CURRENTS IN TEACHING AND LEARNING

VOL. 4 NO. 1, FALL 2011

Faculty Learning: Beyond the Buzzwords

Josna Rege

It will come as no surprise to *Currents* readers that in recent years, institutions of higher education—and consequently, teachers in these institutions—have come under ever-increasing pressure to produce measurable improvements in their students' results, or to "assess learning outcomes." As the emphasis on assessment has increased, so has the pressure upon teachers to engage in their own learning in order to improve student learning. We have all heard numerous acronyms and buzzwords such as SLO's (Student Learning Objectives), LEAP (Liberal Education and America's Promise), and a host of HIP's (High-Impact Practices) with which faculty are required to be conversant so as to serve the needs of their twenty-first century students and meet the accreditation standards for their institution.

There's nothing inherently wrong with the idea that teachers should actually teach their students something, and in such a way that students are better prepared to succeed in a changing world; neither is there anything wrong with faculty development: the ideas that teachers should update their teaching practices and be accountable for student learning. These are all eminently good things. However, it can be frustrating for faculty that the pressure to deliver better learning outcomes is not necessarily accompanied by the concomitant support required to facilitate faculty learning and to implement teaching improvements. Furthermore, as Cheryl J. Daly points out in the first essay in this issue, "Faculty Learning Communities: Addressing the Professional Development Needs of Faculty and the Learning Needs of Students," there is a paucity of research into just how faculty development programs can most effectively foster faculty learning and support student success. Daly seeks to identify the most effective elements of such programs in her study of faculty learning communities (she refrains from collapsing the term into an acronym) at seven different colleges and universities.

The second essay in this issue also seeks to go beyond the acronyms to present both faculty and administrators with a paradigm for effective pedagogy and measurable learning objectives—in this case in WAC/WID: Writing Across the Curriculum and Writing in the Disciplines. In "A 'Layered Literacies' Framework for Scientific Writing Pedagogy," J. Harrison Carpenter offers faculty in the sciences who teach writing in their disciplines and instructors of Writing Across the Curriculum a means of simultaneously teaching

students to master and to deconstruct the conventions that create knowledge and structure communication in their disciplines.

In our first teaching report, "Designing Learning Lessons for the University Classroom," Mickey Kolis, Emily Krusack, Angie Stombaugh, Robert Stow, and Gail Hanson Brenner present the process and outcomes of an interdisciplinary faculty learning community in action. Noting that "most university professors receive little-to-no teacher training," the members of their learning community, composed of faculty in their first five years of teaching, examine and implement an instructional model "flexible enough to fit each of [their] disciplines," and subsequently reflect on its effectiveness in improving their teaching.

Our second teaching report, "Teaching Sexual and Gender Identity in College Courses," proposes a useful approach to a sensitive subject, demonstrating yet again how teachers across the disciplines can employ concepts and techniques that may once have been associated with a particular field. Authors Nathan W. Pino and Amber Blazek point out that despite the increased support for the civil rights of lesbian, gay, bisexual, and transgender (LGBT) persons, a majority of Americans still see these sexual orientations as abnormal. They make a case for addressing LGBT issues in courses on deviant behavior precisely to make the point that the concept of deviance is relative and socially-constructed. They further argue for their sociological approach to the subject in the fields of criminal justice, gender studies, psychology, education, and beyond, offering a variety of classroom exercises that could be adapted for use in courses ranging from humanities to health sciences.

Current Clips & Links features non-profit, open-access resources for teacher learning, sharing, and advocacy, including a site devoted to Faculty Learning Communities. In our occasional Call for Collaborators section, David Stoloff introduces his work in progress on electronic portfolios (or ePortfolios) as a tool for student formative assessment, and invites others to join a conversation "on the applications and evaluation of ePortfolios on their campuses" with a view to future collaborative publication. The book reviews in this issue, Tona Hangen's discussion of *The Learning Paradigm College* and Amy Ebbeson's review of *The Heart of Higher Education*, also discuss faculty learning, calling for new models of higher education and deep institutional change.

In "Teaching as Vocation," his 2012 Presidential Address, Modern Language Association President Russell A. Berman issued an urgent call for educators to "participate in the defense of education under assault." With slashed budgets, threatened programs, and mounting pressures on teachers, he insisted, the upholding of humanistic values is necessary, but not sufficient:

> we should explore ways to go further by developing new modes of practice. The objection that policies and budgets are in the hands of college or university administration should not excuse quietism on our part. The inertia of a bad reality cannot be grounds to forgo efforts to change it.

Through collaborative learning, teachers, however beleaguered, must develop and implement new modes and models of practice, for their students, their institutions, and the future of higher education itself.

Reference

Berman, R. A. (2012, January). "Teaching as Vocation." Presidential Address, Modern Language Association Convention, Seattle, Washington, U.S.A. http://www.mla.org/pres_address_2012

Faculty Learning Communities: Addressing the Professional Development Needs of Faculty and the Learning Needs of Students

Cheryl J. Daly

Abstract

The teaching and learning context has become increasingly complex in recent years, as faculty are challenged to keep pace with emerging developments in their fields and disciplines, adopt innovative pedagogical practices, and assess student learning outcomes. The rapid pace of change and the growing expectations associated with teaching and learning suggest that colleges and universities need to provide additional support for faculty development. Perhaps the most successful faculty development initiative in recent years has been the faculty learning community, which by design incorporates high levels of faculty involvement and ownership. This study examines how faculty learning communities at seven higher education institutions fostered faculty growth and development. Study findings suggest that faculty learning and growth were enhanced by specific dimensions of the faculty learning community, including autonomous self-directed activities, opportunities to identify and build areas of competence, and venues for relationship-building across departments and academic units. These elements can strengthen faculty learning and foster pedagogical improvements that promote student success.

