives and complex film portrayals that seem “alien” or even what we might consider hostile?

This learning community integrates the essential design of both courses. Overall, it is organized into units for exploring four philosophical issues: Peter Berger’s typology for the difference between interior and confrontational religious practices, Mircea Eliade’s explanations of sacred space and sacred time, Lucien Lévy-Bruhl’s and Oren Lyons’ explanations of the characteristics of spirituality for primordial people, and William James’s definitions of types of religious transformations. These are

combined with an examination of the diversity of spiritual practices among and within religious traditions, including primordial religious experience, Judaism, Christianity, Islam, Buddhism, Taoism, and Confucianism. In addition to the usual required text, Huston Smith's *Religions of the World*, we included excerpts from Berger, Eliade, and James, an interview with Lyons, and some optional readings like the *Tao Teh Ching*. (Note: Lucien Lévy-Bruhl's concepts are explained in Smith's (1991) text. Publication information for the other philosophers is cited in References.)

The film studies course focuses on how meaning is constructed through cinematic strategies as they are employed in a variety of traditions—silent and sound, mainstream and independent or experimental. As in stand-alone versions of the course, we watch 10 feature-length films, beginning with silents so students can focus on learning the basic visual rhetoric of mise-en-scène and camera placement. Subsequent units introduce composition, editing, sound, and narrative conventions. In addition to a film textbook, we provide background notes for the films. The films, which form the core texts, are paired in terms of religious traditions.

Defining the Performance Standards

The fishbowl panels were also a great way of proving to myself and my instructors that I knew how to integrate what I had been learning about film and philosophy successfully. . . . After watching the film I knew it was going to be a lot of work for me to try and understand what was happening in the film, not only for myself but for presenting it to my fellow classmates as well. That's when I began working harder than I ever have when it comes to understanding something.

As before, the fishbowl panel remains a central feature of the course, but three revisions now make explicit for students the disciplinary and interdisciplinary evaluation criteria.

The first revision shifts the emphasis from group dynamics to analysis (see Table 1). In the earliest iterations, 12 criteria were divided into three categories, two for communication and one for analysis. The revision compresses the first two categories into one (effectiveness of presentation) with three instead of seven criteria. Although group process is still important, the burden of evaluating group dynamics rests with students who, instead of completing a form, now write two reflective essays.

The second change is in the greater specificity of the criteria for analysis, now called "analysis and integration." This slightly expanded category now represents the majority—literally two thirds—of the evaluation criteria. The revision elaborates separate expectations for each

discipline: for example, for philosophy, that vocabulary is used accurately and effectively and philosophers are identified and their ideas applied. It distinguishes between integrating the two disciplines and integrating relevant ideas throughout the course.

These changes emphasize the importance of articulating precise concepts rather than general notions. Students now know that they should apply one of the four analytical frameworks as presented by the philosophers and explain which aspects are relevant. Thus, for Dupeyron’s *Monsieur Ibrahim* (2003), if a panel chooses to explore whether Momo’s conversion to Islam is evidence of a religious transformation—as one did—they must decide which kind, such as “healthy-mindedness” or “unification,” and use James’s definitions to justify their choice. Their discussion should incorporate specifics about relevant tenets and practices of Islam (particularly Sufism) portrayed in the film, as well as how visual and sound techniques and narrative organization in key scenes support not just that Momo is transformed but that the transformation is religious, that it conforms to one of four different kinds, and that it results, as James would argue, in movement to actions with positive outcomes.

The third change is how criteria are evaluated. Instead of assigning points, we adapted a rubric from Boix-Mansilla, Duraisingh, Woolf, and Haynes (2007). Because the presentations are short and collaborative, we kept our scheme simple: whether the behavior or skill is absent, present but in need of strengthening, present and purposeful, or sophisticated and nuanced.

Table 1. *Comparison of Fishbowl Panel Evaluation Criteria*

VERSION USED IN EARLY LEARNING COMMUNITY	VERSION USED IN NEW LEARNING COMMUNITY
<p>Organization of Time and Materials</p> <ul style="list-style-type: none"> • The members and topics were introduced; members presented their observations clearly, audibly, and fully. • Discussion was orderly and integrated; contributions were clearly related without confusing overlap. • Participation was balanced. • The group used the time well. <p>Clarity of Presentation</p> <ul style="list-style-type: none"> • The discussion remained focused on the established themes, with observations about the film clear, coherent, and relevant to themes and/or concepts about the film. 	<p>Effectiveness of Presentation</p> <ul style="list-style-type: none"> • Group members, topics, and themes were introduced; members presented their observations clearly, audibly, and fully. Participation was balanced. • Development of ideas was coherent and orderly, focusing on one point at a time and developing it fully before introducing a new one; each members’s contributions were clearly related without confusing overlap. <p style="text-align: right;">(cont'd)</p>

<p>Clarity of Presentation (cont'd)</p> <ul style="list-style-type: none"> • Development of ideas was coherent and orderly, focusing on one point at a time and developing it fully before introducing a new one. • If members presented diverse viewpoints, other members were respectful, exploring the diverse ideas. <p>Strength of Presentation</p> <ul style="list-style-type: none"> • The themes and/or concepts were clearly and effectively identified, relevant to those we had studied in the course, and sufficiently explained and explored. • The group identified ample and accurate cinematic techniques throughout the discussion, clearly signaling both the specific uses of those techniques and how they were used in the scenes. • The cinematic techniques cited clearly and logically supported the readings and interpretations advanced in the discussion. • The presentation pulled together related ideas from the course and helped to explain both the film and the meaning more fully. • The presentation pushed beyond superficial observations to more rigorous and meaningful analysis that would help further everyone's understanding. 	<ul style="list-style-type: none"> • When members presented diverse viewpoints, other members were respectful, posing questions and exploring the diverse ideas. <p>Strength of Analysis and Integration</p> <ul style="list-style-type: none"> • The discussion was focused: Themes and concepts were clearly identified, appropriate to the current unit of study, relevant to the film, and discussed in detail. • The discussion was clear and analytical: Relevant terms were defined; observations and interpretations were supported with clearly identified and specific detail and reasoning. • The discussion was grounded in concepts from philosophy: Philosophical vocabulary was used accurately and effectively; specific authors were accurately identified and their ideas applied; ample and compelling cinematic evidence was proposed for philosophical meanings proposed in the discussion. • The discussion was grounded in specifics from film studies: Cinematic vocabulary was used accurately and effectively; ample cinematic techniques – both from specific scenes and overall in the film – were cited as compelling evidence for interpretations of the film as proposed in the discussion. • The discussion was integrated: It effectively integrated the two disciplines into a meaningful analysis of both the film and the concepts in a way that deepened understanding of each. • The discussion was integrative in terms of the entire course: Additional related ideas from the course were included as part of a rigorous and meaningful analysis.
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Finally, because the limited time for fishbowl panels does not allow for detailed reflection on the integration, we incorporated reflection into the two reflective essays. In the first, due shortly after the panel, students explain how their participation illustrates their progress toward meeting their learning goals. In the second, a more comprehensive end-of-quarter essay, they explain how working in groups and integrating the disciplines helped them extract meaning from the films, using, at minimum, one of the two final films to illustrate their discussion. They may also elect to explain learning that was meaningful to them personally. These essays are graded for control of focus, organization, and supported discussion.

Learning and Practicing the Fundamentals

While greater clarity and precision in evaluation criteria is critical, it is, in itself, not sufficient if students are to become skilled in integration. We therefore used activities and assignments to create “scaffolding” for their learning or, to stay with our juggling metaphor, opportunities to practice, to falter, and to learn from “the drops.” Some modifications reflected a strategic shift in emphasis to integration. Others introduced students sooner to sequenced practice in testing their disciplinary knowledge and exploring how to apply it.

Defining Integration

In the first class it became apparent how this class would work, both teachers would combine their knowledge reserves and skills into a cohesive class.

Initially I didn't understand just how philosophy and film would work together, but after the first week of class it became very clear.

On the first day of the term and at regular intervals throughout, we defined interdisciplinary integration and explained its value in academics and employment. We pointed out that while people naturally integrate experiences, perspectives, and information from different arenas, formal education splits out fields of study. Therefore, we would not assume that students were already expert at integrating different disciplines; instead, we would provide constant practice.

Our revised handouts reinforce this emphasis. Film notes embed an interdisciplinary focus in the background information and study questions. Vocabulary study sheets, on which students jot down examples of new techniques as they watch films, now include a question that asks them to

identify in the film a religious concept from the current unit and to list film techniques that suggested it. This simple activity prepares students for group work on the day following the film.

Practicing Integration

Group work [was] a place where I could express my ideas.

We would discuss, usually in excruciating detail, the ideas we were going over.

Hearing the other girls' extrapolations and interpretations caused me to think more in depth about the aspects of the film.

Each exercise was a quick taste of the micro-theme.

During the first hour of class after every film, groups brainstorm answers to questions about the film. They post their results on the board as single sentences supported by lists of relevant cinematic evidence. From the students' perspective, this is one of the most powerful strategies for "authorizing" their thinking. As one of our first students wrote, "When I saw my words written on the board, I realized I do have something important to contribute to analyzation." To help students refine their "analyzation," we fishbowl our observations about those results. While students watch and listen, we annotate the work on the board, praising the strengths and suggesting what changes or additions might be needed to convert these into claims and evidence. Students find this exercise extremely helpful for future group work as well as their formal written analyses.

To make the process of integration more explicit, we sequenced these brainstorm sessions. In the first week, groups wrote a single sentence identifying the film and director and relevant concept from Berger (including his name) and listed cinematic evidence. In the next class, the same groups practiced paraphrasing Berger's definition of that concept and listed—with page references—all the supporting citations they had found in his text. By the third week, groups were identifying precise disciplinary support, for instance, whether and how in Eliade's terms, Arcand's *Jesus of Montreal* (1989) portrays time as homogenous and thus "normal" or as heterogeneous and thus possibly "sacred." Groups might choose, as one did, to argue that the acting troupe and audiences within the film could be seen as experiencing sacred time. The work posted on the board identified the relevant aspects of Eliade's definition—that sacred time is discontinuous and reversible—and then listed filmic support: how the staged Passion Play ritually reenacts the central cosmogony of the death

and resurrection of Jesus and which details of editing, mise-en-scène, and sound in critical scenes suggest that the actors and their diegetic audience have been transported to the first century.

These exercises were the proving grounds for microthemes and, ultimately, the fishbowl panels. Once students were accustomed to citing specific evidence from both disciplines to support their claims, we could concentrate on coaching them as they learned to juggle the pieces of their analysis into a coherent, integrated whole.

Microthemes provided individual practice at more formal integration. In this class, we required five rather than three of these brief writing exercises and dropped the essay exams. This gave us biweekly checks on each student and gave students a chance to “get it right.” In addition to providing a template and examples, we used class sessions and our brief written feedback to direct students to ways they could improve disciplinary grounding and more carefully connect their reasoning and evidence.

Modeling Integration

The turning point for the course was watching the mock-fishbowl panel. . . . It was during the question and answer session, the switch flipped. . . . It was this moment that I truly saw the possibility and scope of this class.

Finally, we slightly modified the fishbowl discussion that we present at mid-quarter. Like student panelists, we sit in front as we discuss the film with each other and take questions with the help of student facilitators. This term, after discussing Caro’s *Whale Rider* (2002), we asked the class to grade our discussion using the evaluation criteria. Not surprisingly, their comments were cautiously generous. We then offered our own assessment. We felt we had explained Lévy-Bruhl’s definition of “the mythic world” and shown how non-diegetic sound and unusual camera angles, shifts in focus, and editing in the opening sequences suggest the presence of this world at Pai’s birth. However, we suspected that as we became engrossed in our exploration, we neglected to cite filmic evidence—an observation that the students confirmed.

The simple step of modeling an attempt to integrate—and discussing the problems that arise—helped enormously. Students appreciated seeing how we developed the analysis by proposing ideas, elaborating on them, countering arguments, and testing evidence. And by inviting them into the evaluation process, we confirmed their expertise in recognizing disciplinary grounding and interdisciplinary leveraging.

Student Learning

What We Saw

Most of my understanding of this film came from watching the fishbowl panel groups.

I could not come to these conclusions without the help of my classmates through group discussions, fishbowl panels, and the typical Q&A with the instructors.

As we observed the nine student panels for *Sacred Space/Sacred Time/Silver Screen*, we were pleased that the revisions to the criteria and scoring had clarified our assessment task. The real excitement came in the dramatic improvements in student performance.

All the panels demonstrated a far greater disciplinary grounding and articulated more purposeful and connected integration than in previous learning communities. Most provided credible interpretations in terms of specific religions and frameworks of analysis from both disciplines; their supporting evidence ranged from sufficient to impressive. Most accurately defined philosophical terms and applied and cited the appropriate philosophical texts. Two of four groups discussing *Monsieur Ibrahim* and *Malcolm X* accurately identified specific Islamic principles like *salat*, *shahada*, *shirk*, and *zakat* and referred to the community of believers as the *ummah*, even though none of these was identified by name in either film. Also, groups began to identify subtle cues to bolster their arguments. One group argued that in permitting Momo to shoplift, Ibrahim was practicing *zakat*, or charity. Another, on the basis of their analysis of composition and editing in *Malcolm X*, argued that Malcolm's second religious transformation stemmed from his recognition of *shirk*, or putting his mentor Elijah Muhammad on the level of Allah. Similarly, the three panels responsible for Jianqi's *Postmen in the Mountains* (1999) and Yong-Kyun's *Why Has Bodhi-Dharma Left for the East?* (1989), discussed by name specific Confucian, Taoist, and Buddhist principles—*ren*, *li*, *Tao*, *wuwei*, and *satori*. One group used verses from *Tao Teh Ching*, an optional reading, to support its analysis.

All groups more consistently cited a range of cinematic evidence to support their readings, and two drew on their understanding of how films adhere to or violate narrative conventions. Of nine groups, only two did not identify sufficient cinematic vocabulary, a fact they ruefully noted in their self-reflections. Nevertheless, even these groups offered sensitive readings of films and supported those with evidence that went well beyond plot and narrative.

The panels also offered multiple perspectives on the films. Although the two panels for *Postmen in the Mountains* each focused on different traditions—Confucian and Taoist—both pointed out that their reading was merely one and not the only way to understand the film. One panel, having explained that the different subtitled translations in the two DVDs they had watched had significant implications for interpreting Taoism in the film, referenced the specifics of each translation in their discussion.

The question and answer sessions were equally productive. In a few instances, when panelists did not clearly or fully connect their essentially good evidence to their claims, questions from other students allowed them to elaborate. When panelists—and the rest of the class—acknowledged that the discussion had made them realize that they were unsure about some aspects of the James’s “sick soul” transformation, we used the class session to clear up confusion. As the quarter progressed, each panel became increasingly careful to connect claims and evidence.

The students’ postpanel reflective essays provided us with further insights. In addition to discussing the impact of working in groups, a majority of students explained how discussions—both prior to and during the panels—helped them to understand the film and the two disciplines. Although they had dreaded the panels, the students were invariably surprised to discover that they had much more to say than could be said in the time allotted. Several who discussed their disappointment at not having provided sufficient evidence or at not having remembered to cite their sources stated that they were confident that “next time” they would be better prepared.

What They Wrote

I will conclude in saying that Bodhi-Dharma is the most accurate portrayal of the human condition I have ever seen. Nothing is glamorized or romanticized; no-one is perfect; life is confusing; there is so much we cannot see or know; and through it all, the world is a beautiful place. There is no way I could have deciphered anything in this film without the skills acquired in this class.

In their final self-reflections, all students discussed the intellectual challenges in integrating two disciplines. As one observed, applying knowledge to a specific text is far more difficult than merely possessing that knowledge:

I could understand [the disciplines] on their own, but when trying to connect them I would get very confused. I could understand the film techniques prior to watching the film, but it was hard for me to see

them in and know how they brought meaning to the film. In the same sense I understood the philosophy concepts, but it was hard for me to incorporate them in the film. However, after the first few films the ideas and concepts started to become easier and I began to learn a lot from both courses.

Despite their concerns, students responded positively to the challenges. As one wrote: “The seemingly impossible task made me very curious to make it work for myself.”

Many students explained how group discussions and microthemes, while intellectually and personally challenging, resulted in the ambition to work harder. One observed that initially “this way of learning bothered me, but I quickly came to realize that it was very effective. The constant reinforcement helped surprisingly when it came to coming up with ideas.” Others echoed this theme of constant reinforcement. By participating in groups throughout the quarter, one student wrote, “I was forced to discuss what I saw and analyze it philosophically. I also had to defend and explain my stance, and be ready to question others to clarify how they interpreted certain scenes.” Another described this as a process of testing her knowledge through explanation, feedback, and clarification; her group notes “became [her] most coveted tool when it came time to write a microtheme.” And microthemes, specifically, or as one student wrote, “the constant repetition of writing, each time with the same general format, but focusing on different aspects of different religions,” helped sharpen their grasp of concepts.

In addition, most students explained that preparing for and presenting fishbowl panels was transformative. It deepened their understanding of films, helped them gain confidence, and taught them about preparation, analysis, and working with others. One woman, a self-described weak “group worker,” explained it this way:

This quarter I became much more comfortable with working in groups of people I don't know, and I found myself able to open up to them and actually learn from them. An example of this was when I got together with “K” [not a member of her panel] to have her explain *Malcolm X* to me. I was really struggling with film concepts and the philosophy, and that's where reaching out to others was helpful. I couldn't have asked her without the prior fishbowl experience.

The final reflective essays also allowed us to gauge students' sense of the purpose and value of the integrations they had undertaken. Many students discussed how studying two disciplines together helped strengthen their understanding of each one. Despite their surprise at the “odd” disciplinary combination, they found they could, as one stated, “use

the two courses together as a tool to extract further meaning from each course by using the other.” Some recognized how this pedagogy differed from traditional modes, like the student who wrote: “I found myself lost and confused until the movies became my way of finding a better connection to religion than just being lectured about it.” Although the combination seemed “weird,” he continued, “if I didn’t have one or the other I would have been in trouble. Both religion and film worked off one another and helped me learn more about each topic in every exercise.”

