Fostering Integrative Learning through Pedagogy*

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Abrupt climate change: what is it and how do we know it when we see it; why do we call it abrupt when it takes so long to happen; what makes something abrupt rather than gradual on a planetary scale; where did we get these data, and how do humans figure into this? These were only a few of the questions raised by students in a first-year interdisciplinary science course that fulfilled a general education requirement at Carleton College in Northfield MN. As discussion shifted from the younger dryas event (part of the course) to Greenland ice cores (planned as part of the course), to the rise of stable agricultural societies (not planned as part of the course), to the domestication of livestock (certainly not), students began comparing timelines learned in high school to anthropology textbooks nestled in backpacks. Not every question was answered, and not every answer was definitive, but for just under an hour these twelve students were using their knowledge gained in class, matching it with information from other classes, relating it to vacations they had taken and newspaper articles they had read, and committing themselves to outside unassigned research in an effort to make sense of their world and satisfy their own growing curiosity. This was a day of integrative learning, and it was the result of an intentional pedagogy designed to help students weave the often disparate elements of their college years into a fabric functional enough to wear yet fine enough to show.

It was early in the fall of 2005 and the course had only met a few times, but already the students were starting to get into the idea of abrupt climate change as something more complicated and complex than headlines and high temperatures. Although the students formed a fairly representative sampling of the campus community, the course was far from

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typical. In fact, it was part of a scholarly investigation designed by two chemists, team-taught at Carleton College by one of those chemists and a colleague from psychology, and never before offered. The professor was Tricia Ferrett, one of twenty-one Carnegie Scholars working to study and understand integrative learning during the 2005-2006 academic year. Her plan was to document and analyze "integrative moments" as they arose in the first-year seminar, and to try to come to some understanding of "how students connect ideas about conceptual change with our seminar topic and with prior beliefs about how, and how fast, change occurs in complex systems." To address this question she chose readings, planned discussions, built assignments, and tried to create "an integrative territory for examination of changes of mind in scientific communities, small groups, and individuals" (Ferrett, nd). In other words, she formed her pedagogy to meet the needs of her students and the objectives of integrative learning. This seems simple enough in the abstract, but it involves a complicated selection process, a dynamic tension between disciplinary content and departmental coverage, curricular planning and emergent awareness, the requirements of the course and the opportunities of the moment.

In thinking about integrative learning, the student is foursquare at the center (which is as it should be); it is the student's development, her capacity for meaning-making, her cultivation of the skills and abilities to make coherent connections that matter most. Huber and Hutchings point out that "integrative learning may also require scaffolding that extends beyond individual courses," and they mention portfolios and self-assessment rubrics as relevant strategies for students trying to make sense of an often baroque college experience (2006, p. 8). Often this is addressed through curricular and co-curricular activities and re-designs and cross-campus initiatives, all well-considered and many very successful. But in the drive to help students develop integrative habits of mind, through freshman seminars and capstone courses, study abroad and service learning, individual activities and dedicated assignments, we sometimes forget that a curriculum or a portfolio is only as effective as the pedagogies that support it. For while continually asking students to be more conscious of

their own learning, faculty often forget that such consciousness is also required of their own practice; some pedagogies are more likely to promote integrative learning, others are just as likely to prevent it. Opportunities for integration do not come easily; they require attention to pedagogies which address the goals of such learning, while also accomplishing course objectives. But neither is integration as difficult as it appears. Through careful pedagogical choices, combining new and established strategies, connecting the unique opportunities of context and content, attending intentionally to ecological changes within and between classrooms, faculty and students can create a more unified and fruitful educational environment where integration becomes more than just an exception, if not the rule.

Pedagogies of Integration

Some pedagogies of integration are strikingly familiar; tried-and-true approaches can serve several masters, originate from established or common knowledge. In fact many of the pedagogies that encourage integration also support other higher-order skills like the development of aesthetic literacy or critical thinking. A recent book on moral and civic education pointed out that while "conventional modes of instruction, especially listening to lectures and reading textbooks, are especially vulnerable to producing fragile and superficial understanding," student-centered strategies "represent models for teaching that if used well can support deep understanding, usable knowledge and skills, and personal connection and meaning" (Colby, Ehrlich, Beaumont, and Stephens, 2003, pp. 133-34). Among the pedagogies that engage students more deeply and thus lead to integrative learning, the most prevalent and prominent are service learning, problem-based learning, collaborative learning, and experiential learning (which might describe all of the above). These operate at multiple levels and find different manifestations in different courses: service and experiential learning can be course-wide strategies or selective units; problem-based and collaborative learning might be applied to single activities or assignments or represent a

more broad-based approach. What this suggests, among other things, is that if there are particularly powerful pedagogies of engagement there may also be signature pedagogies of integration. Carnegie Foundation President Lee Shulman has suggested that signature pedagogies share four distinctive features: they are pervasive, routine, habitual, and deeply engaging for students (2005, p. 22). Although the concept of signature pedagogies was developed through the Foundation's work on professional education, such features also appear in many pedagogies of integration and serve as a useful framework for understanding how such strategies achieve their integrative goals.