Keywords

faculty development, faculty learning communities, self-determination theory, teaching improvement, organizational change in higher education

Cheryl J. Daly is Assistant Professor at Western Carolina University, where she directs the master's program in College Student Personnel. Her research agenda examines organizational leadership and diversity issues in higher education, college teaching and learning environments, and the work environments for faculty and student affairs professionals. Recently, she co-authored a book chapter titled "Engaging Faculty in the Process of Cultural Change in Support of Diverse Student Populations" for S. Museus and U. Jayakumar's anthology, *Creating Campus Cultures: Fostering Success Among Racially Diverse Student Populations*, published by Routledge (2011).

Introduction

The teaching and learning context has become increasingly complex in recent years, as faculty are challenged to keep pace with emerging developments in their fields and disciplines, adopt innovative pedagogical practices, and assess student learning outcomes. Public concerns about the quality of undergraduate education and external pressures for accountability and efficiency put further pressure on faculty to generate positive outcomes for students (Morphew & Eckel, 2009; Schuster & Finkelstein, 2006). Faculty are also called upon to support and mentor students from diverse cultural backgrounds, as well as foster academic skill development for students who enter higher education

with lower levels of preparation for college-level work (Kingston-Mann & Sieber, 2001; Stanton-Salazar, 1997).

The rapid pace of change and the growing expectations associated with teaching and learning suggest that colleges and universities need to provide additional support for faculty development. In response, institutions have created a range of structures, policies, and programs to promote the ongoing growth and development of faculty (Cox & Richlin, 2004; Sorcinelli, Austin, Eddy, & Beach, 2006). Centers for teaching and learning, for example, have been created on many campuses to provide workshops, forums, and seminars on pedagogy and curriculum development. Other institutions have promoted faculty involvement through the scholarship of teaching and learning with a specific emphasis on identifying teaching practices that are well-suited to the needs of students on a particular campus. Still other institutions rely on more individually oriented methods to promote faculty development; including sabbaticals, release time, and grants to attend conferences.

Despite the importance of faculty development for promoting positive outcomes in teaching and learning, the effectiveness of such programs is mixed. In a national survey of community colleges, Murray (1999, 2001) found that faculty did not believe that the faculty development programs on their campuses were addressing the teaching and learning issues that were most important in their work lives. This study also found that faculty development programs often lacked clear goals and were not well attended by the faculty. Furthermore, Akerlind (2005) has argued that faculty development programs have been shaped more by the priorities of administrators rather than by the needs of faculty members. If the goals and activities of faculty development programs are not aligned with the needs and interests of faculty members, then the effectiveness of these programs is likely to be compromised. Specifically, additional research indicates that the effectiveness of faculty development programs depends on a high level of faculty involvement and ownership of the faculty development process (Eble & McKeachie, 1985; Sorcinelli, 2002).

Perhaps the most successful faculty development initiative in recent years has been the faculty learning community, which, by design, incorporates high levels of faculty involvement and ownership. Cox (2004) defines a faculty learning community as a group of faculty members "who engage in an active, collaborative, yearlong program with a curriculum about enhancing teaching and learning and with frequent seminars and activities that provide learning, development, the scholarship of teaching, and community building" (p. 8). These groups may focus on the needs of a particular cohort of faculty members, such as early-career faculty, or direct their attention to a particular topic or issue, such as service learning or writing-across-the-curriculum. The faculty learning community process typically includes frequent seminar-style meetings where faculty discuss readings and research that pertain to teaching and learning. Faculty participants may also experiment with new teaching practices in their classrooms or engage in self-designed teaching projects, while obtaining advice, feedback, and support from their faculty learning community colleagues.

A growing body of research has begun to document the effectiveness of faculty learning communities. Beach and Cox (2009), for example, conducted the first national survey of the impact of faculty learning communities on faculty self-reports of student learning outcomes. Across all six universities in the study, faculty reported that they were using new pedagogical approaches as a result of their participation in faculty learning communities. Faculty also reported that these teaching practices were paying off in terms of improvements in students' critical thinking skills, ability to think holistically, and capacity to synthesize and integrate

information and ideas, among other learning outcomes. Similarly, O'Meara (2005) examined the outcomes of a faculty learning community that was comprised of faculty in science, engineering, and mathematics from seven partnering colleges. The year-long program sought to foster active and collaborative learning in science, engineering, and mathematics courses. Faculty members' self-reported teaching effectiveness improved as a result of participating in this learning community. Faculty also reported that they were more confident in their teaching, had more knowledge of how students learn, and were more willing to experiment with new teaching approaches in the classroom. Other research indicates that participation in a faculty learning community can improve scholarly productivity (Searby, Ivankova, & Shores, 2009), build stronger connections between students and faculty (Dee & Daly, 2009), and foster higher levels of collegiality in the institution (Kingston-Mann & Sieber, 2001).

Although research has documented the characteristics and outcomes of faculty learning communities, few studies have examined the processes through which faculty members learn and develop in these groups. Many scholars are calling for more research on the learning processes associated with faculty development. Alstete (2000), for example, argues that the field needs more theory-building research to explain how faculty grow and develop across their career. Similarly, Neumann (2005) characterizes faculty work as a learning process, which involves continuous refinement and change in faculty practices. Given that faculty development programs are intended to be venues that foster faculty learning, additional research is needed to understand how such programs support faculty members as learners.

The purpose of this study is to examine how faculty learning communities at seven higher education institutions fostered faculty learning and development. The theoretical perspective of this study is grounded in social cognitive theory, which emphasizes the importance of motivation and desire in the process of learning (Bandura, 1986). This theoretical perspective examines the interaction between individual needs and drives and environmental conditions, including the organizational contexts in which individuals work. Thus, a social cognitive perspective enables this study to examine the relationship between faculty needs and the conditions for learning that are provided by the colleges and universities in which they work.