Students also commented on the power of using both disciplines to understand films and new perspectives. One explained that, despite initial difficulties, “as the quarter went on it was easy to see that integrating them would teach me something that I could not otherwise learn.” Another wrote that “without the combination of the two disciplines it would be very difficult to perceive any meaning in quite a few of the films we watched.” And a third, utterly bewildered by *Bodhi-Dharma* explained how, finally, the course had provided “at least a few keys to unlocking the mystery of this film,” specifically some “training in Buddhist philosophy” and an understanding of how “jump cuts enable the viewer to lose track of time in terms of its linearity.”

A few students wrote of applying their new skills in different contexts. One described discussing with a roommate whether the TV show *Battlestar Galactica* (2004) was an attack on all organized religion. The student argued, instead, that because the “enemy robots have a religion that is thinly veiled as Islam” and the “virtuous and devout” good guys have “a religion very similar to the religion of ancient Greece,” the show can be read as “a portrayal about Westerners [*sic*] fear surrounding Islam in space.”

Perhaps the most striking quality we found was students’ intense satisfaction with their ability to analyze the most challenging films of the quarter. While in our view the films were carefully sequenced to build toward the most difficult, we learned that from their perspective, all of the films provided challenges. Two were silent, five were fully or partially subtitled, and one did not provide translations of its characters’ Gullah dialect. No one had seen silent films before, and most were like the student who admitted he could “probably count on one finger” the number of times he had seen a foreign film. Students also struggled with watching films with nontraditional visual or narrative organization, whether silent, like Dreyer’s *The Passion of Joan of Arc* (1928), or with sound, like Dash’s *Daughters of the Dust* (1992). For some, the portrayals of Buddhism and Islam created barriers; for others, issues like the exploration of racism in *Malcolm X* were troubling. Many films proved daunting on several counts.

Despite this, or perhaps because of it, students were exhilarated by their breakthroughs, like the panelist for *Bodhi-Dharma* who slyly incorporated his new understanding of *zazen* in his explanation of its challenges: “The first time our group watched this film we were all uniquely stunned and unable to grasp even small portions. The film was like being beaten with a stick and then asked to describe the stick over the telephone.” Writing of how she used the disciplines to understand the same film, another student described her “little *satori* insight” as she realized how an unusual use of camera focus on a turbulent river instead of the monk meditating beside it “illustrated the Buddhist’s calm connection so beautifully and candidly.”

Final Thoughts

This quarter I realized the importance of connection between all things. I mean this not only in the philosophical sense, but also in the sense that a variety of skills creates a harmony of knowledge as opposed to a series of single notes of wit.

As veteran teachers, we will continue to refine our assignments; however, we are persuaded that in our student’s words, we have located “at least a few keys to unlocking the mystery” of interdisciplinary integration: explicit criteria, constant practice, and intentional design. One student, new to learning communities, described the result this way: “I was worried the connection would be forced upon us, but very delicately the two disciplines were woven together in a mesh that became this class.” Another noted that his prior learning community experiences had “not been quite like this. It was almost as if another step had been taken in the process. Everything fit in more, and more meaningfully.”

As we reflect on the work of these students, we too feel that another step has been taken in the process. True, their microthemes are not polished: The prose is marred by inconsistent control of mechanics and syntax. The panel discussions are, as we would expect, at times hesitant or not fully clear, but we feel that we are now observing and reading the work of apprentices who possess the potential for mastery. The thinking is focused, and, with few exceptions, the disciplinary grounds are explicated and leveraged to produce sophisticated insights. Students managed multiple strands of thought, teasing out meaning and supporting their reasoning. Before, in our feedback we urged students to provide more specific and varied evidence from each discipline; this time we focused primarily on how they might better connect some of the pieces.

We are also reminded again of the extent to which students integrate more than disciplines. Like most community college students, they are, as

one wrote, learning to “juggle life”: school, employment, families, health, and more. They are also struggling to understand the world in which they live, an effort that requires integrating both cognitive and affective understanding. Over a 10-week term, we saw subtle and sometimes dramatic shifts in students’ academic abilities as well as their attitudes toward religions and films, toward philosophical perspectives and academic discourse, and toward working with and understanding others.

Finally, as we think about the purposefulness of interdisciplinary integration, we think of what it provides beyond new theories and nuanced interpretations. As we noted earlier, one of our goals was to provide students the skills to approach complex, difficult material. Although most students were challenged by at least one of the religions we studied, their discussions in writing, in panels, and in class were informed, thoughtful, and respectful. In their reflections, students often described their experience of a personal milestone: integrating new knowledge and insights into a reconsideration of others’ belief systems and their own. Many began the course suspicious of Islam and puzzled by Eastern religions, but, as one wrote: “By taking this class, I feel like I have challenged the paradigms in my head about how different and odd the other religions were. This class has changed that paradigm and led me to believe that the other religions are just as valid in their own way.” For others, Christianity presented the greatest challenge. One student had always considered herself open-minded, except for her aversion to Christianity. “I know,” she wrote, “that here was a barrier.” The films, discussions, and philosophical frameworks all led her to find “beauty in every religion covered in this class,” including the “beauty and subtlety of the teachings of Christianity.” Some who thought they had no religion were, like one student, “thrilled to find that there were other people who believe many of the same things. . . . I am not alone and finally have a kinship to which I belong.”

It is perhaps not surprising that students were often most eloquent when describing this other dimension of purposeful interdisciplinary integration. This was particularly the case with those for whom studying other religions posed a profound challenge, the metaphoric equivalent of juggling knives. We would like to close with an extended passage written by a student, who—like others—feared that studying other faiths would endanger his own. In it he explains how he integrated course concepts, specifically Berger’s typology of exterior and interior (or mystical) religious practices, into a deeply meaningful pattern for his own life:

So I decided to take a completely objective view on both films and religions when I came to class. I left my Christian life at home, and at school, for [the] time I was in class; I tried to look at all the religious

ideas as an agnostic person, and I tried to look at all the film concepts and terms as a film student. . . . *Monsieur Ibrahim* was the toughest film for me. . . . I challenged my faith against Ibrahim's. I came to the conclusion that the internality of Ibrahim's Muslim faith is very similar to externality of my Christian faith. We both believe in worship with all that you are and have. This conclusion was something I would have never come to if I had not challenged myself to be the best philosophy of religions student I could be. The aspect of my own learning I found to be the most meaningful is my new ability to be objective when looking at other religions, and how they are portrayed in films. I am more respectful and looking to learn, rather than judge. This is a part of myself that I found while taking this class, and a part I hope never to lose.

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Assessing Student Work to Support Curriculum Development: An Engineering Case Study

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Today's engineering graduates need specialized knowledge and abilities associated with interdisciplinary education. This article discusses how a departmental curriculum committee in Agricultural and Biosystems Engineering used a collaborative assessment protocol to both examine the development of engineering students' integrative thinking and to guide a continuous curricular improvement process.

Preparing students to address future challenges and to engage with contemporary issues requires helping them to develop the ability to think in multiple ways and to find new ways of integrating knowledge (Boix-Mansilla, Miller, & Gardner, 2000; Lattuca, Voigt, & Fath, 2004). The Association of American Colleges and Universities' report *College Learning for the New Global Century* (2007) affirms this call, stating that every student "will need wide-ranging and cross-disciplinary knowledge, higher-level skills, an active sense of personal and social responsibility, and a demonstrated ability to apply knowledge to complex problems" (p. 11). In the case of engineering, the *Educating the Engineer of 2020* report (National Academy of Engineering, 2005) calls for a different type of engineering graduate who can integrate knowledge across disciplines, apply knowledge to real-world situations, and demonstrate skills in creativity, teamwork, communication, and collaboration.

Even though associations, institutions, and individual disciplines are espousing the goal of promoting a different type of learning, several critical questions remain largely unanswered: How do we clearly articulate,

observe, and measure interdisciplinary learning outcomes? How do institutions encourage interdisciplinary outcomes for students, design intentional learning experiences to promote the outcomes, and ultimately assess student achievement of the outcomes? In this article, we use an engineering case study to explore the implications of using a protocol to assess integrative student learning. We describe the use of a systematic review process to facilitate faculty discussion of interdisciplinary student learning outcomes demonstrated in actual student work. Pellegrino (2006) suggests that three educational components—curriculum, instruction, and assessment—need to be developed to support new learning goals and need to be aligned to support each other. Building on that insight, we offer insights about how this assessment process can facilitate understanding of learning across the curriculum and provide insights into ways of structuring learning experiences.

Why Interdisciplinary Learning for Engineers

Recent studies echo this call to engage students in disciplines beyond engineering to make them better engineers and, ultimately, lifelong learners (e.g., Adams & Felder, 2008; Bok, 2005; Pellegrino, 2006). The literature offers examples of student learning outcomes associated with interdisciplinary education, including integration of knowledge, innovation, synthetic thinking, critical thinking, sensitivity to bias, and ethical reasoning (Kavaloski, 1979; Newell, 2002; Newell & Green, 1998). Similarly, Lattuca et al. (2004) refer to the capacity to recognize, use, and evaluate multiple perspectives. ABET (formerly the Accreditation Board for Engineering and Technology) changed its accrediting process in 2000 to include crosscutting interdisciplinary learning outcomes (see Table 1). These outcomes require students in degree programs to use critical thinking and problem solving to see connections and differences among disciplines, integrating abilities such as communication and teamwork, as well as a knowledge of contemporary issues, ethics, and an understanding of the impact of engineering solutions in multiple, broad contexts. Assisting students in achieving these outcomes involves faculty efforts to design learning experiences that offer opportunities to develop meaningful connections.

Table 1. *ABET Student Learning Outcomes for Engineering Programs (ABET, 2008)*

Engineering programs must demonstrate that their students attain the following outcomes:

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to design and conduct experiments as well as to analyze and interpret data
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4. An ability to function on multidisciplinary teams
5. An ability to identify, formulate, and solve engineering problems
6. An understanding of professional and ethical responsibilities
7. An ability to communicate effectively
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
9. A recognition of the need for, and an ability to engage in lifelong learning
10. A knowledge of contemporary issues
11. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Source: Criteria for Accrediting Engineering Programs, 2008–2009. (2008). Retrieved September 17, 2008, from <http://www.abet.org/Linked%20Documents-UPDATE/Criteria%20and%20PP/E001%2008-09%20EAC%20Criteria%2012-04-07.pdf>

Challenges in Assessing Interdisciplinary Learning

If institutions and disciplines agree that student learning outcomes associated with interdisciplinary thinking are essential, then it is clear that in addition to developing intentional strategies to promote interdisciplinary learning, institutions must find ways to assess whether students acquire interdisciplinary skills as a result of these experiences. Using national data from a faculty survey, Lindholm, Astin, Sax, and Korn (2002) reported that nearly 40% of faculty report having taught an interdisciplinary course. However, there is little evidence of the impact of this strategy on student learning outcomes (Lattuca et al., 2004). Some argue that the inability to assess the impact of interdisciplinary education on student learning is one of the biggest challenges at the undergraduate level (Lattuca, 2001; Rhoten, Boix-Mansilla, Chun, & Klein, 2006).

Part of the difficulty in assessing interdisciplinary learning is because the concept itself remains vague. Stated definitions vary and characterize a broad range of learning practices. Considering the variety of definitions of interdisciplinary learning, Boix-Mansilla and Duraising (2007, p. 218) note “the lack of clarity in the literature about how to define substantive indicators of quality interdisciplinary work is not surprising.” The multiple possibilities and fluid nature of interdisciplinary work can result in “moving targets” that become difficult to assess (Lattuca et al., 2004). In this article, we adopt Veronica Boix-Mansilla’s (2005) definition of interdisciplinary understanding as “the capacity to integrate knowledge and modes of thinking drawn from two or more disciplines to produce a cognitive advancement . . . in ways that would have been unlikely through single disciplinary meaning” (p. 16). Judging the merit of interdisciplinary student work, however, remains difficult and requires a dynamic framework (Boix-Mansilla & Duraising, 2007).

Previous assessment strategies are not well suited to measure the complexity, ambiguity, and multiplicity of skills involved in the creation of new meaning and solutions through integrative learning (Rhoten et al., 2006). Boix-Mansilla and Gardner (2003) suggest that, at best, traditional assessment approaches (e.g., grades, surveys, standardized tests) serve only as proxy criteria that fail to align with interdisciplinary learning measures. Similarly, the engineering curriculum committee for the Agricultural and Biosystems Engineering department at Iowa State University found that assessing the multiplicity of student learning outcomes in the agricultural engineering degree program presented a new challenge for which traditional approaches were insufficient.

Framework/Protocol

Boix-Mansilla (2005) suggests using these three dimensions as the foundation for assessing interdisciplinary work:

1. *Disciplinary grounding*: Has the student demonstrated mastery of the disciplinary content base? Does the student understand the methods used in the discipline? Does the student understand the mechanisms used to communicate understanding in the discipline?
2. *Integrative leverage*: Can the student integrate disciplinary perspectives to generate new understanding? Does the student offer a more comprehensive explanation by integrating knowledge? Is there new understanding generated that would not be possible using a single discipline? Does the piece use

integrative devices such as graphic representations, models, or complex explanations?

3. *Critical stance:* Does the student use integration to strengthen the piece and support the purpose of the work? Does the student understand the limitations of the work? Does the integration withstand critique?

Boix-Mansilla also argues that in order to assess students' ability to integrate material, their thinking must be "made visible" through "performances"—students must be asked to use what they know before assessment can take place. Within this context, the Agricultural and Biosystems Engineering department curriculum committee decided to use the collaborative protocol developed by Boix-Mansilla to assess students' integration of knowledge through a close analysis of student work in departmental courses. The collaborative assessment protocol (see Table 2) identifies the steps the curriculum committee followed to examine the three dimensions of interdisciplinarity. The version of the protocol used by the curriculum committee is an adaptation of the protocol used in the Washington Center's National Project on Assessing Learning in Learning Communities. Our adaptations reflect an effort to align the assessment protocol with the curriculum committee goals, which from the beginning included developing a strategy for examining students' interdisciplinary understanding across a curriculum and also finding ways to ensure that assessment efforts support program improvements.

Table 2. *Collaborative Assessment Protocol for Student Work*

The purpose of this protocol (which was developed by Veronica Boix-Mansilla, March 2006, and adapted for National Project on Assessing Learning in Learning Communities) is to provide opportunities for teachers to discuss pieces of students' work and notice integration and opportunities for growth. The protocol can be used to assess and support students, to advance professional development, and to reflect about assignment design.

I. Getting Acquainted—General Assessment

1. Introducing the work: Presenting teacher shares minimal information about the work, avoiding value description. Teacher should:
 - State the course and the level, whether it is initial or advanced
 - Provide copy of syllabus
 - Describe the assignment, sharing relevant and intended learning outcomes
 - Provide copy of assignment instructions and explain how assignment fits into the overall curriculum

2. Looking at the work: In silence, individuals read or observe the work brought in.
- II. Zooming In—Targeting Assessment of Understanding
1. Revealing disciplinary grounding (learning outcomes): Group members describe what they view as the disciplinary insights or modes of thinking or the ability areas that seem to be informing this work, pointing to the evidence in the work that makes them say so.
 - What evidence suggests achievement of intended learning outcomes?
 - What suggestions might we offer to this student to deepen learning?
 2. Revealing integrations: Group members describe what they view as overarching integrations of perspectives attempted by the student, pointing to the evidence in the work that makes them say so. How is the student bringing things from different classes together—for instance, is the student offering a complex explanation, an aesthetic synthesis, a contextualization, a pragmatic solution, or some other product based on integration?
 - What evidence suggests learning achieved in previous courses?
 - What would happen to students' understanding if key information from another course was not included?
 - What suggestions might we offer to this student to deepen or develop the work?
- III. Stepping Back
1. Hearing from the presenting teacher: After listening without intervening, the presenting faculty adds her or his perspective on the general and targeted assessment comments.
 - What might you do differently in terms of this assignment?
 - What was effective?
 - What changes (assignment, course, curriculum) would you recommend?
 2. Implications for teaching: By examining students' work in this way, what have you learned about designing assignments that support student learning outcomes? What are the curricular implications?
 - What items represent best practices for other assignments?
 - What are the implications (e.g., curriculum, advising)?

In order for its degree program to be accredited, the Agricultural and Biosystems Engineering department must demonstrate that its graduates have achieved the ABET learning outcomes. The overall program assessment plan calls for each department to identify key assignments, which students include in a portfolio. The department uses the portfolio as one of several direct measures of student performance. With the parallel difficulties of assessing a multiplicity of student learning outcomes and using that assessment process to improve curriculum and instruction in mind, the department curriculum committee—which included several faculty, an undergraduate, and a staff member in the department—decided

to use the collaborative assessment protocol to review key assignments. Instructors were invited to bring student work from key assignments, but their selection of work to share was not necessarily made with reference to the overall ABET learning outcomes.

In the following section, we will discuss the process and the results of reviewing student work from four departmental courses in the agricultural engineering curriculum, our initial efforts in using the protocol. These courses included: Engineering Problems with Computer Applications, Computer Applications and Systems Modeling, Agri-Industrial Applications of Electric Power and Electronics, and Engineering Graphics and Introductory Design.

Disciplinary Grounding

The curriculum committee first reviewed a sample of student work from a shared comprehensive exam for a 100-level course Engineering Problems with Computer Applications Laboratory. This three-credit course, focused on solving engineering problems and presenting solutions through technical reports, requires students to create computer programs to solve problems.

The team quickly discovered that interesting things happen when conversations about student learning shift away from a focus on assigning grades or looking for correct responses toward a focus on the evidence of learning present in student work. In particular, the curriculum committee used the collaborative assessment protocol to consider the degree to which selected student work demonstrated an understanding of content and methods within the discipline. For example, on one problem students are asked to provide a free body diagram (a graphic representation of a structural element subjected to various forces) to demonstrate their understanding of the problem. This step requires the students to demonstrate how different disciplines inform their understanding of the problem. The faculty could look at the diagram and determine the degree to which the student had demonstrated understanding of how several disciplines (e.g., geometry, statics, and physics) applied to the example. The inclusion of the schematic not only allowed students to demonstrate their ability to present a solution to a problem, but it also made the students' thinking visible in a way that allowed faculty to explore students' understanding of multiple facets presented in the problem. In this case, the curriculum committee could see evidence that the students demonstrated learning from multiple disciplines rather than simply seeing if the final calculation matched an answer key.