One approach that applies to integration also serves as a signature pedagogy of the liberal arts: the seminar. It is pervasive in that it holds prominence within the liberal arts curriculum, appearing in almost every integrative venue as an important strategy for developing collective and collaborative judgment. Its attention to a particular process of inquiry and discovery through the development of intellectual community and shared understanding are both routine and habitual practices. The seminar requires close reading and broad knowledge, active engagement and connection between not only the ideas and experiences of one student, but the thoughts and insights of an entire class. An often disciplinary but just as easily interdisciplinary venue, the seminar integrates information and analysis, text and dialogue, critique and community, while serving as a forum for experimentation and inquiry. In the Carleton College example mentioned above, the seminar format provided students and faculty with opportunities for engagement and expansion that other pedagogical forums might not have allowed; the class became a vehicle for integrating knowledge, with students making autonomous connections across courses, between experiences, and throughout their own lives. This pedagogy is based on a communal approach to learning that transcends the assignment, operating at the level of course objectives and educational philosophy; when at its best, this is a pedagogy that puts inquiry at the center of the entire course, as a vehicle for the entire class.

Likewise, inquiry is at the heart of problem based learning. Described as "a pedagogy that asks students to work in small groups to investigate and solve teacher-designed real-world problems in the discipline they are studying," problem based learning is a favored pedagogy for many disciplines, and can achieve a number of important outcomes from community building to critical engagement, operating at the activity and assignment levels but contributing to the overall structures of the course (Sommers, nd). An important pedagogy of integration, problem based learning is a way for students to focus attention on common issues, themes, or tasks, working together to share insights and ideas as well as strategies and answers. As students encounter new methods and knowledge within the context of a given course, specified problems provide opportunities to experiment and "play" with existing perceptions in context. In one example from English, Jeffrey Sommers at Miami University Middletown asked students to engage with the following question: "When reading a book set in the past, how are readers supposed to know what to trust or believe, especially when on some occasions they encounter actual persons, places, events from history and on other occasions are reading about cultures with which they are unfamiliar?" (Sommers, nd) Other approaches to the "real-world problems" of particular disciplines might range from season attendance trends in theatre, intermarriage outcomes in biology, or the distribution of pollution credits in economics. Problem based learning would appear to be most promising as a pedagogy of integration when applied to the gathering of both internal (class-based) and external (real-world-based) knowledge in support or defense of a collective premise and to solve a shared problem.

The importance of real-world integration is nowhere more evident than in emergent pedagogies that grow out of students' need for engagement with an occasion or an issue that trumps whatever might be on the syllabus. This has certainly been the case in recent years, when the Challenger disaster, the killing of Matthew Sheppard, or the events of September 11th rose to prominence in classrooms, demanding attention and consideration regardless of the original course theme or disciplinary focus. But in order to be seen as

signature, emergent pedagogy must be not only an incidental approach to a "teachable moment" or "learning opportunity," rather it must be an integral part of a pedagogical commitment to student voice, social engagement, critical inquiry, and integrative learning. Embracing emergence as a course strategy is difficult on many levels, from the logistical to the emotional, but the benefits can be profound in terms of deep student engagement and the sense of ownership which is at the heart of intentional (and perhaps all forms of important) learning. Furthermore, the new media environment which has fast become a part of all campus cultures and most students' lives makes it possible to integrate emergent issues into virtually any course, from biology to economics, music to women's studies, through active and aggressive use of the internet and its vast storehouse of useful information and misinformation. In one instance, a pre-law course on free speech at CSU Monterey Bay made use of Web logs (blogs) to provide students opportunities to contribute and comment upon evidence of free speech in question and conflict in contemporary society. This attention to course content within the context of "breaking news" provided students with a confluence of material and an open-ended occasion for connection, as well as an unexpected venue for their own voice (Reichard, nd). Thoughtful integration of information systems, used with a critical eye and a careful hand, provide immense opportunities for emergent and integrative learning in virtually any course.