Few studies have attempted to explain why faculty learning communities seem to be effective venues for promoting faculty growth and development. Carter, Nugent, Reardon, Rhodes, and Smith (2010) attempted to explain the individual and collective learning processes associated with a two-year faculty learning group in which the focus was on teaching with technology. An important finding in this study was the interplay between self-directed learning and the social context of the faculty learning community. Faculty pursued their own individual interests in experimenting with new forms of instructional technology, but in order to extract meaning from their individual experiences, the faculty reported that they needed interactions with other members of the faculty learning community. As faculty experimented individually with new technologies, they shared their stories of success and failure. In this way, individual autonomous projects led to greater collective learning among the faculty. Faculty were influenced and inspired by the learning of others. Also, through interactions with the group, faculty came to understand more clearly what they had learned in their own individual projects. Carter et al. (2010) concluded that faculty learning communities can embrace the principles of adult learning theory. These principles emphasize a process of self-directed learning in the context of peers, role models, and other collaborators. The Carter et al. (2010) study is one of the few publications that focus on the learning processes within

faculty learning communities. Therefore, more research is needed to understand how faculty learning communities can foster growth and development for faculty.

Description of the Faculty Learning Communities

Seven institutions (including three public universities, two private liberal arts colleges, and two community colleges) participated in a grant-funded project to implement faculty learning communities on their campuses. The grant also funded a research project on the experiences of the faculty in these learning communities. The participating institutions were the University of Massachusetts Dartmouth, Lesley University, Rhode Island College, University of New Hampshire, Massasoit Community College, Middlesex Community College, and Emmanuel College. Institutional names and academic disciplines were removed from the study data to maintain confidentiality for the individual participants. Dr. Jay Dee at the University of Massachusetts Boston was the principal investigator on the grant, and Dr. Cheryl Daly (the author) served as the lead researcher on the project that studied the experiences of the participating faculty. The faculty learning communities had a dual purpose: to help the faculty participants improve teaching and learning in their courses, and to foster campus-wide change on issues related to teaching and learning.

The topical focus for all seven learning communities was college student diversity, including race, ethnicity, gender, age, social class, religion, culture, sexual orientation, linguistic background, academic skills, and learning styles. College student diversity is an important issue for faculty development programs. Research indicates that students achieve significant intellectual growth when they encounter a diverse student body and faculty (Chang, 1999; Hurtado, 2001). Diversity-related activities and experiences with multicultural curricula can improve learning outcomes for all students, regardless of racial or ethnic background (Hurtado, 2001; Pascarella, Palmer, Moye, & Pierson, 2001).

The seven institutions that participated in this project were identified through a regional faculty development network. Institutional membership in the regional network was viewed as an indicator of administrative support and commitment to faculty development. As a first step in site selection, the principal investigator for the grant examined websites and institutional documents to characterize the type and extent of faculty development programs offered by each of the 45 institutions that were members of the regional network. Institutions with limited faculty development activity were eliminated from consideration. Furthermore, institutions that were already convening faculty learning communities were eliminated from consideration, because the purpose of the grant was to foster the development of new faculty learning groups. Next, the principal investigator identified community colleges, liberal arts colleges, and research universities with extensive faculty development offering: the purpose of this selection strategy was to study the phenomenon in three different types of institution. Finally, the principal investigator met with the chief academic officers at the selected institutions to determine the institution's willingness to participate in the project.

Each of the seven institutions issued a call for volunteers to participate in the faculty learning community. The participants were selected in consultation with a senior faculty member at each institution who served as a liaison to the project. Selection criteria included variety in academic discipline, diversity in personal characteristics, range in years of teaching experience, and an expressed desire to engage in changes to improve teaching and learning. A total of 51 faculty members participated in the learning communities at the seven selected institutions. Rather than rely on outside experts or internal faculty development staff members, the learning communities were led by

a faculty member at each participating institution. The intent was to foster leadership development among the faculty, and build institutional capacity for ongoing pedagogical and curricular change.

Grant funds were used to provide release time for the faculty to participate in weekly seminar meetings, engage in readings and research, and attend related events at the other participating institutions. Faculty members met weekly over an entire semester to engage in professional reflection and initiate changes in their courses to improve curriculum and pedagogy. Each faculty learning community also conducted a campus-wide needs assessment to identify important, institution-specific issues regarding student diversity. Based on the needs assessment findings, the faculty groups designed organizational change projects that sought to improve the teaching and learning environment for diverse students. Faculty participants continued to meet over a second semester to implement these projects. Some examples include the following:

- Faculty participants at a liberal arts college worked with staff in the student affairs division to establish the college's first organization for lesbian, gay, bisexual, and transgender (LGBT) students.
- Faculty participants at a public university established an annual student-faculty research conference, where presenters discussed research they conducted on issues regarding race, ethnicity, and cultural difference.
- Faculty participants at a community college developed a handbook and website which identify diversity initiatives and resources that address specific teaching and learning issues (for example, assessing writing for non-native speakers of English and addressing the learning needs of students with disabilities).
- At another community college, faculty participants established a center for pedagogical innovation, which provides ongoing support for faculty who seek to adopt new teaching practices in their courses, as well as for faculty to conduct research on teaching and learning.

Research Methods

After the one-year project concluded, all faculty learning community members were invited to participate in a 60-minute interview to discuss their experiences in the seminar, as well as their overall growth and development as a faculty member (see Appendix for the interview questions). The interview protocol relied on open-ended, semi-structured questions, which allowed the study participants to define the concepts of growth and development from the vantage point of their own interpretations and experiences (Kvale, 1996; Strauss & Corbin, 1998). This qualitative, inductive research design was well-suited for the purpose of understanding individual experiences in the emerging social system of a faculty learning community, which itself is embedded in the complex system of the higher education institution in which it operates (Bess & Dee, 2008).