In reviewing another problem from the course final exam, the curriculum committee determined that students struggle with understanding units of measurement. The discussion moved beyond a simple notation of whether students have the correct answer to a review of curricular areas where they might gain exposure to these key understandings. The faculty began to ask questions like, “If students learn about units in chemistry, are they able to apply that understanding to different contexts?” or “If students are asked to solve a problem in its entirety instead of in smaller parts, do they learn key concepts such as units of measurement more effectively?” By reviewing examples of student work, the curriculum committee was able to focus on a specific disciplinary skill (understanding units of measurement), but then expand the conversation to consider ways to support student learning. Notice that the conversation did not focus on the quality of the exam question or the preparation of the student. Instead, the group acknowledged that they saw evidence of a lack of understanding in the student work; they confirmed that they had also noticed this lack of understanding in their classes, and they began to ask important questions about ways to enhance understanding.

The conversations helped to clearly define the important disciplinary content, methods, and types of communication we expected students to demonstrate. One faculty member who used the protocol process outside of this curriculum committee noted, “Until this process, I didn’t stop to think about what things I wanted students to be able to do and demonstrate in my assignment.” The refined protocol process we used asks the presenting faculty member to clearly articulate the expected learning outcomes from the course syllabus and to briefly explain how the assignment aligns with the core curriculum in the department. Our experience suggests that when we develop an intentional focus on discovering evidence of these key student learning outcomes, we come to a better understanding of the core disciplinary skills we hope students achieve.

During the review of student work, faculty began to wonder about ways to design assessment activities that would clarify for them whether students achieved the key learning outcomes in the course. For example, instead of simply determining whether the programming language developed by the students demonstrated proficiency in writing computer code, could the faculty develop components of an assignment that would make the students’ thought processes more clear? One strategy the curriculum committee discussed was the incorporation of flow charts that would help students illustrate their thought processes and problem-solving strategies as they developed their programming. Through this conversation, faculty began to wonder whether the key disciplinary content focus should

be on students' ability to write programming codes that solve a problem or whether the key focus should be on the overarching logic that provides a framework for how to solve the problem. While students ultimately need to combine these two skills, the inability of the faculty to see students' understanding of the overarching logic presents two problems. First, it is not clear to the faculty if the students have an underlying understanding about how to address the problem. Second, if the task does not ask about the underlying logic, it may provide an implicit message that the key learning outcome is simply developing the right code or series of programming commands rather than developing critical thinking skills in addition to developing the appropriate code or command sequence.

The curriculum committee also reviewed a 200-level course Computer Applications and Systems Modeling. One of the important learning outcomes for this course is students' ability to apply their knowledge of mathematics, including their understanding of differential equations. After the committee reviewed the assignment, the group noted that the assignment did not include opportunities for students to make their understanding of differential equations visible. The group then talked about the importance of this skill in order for students to fully understand solutions, while noting that the differential equation course is not a prerequisite for the course. Noticing that students' understanding of a key concept (differential equations) was not visible in the assignment eventually turned into a discussion about course sequencing; faculty began wondering whether it was important for students to have this key understanding before taking the course. By reviewing the sample of student work and recognizing the ways in which the assignment limited students' ability to demonstrate their understanding of numerical techniques and mathematical models, the team understood that not only is this key learning outcome missing from the assignment, but also that the outcome might not be fully integrated into the course. Faculty noted that students could arrive at the correct answer by supplying the necessary programming code without necessarily understanding the mathematical concepts. An important outcome of using the collaborative assessment was a curricular change: The course was moved to the junior (300) level so that students had the necessary prerequisites to help them achieve the course learning outcomes.

Integrative Leverage

The curriculum committee considered the second dimension, integrative leveraging, by using the protocol process to explore ways that

student work demonstrated students' ability to integrate knowledge across disciplines. This review considers questions such as:

- What evidence suggests learning was achieved in previous courses?
- What would happen to students' understanding if key information from another course was not included?
- What suggestions might we offer to this student to deepen or develop the work?

Clearly it is difficult to consider the first foundation of interdisciplinary work (disciplinary grounding) without also noticing the ways that students integrate disciplinary perspectives. For example, in the first example the committee considered how the student work integrated chemistry, physics, and statics to answer problems. Here, we offer another example of student work from a key assignment to consider student integration in more detail.

The committee reviewed student work examples from a 300-level course Agri-Industrial Applications of Electric Power and Electronics. In this course, students are given a ground fault interrupter (GFI) laboratory assignment. The committee reviewed responses to the assignment, looking for evidence of students' ability to apply knowledge of mathematics, science, and engineering; analyze and interpret data; communicate effectively; and solve problems.

During the review, the committee discussed the importance of finding ways to make integrative thinking observable in student learning assignments. In this laboratory assignment, students analyzed the functioning of a ground fault interrupter, a lifesaving device many of us rely on when plugging in an electrical appliance in wet conditions like a bathroom or kitchen. The student response to the laboratory problem included the creation of multiple ways of communicating technical information, such as visual representations of the laboratory circuit that the student constructed, and numerical data. The review committee noted how the visual diagrams and graphs helped students demonstrate their ability to analyze data and effectively communicate information.

The committee found the focusing question regarding "what suggestions might we offer to this student to deepen or develop the work?" to be extremely valuable. For example, in one case the group recommended that the student review how the individual pieces of communication might be better integrated to address the problem. The group noted that the student reported data using a measurement of time; however, a diagram of the laboratory circuit did not include any equipment that could measure

time. In this case, it was not clear if the student understood the purpose of the task, was uncertain about the necessary equipment to solve the problem, or simply forgot to include the equipment in the experiment design sketch. However, the committee noted a lack of clarity in the student's communication about the purpose of the experiment and use of equipment. The invited representation of the student's thinking created an opportunity for faculty to challenge the student to think more deeply about how all the pieces of his or her response could be integrated to clearly present a solution to the problem.

The committee also noted the importance of open-ended questions in the lab assignment. For example, the last question of the assignment asked students two items: "Did the GFI exhibit adequate performance for personal protection?" and "Draw a conclusion and then explain how you were able to come to that conclusion." We noted that this type of open-ended question is critical to a laboratory assignment where students may stop short of the key learning outcomes. Rather than focusing on the experimental design and the reporting of data, the key task for the assignment rests on students' ability to analyze and apply the information in a meaningful and accurate manner. The group noticed the need to encourage students to provide detailed responses to this question—to explain their solution, communicate knowledge, and demonstrate integration.

As we discussed ways of encouraging more thoughtful responses to open-ended questions, the committee thought about strategies for sequencing assignments that would help students understand the expectations for integrative learning. For example, our review team recommended that after an assignment, the class could have a discussion of a key question (like one of the questions noted above), including a review of samples of previous student work to engage students in discovering what was done well and what could be improved in the work. We highlight here that a student served as a member of the department curriculum committee. The student noted several times that similar discussions of student learning and the quality of student work would be extremely helpful in giving students information about expected learning outcomes and ways to demonstrate understanding in assignments. Another possible strategy we discussed would be the development of a common rubric that students could use to self-reflect and to critique drafts of peer projects. The committee wondered if a rubric on the design process would help students develop deeper thinking in areas such as the analysis of alternative designs. In short, the committee realized that if we expect students to demonstrate integration then we need to find ways to make it clear to students what we mean by integration and what constitutes high quality student work.

Critical Stance

The curriculum committee considered the last dimension, critical stance, by exploring ways that integrating disciplines strengthened student work and also by critiquing the integration in students' work. Although the protocol process does not specifically highlight this step, we found that the "Stepping Back" section of the protocol allowed the committee to examine critical stance in detail.

The curriculum committee reviewed a key assignment from a 100-level engineering course, *Engineering Graphics and Introductory Design*. The course includes graphics, computer modeling, design, and geometry. In the course, students learn to apply the engineering design process while developing communication skills. The sample of student work reviewed by the curriculum committee was a team design project that presented multiple designs for a machine built to perform specific tasks. The paper also included an analysis of the design and alternative solutions to the design problem.

The review team noted that the student work provided evidence of students' ability to integrate multiple disciplines. Initially the group recognized aspects of quality in the students' responses that enhanced the effectiveness of the student work. For example, the presence of figures with captions demonstrated strong communication skills. Students' use of language, citations, and transition sentences demonstrated high-quality writing. With time, the group considered more substantive questions about the quality of integration as evidence of student learning. For example, the committee noted that the students' use of the same baseline body for their machine while exploring alternative designs was an efficient use of time and resources and demonstrated a clear understanding of engineering design. Similarly, the students presented information about the costs and benefits of alternative designs in both the written text and through the display of data in graphs. In this way, students demonstrated an understanding of engineering trade-offs and the various constraints that impact the engineering design process. The review team also noted that the design matrix students included, ranking each design alternative on specific criteria, demonstrated their ability to integrate math and technical content with their design decisions.

Faculty commented that these integration and analysis skills are not always evident in the student work they see in subsequent design projects in the senior capstone course. Some faculty noted that senior students sometimes "short cut" the design process because they enter

the problem “knowing” a solution and then they simply plow ahead with an assumed best solution. Faculty commented that when students try to find the one best solution at the start, they are less likely to fully analyze their solutions. When the capstone projects fail to demonstrate analysis of alternative design solutions, faculty wonder if students still understand the multiple factors that influence design; they also wonder about the learning experiences students have between this first-year design course and the senior capstone which might contribute to an apparent decrease in the ability to effectively use the engineering design process.

Implications for Designing Learning Experiences

1. Align assignments with key learning outcomes. Clearly articulate the expected learning outcomes for the course and examine how key learning assignments align with expected course outcomes. Because the key assignments were selected by instructors, the curriculum committee could offer suggestions for strategies to increase alignment and to ensure focus on key departmental learning outcomes.

2. Invite students to make their integrative thinking visible in assignments. Find ways to make student thinking observable in student learning assignments. Specifically, find ways to make students’ integrative thinking visible. Design specific questions that support students’ ability to demonstrate key learning outcomes.

3. Clarify expectations. Design strategies that help students understand expectations for integrative learning.

4. Support deep learning by using collaborative conversations about students’ work to identify important pedagogical questions. Identify ways to scaffold student learning to encourage deeper understanding. The review group considered questions like: “How do we encourage students to offer detailed responses when asked to ‘explain your answer’?” “Should we actively encourage students to incorporate other disciplines or skills (e.g., drawing a sketch of a design) or should this be left to the students’ judgment?” “How do we best support student learning without being prescriptive?” “Should early assignments contain cues or an outline that helps students address complex and open-ended problems?” “How do we support creativity and limit the temptation to find the ‘one right answer’?”

5. Consider student learning across the curriculum and over time. A review of student learning from courses across the curriculum allows faculty to engage in conversations about developing comprehensive learning experiences that cross the curriculum. Our faculty team came up

with questions about course sequencing, noticed gaps in key integrative learning outcomes, and considered new ways of designing learning experiences across courses. For example, the team wondered about the possibility of “spiraling” the curriculum so that students would learn key skills in early courses (like analysis of design solutions) and then be asked to apply those skills in more advanced levels in similar assignments in subsequent courses. Another strategy we considered was working on being more intentional about sequencing assignments across courses to build on previous projects. For example, if the key learning outcome of a course is analysis and critical reflection, rather than invest additional time in the development of a new design, could students use a design from a previous course and work with it on a deeper level?

6. Redesign learning experiences based on engaging in the protocol process. We found that our thinking about assessment took a different direction when we were not focused on assigning a grade to an individual. Our use of the protocol—of looking at student work for evidence of learning—enabled a faculty team to ask questions such as: “What evidence do you see that reflects achievement of intended learning outcomes?” and “What suggestions would you offer this student to deepen or develop his or her understanding?” The shift in focus here is clear. Instead of determining whether an answer was correct, we engaged in a discussion of student learning and of ways to better support that learning. Often the answers to the question regarding suggestions we might make to the student to deepen his or her understanding pointed to ways that we as faculty could redesign learning opportunities to be more helpful.

Although our title focuses on assessment and curriculum development, this should not obscure the fact that our use of the collaborative assessment protocol ultimately focused on finding ways to improve student learning. Through this project, we experienced a version of an effective approach to assessment that can guide a continuous curricular improvement process with improved student learning at its heart. Helping students achieve critical learning outcomes requires that curriculum, instruction, and assessment align. This case study provides examples of how the use of the collaborative assessment protocol can assist with this alignment process. The Agricultural and Biosystems Engineering curriculum committee’s use of this process is radically changing—for the better—its conversations about instruction, curriculum development, and assessment. We encourage others to consider using this protocol as a way to intentionally concentrate on examples of integrative student work.

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Beyond “Parallel Play”: Creating a Realistic Model of Integrative Learning with Community College Freshmen

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Thematically-linked courses do not necessarily result in the kind of integrative learning associated with learning communities. This article explores the untapped interdisciplinarity potential in developmental learning communities when assignments are designed with intentional integrative learning in mind.

At a learning communities meeting where faculty were sharing examples of interdisciplinary integration from the paired courses *Critical Thinking* and *Introduction to Algebra*, a faculty member asked, “But is this really integration? Shouldn’t the students know this already?” The assignment she was questioning had asked students to keep track of how much electricity they had consumed and how much they had saved over a brief period of time as well as evaluate the possible social effects of their electricity use. In her critique of this student’s work, that faculty member frames the question at the center of this article: What might interdisciplinary integration actually look like at the early stages of a community college career when students are still in developmental courses?

A decade ago, Vincent Tinto (1998, p. 175) qualified his own earlier research where he had suggested that academic integration did not matter for retention in two-year colleges, admitting that it was “merely another way of saying that those classrooms were not involving and did not promote academic integration.” He noted that his co-authors had not said that learning communities for developmental students “could *not* be used to promote integration,” suggesting that the intervening period had produced examples of integration in learning communities at those colleges. Tinto

acknowledged that, “We would have understood this relationship if we were more conscious of existing practice and the ways in which our research is a reflection of existing practice. Unfortunately, too much of our research has been blind to practice and its recent innovations” (p. 175).

For several decades LaGuardia, CUNY, a diverse urban community college in western Queens, New York City, has offered learning communities involving a cohort of students and faculty who work together. Our institution believes in their value as do many other institutions nationally. The question is, to what extent is this faith justified? For the last two years, our college’s Learning Communities Assessment Team, led by Professor Phyllis van Slyck, has participated in the National Project on Assessing Learning in Learning Communities, led by the Washington Center, in which we have been designing integrative assignments and then following up by examining student work. As we worked together at LaGuardia and at the Seattle meetings, our perception of what we do in learning communities at LaGuardia, as well as what we might do, evolved. Van Slyck, a nationally recognized expert on learning communities, remarked at the start of this project that over time at LaGuardia we had gotten quite good at “parallel play,” that is, working collegially with faculty from various disciplines linking our courses thematically and in practice (2003, 2006). While there were shared themes and some consultation back and forth, ultimately the classrooms and contents remained distinct, similar to the ways they were taught outside the learning community. There was much that benefited students psychologically and even intellectually, in that they enjoyed special events and attention, but little that was pedagogically unique about the process.¹ We were unsure whether we were achieving true “integration,” what Tinto had described as the “shared knowledge” of a discipline as well as the “shared knowing” with other students in the community (1998).

We also had a sense that there were untapped interdisciplinary potentials in our developmental learning communities, but inevitably our focus in those communities was the completion of the syllabus content and student survival/retention at the college. We had multiple desired ends for our students in those initial learning communities: We wanted them to pass high-stakes exams, to help each other navigate the bureaucracy and isolation of the first year of a commuter college, to get special attention from their professors when needed, and to generally have a stronger more relevant learning experience and thus do better than the average entering student. From various indicators, particularly student retention, it appeared our learning communities succeeded. Students in learning communities at LaGuardia are retained at a rate of 75.7% versus 70% for non-learning

community students.² Yet how much of this—if any—had to do with experiences of interdisciplinarity or integrated learning?

Why is interdisciplinary learning such an issue for us in the first place? Team discussions reaffirmed that we certainly live in an interdisciplinary world. Media and the Internet press us with material on every possible subject simultaneously: global warming, the mistreatment of animals, elections, gossip, new art forms. An artist may need to understand evolutionary biology or computer programming if she or he is to raise consciousness on climate change or create visuals for tomorrow's games; a metallurgist, physicist, or doctor may now get more training in aesthetics or ethics than earlier generations ever assumed they needed, while the study of literature reveals lessons for law. The rise of multiple "studies" majors over the last 20 years recognizes that students today are expected to not only have particular knowledge of various subjects, but to operate on the liminal border areas of multiple disciplines and new disciplines. Students today will be expected to be specialists early on as well as generalists later. They will likely have multiple careers and each job they take may transform while they work at it. A literate bilingualism will be neither debility nor luxury, but most likely a necessity in many global industries. Persons entering the workforce will need to demonstrate facility with both technology and with ideas, applying concepts to new and unpredictable situations. Furthermore, it appears that workers will need to know how to work together and apply the knowledge of experts to solve the many global problems from which Americans are no longer insulated. How can community colleges and their faculty approach these challenges?