In fact, the now ubiquitous on-line environment provides multiple opportunities for integrative learning through another signature pedagogy familiar to many faculties: the learning community. Variously described and documented, learning communities offer students a level of coherence and overlap which stand-alone courses often cannot achieve. Ranging from living learning communities that share dorm space as well as class and study time, to more limited course pairings which seek to align the pedagogies and outcomes of two dissimilar experiences, the strength of learning communities comes not from the milieu they create but the teaching and learning philosophy and practice they typically embrace. What makes learning communities of any stripe succeed (as a persuasive, routine, habitual,

engaging pedagogy) is their internal mechanism for understanding and their establishment and championing of a seeing, thinking, knowing process that will stand students in good stead, continuing to influence their educational journey beyond the initial term or year of the community. These pedagogical strategies include cross-disciplinary reading and critical review, the assisted analysis of text and artifact from at least two separate yet triangulated perspectives, and the carrying of disciplinary skills both in tandem and in harmony from one learning landscape to the next. Perhaps most important, learning communities provide unparalleled opportunities for making connection within individual assignments, between course units, and among linked courses. In a recent investigation, Jack Mino at Holyoke Community College examined the ways in which students made a variety of conceptual connections by adapting the "think-aloud" protocol for harvesting evidence of student learning into a "link-aloud" that demonstrated evidence of student integration (Mino, nd).

Finally, the portfolio experience, when approached as pedagogical strategy, may be another signature pedagogy of integrative learning, especially in light of its flexibility and portability. Portfolios have long been used within courses to help students make connections and reflect on continuing and cumulative work. Some programs have embraced them as a way to link the work of often disconnected courses, and entire institutions have turned to portfolios as a way of capping two or four years of study. This was one of the findings which resulted from an investigation of program portfolios in the Hutchins School of Liberal Studies at Sonoma State University. As a result of a year-long inquiry project, students determined that although useful as a culminating repository of completed work, portfolios were not an integral part of the curriculum or of any one course. Their recommendations included explicit scaffolding of the portfolio process throughout the program, integration of portfolio objectives within all courses, and ongoing revision of the portfolio and its use at regular intervals (Gale, nd).

With the advent of electronic portfolios and on-line repositories of student work and experience, opportunities for integration become legion, if (an important "if") these tools for

learning are themselves integrated into pedagogical practice. The electronic portfolio is by definition engaging, as it involves a level of commitment, innovation, interpretation, and freedom that encourages active connection. But to make portfolio use a truly pedagogical experience, it must become routine, not just on campus and between courses, but within courses where it must go beyond its role as a place to gather evidence. Routine use and revision of portfolios within courses is the first step, providing the building blocks for habitual use beyond the initial site of connection. In order for this pedagogy to be taken seriously by students it must be used thoughtfully by faculty within the context of short- and long-term learning objectives. For unlike other pedagogies, the portfolio is not automatically pedagogical in its use and application in the classroom, is not always familiar to the faculty, and is not usually "owned" or managed by the teacher. Faculties working at institutions with portfolios require thoughtful instruction in not only the technologies of operation and access, but also the ways in which the philosophy behind the apparatus can be infused into teaching and learning in multiple, connected, and overlapping courses.

All of these pedagogies of integration, and many more, share certain qualities and elements that operate regardless of the level at which they are used. They acknowledge the realities of a changing world where disciplinary and curricular isolation are neither feasible nor desirable and in doing so blur the boundaries between areas of expertise, stretching teachers and students into new cognitive and affective arenas. Likewise, they embrace a level of expanding and expandable ambiguity uncommon in most pedagogical contexts but nonetheless valuable for understanding the rapid-fire reality of today's students and the ever-changing environment of the modern world. They require intellectual dexterity on the part of the teacher and the student, and the ability to speak to (if not from) a broad spectrum of knowledge and experience. They also embrace a commitment to dialogue (between ideas and issues as well as people and positions) and conflict (especially when the theory of the classroom meets the reality of the world) that requires the sharing of authority and control within the classroom. As a result of all these aspects, such

approaches necessitate a more flexible approach to assessment, a nimble attitude toward content and objectives, and the development of a culture of inquiry and evidence focused on often less-than-obvious evidence of student learning. For these pedagogies are student-centered, student-influenced, and often student-directed, shifting the center of gravity (and balance) from coverage and content to engagement and experience.