Forty of the 51 faculty members agreed to participate and were interviewed in-person by the author of this study. The author was not affiliated with the implementation of the project, which minimized the potential for the interview responses to be biased or conditioned by the relationship between the faculty participants and the principal investigator for the grant.

Tape recordings of the interviews were transcribed by the author and then analyzed using a process of open and axial coding. Open coding refers to an inductive process in which the researcher examines the total database for broad themes and constructs that are relevant to the purpose of the study (Creswell, 2007). The identified themes and constructs then serve as codes for categorizing the data. In this study, the open coding process identified a set of themes related to faculty growth and development, as well as a set of

factors in the organizational context that fostered or impeded faculty learning, as reported by the study participants. The open coding categories that pertained to faculty growth and development included pedagogical change, professional autonomy, collegiality, trust, self-knowledge, and reflection. The categories that pertained to the organizational context included administrative support for faculty learning communities, support from departmental colleagues, and institutional spaces and venues to connect and share knowledge with other faculty.

Creswell (2007) states that axial coding frequently follows the use of open coding. Axial coding refers to a process by which the researcher identifies connections between various data categories and the central focus of the study. Strauss and Corbin (1998) explain that the process is described as "axial," because the researcher connects each data category to the axis of a central phenomenon. "The overall process is one of relating categories of information to the central phenomenon category" (Creswell, 2007, p. 237). Through axial coding, the author linked various concepts associated with participation in a faculty learning community to the central phenomenon of this study, faculty growth and development. As evidence was compared across cases, the author determined that the association between participation in a faculty learning community and the experience of faculty growth and development could be explained through the framework of Deci and Ryan's (2000) self-determination theory. A subsequent round of axial coding confirmed that this framework had the capacity to explain the learning and growth that study participants attributed to their participation in the faculty learning communities.

Study Findings

Study findings indicated that faculty learning and development occurred through individual and social processes that enhanced these faculty members' motivation and desire to improve teaching and learning. The learning processes described by these faculty members can be explained using Deci and Ryan's (2000) self-determination theory, which focuses on the needs of individuals for autonomy, competence, and relatedness. According to Deci and Ryan , autonomy refers to an individual's ability to self-organize and regulate his or her own behaviors. Competence is defined as engaging in optimal challenges and experiencing mastery of both physical and social environments. Relatedness is described as feelings and experiences of attachment, security, and belongingness. The satisfaction of these three needs influences "development, performance, and well-being" (Deci & Ryan, 2000, p. 263). Accordingly, "people will pursue goals, domains, and relationships that allow or support their need satisfaction" (Deci & Ryan, 2000, p. 230).

It is important to note that the "needs" in Deci and Ryan's (2000) theory differ from the needs described in drive theories of motivation. Drive theories assume that deficits and unmet needs "push" an individual to act in order to satisfy the need or address the deficiency (Maslow, 1970). Deci and Ryan (2000), however, do not assume that individuals need to be pushed to act. Instead, they argue, people are "naturally inclined to act on their inner and outer environments, engage activities that interest them, and move toward personal and interpersonal coherence" (p. 230). Thus, the theory emphasizes individual agency and free will, rather than overcoming constraints on action (the emphasis of drive theories).

Deci and Ryan (2000) state that autonomy is essential to intrinsic motivation, which tends to be more salient for faculty members than extrinsic motivation (Austin & Gamson, 1983; Bess, 1998). Competence is also important to intrinsic motivation; "events such as negative feedback that foster perceived incompetence tend to undermine intrinsic motivation, whereas events such as positive feedback that foster perceived com-

petence tend to enhance intrinsic motivation" (Deci & Ryan, 2000, p. 235). Relatedness, according to Deci and Ryan (2000), plays a secondary role compared to autonomy and competence, and may constitute more of a "needed backdrop" for intrinsic motivation or a "sense of security" that makes the intrinsically motivated activity more robust (p. 236).

Autonomy

Faculty indicated that their learning was enhanced through the autonomy provided by the structure of the faculty learning community. Specifically, the structure provided the opportunity for the faculty members themselves to develop the curriculum for the learning community. The only stipulation of the grant-funded project was that each faculty learning community must promote the improvement of teaching and learning in the context of higher education diversity. There was no pre-determined curriculum or prescribed set of activities for the faculty participants to follow. Instead, the faculty participants designed their own campus needs assessment survey, analyzed the survey data, and designed new faculty development initiatives to improve teaching and learning on their campuses.

Given a high level of autonomy, faculty indicated that they were able to construct a learning environment that was consistent with their learning preferences. Rather than being assigned a prescribed set of readings and activities on the shared theme of diversity, faculty were able to customize their learning. Some faculty reported that they learn best through reading and reflection. The seminar sessions enabled them to select books and articles on diversity issues in teaching and learning, and then present what they learned from this literature to the larger group. Other faculty indicated that they learn best from data. In the seminar, they developed research projects that attempted to identify the effects of the inclusive teaching practices that they introduced in their classrooms. Some faculty noted that their learning was enhanced through group discussions and conversations with colleagues. As a faculty member at a liberal arts college explained, "To me, it seemed like this was going to be a group where I could connect with other people who were wondering about the same kind of questions. And that surely turned out to be true." The flexible structure of the faculty learning community enabled participants to customize their experiences so that they could focus on activities that best fit their learning preferences, whether those preferences were for individual reflection, data-based analysis, or collaborative inquiry.