As basic skills faculty, we believe that interdisciplinary learning is one way to adapt the traditional issues and methods of the disciplines to a new world. No doubt the traditional liberal arts education pursued a similar end, albeit in a different manner. Today's workers and citizens need to think on multiple levels starting out; community college students have less time to assimilate ideas gradually and associate them fortuitously at a later date. In our first-year and developmental learning communities, we are doing no less than trying to stimulate students to search for connections across disciplines as a habit of mind rather than as a happy accident. Students sometimes prefer the security of isolated disciplines. For example, if a student does not enjoy math and prefers history, or vice versa, it is easy to take the minimal course requirements and never learn anything more about a subject that he or she "is not good at." The interdisciplinary learning community, instead, encourages phobic students to approach one subject through another.³

A core practice for our team was using the collaborative assessment protocol designed by Boix-Mansilla (2005) and adapted for use in the national project. Based on research by Boix-Mansilla, the protocol invites readers to notice four dimensions of interdisciplinarity: purposefulness, disciplinary grounding, interdisciplinary leveraging, and reflective thoughtfulness. In interdisciplinary learning, we want students to recognize structural similarities between different ideas in varied disciplines and also to apply them directly to practical problems generated by today's world. The collaborative assessment protocol and Washington Center's heuristic for designing integrative assignments (Lardner & Malnarich, 2008) both assume that consideration of a social issue grounds the interdisciplinary project so as to serve as a central problematic which the learning community explores and attempts to answer together.

The need for these interdisciplinary realities still exists, even at the level of students entering college through basic skills courses, especially when the focus is on acquiring literacy and basic math skills. At LaGuardia, two thirds of the students are English language learners, and too many come from local high schools where 50% or fewer students are college bound when they graduate. Those students who make it to us face any number of obstacles. Once in our doors, they cannot rely on attaining a degree; they need the courses they take to matter as well.⁴ Most of them will have to complete at least one developmental course, and unless they pass university-mandated exams, they will not move into college-level courses. In our system, students need to learn to pass high-stakes reading exams where they face random unrelated materials that they need to assimilate quickly and writing exams where they are asked to write about an artificial and often unfamiliar situation in 60 minutes.

Studies have shown that thematically linked content in reading classes helps readers to acquire the vocabulary and background knowledge they need to increase their skills rapidly; basic writers improve more quickly when they are invited to respond to readings on compelling subjects. In acquiring literacy skills that will prepare them for college and later, students profit from reading, writing, and thinking critically and metacognitively on serious subjects that are linked thematically. A situation—as in a learning community—where a group of students takes all their courses together guarantees a shared conceptual vocabulary as well as the social bonds that reduce first-year anxiety at a large commuter institution. LaGuardia's learning communities are intended to draw on these two features—relevant, thematic links and a clear social cohort—and to help students grasp these links directly, draw conceptual parallels, and begin to operate with real facility in a borderless universe of contiguous ideas.

In our attempt to “do” integration, we encountered two major problems. First, our faculty were not in agreement about the meaning of integration; and second, our students often could not grasp the disciplinary grounding of the subjects that faculty were integrating. We sought first to rectify the issue with our faculty. We brought back from our meetings in Seattle a variety of different techniques to use in a yearlong *Focus on Learning Communities* faculty seminar. However, our strategies had varying degrees of success. Faculty frequently reported that they were most comfortable in isolated disciplines—just like our students! The real challenge in helping faculty move toward intentionally integrated assignments is the fact that we were all responsible for basic skills components. Even in a class that is nominally a “content area,” such as Introduction to Computers or Introduction to Business, faculty teaching in first-year experience learning communities always have to work with students who are not college ready.

In a Basic Writing class clustered with Internet Research Skills, Introduction to Computers, and a New Student Seminar, students struggled with integrating the skills needed to write a college-level research paper. In a reflection on this cluster, one student wrote:

According to the courses that I took, I found all of them very important to my life and to my future life. I will be able to use all the skill [sic] that I learned in the class, especially for the computer class. Because all the courses that I will take will need a computer skill.

Thus, though this student is attempting reflection, he is not able to speak to the specific integration of skills that instructors might hope to see. Another student had a similar experience. In this sample of her research paper, she fails to integrate the skills she learned in the various cluster classes:

Here's a security option that you can use for your young siblings and or [sic] children. You can set boundaries on the pc [sic] so the child can enjoy a safer experience on the PC. You could better secure your pc [sic] with many other security options.

Again, this student was unable to synthesize the material in a way that created an effective integration. While occasionally students in these first-year developmental classes were able to synthesize their classes, more often the above example exemplified the work they were doing. In terms of their own work, students appeared to have no clear idea of what integration would look like. Moreover, students often would not report seeing any points of integration in their classes beyond recognizing that

sometimes their teachers talked to each other or that the teacher in one class seemed to know what was going on in students' other classes.

Thus, we reevaluated what integrated learning could or should look like at our college. We are not asking our developmental students, who are ostensibly first-year and sophomore students, to integrate materials in the same way that we might ask graduate students to integrate their ideas. Integrative learning in a two-year college must take into account the developmental level of our students—what the majority of our students are ready to do. Integrative learning need not be elaborate or in-depth, but it should begin a real process of disciplinary connection for students. It might be something as simple as a student using the skills they learn in an Internet Research Skills class to write a paper for Introduction to Computers while simultaneously using what they have learned in a basic writing and rhetoric course to do something as complex as analyzing characters in Greek Drama using the tools they learned in an Introduction to Psychology course. However, at its most basic level, we want our students to begin to understand a process of making connections and relations between very different ideas. As instructors, we think we can help by making the potential opportunities for integration more explicit. For our beginning students, we may begin by working with connections that can help students feel comfortable, increase basic comprehension, and then later work on connecting ideas in new ways.

This line of thinking led our group to questions about how much “pre-integrating” we should do; for instance, should we ask leading questions in assignments to make it clear we are inviting students to make connections? Though this remains a topic of debate in our group, still, at the crux of developing integrative assignments is making sure that the faculty who are working within a learning community are clear on how and what they want to integrate across courses from the start. Returning to the question we cited at the opening of this paper about what interdisciplinary integration looks like in the context of basic skills courses, we offer the following example of an interdisciplinary learning community project and ask readers to judge for themselves: Is meaningful integrated learning taking place here? The example comes from a math course and a critical thinking course that were paired as part of the pilot for Project Quantum Leap, which uses the Science Education for New Civic Engagements (SENCER) model. SENCER hopes that by making math relevant to students' lives, students will be more successful in practice. Introduction to Algebra, the math class in this pair, has a set syllabus with an exit exam; the other course, Critical Thinking, only has a core syllabus and a required textbook. The students enrolled in this pair of courses have usually had a

difficult time with math. Some may be repeating the course for the second or third time. They typically do not see the point of knowing math beyond the fact that they need it to pass the university high-stakes exam.

Since these pre-existing restrictions do not allow faculty to build a new paired course entirely from scratch, they instead created three common assignments for the semester exploring the environment through mathematics. The first assignment is about the environmental footprint that students leave via their electrical consumption. This assignment was staged in three parts: a project that involved data collection, an application/integration section, and finally, a reflection on what was learned and what the personal and social value was.

Part One: Data Collection

For this part of the assignment, students have to choose three appliances, record their daily use of them, calculate their energy consumption for a week, and then reduce the amount of time they spend using the appliances. The common assignment shared for the two classes is an essay in which students discuss how their energy consumption impacts the environment and how changing their habits has affected their lifestyle.

The first time we taught the class, we noticed that because the calculations were not very accurate, the analyses were not very accurate either, so we added activities to familiarize students with how to do the calculations and with the issue of the environment to give them a broader context. Students watched *An Inconvenient Truth: A Global Warning* (Guggenheim, 2006), calculated their footprint using a Web site, and engaged in a discussion about our impact on the environment. Then, as they collected data, they practiced doing calculations with “fake” data. The goal of the project was to not only to raise students’ awareness regarding their energy consumption but also to get them to use the data they collected as evidence in their essays.

Part Two: The Application of Ideas and Integration

The essays showed the students generally had no problem collecting the data, but even with the extra practice in calculation, they still had difficulty with quantitative literacy. Some did not fully understand the meaning of the numbers; others did not use data at all; still others had trouble writing about the data they had collected in a way that made sense to a reader. For example:

I did my experience [sic] with all three appliances which I used the most like the TV, the Computer [sic] and the living room light bulb [sic]. All together per day that became in current electricity consumption of 2.145 and reduced rang up to 0.99 which made a difference of 1.155. After getting to this point of my experiment I calculated how much electricity I could be able to save in 1 year, which gave me a total of 421.575. Having known that the average retail cost of electricity per kilowatt-hour in New York State is \$0.1619, I calculated how many dollars I was able to save, which gave me \$0.202.

This essay shows the incorporation of data in the analysis, but the units are not specified: 421.575 of what? Also, the student does not tell us that the amount of energy saved is per day. In spite of these technical flaws, the essay has an interesting conclusion:

In conclusion I find that if people were to reduce their energy consumption not only with that benefit our environment but also can benefit them as well [sic]. As it turns out, the more time we get away from our computers and TVs the more time we can spend on self improvements [sic]. Our environment is suffering due to our laziness and availability of quick information and simplification of life.

In the following example, the student showed an understanding of the issue, but did not use data to support the claim, thus the integration was not as complete as it could have been:

I think that money and energy are crucial points. In my data collection I realized that I reduced my time in half on each appliance. This also reduced the money in half, the exact time saved. To many people this may be beneficial because you are reducing your costs and helping the environment. To others however they may rely on the use of things such as a computer so much that the price will not encourage them to use it less. So depending on a persons [sic] view and on the time frame that they have available I believe that the choice is theirs.

This essay concluded by stating that everybody has a choice when it comes to making an effort for the environment. While this student understood the role that everybody plays, there is no integration of the math concepts, and consequently, the essay is very general.

These two examples show that the students can think critically about the issue, but we only see limited attempts to use their calculations as evidence to support their arguments. However, even with imprecise data, the reflection papers did show an increase in the understanding of their impact on the planet. Some were shocked at how much time they used certain appliances, others reflected on what they did with their time if they were not using their computers.

Here is probably the kind of essay we were looking for and the best example of integration:

To be honest, the Math part of the project held little significance to me. I know it means a lot in the world we live in and such, but it just didn't grab my attention. I do know without it, I wouldn't be able to know how much time I actually spent doing things regularly, or when they were reduced. So, I'm not saying Math didn't play a role, I just didn't care for it. I could "physically & personally" feel the differences, I don't need numbers to tell me that. On the money standpoint, Math held more weight, on displaying how much money was saved. I'm always back and forth with Math and how it relates to me. It's kind of like a love/hate relationship and I'm sure my reflection on Math is coming across like that. Nevertheless, I was able to save money by reducing my usages. After I reduced everything, I was able to save \$56.84! That's a lot of money, maybe math does hold significance!

This example shows the student's ability to think critically about the environment and the use of math. There is both an integration of data to understand energy consumption and also a reflection on the change in the student's mind regarding math.

Part Three: Reflection on What is Learned

Some may wonder whether this is the kind of integration we should aim for, or whether it is so basic that the students should be able to do work like this before taking our classes. Judging by the results of our projects, our students do find it difficult to integrate data into their reasoning as a way to provide evidence for their argumentation and sharpen their critical thinking skills. At the end of the semester, when students were asked how critical thinking and math contributed to their understanding of the theme (environment), for the most part they found that they understood that saving energy was necessary for the environment and also might save them money:

I also stopped looking at math as just numbers. I think that if these paired classes were offered to me in high school maybe I would not have had such a hard time passing math because it would help me to better understand math and how it applies to my life experiences.

... two weeks into the class I was see [sic] a changing in the way I was thinking about math, I still hated math but being able to use a method to try understand [sic] the course was so much easier.

With respect to integrating the environment theme into two courses, we can say our pair is successful, especially in Critical Thinking where

the students are able to use what they learned in that course and apply it to their thinking about the environment—they began to see how mathematical data can impact decision making and the shape of daily life as well as our future.

We still need to help students increase their ability to use math outside of the math class and feel comfortable enough with numbers to use them the same way they use any type of evidence in any project. Judging from this example, what does integration look like at the level of developmental education at a community college?

We would like to suggest a few considerations in thinking about integration at this level. Students completing the course should understand the boundaries of a discipline and the fact that the boundaries are sometimes not as solid as they appeared previously. This is a first step to valuing interdisciplinary learning and reaping its special benefits. Whether these students created masterful integrated projects was not the point; in fact, the faculty were not entirely sure they had created masterful assignments themselves. The fact was that the students were not able to make these connections at the start and needed to be directed in their reflection to rethink the connections and their relevance to their own learning. In more than a few cases, they did. As we develop our facility with designing integrative assignments, we need to take a parallel step as well, which is that of creating a realistic assessment model for looking at student work, one that recognizes that integration will occur in multiple stages and at multiple levels. In this way, we can keep the conversation about integrative learning tied to and reflective of the inclusive mission of the community college.

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Exploring Voice as Integration: A Direction for Assessing Student Work in Learning Communities with Composition

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Learning communities have been one response to the call for integrative learning in higher education. This paper investigates the assessment of integrative learning in learning communities where a composition course is linked to a general education course and explores the role of voice in students' writing as evidence of integration. We begin by discussing approaches to the teaching of composition, suggesting a theoretically integrative approach, and then turn to the concept of voice, including the ways in which it can be developed in a learning community. We end by discussing possible directions for examining voice in student work that may serve as evidence of integrative learning.

In higher education, there has been a renewed interest in integrative learning. Interpretations and applications of this phenomenon are diverse and complex. In fact, Mary Taylor Huber and Pat Hutchings (2004) characterize integrative learning as coming "in many varieties: connecting skills and knowledge from multiple sources and experiences; applying theory to practice in various settings; utilizing diverse and even contradictory points of view; and, understanding issues and positions contextually" (p.13). The importance of integrative learning as dynamic knowledge practice has been attributed to the vast amounts of information available in our world, the demands of technology and globalization, and the rising need for flexibility and mobility in the workplace (Gardner, 2007; Huber & Hutchings, 2004).

Learning communities have been a primary site for responding to this growing national call. By linking courses in different disciplines,

learning communities potentially afford students integrative learning opportunities as they approach issues from interdisciplinary perspectives. Recent work in developing methods for assessing interdisciplinary learning (Boix-Mansilla, Duraisingh, Wolfe, & Haynes, 2007) looks for evidence that student work is not only grounded in each of the contributing disciplines, but also demonstrates synthesis, e.g., as a learner considers issues and questions and engages in problem solving or “takes information from disparate sources, understands and evaluates that information objectively, and puts it together in ways that make sense” (Gardner, 2007). While this emerging field of assessment-based research on integrative and interdisciplinary learning has been a fruitful area of study, the protocols used to examine student work did not emerge from studies of students’ work in community college classrooms, and particularly not from learning communities that include composition courses. For us, a central question growing out of the Washington Center’s National Project on Assessing Learning in Learning Communities is what disciplinary grounding in composition looks like, particularly (though not exclusively) in community college learning communities. How do our expectations for student work produced in a learning community that links composition with psychology differ from what we would expect in student work produced in a stand-alone psychology course?

As professors of English composition in a community college interested in interdisciplinary assessment, we wish to explore, in the pages that follow, the question of what counts as evidence of integration in student work produced for learning communities that include a composition class. In particular, we want to pursue the question of what evidence of disciplinary grounding in composition looks like in a piece of student work. To address this foundational question concerning the focus, the logic, the content, the methods, even the boundaries of our discipline, we turn to a related question. Assuming that composition courses aim to introduce students to the discipline of composition, we asked ourselves about the stated student learning objectives for composition courses. We anticipate that by working backward from the learning objectives, we will be able to tease out the nature of the disciplinary grounding we might expect to see in students’ work.

Student Learning Objectives for a Composition Course

For those not teaching composition, the answer to the question above might seem obvious—for students to be able to write well. The field of composition has yielded multiple answers—multiple ways

of characterizing “good writing.” In fact, Richard Fulkerson (2005) argues that there is no single, agreed upon approach to the teaching of composition, nor to the attendant learning objectives. A central debate that emerged in the 1990s was whether instructional goals ought to center upon personal writing or academic writing (Bartholomae, 1985; Elbow, 1995), and Fulkerson reports that a developing branch of the field—critical/cultural studies—has complicated the nature of this debate. His review of scholarly work in the field of composition since 1990 yielded “three alternative axiologies” (p. 655), that is, theories of value—critical/cultural, expressivist (personal), and rhetorical (academic). Moreover, Fulkerson argues that the rise of critical/cultural studies has transformed the older *academic writing versus personal writing* debate into a debate about *insider versus outsider*. Rhetorical approaches, with an emphasis on academic writing, aim to help students become “successful insiders” in academic discourse communities whereas critical/cultural and expressivist approaches value students’ “outsider” status with respect to academic discourse. Rather than inviting learners into the academy through the development of formal writing abilities, the aim of critical/cultural and expressivist approaches is to provide students with tools to stand outside these communities, to “become articulate critical outsiders,” or to “come to know themselves” (p. 679).

Students as Insiders versus Students as Outsiders

Fulkerson (2005) claims that rhetorical approaches to composition, focused on helping students become successful insiders in academic settings, are the most widespread nationally. He highlights three distinct emphases within rhetorical approaches: composition as argumentation, genre-based composition (the examination and production of various discourse forms), and composition as an introduction to an academic discourse community (writing that reflects common college-level “rhetorical moves”). Simultaneously, pedagogical emphases within rhetorical approaches are tied to a core set of theories and practices, including a greater stress on writing than on reading, the grounding of classroom activities in a wide range of drafting and revising tasks, and a view of teacher as modeler. In all rhetorical approaches, the centrality of writing for particular situations and audience is underscored.

In contrast to these rhetorical approaches, the primary instructional aim of critical/cultural studies courses is “‘liberation’ from dominant discourse” (Fulkerson, 2005, p. 660), thereby encouraging students to be critical outsiders of that discourse. Reading takes a central role, with

cultural theories, narratives, and artifacts employed as course “texts,” and textual interpretation often occurring around a common theme (e.g., the Vietnam War). A primary intent within a critical/cultural studies approach to composition is empowering learners through an analysis of power imbalances in society, with student writing assessed by “how sophisticated or insightful the teacher finds the interpretation of the relevant artifacts to be” (p. 662). Given an emphasis on cultural interpretation and critique over “improved writing,” Fulkerson sees critical/cultural approaches at the periphery of composition studies, noting that “papers are judged in the same way they would be in any department with a ‘content’ to teach” (p. 662).