Beyond Pedagogy

All of these pedagogies (and more) provide opportunities for integration of student learning, but all of them also require attention to and instruction in assessment, curricular alignment, and faculty development, as shown by the experience of institutions participating in the Integrative Learning Project. It is well and good to say that we want our students to be integrative learners, but how will that integration be demonstrated and how will those demonstrations translate to the world of grades? Some institutions, such as the University of Charleston, are grappling with this question in terms of assignments, collecting and sharing the kind of faculty work that serves to prompt student integration. Others, like Michigan State University, are looking to special contexts and programs that can demonstrate integration for other campus units. Philadelphia University is redesigning its approach to capstone courses and their role in liberal learning, while La Guardia Community College focuses on electronic portfolios as integrated and integrative structures for student intentionality and coursework alignment. Still others, like Portland State University and Salve Regina University, are including issues of integration and assessment in larger conversations about general education, core courses, and student transfer as they strive for more coherence in their curricula.

The question of curricular coherence and alignment is always important, but nowhere more so than in the arena of integrative learning. For if colleges and universities are asking students to make sense of their experience do they not also then have a responsibility to be sensible about how that experience is framed and supported? This is at the heart of

Carleton College's efforts to identify and understand campus-wide cross-cutting literacies, but it is also evident in SUNY Oswego's innovative Catalyst Project. And of course, all of this is only possible when faculty are provided with opportunities to connect what they are doing in their own classrooms with the work being accomplished across the hall, the quad, the country, and the globe. Too often teachers are left to their own devices, asked to address overarching objectives and vaulted outcomes without proper guidance or assistance. If integrative learning is only as good as the pedagogy supporting it, then integrative teaching is only as successful as the educational development that makes it possible and then makes it work.

Perhaps this suggests that a focus on the pedagogies of integration is only the beginning, and that we also need an *integration of pedagogies* in support of deeper, more connected, and more inclusive student learning. In fact, just as integrative learning is the connection of ideas, experience, and inquiry, pedagogies of integration may be best understood and facilitated through collaboration among faculties, administrations, and, of course, students. This is precisely what has happened at the College of San Mateo where a new pedagogical strategy has appeared, one that braids long-standing and successful learning communities, attention to the goals and inquiry processes of the scholarship of teaching and learning, and growing administrative interest in and support for integrative learning. This vision has started a campus-wide dialogue about integrative learning, attracted new faculty to the idea of pedagogical collaboration, and most important, has helped students from different isolated course contexts begin to see and use the links between knowledge and meaning that had previously been unavailable to them.

Yet integrative learning, despite its current vogue, is not a new idea. Indeed many assignments ask students to connect material across multiple contexts, frequently course content is provided in coordinated units that seek to draw on real-world example and student experience, and linked or otherwise integrated courses have been the norm at many institutions for decades. But it is important to acknowledge that while integrative

learning may seem both logical and likely given the right institutional context, it is not always easy to develop an intentionally connected pedagogy that will address the needs of students, the hopes of faculty, and the desires of campus administrations. But neither is it an impossible task; much of what already occurs at classroom, program, and institutional levels strives for integration. The difficulties lie not in imagining integrative pedagogies, nor in combining innovative strategies for teaching and learning. Rather, the key to success can be found in communication, collaboration, and connection within and between institutions. For one of the most useful lessons to come from the AAC&U/Carnegie Integrative Learning Project and its facilitation of partnerships between ten very different campuses is the way that inter-campus inquiry and exploration can yield cross-campus pedagogical innovation. When faculty are given the opportunity to collaboratively re-think their pedagogy, when institutions are rewarded for inventive structures that scaffold pedagogical innovation, and when national attention is turned to the questions of and strategies for integrating student learning, the results become greater than the sum of their parts.

While integrative learning is by no means the be-all and end-all of undergraduate education, it is certainly a central feature of liberal learning, a core capacity for academic success and life-long meaning-making. It has the ability to change the way students see the world and make sense of the often overwhelming information, knowledge, and experience they encounter on a daily basis. Yet in order to make a difference it must be taught with intention, and become an integral part of a pedagogical commitment. What makes this not only desirable but likely, is that it is already central to many teachers' ideas of a good education, relying and building on the work underway in many classrooms. In fact, the key to integrative learning and the pedagogies of integration may be found in the realization that faculty not only *should* be doing his kind of work, and *can* do this kind of work, but that they often *are* scaffolding deeper student learning, and teaching in ways that can ultimately lead to connections that matter and persist.

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