Study participants reported that initially they found the autonomy of the community to be challenging, but they also noted how it compelled them to take ownership of their own learning process. As a participant at a research university explained, "I have to admit that I was really frustrated at first. I guess I expected [the principal investigator] to tell me what we were supposed to be doing. But I guess that was the point. To figure it out for ourselves. And I am glad that we did, because now we have this shared experience of figuring something out together." The autonomy granted to the faculty enhanced their sense of ownership of the faculty development process, and it enabled them to view faculty development programs as venues to advance their own professional learning goals. This new perspective displaced the view on some campuses that faculty development programs were mechanisms to correct deficient performance. "I am not sure if this was true on other campuses, but around here faculty development was seen as punishment for bad teaching," explained one participant at a research university. "You know, you get bad course evaluations, and your chair sends you to the center [for teaching and learning]. The seminar was completely different. We got to talk about good teaching, and that made me realize that I have something to offer to other folks on campus.

Competence

The self-directed learning process enabled faculty participants to identify new areas of competence in their teaching practice. In some cases, faculty were unaware of the level of expertise that they already possessed, and as a result, they did not necessarily view themselves as experts on teaching and learning. But this perspective changed over the course of the seminar, according to study participants. Faculty members indicated that participation in the faculty learning community enabled them to realize their "hidden talents" in teaching and have those talents recognized and valued by colleagues and administrators. As a faculty member at a liberal arts college commented: "I have no formal training in teaching, so I didn't have the vocabulary to talk about [teaching and learning], at least not in a very sophisticated way. I mean, I am still not sophisticated in my understandings of it, but at least I can share my ideas in a workshop and not feel like I have nothing to contribute."

Study participants indicated that their involvement in the faculty learning community enhanced their pedagogical knowledge, especially in terms of how collaborative practices can foster higher levels of student engagement and academic achievement in the classroom. Several faculty admitted that they were unfamiliar with concepts such as student engagement or that they lacked the knowledge about how to promote student-faculty interactions and collaborative learning in the classroom. They indicated that the faculty learning community provided a safe, confidential venue in which to admit their limitations and to acknowledge that they had more learn about becoming effective teachers.

The focus on diversity in these faculty learning communities also served to validate areas of competence developed by faculty who often felt that their work had been marginalized in their institutions. Several faculty described their extensive research agendas on issues of diversity, but they indicated that their expertise had been overlooked or minimized by their departments or by the institution as a whole. The faculty learning community initiative, in contrast, transformed faculty members' diversity-related expertise into an institutional resource that could improve teaching and learning. As a faculty member at a research university explained:

> I have devoted my whole professional life to these issues [diversity and inclusive teaching]. And I have always felt like I have been on the outside looking in. But this time [in the seminar], I was on the inside. I had a voice. My perspectives on [field of study] were valued by the rest of the seminar, and I think the administration is now listening.

Relatedness

Competence was intricately linked to relatedness. Personal connections with other learning community members, faculty at other participating campuses, and administrators on their own campus confirmed and reaffirmed areas of developing expertise. The faculty learning community also motivated a desire to extend connections to other faculty members on their campus, and provide them with similar faculty development opportunities. "I guess it was sort of like being baptized into a new religion," explained a community college participant. "Once you go through the seminar, it sort of sticks with you, maybe for life. Now I feel an obligation to go out and get other faculty involved in this work and to give them an opportunity to grow and develop in the same way that I did."

Study findings indicated that relatedness was not merely a backdrop to autonomy and competence, as Deci and Ryan (2000) suggested. Instead, growth and development through the learning community led to an increased desire to connect with colleagues for non-instrumental reasons. Faculty participants wanted other faculty to share in the learning community experience and develop stronger collegial connections. "This [sem-

inar] was the only thing that we had to bring faculty together across the whole university," noted one participant at a research university. "There were people in the seminar that I never met before, maybe saw them in the hallway, but that was it. Now we get together over coffee, talk about teaching and students. And these are people who aren't in my department. We still connect, and still want to connect. I guess that's what keeps me growing and developing as a teacher."

The diversity-related focus of the faculty learning community was also important in establishing relatedness. "One of the things that we started with was writing and presenting our educational autobiographies," explained a seminar participant at a liberal arts college. "That process helped me connect who I am as a person to how I teach. But it was also amazing to see the different experiences that people have had. To see how many were first-generation college students themselves. How many had to work menial jobs to get through college. How many had to endure ignorance and racism. That was so powerful, and I will never forget it."

Finally, an important dimension of relatedness involved trust. Seminar sessions were conducted under norms of confidentiality, and no information from the seminar was to be used in any evaluations of faculty performance. These guidelines established a climate of trust that contributed to open sharing of successes and failures in the classroom. Trust facilitated strong interpersonal bonds among learning community members, and strengthened their commitment to support each other's growth and development.

Findings are limited in that faculty volunteered to participate in the learning community, and may have already had strong motivation to improve their teaching. Interviews revealed, however, that participants were generally dissatisfied with their institution's current array of faculty development options. Many reported feelings of burnout, mental exhaustion, or declining motivation prior to entering the learning community.

Conclusions

This study examined the impact of semester-long faculty learning communities at seven institutions. Findings suggest that faculty growth and development can be promoted through activities that enhance autonomy, competence, and relatedness, which in turn contribute to strong intrinsic motivation to grow and develop as a faculty member. The faculty learning communities examined in this study provided opportunities for faculty members to self-organize and direct their own developmental activities (autonomy). The needs assessment processes and the research associated with the campus-wide change projects built competence in the areas of pedagogical and curricular reform. And the connections among the seminar members—built through trust and extended conversations over the course of an entire semester and supported with release time from other responsibilities—established a sense of relatedness and commitment to long-term collective goals for teaching improvement.

The study's findings indicated that specific dimensions of a faculty learning community can foster autonomous, self-directed learning among faculty participants. Because these learning communities did not follow a prescribed curriculum, the faculty participants had the opportunity to set the agenda for the faculty learning community, designing campus-wide change projects based on their work in the learning community. These projects enabled faculty to assume leadership roles in new initiatives on their campuses. Being able to lead a campus-wide initiative fostered a greater sense of autonomy because faculty were able to apply their expertise as they designed new structures and practices to address important issues of teaching and learning.