Expressivist composition classes are similar to courses in critical/cultural studies in that they provide a rich yet “safe” social setting for students to examine their beliefs and experiences and, in this way, are not intrinsically aimed at helping students become academic insiders. Unlike rhetorical approaches, expressivist approaches are rooted in the worlds of individual learners, valuing writers’ “imaginative, psychological, social, and spiritual development” as well as the ways “that development influences individual consciousness and social behavior” (Burnham, 2001, as cited in Fulkerson, 2005, p. 667). Kay Halasek (1999) claims the goal of expressivism involves students finding their center of writing, that is, becoming better able to tap into and express their beliefs, both to others and to themselves.

Furthermore, according to Christopher Burnham (2001), expressivism champions dissensus, or differences in opinion, as it emerges within a social context, echoing the outsider perspective of the critical/cultural studies approach. Burnham notes that “Dissensus concedes the power of groups and culture to shape individuals, but maintains the possibility of individual agency. Expressivism shares this belief and purpose. The proof of dissensus . . . is voice, the individual identity of the writer working in community” (p. 23). As such, voice—equated in expressivism with ethos or writer presence—serves as a centerpiece of the expressivist classroom. Activities such as freewriting, reflective writing, and small group discussion are used as strategies for fostering learners’ processes of “coming-to-voice.” This notion of voice as “writer presence” is called for across text types, including research-based pieces, and “whether explicit, implicit, or absent” serves as a central criterion for assessment (p. 19).

Although Fulkerson (2005) presents the insider/outsider debate as a dichotomy in the field of composition studies, we see the possibility of adopting an integrative approach to the teaching of writing. From the perspective of practice, as Fulkerson’s review makes clear, lines defining

different approaches to teaching composition cannot be clearly drawn. Adherents to the various approaches described typically have views that diverge, overlap, and dovetail about matters of practice, including the roles of teacher, learner, text, task, course content, goals, plus the relationships among them. Moreover, in line with Fulkerson's argument, we think that two perspectives—writing as a process and knowledge as dialogically constructed—undergird the full range of current approaches to composition studies.

A Theoretically Integrated Approach: The Heteroglossic Classroom

Taking a Bakhtinian perspective, Halasek (1999) argues against viewing learners and their discourses through binary lens such as “insider” versus “outsider,” or “home” versus “academic” language. Instead, calling for classrooms that honor heteroglossia, she advocates that the work of composition classrooms embrace discursive tensions and honor linguistic diversity. For Bakhtin, speakers do not speak alone, but carry with them the histories of those who have spoken before them and the anticipated responses of those they are currently speaking to. In Bakhtin's view, the primary unit of communication is the utterance (spoken or written). An utterance is “*dialogic* [italics added] along three planes: it uses and responds to past utterances, it is oriented to the immediate context of the situation, and it is addressed to future utterances and situations” (Prior, 2001, p. 59). In this way, utterances are heteroglossic, reflecting a “matrix of forces,” including social and historical ones, that imbue our words and give them meaning (Emerson & Holquist, 1981, p. 428).

According to Halasek (1999), college writing classrooms are naturally heteroglossic spaces, “site[s] of lived and immediate response, full of addresses and answers, and marked by a certain restlessness, even a discomfort, over meaning” (p. 7). An integrated theoretical approach to the teaching of composition recognizes, and celebrates, these heteroglossic ambiguities and tensions; as Halasek writes:

Basic writers . . . live precarious educational existences on the border between competing worlds of their home cultures and the foreign discourses of academia. Such a multicultural frontier provides every teacher of first-year writing a rich and unique landscape to survey. The student's essay is a subversive, centripetal text—a text of dissonance and harmony, rebellion and accommodation, of rejection and acceptance. The voices that infuse that essay cannot be extracted from it or from its writer without severing the elemental characteristics of linguistic and cultural identity. (p. 43)

By pointing to the historical, political, and cultural dimensions present in all utterances, Halasek (1999) advocates an approach focused on giving composition students new linguistic and cognitive tools, thereby granting them opportunities to “make conscious choices” about the language they employ in a variety of rhetorical situations (p. 34). Doing so calls for an integrative approach to the teaching of writing, an approach whereby a teacher encourages a student to “interanimat[e] one’s own words and discourses with those already in use” (p. 172).

Similarly, arguing that students’ personal or expressive language can mediate their acquisition of more formal, academic discourse, Rebecca Williams Mlynarczyk’s (2006) work in the composition classroom reflects such an integrative approach. Before requiring her students to take on the academic essay, Mlynarczyk asks them to track responses to their readings informally, in journals. In this way, Mlynarczyk is providing a place and function for personal language. While this kind of freewriting activity might be associated with an expressivist approach, Mlynarczyk points out that the central text in her classroom is not students’ own writing, but rather the texts that she asks students to write about. She finds, however, that students’ use of expressive language in response to these texts—language that, according to Britton (1970), is “close to the self”—serves to deepen their ideas, providing a bridge to the types of writing assignments typically favored in rhetorical composition approaches. In describing the work of one of her students, Roberto, Mlynarczyk provides a description of heteroglossia in action; she writes, “the freewheeling engagement with texts and ideas that Roberto practiced in his journal serves to broaden the academic conversation, bringing other voices into the dialogue” (p. 22).

Learning Communities: Supporting a Theoretically Integrative Approach in Composition

The composition classrooms described above have been shown not to treat writing students as either insiders or outsiders of academic discourse communities, but rather to build upon the languages students already speak, integrating aspects of various composition approaches to extend learners’ linguistic resources and choices across texts and contexts. Given that integrative approaches are possible, why would instructors who see value across the various approaches feel the need to choose from among them? The only significant choice we see in terms of adopting an integrative approach is one for focus as measured by time. For example, Fulkerson (2005) shores up a bias against critical/cultural studies composition courses by arguing that such courses, focused as they are on

“reading, analyzing, and discussing the texts upon which the course rests are unlikely to leave room for any actual teaching of writing” (p. 665).

Learning communities, by their nature, support a theoretically integrated approach to composition in three key ways. First, they provide a rich interactive setting to support the social nature of writing and learning (Vygotsky, 1978, 1986). Second, since reading, writing, and discussion are distributed over at least two courses, students have more time to critically explore issues, themes, texts, and topics—interweaving language they already know with new disciplinary language. This contribution of more time is not trivial. As David C. Berliner notes (1991), time as a variable in a model of learning (Carroll, 1963) deserves our attention, and, as Lee Shulman (2007) argues, when we attempt to measure student success, our mistake is in “treating time as fixed and success as variable” instead of the other way around.

Finally, in a learning community where composition is paired with a non-composition, general education course, the latter can provide themes, topics, issues, and texts upon which the work of reading, writing, and discussion are based. And if such work is galvanized by a public issue (Lardner & Malnarich, 2007, 2008), the general education course can provide a critical disciplinary perspective on real-world problems. The contribution then, of an integrative composition course, is to guide and support students as they—grounded in what they know—read, write, and speak their way toward conscious participation in new discourse communities.

Evidence of Integrative Learning in Learning Communities

Learners’ transformations from novice to conscious participants in the general education discipline is a central shared student learning objective in a learning community that pairs composition with a general education course. We argue that another way to describe this critical learning objective is as the development of voice.

Voice in Student Writing

We often talk of good writing as writing that has voice. If all words in our own writing reflect the “tones and echoes” (Bakhtin, 1986, p. 88) of utterances put forth by others, what does it mean for a piece of writing to be judged as having voice from a socio-historical perspective? If the internalization of new knowledge is, in fact, a process (Vygotsky, 1978, 1986), then as students write within a discipline, they may be internalizing others’ expert voices from that discipline and gradually coming to own

their words. It is this ownership, this *population* of disciplinary ideas with a learner's *own intentions* that we might recognize as voice.

Viewed this way, we see the potential of composition courses linked with general education courses in learning community settings to help learners develop voice in their writing. With all approaches to composition sharing a belief in writing as a process (Fulkerson, 2005), students in composition classes have opportunities to step back from a piece of writing and reflect on it—in collaboration with teachers, peers, or by themselves. In fostering dialogues between readers and writers, composition courses may help learners write with voice as they engage with a disciplinary topic and an audience over time and respond to others' words over multiple drafts.

Thus, if we think about *learning to write* as the result of *writing to learn*, or the sense making that Paul A. Prior (2001) discusses, we should see the development of learners' voices as they draft papers on disciplinary issues in composition courses. Learners may begin to write solely with language that is "close to the self." However, through engaging in the composing process in the presence of expert members of new discourse communities, students may come to appropriate the voices of these communities and, through writing, gradually make them their own.

Assessing Voice

In assessing student work in a learning community with composition we ask: How might learners' voices—that is, their demonstrated ownership of disciplinary voices—become manifested through the writing process? A number of researchers examining the concept of voice from a socio-historical perspective point us in a direction for how this question might be answered (Brodkey & Henry, 1992; Ivanic, 1998; Ivanic & Camps, 2001; Palacas, 1994; Prior, 1998, 2001; Wertsch, 1991).

James V. Wertsch (1991), drawing from Bakhtin's work, poses the question "Who is doing the talking?" to illustrate how a socio-historical understanding of voice might be applied to a text. Examining a George Bush presidential nomination acceptance speech, he notes that a first reading might answer this question as George Bush himself. But a closer analysis sheds light on the "other concrete speaking consciousnesses" beyond the speaker that may be at work, noting, for example, the likely influence of speechwriters in such a way that "the end product is one in which the informed ear can hear a polyphony of voices" (p. 64). Prior (2001) makes a similar observation in his discussion of student writing in graduate programs. Describing his research as uncovering a "direct intermingling of voices" (p. 67) in student work, Prior (2001) cites an example of a learner

incorporating the numerous textual revisions proposed by her professor in an earlier draft—105 out of the 106 words the teacher had written, a “tacit co-composing of text” (p. 67). Brodkey and Henry (1992) looked at the writing of an architecture student as it developed from the responses of his professor and a teaching assistant, finding, and tracking, six voices in the work—including those of the composition teacher and the rhetoric of architecture. Studying the words selected by students in final drafts, and looking backward at earlier drafts to trace how these words changed over time through students’ participation in their composition and general education courses, may uncover how learners are “positioning . . . and being positioned as part of a process of disciplinary enculturation” (Prior, 2001, p. 62), choosing which disciplinary voices to take on as their own.

Citing Valentin Voloshinov (1973), Wertsch (1991) also notes that a particular phenomenon of interest to Bakhtin is reported speech, whereby “one voice (the ‘reporting voice’) reports the utterance of another (the ‘reported voice’)” (p. 80), a practice that also speaks to the written work of college courses across multiple disciplines. In our own informal observations as composition teachers, we find that as students delve into disciplinary texts to inform their writing, they often begin, in their earliest drafts, by heavily quoting text as a way of reporting what they have read. As student writers come to have a better grasp of the ideas they are grappling with, they may continue to report. However, they may start to step back from quoting and instead paraphrase, drawing bits and pieces of the language of the text (Ivanic, 1998) mingled with their own to approximate that of the text. In this “intermingling” of voices, students make a number of linguistic choices that reflect their views and understanding of the material. While students, even in the act of quoting, position themselves in relation to disciplinary texts in the way they introduce the quoted material and in their choice of material to quote, *how* they use other’s words in their writing may serve to uncover their process of internalizing new disciplinary material—how deeply they choose to “infiltrate” (Voloshinov, 1973, as cited in Wertsch, 1991, p. 81) another’s voice with their own.

As students take increasing ownership of disciplinary texts, they move beyond reporting to reflecting, discussing, and evaluating—connecting others’ ideas and experiences to their own. In this process, they no longer depend on quotations and paraphrases to serve as the primary content of their papers, but use these instead to advance their own positions. Drawing from Bakhtin’s heteroglossic view of voice, Arthur L. Palacas (1994) identifies two aspects of voice that demonstrate how writers express both “factually presented truths” and “evaluations of” these truths, arguing that shifts from factive to reflective voices are often

signaled by parentheticals such as “I think” and “I disagree,” which can take an evaluative stance. In this way, writers are able to draw connections between utterances and present “a sense of self-consciousness” (p. 126). Studying how students linguistically move between factive and reflective worlds in their compositions might be a mechanism for uncovering how their use of multiple voices serves to construct and support their disciplinary arguments.

We have suggested some ways to examine how voice might be assessed in pieces of student writing in learning communities with composition courses. With Wertsch’s (1991) Bakhtinian question: “Who is doing the talking?” guiding the discussion, we have proposed that students’ gradual ownership of new disciplinary material might be revealed in their writing process as they draft compositions and respond to their own words, the words of peers, and such disciplinary experts as authors and professors. We have also suggested that specific linguistic phenomena, including paraphrases, reported speech, and parentheticals, might be fruitful areas of investigation, uncovering how students integrate their own voices with those of others. Drawing from this review, the final section below will revisit questions posed in our introduction, and point our exploratory answers in the direction of future empirical research.

Conclusion

At the start of this paper, we raised two questions: (1) What, besides the form of student work (i.e., a piece of writing) counts as evidence that the work is grounded in the discipline of composition? and (2) How do our expectations for student work produced in a learning community that links composition with a general education course differ from those we would have for student work produced in a stand-alone general education course?

We see the answer to both questions in terms of the development of voice as defined in socio-historical terms. Of course voice, defined here as a students’ incorporation of other disciplinary voices into their own, can be present in student writing for stand-alone general education courses. However, we see the potential role of composition courses as providing, through the activity of process writing, opportunities for student voice to develop in richer and more intentional ways as students take gradual ownership of new disciplinary material through dialogue and drafting.

In a learning community that pairs a general education course with composition, students benefit from extended time to appropriate the concepts and discourse of the general education discipline through focused

attention on the development of voice. For community college students in particular, time to develop voice is crucial—allowing students to make conscious choices between different types of discourses and employ new tools for expressing themselves.

In this paper, we have explored the idea that voice, understood as simultaneously personal and social, may point to integrative learning in student work for learning communities involving composition courses. We have also argued that voice may be developed in an integrative composition course as learners dialogue about new disciplinary content with teachers, learners, and themselves through the drafting of process writing. Finally, we have considered some possible ways to view student work in light of a socio-historical view of voice and have suggested that the development of voice may be tracked and assessed through the choices students make as they revise their work in collaboration with others. A future research project entails our collection and analysis of student work in linked composition and general education courses to inductively explore how, through drafting, their voices layer with those of others, how these voices might change and interweave over time, and how students use linguistic devices to express their growing internalization of new, interdisciplinary knowledge.

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Assessing Interdisciplinary Learning in Theme-Based, One-Semester Communities

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Kennesaw State University's team of interdisciplinary scholars qualitatively assessed student learning within theme-based learning communities to determine whether content from one discipline was evident in student work produced within another discipline. Faculty concluded that they were likely expecting more disciplinary integration than first-semester college students were capable of providing, and that they were likely not asking for the integration they were expecting. By examining student work as evidence, the researchers became more acutely aware of the assignment instructions, prompting them to work more closely with colleagues in their future learning communities to develop interdisciplinary assignments with explicit expectations for integration.

The positive impact of learning communities on student learning has been established by a significant body of research that assessed student retention, improved student academic performance, and higher levels of student and instructor satisfaction (e.g., Dillon, 2003; Knight, 2002; Scharff & Brown, 2004; Taylor, Moore, MacGregor, & Lindblad, 2003). While these findings likely contribute to the popularity of learning communities in higher education institutions across the United States, one area in which research is lacking is the assessment of the distinctive type of student learning that is possible in learning communities (Taylor et al., 2003).

Learning communities, in which the same cohort of students share two or more classes, create a unique academic environment where student

learning can potentially be improved by the deliberate pairing of courses that require students to call upon similar cognitive skills regardless of the discipline that houses each course (Goldfine, 2006). For example, Pesante (1991) has found it effective to “draw parallels between the development of a software system and that of a document” (p. 206) when teaching composition to software engineering students. Similarly, Scharff and Brown (2004) linked an introductory computing course for non-computer majors with a logic course offered by the philosophy department based on their belief that each discipline supports the other, and that a learning community could serve as a vehicle for helping students better understand the connections between computing courses and other fields. In assessing the effect of their learning community on student learning, Scharff and Brown discovered that first-year students in their learning community were able to identify a greater number of connections between the two courses than were junior- and senior-level computer science majors.

Gammill and Hansen (1992) had a similar experience with a learning community they created in which two skills courses, Introductory Computer and Library Science, were linked with a content course, Introductory Economics, through “coordinated assignments that required the students to use all their skills in all three courses” (p. 1). In assessing the impact of this learning community on student learning, they found that entering freshmen produced term papers that surpassed faculty expectations for first-year students and “achieved the same level of mastery as did the more experienced students in the traditional sections” (p. 1). The researchers believe that the emphasis in their learning community on basic computer, library research, and writing skills gave students an “important and realistic introduction to the university,” and that having students “apply computing and research skills to a content course helps [them] see the real value of these skills for their future college success and may enhance mastery of these skills” (p. 6).

Given these findings, it seems plausible that learning communities might foster learning that transcends disciplines, allowing students not only to reinforce knowledge and cognitive skills through repetition in their linked courses, but also to identify and make connections between disciplines in ways that would not be possible if the courses were taught in isolation. The Kennesaw State University team, participants in Washington Center’s National Project on Assessing Learning in Learning Communities, decided to investigate examples of student learning produced by students enrolled in linked courses. We chose to adopt the Brower and Dettinger (1998) definition of learning communities as the ideal: “. . . integrated, comprehensive programs in which transformative learning takes place

through a community process as students develop professional, civic, and ethical responsibility” (p. 21). In this article, we discuss what our team discovered about student learning and our own expectations about integrative or interdisciplinary learning.

Institutional and Program Characteristics

Kennesaw State University, 30 miles northwest of Atlanta in Kennesaw, Georgia, began as a two-year institution attended by 1,000 students when it offered its first classes in 1966. Now more than 20,000 students are enrolled in expanding undergraduate and graduate programs, and Kennesaw State is the third-largest university in Georgia.

The Kennesaw learning community program, housed in the Department of First-Year Programs, has also grown exponentially since it began in fall 2000 when eight sections of the first-year seminar course (KSU 1101) were paired with general education courses in two-course learning community links. While initial results showed that first-year students in these learning communities had higher GPAs than a random sample of students enrolled in an independent section of the seminar or students not enrolled in either the seminar course or a learning community, these first learning communities were really “learning coincidences” (Casey & Hoerrner, 2005). That is, although student cohorts shared common classes, the learning communities were not themed communities, and the faculty participants did little to explicitly integrate the linked courses. They were primarily for social connections more than academic connections.

Eight learning communities were again offered in 2001 with little change in pairings or integration. In 2002, the number of learning communities increased to 16, and by fall 2003, learning communities had increased to 25 with greater integration among the linked courses. Specifically, all learning communities were thematically based, and faculty were asked to integrate these themes into their course work. Team teaching has not been a component of Kennesaw’s learning community initiative since its inception.

The success of these learning communities, based on promising data gathered during a preliminary assessment including first-year students’ retention rates and GPAs (Hoerrner & Goldfine, in press), prompted Kennesaw State University to strongly recommend the learning community program for first-year students. The first residential students² that moved into the university’s new campus housing in 2003 were required to join a learning community during their first semester. (Approximately 10% of the university’s undergraduates live on campus.) Commuter students, though

not required to enroll in a learning community, were also encouraged to participate in the program. In fall 2004, faculty taught in thirty-four learning communities. By fall 2005, this number increased by 60% owing to the development of University College and a first-year curriculum requirement that took effect, which stated all first-time, full-time students with fewer than 15 credit hours must take either KSU 1101 or a learning community.

Beginning fall 2005, students were required to enroll in one of four curriculum options: an independent section of KSU 1101, a learning community that included KSU 1101 and/or BIOL 2101, a learning community that did not include KSU 1101 and/or BIOL 2101, or an independent section of BIOL 2101 (for biology majors). The requirement was changed again in fall 2008 because BIOL 2101 was no longer offered by the Department of Biology and Physics.

To accommodate the increasing number of students at Kennesaw State University and to promote greater faculty participation, a proposal process for learning community themes and composition was initiated. This process invites faculty across campus to develop either discipline-based or general-interest learning communities. Regardless of theme, enrollment is limited to 25 students through anchor courses, such as English composition and the first-year seminar courses. These limited-capacity classes frequently are linked to larger sections of other courses; thus, the learning community student cohort is sometimes embedded within a larger class. The intermingling of learning community and non-learning community students within a single class creates the challenge of promoting multiple learning community themes or imposing the theme upon non-learning community students.

From fall 2004 through spring 2008, 11 learning outcomes were utilized to assess all learning communities, regardless of theme or composition of courses. These were as follows:

1. Enhance study skills
2. Promote cognitive/academic skills
3. Improve critical thinking skills
4. Provide greater connection to faculty
5. Provide greater connection to student peers
6. Increase out-of-class engagement opportunities
7. Increase student knowledge of campus policies
8. Increase student knowledge of academic services
9. Promote skill in managing time and priorities
10. Improve knowledge of wellness
11. Enhance understanding of global perspectives

Faculty members teaching in each learning community were asked to collaborate in identifying how they intended to meet each of the learning outcomes by completing a three-page form asking primarily open-ended questions. At the conclusion of the semester, learning community faculty were asked to complete an end-of-the-semester self-evaluation form that was more quantitative to assess the degree to which they accomplished the goals set out in the planning form at the start of the term. Students were also asked in a quantitative, end-of-the-semester survey to evaluate the degree to which their communities fulfilled each of the learning outcomes.

No assessment had been done on student work prior to Kennesaw State University's participation in Washington Center's National Project on Assessing Learning in Learning Communities. Our team, consisting of seven faculty members and administrators who have taught in learning communities and who represent six diverse disciplines—business administration, communication, English, first-year programs, psychology, and visual arts—viewed participation in this national project as an opportunity to strengthen our campus learning community initiative by providing us with the means to take our program “to the next level.” Having developed an extensive and thriving program, we were in the process of investigating additional measures to assess the success of our program in order to determine how we might refine and improve upon it when the Washington Center invited applications for the project.

Method

Since Kennesaw State's learning community program is quite large and varied, we were eager to gather data that would help us determine the effectiveness of the program. The Kennesaw national project team chose to focus closely on the extent to which interdisciplinary learning occurred in thematically driven learning communities. We believe that meaningful exploration of student learning—both interdisciplinary and otherwise—will assist us in not only improving our learning community program but also in improving our teaching. Thus, our guiding research questions were as follows:

- RQ1:** What evidence exists for interdisciplinary learning within learning communities?
- RQ2:** To what degree does student work show evidence of the transferability of one discipline to others within a learning community?

Operational Definitions

The definition used for “interdisciplinary learning within learning communities” was developed by adapting Boix-Mansilla’s (2005) definition of *interdisciplinary understanding*, that is, “the capacity to integrate knowledge and modes of thinking drawn from two or more disciplines to produce a cognitive advancement . . . in ways that would have been unlikely through single disciplinary means” (p. 16). Thus, our definition of interdisciplinary learning in learning communities was articulated as follows: the capacity for first-year students enrolled in a theme-based cohort of courses to integrate knowledge and modes of thinking drawn from two or more academic disciplines to produce cognitive advancement in ways that would have been unlikely through single disciplinary means.

The definition of “transferability of one discipline to others” was defined as the explicit evidence provided within student work products that knowledge or modes of thinking from one discipline was/were utilized in a course within another discipline.

Protocol

All teams participating in the National Project on Assessing Learning in Learning Communities were charged to gather evidence of student learning from works produced by the students. To collect the data, the teams were provided with a protocol, developed by Boix-Mansilla (n.d.), to guide the process and ensure teams, as nearly as possible, were gathering similar data in a like manner. This protocol is presented in Table 1.

Table 1. *Protocol for Washington Center’s National Project on Assessing Learning in Learning Communities*

COLLABORATIVE ASSESSMENT PROTOCOL**FOR STUDENT WORK** [Developed by Boix-Mansilla]

The purpose of this protocol is to provide opportunities for teachers to discuss pieces of students’ work and notice integration and opportunities for growth. The protocol can be used to assess and support students, to advance professional development, and to reflect about assignment design.

I. GETTING ACQUAINTED—GENERAL ASSESSMENT

1. Introducing the work:
Presenting teacher shares minimal information about the work, avoiding value description—e.g., stating the course and the level, whether it is initial or advanced, and the assignment.
2. Clarifying specific goal:
The group makes sure that the goals for the conversation are clear. For instance, are we seeking to examine the degree to which a piece

represents integrative or interdisciplinary understanding? Are we trying to diagnose opportunities for growth in an initial or developing piece?

3. Looking at the work:
In silence, individuals read or observe the work brought in.
4. Pointing out:
The group points out any aspect of the work noticed, withholding judgment about quality or comments about taste.
5. Valuing the work:
Group members share general qualities of the work that they appreciate (e.g., student shows strong personal voice, paper is clearly composed, student uses primary sources, provocative use of imagery).
6. Raising questions:
Once everyone has a chance to describe appreciated qualities in a work, the group is asked to raise questions and concerns that have come up. Participants are reminded that not all questions will be answered. Questions open up the work and make the group's thinking visible.

II. ZOOMING IN—TARGETING ASSESSMENT OF INTEGRATIVE INTERDISCIPLINARY UNDERSTANDING

7. Discerning the purpose of the work:
Based on their reading (observations, etc.) of the work and their knowledge of the assignment (see #1 above), group members describe what they view as the purpose of the work, pointing to the evidence in the work that makes them say so.

Optional: Once the group agrees on the inferred purpose or purposes of the work, they can discuss the degree to which this purpose lends itself to or embodies integration or interdisciplinary work. Is there something in the purpose that invites students to make that integrative step?

8. Revealing disciplinary grounding:
Group members describe what they view as the disciplinary insights/modes of thinking or ability areas that seem to be informing this work, pointing to the evidence in the work that makes them say so.

Focusing on one discipline or ability area at a time, the group discusses these questions:

Are the particular disciplinary insights/modes of thinking selected appropriate to inform the purpose of the work? Does it make sense to bring them to bear upon the issue?

To what extent is the student able to use disciplinary insights/modes of thinking or ability areas in accurate and/or effective ways?

What suggestions might we offer to this student to deepen or develop his or her use of disciplinary insights or ability areas in the context of this work?

9. Revealing integrations:

Group members describe what they view as overarching integrations of disciplinary perspectives attempted by the student, pointing to the evidence in the work that makes them say so. How is the student bringing things together—for instance, is the student offering a complex explanation, an aesthetic synthesis, a contextualization, a pragmatic solution, or some other product based on integration?

(Note: The form of the integration may be signaled in the assignment itself; the focus here is on what the work itself does. The inferred purpose of these things—the initial assignment and the student's work—may be the same, or they may not.)

Once the group has gained a sense of how the disciplinary insights seem to be coming together, group members discuss: To what extent does the integration appear to enrich, enlarge, or deepen the student's understanding of the issue under study?

(One way to get at this is by asking what would have happened to students' understanding if discipline x had not been brought in.)

What suggestions might we offer to this student to deepen or develop the integrative or interdisciplinary nature of the work?

10. Assessing thoughtfulness:

Group members describe what they view as student's reflections about the nature of his or her work and learning (e.g., comments on the relevance of the work, the limitations of single disciplines, limitations of the work itself). Participants are asked to point to the evidence in the work that makes them say so.

Once the group has gained a sense of the reflective stance taken in the work, the group discusses how student reflections reveal a developing ability to do interdisciplinary work.

What suggestions might we offer to this student to deepen the reflective stance he or she takes?

III. STEPPING BACK

11. Hearing from the presenting teacher:

After listening without intervening, the presenting faculty adds her or his perspective on the general and targeted assessment comments. He or she may or may not choose to address particular questions raised or clarify aspects of context.

12. Implications for teaching:

By examining students' work in this way, what have you learned about designing assignments that invite integrative or interdisciplinary learning?

13. Reflecting on protocol:

It is always helpful to leave time at the end to revisit the process and the protocol, considering what was helpful in the conference structure and what was frustrating.

All teams were invited to modify elements of the protocol if necessary to accommodate their specific research questions. Consequently, after struggling through several months of applying the protocol, and after receiving additional insight on the protocol from Boix-Mansilla at the March 2007 National Project meeting in Seattle, our team developed a pared-down protocol that allowed us to more quickly and effectively assess student work. This protocol is presented in Table 2. The majority of our modifications appear in items 4–10; for these items, we developed abbreviated forms of the original questions that clarified for us the focus and goal of each step in the protocol. Additionally, for item 13, we developed questions that allowed us to consistently assess each work for trends that we saw emerging early in our research.

Table 2. *Kennesaw State University Modified Protocol*
(changes in italics)

COLLABORATIVE ASSESSMENT PROTOCOL FOR STUDENT WORK

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Presenting teacher shares minimal information about the work, avoiding value description—e.g., stating the course and the level, whether it is initial or advanced, and the assignment.
2. Clarifying specific goal:
The group makes sure that the goals for the conversation are clear. For instance, are we seeking to examine the degree to which a piece represents integrative or interdisciplinary understanding? Are we trying to diagnose opportunities for growth in an initial or developing piece?
3. Looking at the work:
In silence, individuals read or observe the work brought in.
4. Pointing out:
What do you notice about the work?
5. Valuing the work:
What do you value about the work?
6. Raising questions:
What questions do you have about the work?
What do you wonder about?

(cont'd)

II. ZOOMING IN—TARGETING ASSESSMENT OF INTEGRATIVE INTERDISCIPLINARY UNDERSTANDING

7. Discerning the purpose of the work:
What is the student's purpose in doing the work?
What is the student trying to achieve?
8. Revealing disciplinary grounding:
What disciplines are important for the students to consider?
What disciplines are apparent in the work?
What else could the student do to deepen her or his use of the disciplines?
9. Revealing integrations:
How is the student putting the disciplines together? What ideas bring all this together?
What would you like to see in this work that goes beyond what the student has done here? What would you like to see the student do to demonstrate a deeper understanding?
10. Assessing thoughtfulness:
Did the student put thought into the assignment?
Is the student being thoughtful about his or her work?
Where is the student being thoughtful?
What is the student's next challenge in terms of thoughtfulness?

III. STEPPING BACK

11. Hearing from the presenting teacher:
After listening without intervening, the presenting faculty adds her or his perspective on the general and targeted assessment comments. He or she may or may not choose to address particular questions raised or clarify aspects of context.
12. Implications for teaching:
By examining students' work in this way, what have you learned about designing assignments that invite integrative or interdisciplinary learning?
13. Reflecting on protocol:
How can we assess the interdisciplinary nature of a work if we aren't experts in all the disciplines we identify?

What do we need from the student to ensure integrative learning is taking place? We need a variety of pieces of work to ensure the student is learning and to ensure we can assess that.

Are we finding the integration/interdisciplinarity for the student, or did he/she intentionally do that in preparing the assignment?

Evidence

In gathering evidence of student learning, each team was directed to use the protocol to assess a piece of student work supplied by one of the team members. Given the breadth of disciplines represented by our team, we had the opportunity to assess brief in-class short response papers, three- to five-page essays, a PowerPoint presentation, a video production, an art project, a reflective essay responding to an out-of-class engagement,

and two public speaking outlines. In total, the team evaluated 11 pieces of student work during a five-month period.

Procedure

From our first meeting in September 2006 where we discussed the protocol, we met once a month to discuss student work. At each meeting, two team members brought student work from a learning community to review, selected at random with varying quality, based on the process outlined in *The Evidence Process* (Harvard Project Zero, 2001). At each meeting, we discussed two pieces of student work, allotting half of the available time to each piece (approximately 45 minutes per item). A timekeeper was assigned to ensure that we did not spend too much time on any individual piece of work. A note-taker was also assigned for each meeting to keep a record of our discussion.

Results

In the first stage of the protocol, “Getting Acquainted,” we tended to notice superficial elements of the student work we were assessing. Often, these were obvious attributes that might generally be overlooked because they were commonplace. For example, our observations might include the fact that a paper was double-spaced, that a video clip was in color, or that a drawing was two-dimensional.

At the next stage, “Zooming In,” we became more interpretive as we attempted to discern the purpose of the work and identify examples of disciplinary grounding. Although we attempted to remain focused on only that which was apparent in the student work, it became difficult at times not to apply our own disciplinary understanding and identify examples relevant to our individual disciplines. Furthermore, we became aware that we might inadvertently be “seeing” evidence or connections that may not have been intentional on the part of the student. Our realization of the lack of student intentionality led us to wonder whether we can expect students to make integrative or interdisciplinary connections without explicit direction to do so.

In the final stage, “Stepping Back,” we attempted to discern from the student work what the actual assignment asked students to produce. In many instances, the team members found it difficult to articulate the particulars of the assignment (i.e., the instructions or guidelines provided by the instructor) based on the student work under evaluation. Our efforts at this stage were quite illuminating as we discovered that the instructions given to students at times did not at all resemble what the student produced

or, in some instances, what the instructor intended. This realization led to discussions of how we might revise our assignments to better elicit the result we envision.

Three significant trends emerged in our findings. First, for those assignments in which students were specifically asked to make connections between disciplines, the work they produced typically bore evidence of those connections or at least of attempts to make such connections. Second, the disciplinary connections which were apparent, whether intentional or not, tended to be superficial rather than thoughtful or in-depth. Third, team members experienced tremendous difficulty in articulating the specific assignment or instructions that the student work was intended to fulfill. Given the regularity with which this occurred, our team concluded that perhaps the assignments themselves were unclear and did not necessarily provide sufficient (or sufficiently clear) instruction to produce the results faculty sought.

In those instances in which the instructor provided very specific, clear instructions for integrating disciplines, team members could typically determine (or at least discern a close approximation) of what the instructions or objective of the assignment had been. For example, in a learning community with an ethics theme, the KSU 1101 professor asked students during an in-class assignment to explain how a reading from their linked English 1101 course (that was a general discussion of resolving ethical dilemmas) related to a specific global issue they were discussing. The student work presented as evidence showed a clear ability to draw on the reading from the English class to answer the question in KSU 1101.

In another notable sample of student work, a student in an introductory art studio course produced a drawing of a man walking along a path. The drawing included some very specific and telling details that provided clues as to the nature of the assignment. Specifically, the subject in the drawing was clearly walking along a path, and he was wearing pilgrim shoes (i.e., the style of shoe one typically associates with early United States settlers). The shading in the background was created through the careful and deliberate placement of words and phrases such as “worldliness,” “sin,” “Dante,” “the straight and narrow path,” and “the woods of error.” The English professor on the team noted that many of the distinct features of the drawing alluded to the pilgrim traveling through the circles of hell in Dante’s *Inferno*. Once this association was made, other team members quickly identified other aspects of the work that were representative of the language or message in the *Inferno*. Based on these observations, the team concluded that the assignment was to produce a two-dimensional work of art that depicted a work of literature.

The presenting team member verified that the assignment had been for students in ART 1100, a two-dimensional studio class, to select a work they were currently studying in their linked English course and represent it in a drawing. That is, they were not just assigned to demonstrate specific artistic techniques in their drawings; they were instructed to demonstrate these techniques while creating a work of art that demanded they reflect on material from their linked course to determine how to best capture the essence of that work in a drawing. Though most team members evaluating the work were impressed by the student's ability to interpret and vividly illustrate the *Inferno*, the presenting art instructor reported that the work had not received an A because it failed to achieve certain artistic requirements, such as perspective.

The second trend that emerged in the student work we studied was that connections between the disciplines were generally superficial rather than thoughtful. For example, a review of the transcribed notes from all 11 pieces of evidence revealed that both English and communication appear in the "discipline grounding" responses for each piece of student work, yet the supporting statements simply note that words were used to communicate a message in each assignment. In a video produced by 7 students in an ART 1107 (Arts in Society) course, theatre, radio/television broadcasting, and music were three of the primary disciplines found in the work. Again, the mere fact that students were performing does not constitute true "disciplinary grounding" in theatre and performance studies. In the two-dimensional drawing previously discussed, the student artist keyed in on specific words and included detail in the drawing that represented those words, as in drawing pilgrim shoes to prompt the notion that the subject represents the pilgrim in the *Inferno*. A more thoughtful piece of artwork might have synthesized the meaning and message of Dante's work and created a more abstract drawing instead of literally depicting individual words.