Several elements of the faculty learning community also contributed to a growing sense of pedagogical competence among participants. These faculty learning communities provided a confidential environment for faculty to discuss their challenges, but participants were

also able to identify and share information about teaching practices in which they had developed significant expertise. As faculty engaged in more reading and reflection regarding pedagogy, they reported that they began to realize that they had already been using teaching practices that research has shown to be related to student engagement and academic achievement in the classroom.

Finally, in terms of the relatedness dimension of the study findings, the faculty learning communities in this study were able to establish a climate of trust and open communication, which provided support for sharing experiences of failure and success in the classroom. These interpersonal experiences of trust led to the formation of durable relationships among colleagues. Faculty reported that they remained in contact with their colleagues, even after their participation in the faculty learning community had concluded.

The findings of this study contribute to the growing body of research on faculty learning communities as an effective mechanism to promote faculty development (Beach & Cox, 2009; Cox, 2004; O'Meara, 2005). While other studies have generally endorsed the faculty learning community model, this study has identified the specific components of a faculty learning community that participants perceive as most important to their professional learning. As college and university leaders seek to implement effective faculty learning communities, they should ensure that related structures and processes include autonomous self-directed activities, opportunities to identify and build areas of competence, and venues for relationship-building across departments and academic units. The role for campus leaders is to provide resources and support for the formation of faculty learning communities and then to allow the faculty members themselves to identify the goals and activities that will be most effective for their own learning.

Furthermore, this study demonstrated how topic-based faculty learning communities can promote specific types of pedagogical change. In this study, the topic of diversity served as an important organizing construct for fostering changes in faculty teaching practices. Other topic-based faculty learning communities could be organized around specific pedagogical practices, such as service-learning or the use of technology and social media in instructional delivery. Another approach would be to design faculty learning communities that focus on specific campus initiatives, such as writing across the curriculum, student engagement, student leadership development, or first-year experience programs. If colleges and universities design faculty learning communities that address a broad range of topics, then they may be able to attract high levels of faculty participation in and commitment to the ongoing process of pedagogical change and teaching improvement.

Acknowledgments

The project described in this article was supported by grant number 1040-0275 from the Ford Foundation. The contents of this article are solely the responsibility of the author and do not necessarily represent the official views of the Ford Foundation.

References

Akerlind, G. (2005). Academic growth and development: How do university academics experience it? *Higher Education, 50,* 1-32. doi:10.1007/s10734-004-6345-1

Alstete, J. (2000). *Post-tenure faculty development: Building a system for faculty improvement and appreciation*. San Francisco: Jossey-Bass.

Austin, A., & Gamson, Z. (1983). *The academic workplace: New demands, heightened tensions*. San Francisco: Jossey-Bass.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Beach, A., & Cox, M. (2009). The impact of faculty learning communities on teaching and learning. *Learning Communities Journal, 1*(1), 7-27.

Bess, J. (1998). Contract systems, bureaucracies, and faculty motivation: The probable effects of a no-tenure policy. *Journal of Higher Education, 69*(1), 1-22.

Bess, J., & Dee, J. (2008). *Understanding college and university organization: Theories for effective policy and practice*. Sterling, VA: Stylus Publishing.

Carter, T., Nugent, J., Reardon, R., Rhodes, J., & Smith, F. (2010). Self-directed learning in a faculty learning community: The FLC as "organizing circumstance." *Learning Communities Journal, 2*(1), 27-48.

Chang, M. (1999). Does racial diversity matter?: The educational impact of a racially diverse undergraduate population. *Journal of College Student Development, 40*(4), 377-395.

Cox, M. (2004). Introduction to faculty learning communities. In M. Cox & L. Richlin (Eds.), *Building faculty learning communities: New directions for teaching and learning, no. 97* (pp. 5-23). San Francisco: Jossey-Bass.

Cox, M., & Richlin, L. (Eds.). (2004). *Building faculty learning communities: New directions for teaching and learning, no. 97.* San Francisco: Jossey-Bass.

Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Deci, E., & Ryan, R. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.

Dee, J., & Daly, C. (2009). Innovative models for organizing faculty development programs: Pedagogical reflexivity, student learning empathy, and faculty agency. *Human Architecture: Journal of the Sociology of Self-Knowledge, 7*(1), 1-22.

Eble, K., & McKeachie, W. (1985). *Improving undergraduate education through faculty development: An analysis of effective programs and practices.* San Francisco: Jossey-Bass.

Hurtado, S. (2001). Linking diversity and educational purpose: How diversity affects the classroom environment and student development. In G. Orfield (Ed.), *Diversity challenged: Evidence on the impact of affirmative action* (pp. 187-203). Cambridge, MA: Harvard University Press.

Kingston-Mann, E., & Sieber, T. (Eds.). (2001). *Achieving against the odds: How academics become teachers of diverse students.* Philadelphia: Temple University Press.

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.

Maslow, A. (1970). *Motivation and personality.* New York: Harper & Row.

Morphew, C., & Eckel, P. (Eds.). (2009). *Privatizing the public university: Perspectives from across the academy.* Baltimore: Johns Hopkins University Press.

Murray, J. (1999). Faculty development in a national sample of community colleges. *Community College Review, 27*(3), 47-64.

Murray, J. (2001). Faculty development in publicly supported two-year colleges. *Community College Journal of Research and Practice, 25*(7), 487-502.

Neumann, A. (2005). Taking seriously the topic of learning in studies of faculty work and careers. In E. Creamer & L. Lattuca (Eds.), *New Directions for Teaching and Learning, No. 102* (pp. 63-83). San Francisco: Jossey-Bass.