This second trend speaks to two of Boix-Mansilla's (2005) assertions regarding interdisciplinarity. While our sample of student work supports her argument that a "performance view of [interdisciplinary] understanding . . . privileges the capacity to use knowledge over that of simply having or accumulating it" (p. 17), it fell rather short of her assertion that "interdisciplinary understanding is highly 'disciplined'—that is, deeply informed by disciplinary expertise" (p. 17). It should be remembered, however, that the student work selected for study were all works from first-semester students. The in-depth understanding of numerous disciplines that would be required for students to demonstrate interdisciplinarity in their work, according to Boix-Mansilla's full interpretation, is likely beyond the

ability of these students, many of whom may be experiencing their first introduction to some disciplines during their first year of college.

The third trend identified was the inability of the team to elucidate the assignment or instructions from the student work. In some instances, we came close to discerning the requirements of the assignment, but many times we were woefully inaccurate in our presumptions. For example, we were unable to determine that a public speaking outline focusing on Senator Hillary Rodham Clinton was not for an informative or persuasive speech but, rather, for a commemorative speech. The regularity with which this occurred suggested to us that perhaps the product did not match what the instructor had anticipated not through any fault of the student but rather due to the instructions for the assignment. That is, if the instructor did not clearly structure and articulate the assignment, the work students produced was not of the type or caliber that was expected. In short, we get what we ask for.

Thus, while our research was an attempt to identify interdisciplinary learning among students in learning communities, it seems we instead gained insight into our role, as instructors, in crafting assignments that lead students to make the types of connections we are looking for. Clearly, in order for students to produce work that demonstrates connections between disciplines, we must develop and clearly articulate assignments that foster these connections.

Given that the purpose of our study was to examine interdisciplinary learning and transferability in learning communities, the results were not what we expected. While we were able to identify numerous superficial connections between disciplines, these may or may not have been disciplines linked in the particular learning community from which the student work was taken. Additionally, it is impossible to determine whether these connections were intentional. In fact, we concluded that much of what we noted might have been the result of the depth of our own grounding in our individual disciplines. That is, we might have been reading into what we saw rather than simply making an observation.

Discussion

Though our research did not produce the type of insights into student learning in learning communities that we had hoped it might, we instead discovered much about the scholarship of teaching and learning. Specifically, we were confronted with evidence time after time demonstrating that poor student work may, in part, be the result of poorly designed and poorly communicated assignments on the part of the instructor. This led to the

modification of some assignments by team members in order that we might compare the results of the original assignment with that of the newly modified assignment.

One of the stated goals of the learning community faculty was to create a situation for integrated learning, but what we found was a disconnect between this goal and the coordination between the faculty teaching linked courses. We found that many faculty previously taught these learning community courses as independent sections and had not modified their assignments to create integration among courses linked in their community. In fact, some instructors may teach the same course the same semester—some linked in learning communities and some as stand-alone sections. Furthermore, it is unreasonable to expect that first-year students, new to the college environment and accustomed to receiving specific instructions for each assignment in high school, would take the initiative to go beyond the basic requirements of an assignment in order to provide a multi-interdisciplinary perspective. Students tend to provide what they are asked for, what they think is expected of them, and what they have enjoyed rewards for in the past. This may lead students to become more concerned about page limits or associated assignment details rather than embracing the opportunity to explore their interdisciplinary knowledge. This is essentially scholarship of teaching and learning, as the question arises of how students learn and also how faculty structure their assignments.

Based on the findings of our research, we believe that, first and foremost, administration of first-year programs should purposefully link courses together to meet interdisciplinary goals. Furthermore, learning communities should be populated by faculty who are skilled in working with first-year students and inspired to creatively integrate the courses in a coordinated fashion. As a first step in facilitating this integration, the faculty members within a single learning community should examine the basic learning outcomes they hope to achieve. Each discipline will certainly have its own learning objectives that must be included, but the community must also meet the objectives specific to the first-year program.

Finally, learning community faculty need to spend time together well before the semester begins with the goal of creating clear overlaps in their semester's curricula. Ideally, the teaching faculty should meet multiple times during the term to deal with any changes. To promote this degree of integration and coordination, there should be some accountability, a reward system (either intrinsic or extrinsic), and protected time together. It cannot be overstated that this attention to the coordination is fundamental and paramount in creating integration in learning communities.

As a next step in developing a thoroughly integrated learning community, the learning community faculty should design assignments that elicit the desired learning outcomes. However, carefully articulated assignments alone are not sufficient; faculty should also actively draw connections between the linked courses within their learning community and make explicit reference to relevant disciplines in class lectures and discussions. Introducing the relevant disciplines in the classroom is vital because students arrive at college with widely varying degrees of knowledge in the many disciplines represented at the university; thus, it is incumbent upon the instructor to ensure all students in his or her class possess a baseline understanding of the disciplines they will be expected to call upon for the course. That is, we can help students make interdisciplinary connections by specifically asking that those perspectives be included in their work. By stating different expectations, we will elicit different and, hopefully, integrative results.

Through this research, we gained insight into how our assignments might be better designed and more clearly articulated to students. While in some instances students seemed to intentionally integrate various disciplines into their work, we identified cases in which the integration of disciplines seemed to be a “happy accident” or drew upon disciplines not anticipated. We concluded that both the intentional and unintentional integration of disciplines are evidence of interdisciplinary learning. The former suggests that some instructors are successfully promoting and facilitating interdisciplinary learning sometimes, while the latter implies that students are sometimes making interdisciplinary connections on their own, bringing their own experiences in the disciplines to the particular assignment.

In analyzing student work, our team has come to realize that linking courses alone—even under specific themes—is not sufficient to ensure that students recognize and understand the relationships between disciplines and to ensure they use their knowledge of the various disciplines to produce interdisciplinary work. To echo our insights in the other areas, if our learning communities are to promote interdisciplinary learning, we must intentionally lead our students into interdisciplinary thought through examples, stories, and suggestions that draw them into this perspective.

Limitations

A significant limitation of this study was that, while following the protocol, we examined the assignments in isolation without access to the written or oral assignment directions. Since the point of this research was

to determine if interdisciplinary learning was taking place, we did not need to know what the assignment was about to determine if there was evidence of such learning. However, under these conditions it was nearly impossible to determine what the faculty had asked for or if students had missed the opportunity for a truly integrative approach. Although the protocol allows in the section, "Stepping Back," for the faculty who had given the assignment to answer questions or elaborate on certain points, we had to make assumptions as to how the assignment had been interpreted by the students.

The second major limitation to the study was the team members' lack of expertise in researching "integrative" versus "interdisciplinary" learning and utilizing the protocol instrument to discern disciplinary connections. A team leader grounded in this area of expertise, rather than learning communities in general, would have provided greater focus for the study.

Areas for Further Research

The benefits of moving beyond baseline quantitative research (i.e., grade point averages and retention rates) to determine the effectiveness of learning communities were evident as a result of this national, qualitative research initiative. The benefits of integrative learning, which have been shown repeatedly by Boix-Mansilla (2005) and others (Huber & Hutchings, 2004), are also evident. Because of their unique attributes, learning communities lend themselves to integrative learning. Their structures should be studied further; the intentionality of the faculty members and their assignments should be explored; and their effectiveness in encouraging students to integrate knowledge and modes of thinking beyond the walls of a single discipline should be assessed. Accomplishing these objectives will require time and conscientious effort, but the reward will be integrative learning that is greater than the sum of the individual courses being studied.

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Templates and Rubrics: Connecting Outcomes, Assignments, and Assessment in Interdisciplinary Learning Communities

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At a college where integrative learning is a campus-wide student learning outcome, a template designed for learning community course development also helps students see connections between their assignments, expected learning outcomes, assessment tools, and general education outcomes.

While the need for effective education has always been with us, it seems increasingly urgent in the context of the divisiveness of political, economic, religious, and social claims on individuals. In *Greater Expectations*, the Association of American College and Universities (2002) argues that higher education is a crucial experience for individuals to be able to respond to a world that “is complex, interconnected, and more reliant on knowledge than ever before” (p. 4). The report points out that a specialized education alone is insufficient; college students must become “integrative thinkers who can see connections in seemingly disparate information and draw on a wide range of knowledge to make decisions” (p. 21). Similarly, the National Leadership Council for Liberal Education and America’s Promise report, *College Learning for the New Global Century* (Association of American Colleges and Universities, 2007), identifies not just intellectual and practical skills (including inquiry and analysis, critical and creative thinking) but also integrative, contextual learning as essential outcomes for education and employment.

Skagit Valley College, a college located in northwest Washington State, has embraced these concepts since 1986 when the college began offering curricular learning communities. The college has continued to

refine and improve the learning community program through classroom assessment, evaluative research and studies, networking with other colleges and, most recently, participation in the Washington Center's National Project on Assessing Learning in Learning Communities.

Our team walked away from our two-year participation in this project with new friends, new skills, and new tools. Those tools include a protocol for assessing integrative learning, drawing in part from the work of Veronica Boix-Mansilla (2005), and a heuristic for designing integrative and purposeful assignments developed by Lardner and Malnarich (2008). Since the college had been engaged in activities to align general education outcomes, from course outlines to syllabi to outcomes assessment, a logical next step was connecting these two separate but valuable tools. Our goal was to create an uncomplicated yet comprehensive template for developing integrative learning assignments and assessments so that faculty and students could more easily recognize connections between disciplinary and interdisciplinary learning outcomes, assignments, and assessment criteria.

In this paper, we report on our initial efforts to create this framework. We argue that one of the crucial components of an effective learning community lies not just in placing two disciplines side by side, nor even in examining how one illustrates another, but exploring with students complex issues through the lenses of those disciplines. By grounding learning communities within specific disciplines—and most appropriately within the intersection of two or more disciplines—students have the opportunity to interact with others who have different disciplinary groundings and can begin the shift from reflexive responses to more nuanced analysis and purposeful action. It is our hope that by utilizing the template as a means of visually connecting assignments, assessments and outcomes will enhance our students' integrative learning experiences.

Skagit's Learning Communities and General Education

An early adopter of learning communities in Washington State, Skagit Valley College has required learning communities for the transfer degree since 1993. The primary goals of the requirement are to help students develop an understanding of the connections among disciplines and to support students' development in academic writing. To meet these goals and the needs of students, Skagit offers approximately 50 learning communities each year, generally pairs of courses, both developmental and college-level, in a variety of structures—fully collaborative, linked, federated, on-ground, and online.

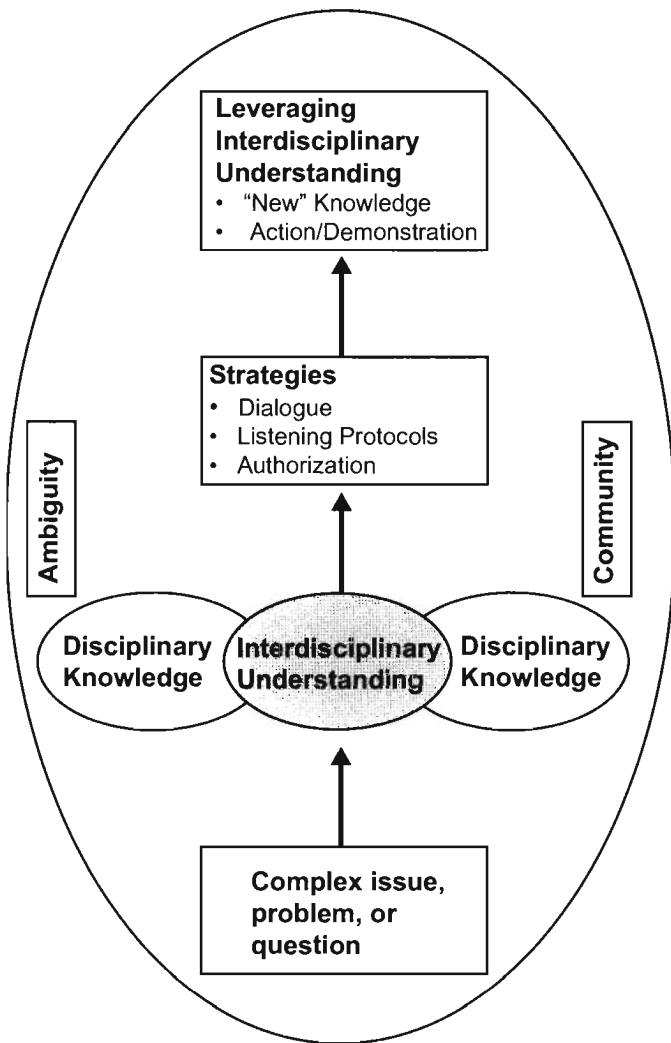
While the degree of integration varies, the expectation is that all learning communities will emphasize collaborative, interdisciplinary learning and that students will work together to prepare projects, panels, or papers that show their understanding of the connections between two fields of study (Dunlap & Pettitt, 2008).

In addition, the college recently completed a three-year review of its general education program to evaluate relevance and ensure measurability of the college's general education learning outcomes. As a result, Skagit Valley College has identified eleven learning values, each with associated student learning outcomes: application and integration, information literacy, critical thinking, communication, community and cultural diversity, global/local awareness and responsibility, individual awareness and responsibility, aesthetics and creativity, mathematical reasoning, scientific literacy, and technology. Since the adoption of these learning values, faculty have been working to integrate associated outcomes into their course outlines, syllabi, and assessments.

Leveraging Disciplinary Knowledge and Interdisciplinary Understanding

Central to Skagit's learning communities program is an understanding of learning communities as a set of practices that support and deepen learning. These best practices include curricular integration, collaboration, reflection and synthesis, as well as the experience of linking theory with practice and learning in community. To this end, students are given the encouragement and means to engage in strategies that connect diverse voices and viewpoints—their own and others'—for purposes of challenging, reworking, and transforming traditional boundaries of knowledge.

Our view of the complex process of integrative learning, described in Figure 1, embeds integrative learning in the overall context of ambiguity and community, both of which represent the socially mediated and socially constructed nature of interdisciplinary learning. On the one hand, community and community relationships offer the supportive and nourishing network that facilitates the questioning, exploration, and risk taking representative of interdisciplinary modes of inquiry. On the other hand, ambiguity represents the real world of multiple choices and available options, the selection of which implies certain consequences, outcomes, and access to further choices.

Figure 1. *Leveraging Disciplinary and Domain Knowledge*

A key element in the process of integrative learning is to begin with a significant question that intersects or bridges two or more disciplinary pools of knowledge—what we refer to as “interdisciplinary understanding” (the shaded area in Figure 1). In elaborating on the significant question that has been posed, we attempt to engage the student in three critical strategies that contribute to the leveraging of disciplinary understanding into a more complex understanding of the world through interdisciplinary-based lenses.

The first strategy—dialogue—places students in different groups to discuss specific aspects of the question at hand and how different perspectives shape perceptions and analyses. This strategy encourages students to think contextually, to deepen their understanding of disciplinary concepts through application, and to recognize interconnections and relationships.

A second strategy—listening protocols—helps learners move beyond accumulated pools of received knowledge toward broader understandings of difference and similarities. Opportunities to interact with others who have different views foster respectful interactions and the creation of a discourse community where learners can begin to shift from reflexive responses to more nuanced analysis. Through listening activity, students identify limitations and silences endemic to various perspectives and appreciate alternative ways of constructing realities and interpreting the world.

A third strategy—authorization—involves students in assessing different viewpoints. By taking the “best” pieces of the perspectives heard in the discourse community and patching them together, learners begin to shape and construct a communal synthesis. New patterns of connections between pools of knowledge are authenticated and, consequently, authorize and cumulatively strengthen a novel mosaic of competencies and perspectives related to the significant question initially posed by the group.

The end point of the application of these strategies is the emergence of a consensual, interdisciplinary knowledge base—a mini-community respectful of its members and confident of its own outcomes and collective viewpoint. The generation of interdisciplinary understanding through this ensemble of methods is not a step-by-step process. Rather, dialogue, listening protocols, and authorization are strategic activities that lead to a socially constructed and socially mediated system of information sharing that requires a more complex means for assessing student learning outcomes. Thus, there is a need for purposely designing assignment and assessment criteria with this synchronicity in mind.

The Study of Social Problems Learning Community

An example of a fully collaborative learning community that explicitly attempts to engage student learners in the aforementioned strategies is *An Introduction to the Study of Social Problems*, which combines Sociology 201 (Social Problems) with Psychology 205 (Social Psychology). In a

general way, this learning community attempts to sensitize students to the conditions necessary for maintaining a democratic way of life in the face of structural, technological, and institutional changes taking place in contemporary society. More particularly, *An Introduction to the Study of Social Problems* works to help learners construct an understanding of the roles that violence and inequality plays in United States society. The construction of this understanding is primarily driven by constantly shifting between the individual (psychological) and structural (sociological) levels in order to isolate possible causal factors capable of shedding light on why violence and inequality play the role they do in our society.

The focus of the learning community is on four highly readable paperback works: Sam Chaiton and Terry Swinton's *Lazarus and the Hurricane* (2000), Sonia Nazario's *Enrique's Journey* (2006), Tracy Kidder's *Mountains Beyond Mountains* (2003), and Elizabeth Kolbert's *Field Notes from a Catastrophe* (2006). These texts address issues such as racism and social justice, immigration, disparities in health care and global relationships, and human-produced environmental degradation, respectively. Taking each book in turn, students collectively discuss and research identified issues for each social problem, paying close attention to the source, consequences, implications, and possible solutions to each issue or identified problem at both individual and structural levels. These discussions take place in groups and as a class.

Simultaneously with the reading of each text, students develop skills for defining how one recognizes a social problem, analyzes social problems using scientific methods, and applies different sociological and psychological perspectives to social problems for interpretive purposes. Students are expected to progressively incorporate these skills into each of the writing requirements associated with the text under review. Each paper builds on the one before as students demonstrate increasingly sophisticated thesis statements as well as carefully reasoned, evidence-based conclusions derived from their analyses as they traverse the four major readings of the course.

More specifically, in the first essay focusing on the issues described in *Lazarus and the Hurricane* (Chaiton & Swinton, 2000), students are asked to identify and empirically establish a social problem through the use of a working definition of what constitutes a social problem. In the second essay, focused on *Enrique's Journey* (Nazario, 2006), in addition to establishing a social problem, students are asked to use different sociological and psychological perspectives in their analysis of the social problem. (For example, sociological perspectives might include functionalist, conflict, and interactionist; psychological perspectives might

include behavioral, psychoanalytic, and hierarchical.) In the third essay, after reading *Mountains Beyond Mountains* (Kidder, 2003), students add a third requirement, the use of formal causal models in their analysis. In the remaining essay, on *Field Notes from a Catastrophe* (Kolbert, 2006), students incorporate all the components of social problem analysis with increasing sophistication while addressing the writing requirements of the assignment.

While the writing assignments, primarily essays, are individually produced, they are informed by collective dialogue and insights. Toward the end of the *Study of Social Problems* learning community, students are invited to make their learning significant through some group community project or through sharing their expertise in a campus-wide social science symposium.

As noted previously, each written assignment is preceded by the formulation of a specific question or issue(s) based on the text under consideration. The assignment asks students to craft a response that not only specifies disciplinary outcomes (e.g., the structural or individual impacts of the problem or issues) but also to demonstrate integrative reasoning or an analysis that leverages disciplinary knowledge and interdisciplinary understandings into novel analytical, predictive, or inferential territory. Assessment of these skills is then based on both disciplinary learning outcomes and the integrative outcomes that make up Skagit's general education learning outcomes.

Template for Connecting Outcomes, Assignments, and Assessments

The template we designed for the *Study of Social Problems* learning community (see Table 1) is based on the belief that a guided, intentional process for connecting course outcomes, assignments, and assessments during course development must also be explicitly modeled so students can see the connections between their assignments, expected learning outcomes, assessment tools, and general education outcomes. The template provides a framework for identifying learning outcomes (e.g., knowledge, skills, and abilities) as well as measures for assessing both disciplinary and integrative outcomes, and includes the following elements:

1. The question or issue that drives course outcomes—in the case of the *Study of Social Problems* learning community that question is: “How do multiple disciplinary perspectives broaden and sustain our understanding of a complex social problem?”

2. A brief summary of the assignment from the syllabus (a more detailed assignment sheet is given to the student).
3. The first column identifies student learning outcomes. Each instructor in the *Study of Social Problems* has indicated both disciplinary outcomes and interdisciplinary outcomes. The integration outcomes in the last row of the first column are drawn from Skagit's integrative general education outcomes.
4. The second column indicates the specific knowledge, skills, and abilities that the student is expected to demonstrate in the assignment. In addition, the associated general education outcomes are listed. In the table, the outcomes are identified by a number—the actual language of the general education learning outcomes is included at the bottom of the table.
5. In the third column, the instructor identifies how knowledge, skills, and abilities will be assessed. This column is an abbreviated version of more elaborate rubrics developed by faculty as part of the general education program at the college. Faculty may use these, modify them, or create their own. A complete rubric for one of the learning outcomes addressed in this course assignment (Learning Outcome 4.2) is presented in Table 2. Table 3 illustrates the complete rubric for assessing interdisciplinary learning based on an assessment rubric for interdisciplinary writing developed by Boix-Mansilla, Duraisingh, Wolfe, and Haynes (2007).

Table 1. *Connecting Outcomes, Assignments, and Assessment in Integrative Experiences, Social Problems Learning Community*

Significant Question/Issue: How do multiple disciplinary perspectives broaden and sustain our understanding of a complex social problem?

Assignment: Using an assigned text on the immigration experience (e.g., Enrique's Journey), write a 5–7 page, well-researched essay that applies and describes how immigration would be treated from at least three major sociological and/or psychological perspectives.

Outcomes	Specific Knowledge, Skills, and Abilities Demonstrated	Assessment Tools – Rubric Criteria
<p>Disciplinary Outcomes – Sociology Identify the structures and institutions involved in or contributing to the existence of the social problem</p>	<p>Identify specific aspects of the family, court and justice system, local government funding mechanisms, etc. that impact or contribute to the social problem (Gen Ed Outcomes 5.2, 9.2)</p>	<p><i>Deficient (1):</i> Does not demonstrate awareness of specific structures related to a social problem <i>Developing (2):</i> Demonstrates a limited awareness of specific structures <i>Sufficient (3):</i> Analyzes structural characteristics or practices <i>Proficient (4):</i> Compares and contrasts structural characteristics or practices of several institutions</p>
	<p>Devise an explanation of how these structures and institutions are involved (Gen Ed Outcomes 2.2, 2.4)</p>	<p><i>Deficient (1):</i> Does not demonstrate contributions or influences of specific structures on a social problem <i>Developing (2):</i> Identifies a contribution or influence of a specific structure <i>Sufficient (3):</i> Identifies a source of a contribution or influence of a specific structure <i>Proficient (4):</i> Identifies the impact of the contribution or influence of a specific structure</p>
	<p>Develop skills to research data that support your view about how they are involved (Gen Ed Outcomes 1.1, 1.2, 1.3, 2.3, 10.3)</p>	<p><i>Deficient (1):</i> Does not identify key words or concepts, appropriate sources, or extent of information needed <i>Developing (2):</i> Frames a research question, but does not identify appropriate sources or determine extent of information needed</p>

<i>Table 1 (cont'd)</i>		
Outcomes	Specific Knowledge, Skills, and Abilities Demonstrated	Assessment Tools – Rubric Criteria
		<p><i>Sufficient (3):</i> Frames a research question, identifies appropriate and varied sources, and determines a point of view</p> <p><i>Proficient (4):</i> Frames a research question, determines extent of information needed, identifies appropriate and varied sources, determines point of view, integrates information to support the point of view, and cites appropriately</p>
<p>Disciplinary Outcomes – Psychology Identify how the social problem impacts the individual or interacts with the individual's physical, mental, and emotional development</p>	<p>Identify individual definitions of the situation (Gen Ed Outcomes 2.3, 6.4)</p>	<p><i>Deficient (1):</i> Does not demonstrate awareness of individual diversity within the social problem</p> <p><i>Developing (2):</i> Demonstrates a limited awareness of individual diversity</p> <p><i>Sufficient (3):</i> Analyzes the individual's definition of the situation</p> <p><i>Proficient (4):</i> Compares and contrasts individual's definition of the situation with others' definitions</p>
	<p>Identify the processes used by the individual to assess context and implement behaviors appropriate to the context (Gen Ed Outcome 4.2)</p>	<p><i>Deficient (1):</i> Does not demonstrate awareness of the processes used by individuals to assess their situation</p> <p><i>Developing (2):</i> Identifies at least one process by which a person assesses his or her situation</p> <p><i>Sufficient (3):</i> Identifies a variety of processes by which a person assesses his or her situation</p>

<i>Table 1 (cont'd)</i>		
Outcomes	Specific Knowledge, Skills, and Abilities Demonstrated	Assessment Tools – Rubric Criteria
		<i>Proficient (4)</i> : Identifies a variety of processes and connects them to specific behaviors appropriate to the situation
	Determine how the individual tests his or her reality through impression management or image feedback (Gen Ed Outcome 2.4)	<i>Deficient (1)</i> : Is not able to identify reality testing mechanisms <i>Developing (2)</i> : Identifies a single mechanism for reality testing <i>Sufficient (3)</i> : Identifies how individuals use others as social mirrors to adjust behavior <i>Proficient (4)</i> : Compares and contrasts the efficacy of different impression management techniques in response to a social problem
Integration Outcomes Identify and evaluate the relationships among different perspectives within a field of study or among different fields of study (0.3) Integrate concepts and analytical frameworks from multiple perspectives to develop one or more of the following: more comprehensive descriptions, multicausal explanations, new interpretations, or deeper explorations of issues (0.4) Analyze and reflect upon insights gained from integrating multiple perspectives in a purposeful project or experience (0.5)	Sociological functionalist approach integrated with the psychological behavioral approach	<i>Naïve (1)</i> : No obvious sense of interegration of sociological and psychological perspectives <i>Novice (2)</i> : Minor efforts of integration present, but language of integration is used mechanistically <i>Apprentice (3)</i> : Makes a valid integration of interdisciplinary insights to generate understanding <i>Master (4)</i> : Integration is elegant, balanced and coherent, and results in novel or unexpected insights
	Sociological conflict approach integrated with the psychological conflict approach (e.g., Freudian psychoanalytic theory)	
	Sociological interactionist approach integrated with Maslow's hierarchical approach	

<i>Table 1 (cont'd)</i>		
Outcomes	Specific Knowledge, Skills, and Abilities Demonstrated	Assessment Tools – Rubric Criteria
Identify and evaluate connections and relationships among disciplines (2.7)		

General Education Outcomes Addressed

Disciplinary Outcomes—Sociology

- Identify diverse communities and their shared/competing interests and develop strategies for prevention and resolution of conflict (5.2)
- Demonstrate their understanding of the principles of scientific methods, analysis, and reasoning (9.2)
- Analyze issues and develop questions within a discipline (2.2)
- Evaluate decisions by analyzing outcomes and the impact of actions (2.4)
- Determine the extent of information needed (1.1)
- Access the needed information effectively, efficiently, ethically, and legally (1.2)
- Evaluate information and its sources critically (1.3)
- Identify, interpret, and evaluate pertinent data and previous experience to reach conclusions (2.3)
- Use technology appropriate to the context and task to effectively retrieve and manage information, solve problems, and facilitate communication (10.3)

Disciplinary Outcomes—Psychology

- Interpret and evaluate pertinent data and previous experience to reach conclusions (2.3)
- Use self-reflection to recognize and define a sense of self-identity in personal, social/gender, and/or cultural/global terms and in relationship to others (6.4)
- Understand, value, and respect human differences and commonalities as they relate to issues of those diverse perspectives (4.2)
- Evaluate decisions by analyzing outcomes and the impact of actions (2.4)

Table 2. *General Education Learning Outcome Rubric for Community and Cultural Diversity Outcome 4.2*

Learning Value Definition: Recognizing the value of human communities and cultures from multiple perspectives through a critical understanding of their similarities and differences

Learning Outcome: Understand, value, and respect human differences and commonalities as they relate to issues of race, social class, gender, sexual orientation, disabilities, and culture

Capability	Deficient (1)	Developing (2)	Sufficient (3)	Proficient (4)
1. Demonstrates awareness of diverse peoples and cultures	Does not demonstrate awareness of diverse peoples or cultures	Demonstrates a limited awareness of peoples and/or cultures other than one's own	Analyzes the characteristics or practices of a culture other than one's own	Compares and contrasts the characteristics or practices of several cultures
2. Identifies the contributions and influences of diverse cultures	Does not identify the contributions and influences of diverse cultures	Identifies a contribution and/or influence of a culture other than one's own	Identifies the source of a contribution and/or influence of a culture other than one's own	Identifies the impact of the contribution and/or influence of a culture other than one's own
3. Understands the economic, historical, political, or social influences on culture and/or exerted by culture	Does not demonstrate an understanding of the economic, historical, political, or social influences on culture	Demonstrates slight understanding of the economic, historical, political, or social influences on culture	Demonstrates an understanding of the economic, historical, political, or social influences on culture	Able to draw conclusions that demonstrate an understanding of the economic, historical, political, or social influences on culture
4. Builds knowledge of diverse ideas, values, perspective, and experiences	Acknowledges the existence of multiple points of view, but tends to discount alternatives to one's own perspective	Demonstrates an awareness of different ways of knowing, but little empathy	Demonstrates respect for multiple points of view and can clearly articulate those perspectives	Integrates various points of view into work and demonstrates an appreciation for the value of multiple points of view

Table 3. *Assessment Rubric for Interdisciplinary Learning in an Integrative Experience*

	Naïve (1)	Novice (2)	Apprentice (3)	Master (4)
1. Does the work include selected concepts and methods from two or more disciplinary traditions relevant to the purpose of the work?	<p>The work shows no evidence that <i>disciplinary</i> concepts or methods are used to address the work's purpose.</p> <p>Multiple concepts or methods may be considered, but these do not represent <i>disciplinary</i> insights or are not clearly related to the work's purpose.</p>	<p>The work includes two or more relevant disciplinary concepts and methods, but the connections between the included disciplinary insights and the purpose of the work are superficial or unclear.</p> <p>Crucial disciplinary concepts and/or methods may be missing.</p>	<p>The work includes concepts or methods from two or more relevant disciplines or fields. Selected disciplinary insights are clearly connected to the purpose of the work.</p> <p>Disciplinary insights that are tangential to the purpose may be present, or relevant perspectives missed.</p>	<p>The work includes concepts or methods from two or more relevant disciplines or fields. Selected disciplinary insights are clearly connected to the purpose of the work.</p> <p>No unrelated disciplinary insights appear and no crucial perspectives are missing.</p>
2. Is there an integrative device or strategy (e.g., a model, metaphor, or analogy)?	<p>The work may explore a topic in a holistic way, but connections are unclear and there is no obvious sense of integration.</p>	<p>The work may explore a topic in a holistic way, making valid connections across disciplinary or field perspectives; however, insights from different perspectives are not integrated coherently or effectively.</p> <p>In some cases, disciplinary concepts, theories, perspectives, findings, or examples are</p>	<p>An integrative device (e.g., a leading metaphor, a complex causal explanation) clearly brings disciplinary insights together in a generally coherent and effective way.</p>	<p>A novel, imaginative, or well-articulated integrative device (e.g., a leading metaphor, a complex causal explanation) is used to bring disciplinary insights together in a coherent and effective way.</p>

<i>Table 3 (cont'd)</i>				
	Naïve (1)	Novice (2)	Apprentice (3)	Master (4)
		placed side by side; connections and analogies are made, but no overall coherent integration is discernible.		
3. Is there a sense of balance in the overall composition of the work with regard to how the disciplinary perspectives are brought together to advance the purpose of the work?	The work shows an imbalance in the way particular disciplinary perspectives are presented in light of the purpose of the work (e.g., particular disciplinary perspectives are given disproportionate weight for no obvious reason).	The work attempts to balance perspectives, but this is built on artificial or algorithmic grounds rather than substantive ones (e.g., giving equal weight to each disciplinary perspective studied irrespective of its substantive relevance to the problem at hand).	Disciplinary insights in the work are generally balanced on substantive grounds in light of the purpose of the work. However, one or more aspects of the argument may be weakly addressed.	Disciplinary insights are delicately balanced to maximize the effectiveness of the work in light of the purpose of the work. The integration is elegant and coherent.
4. Do the conclusions drawn from the work indicate that understanding has been advanced by the integration of disciplinary views?	The work attempts to make connections across different perspectives, but these are unrelated to the apparent purpose of the work.	Minor efforts at integration are present or a language of integration is present, but is used mechanically to yield minimal advancement toward the intended purpose.	The work makes a valid integration of disciplinary insights to generate understandings linked to the purpose of the work. However, some obvious opportunities to advance the purpose of the work are overlooked or undeveloped.	The work takes full advantage of the opportunities presented by the integration of disciplinary insights to advance its intended purpose both effectively and efficiently. The integration may result in novel or unexpected insights.

Table 3 (cont'd)

	Naïve (1)	Novice (2)	Apprentice (3)	Master (4)
5. Does the student exhibit awareness of the limitations and benefits of the contributing disciplines?	There is no awareness of the differing contributing disciplines or fields or their benefits or limitations (e.g., the topic is only approached from a commonsense or very general standpoint).	There is awareness of which disciplines are being used, but there is no or only brief discussion of the limitations and/or benefits of the disciplinary contributions. There may be some misconceptions about how the disciplines are being used.	The benefits or limitations of the differing contributing disciplines or fields are sufficiently and clearly discussed. Some of the points made may be general or obvious.	The benefits and/or limitations of the differing contributing disciplines or fields are discussed clearly, insightfully, and in relationship to one another (e.g., students not only describe individual contributions but highlight how views complement, balance, add empirical grounding, or put into question insights from other disciplines included in the work).

Instructors guide students through the template, emphasizing the connections between their assignment, the expected outcomes, and how the students' work will be assessed. Students can apply the abbreviated assessment criteria in the template (third column in Table 1) when developing draft essays. Instructors could collaboratively assess the students' work using either the abbreviated criteria in the template or more comprehensive rubrics like those illustrated in Table 2 and Table 3. Alternatively, the students could assess one another's work using the abbreviated criteria during in-class, peer-review activities.

Conclusion

In a 1999 monograph, Cross describes the growing evidence that learning is about making connections—neurological, cognitive, social, and experiential—and contends that the connections resulting from curricular learning communities result in a more coherent curriculum and

increased student engagement. Bringing this notion into the development of assignments and assessments in the *Study of Social Problems* learning community has been the focus of the work described in this article. Our goal has been to create an uncomplicated yet comprehensive template for developing integrative learning assignments and assessments—one which allows both faculty and students to see the link between disciplinary and interdisciplinary learning outcomes, the assignments, and the assessment criteria.

These initial results suggest that the model presented in Figure 1 and the increased coherence between outcomes, assignments, and assessment depicted in Table 1 have enhanced interdisciplinary learning in this learning community and may be worthy of further development, refinement, generalization, and wider applicability.

Student work from the *Study of Social Problems* demonstrates identifiable, major differences from their early individual assignments to their final essays. Students can make connections they were unable to even ponder at the beginning of the course; some can leverage disciplinary knowledge to create novel ideas; and most have developed a sharpened and more coherent view of the issue or problem. The final essays and student evaluative summaries also indicate students are testing their understanding of their own experiences and determining how these experiences are related to the new connections they are making. These evidentiary findings are reinforced by the commentary received in evaluations administered at the completion of the course.

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Endnote

¹ Campuses in Mount Vernon, on Whidbey Island, and in several outlying areas enroll approximately 6,500 students (3,800 FTE) each quarter in credit courses leading to a university transfer degree or to a degree or certificate in one of 24 professional-technical programs. The student body is primarily white (80%), and one third are first-generation college attendees. As the region's Hispanic population grows, their participation in higher education is increasing.