O'Meara, K. (2005). The courage to be experimental: How one faculty learning community influenced faculty teaching careers, understanding of how students learn, and assessment. *Journal of Faculty Development, 20*(3), 153-160.

Pascarella, E., Palmer, B., Moye, M., & Pierson, C. (2001). Do diversity experiences influence the development of critical thinking? *Journal of College Student Development, 42*(3), 257-271.

Schuster, J., & Finkelstein, M. (2006). *The American faculty: The restructuring of academic work and careers*. Baltimore: Johns Hopkins University Press.

Searby, L., Ivankova, N., & Shores, M. (2009). Capable, contributing, and connected: New professors find support through a peer learning community. *Learning Communities Journal, 1*(2), 97-119.

Sorcinelli, M. (2002). Ten principles of good practice in creating and sustaining teaching and learning centers. In K. Gillespie, L. Hilsen, & E. Wadsworth (Eds.), *A guide to faculty development: Practical advice, examples, and resources* (pp. 9-23). Bolton, MA: Anker Publishing.

Sorcinelli, M., Austin, A., Eddy, P., & Beach, A. (2006). *Creating the future of faculty development: Learning from the past, understanding the present*. Bolton, MA: Anker Publishing.

Stanton-Salazar, R. (1997). A social capital framework for understanding the socialization of racial minority children and youths. *Harvard Educational Review, 67*(1), 1 -38.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.

Appendix

Interview Questions

Background questions

» For how many years have you been a teacher in a college or university setting?
» How long have you been in your present position at this institution?

Job satisfaction and socialization

» What do you enjoy the most about your job?
» What do you enjoy the least about your job?
» How did you learn to do your job?

Growth and development as a faculty member

» How would you describe your growth and development as a faculty member?
    - Follow-up questions as necessary:
        - in relation to how you allocate your time to different tasks
        - in the extent of your knowledge base
        - in your approach in the classroom
        - in your work with colleagues

» What steps have you taken to facilitate your growth and development as a faculty member?

» Which experiences and events have been most important in your development as a faculty member? (turning points – be sure to probe for when these events occurred; how many years ago)

» Which people have been most important in your development as a faculty member? (turning points)

» Has your growth and development as a faculty member occurred primarily within your original academic field/discipline, or has it extended to other fields/disciplines?

» Do you experience any barriers to your growth and development as a faculty member?

Appendix

Interview Questions (continued)

Improvement and self-assessment

» What does "improvement" mean to you in the context of your teaching?
» How do you know if you are improving your teaching?

» Describe your learning process. How do you learn new things related to your teaching role as a faculty member?

Faculty Development Seminar

» Why did you decide to participate in the faculty development seminar? What did you hope to gain through this experience?

» What have been your personal learning outcomes from the faculty development seminar?

» As a result of your participation in the seminar, do you do anything differently in your teaching role?

» Did your seminar group engage in any activities that had an impact on the institution as a whole (that is, activities that had an impact beyond your seminar group)?

» Through the seminar, what have you learned about yourself?

» Through the seminar, what have you learned about your colleagues at your institution?

» Through the seminar, what have you learned about your students?

» Through the seminar, what have you learned about your institution?

Other comments

» Is there anything that we did not discuss that you would like to add? Is there a question that I should have asked, but did not?

A "Layered Literacies" Framework for Scientific Writing Pedagogy

J. Harrison Carpenter

Abstract

Composition scholars and writing teachers have recognized students' needs for multiple literacies, yet little attention has been given to the multiple literacies required for effective disciplinary writing. The lack of attention can be seen as problematic by looking closely at typical writing practices within any discipline; without a concise definition of the literacies required in such discourse communities, teachers of classes devoted to Writing Across the Curriculum (WAC) and Writing in the Disciplines (WID) may find it challenging to determine effective pedagogy. What is more, many disciplinary writing textbooks concentrate only on basic literacy skills, offering only minimal mention of others. Instructors of WAC/WID courses can enrich the learning experiences of their students by developing a coherent framework for teaching "layered literacies"—literacy practices integrated and interwoven into the texture of disciplinary values, beliefs, and norms. Such a framework may also help WAC/WID program administrators to develop rigorous goals across courses, and so to improve the effectiveness of their programs.

Keywords

layered literacies, multiple literacies, WAC, WID, pedagogy, disciplinary writing

J. Harrison Carpenter is Senior Instructor of Scientific Communication in the University of Colorado's Department of Ecology & Evolutionary Biology. He teaches scientific writing to undergraduate and graduate students and consults with faculty seeking to incorporate writing into their science classes.

Introduction

Compositionists have come to see things in sophisticated and complex ways; it was long ago decided that grammar is not the be-all and end-all of writing classes. Our approaches to composition pedagogy have also become more complex. Basic writing skills are not the foci of composition courses any longer, especially not in Writing Across the Curriculum (WAC) or Writing in the Disciplines (WID) programs. Yancey's (1998) pedagogical framework informed those teaching WAC/WID courses that our students' needed literacy skills are often pre-defined and that students merely reaffirm those definitions in classes that are designed to emphasize one specific type of literacy. Ergo, Yancey (1998) suggested that focusing attention on minimal writing tasks is asking students to "operate in a vacuum" (p. 173). Quite understandably,

faculty have not expressed interest in teaching WAC/WID courses narrowly focused on basic literacy.

In his review of WAC/WID pedagogy, Russell (2001) pointed out the instructors' recognition that, for their professional preparation, students need to learn how contextual issues influence their disciplinary writing norms; that is, how the "social life of the discipline" (p. 283) affects the writing practices of its members. Students not only need to know the disciplinary conventions of writing within their chosen fields of study, but also to see themselves as stakeholders in the outcome of activities undertaken by professionals within those fields. According to Russell (2001), students' acquisition of such a perspective requires that WID courses act as more than introductions to basic literacies. He maintains that such courses must also act as means by which those conventions can be deconstructed, in order to foster students' critical understanding of the "motives for and objectives of writing"—and, as an added benefit, to open students to "further involvement in a profession" by giving them opportunities to learn "the relation[s] between the ongoing activity of the profession and writing in the classroom...[thus enabling them to] enter and transform the profession" (p. 284-285).

Pedagogy that works toward professional preparation can be thought of as a strategy that enables students to acknowledge, and ultimately to master, their disciplines' communication standards. Russell (2001) particularly noted that communication motives, communicators' identities (ethoi), stylistic tools and processes both rhetorical and technological have been found to be important subjects for students to research as they prepare for their professional careers. As WAC/WID faculty have long known, merely teaching students how to organize a report, or the like, can make them assume that writing can be isolated from context (see Bizzell, 1988), and, by extension, that mastering the norms by which members of a discipline communicate with each other merely involves remembering a specific set of rules. If attempts are not made to help students see that literacies are dynamic and interwoven, differential and adaptable, students may have difficulties acquiring the savvy they will need as communicative professionals.

In order to successfully learn these communication standards, students need to focus attention upon such things as the recurrent rhetorical situations, genres and their organization, and practical publication standards within their professions; students looking to go on to careers in the scientific disciplines may be especially in need. It has been recognized that both scientists and their non-scientist audiences need multiple literacies in order to be successful at "doing" and/or "using" science (Hazen & Trefil 1991, p. 11), including knowledge of how scientific language affects how people understand, practice, apply, and critique science. The idea of teaching multiple scientific literacies—a collection of different but related reading and writing tasks—has come to the attention of science educators (deCaprariis, 1994; Hobson, 2000; Jenkins, 1994; Shamos, 1995; Wright & Wright, 1998), who recognize that scientists need to comunicate in many different ways. However, there has been very little said about the ways in which these literacies connect with each other, or how they are integrated and interwoven into the texture of disciplinary values, beliefs, and norms—layered into an overall understanding of scientific communication. WAC/WID educators are attentive to multiple literacies within the disciplines as well (Ambron, 1991; Angelo, 1997; Bamberg, 2000; Donnell, Petraglia-Bahri, & Gable, 1999; Poe, 2000; Russell, 1997), though this group has not often considered multiple literacies in the sciences specifically. Perhaps that is because there is no doubt that scientists require literate capabilities.

Modern scientific practice requires the use of multiple literacies, though the specific modes vary from field to field. In general, being a scientist requires one to be literate in the use of "tools and external aids,"

such as computers, laboratory equipment, and field instruments, to complete research projects. In addition, scientists must read and "draw upon private stores of information," including notebooks, published literature, online databases, and printed indexes and abstracts in the course of their studies. The ideal of consensus practice—in which "scientists change their minds through social exchanges[,] conversations with peers[, and] interactions with people" (Kitcher, 1994, p. 60-61)—suggests that scientists must be socially literate as well. Rhetoricians of science remind us that the adjudication of knowledge claims and persuasion are primary features of scientists' discourse and that the ability to critically analyze and respond to others' discourse is paramount in both these activities (see Prelli, 1989, pp. 83-100, and Taylor, 1994 for examples). Critical perspectives on scientific practice have increased awareness of the power structures inherent in science and the need for scientists to work for change within their own institutions (Dickson, 1993), as well as for a just application of scientific knowledge to civic problems (Greenwood & Riordan, 2001).

The diverse literacies required of scientists create demands upon teachers of scientific writing to define a framework for their pedagogy, but three problems may prevent them from doing so. First, no concise definitions of scientific literacies can be found. This lack is not the result of a dearth of literature on scientific practice; on the contrary, it is largely due to the diversity of literature available on the subject. Second, there is a dearth of clear ideas regarding how these multiple literacies can (or should) be integrated into our classrooms. Third, many scientific writing textbooks concentrate on basic literacy skills, offering only minimal mention of other important literacies. These problems are exacerbated by the fact that numerous teachers of scientific writing have not enjoyed rigorous preparation in its pedagogy, and many may in fact be teaching it with little or no coursework in the rhetoric or sociology of science. A coherent framework for integrating the literacies of science into their courses may help instructors of scientific writing to enrich the learning experiences of their students, as well as to help determine students' progress. Such a framework may also help WAC/WID administrators to develop rigorous goals across courses and so to improve the effectiveness of their programs.

In order to begin discussion of such a framework, this paper offers definitions of scientific literacies (adapted from Cook, 2002)—communicative, graphical, technological, and sociocultural—that scientific writing pedagogies may address. The paper then provides an illustration, through an extended example, of how this framework can be applied to everyday teaching situations.

Scientific Literacies

In general, WID pedagogy has traditionally worked within a single framework, designed to teach students the rhetorical tools needed to become active participants in the lives of their professional and/or academic fields. This framework makes use of rhetorical genre theory as represented by the work of Berkenkotter and Huckin (1995), Campbell and Jamieson (1978), Miller (1984), Swales (1990), and others. Genre theory, in recognizing that rhetorical situations recur in the disciplines, suggests that writers' creative processes are influenced and socialized by their awareness of forms appropriate to the rhetorical situation in which they are writing. Hence, genre-based approaches to teaching WID allow students to see not only the common writing practices of their fields, but also the norms and ideologies specific to the disciplines that drive the formation of genres (Cope & Kalantzis, 1993). In employing genre-based pedagogies, teachers of scientific writing can teach their students much about the philosophy and ideology of science as well as much about the style, forms, and standards of scientific writing.

While a move to genre-based pedagogies is encouraging for the future of scientific writing courses, such pedagogies do not fully articulate the multiple literacies necessary to succeed as a practicing scientist. An integrative framework is called for, one that recognizes and incorporates the multiple literacies required in science. In the practical sense, teachers and administrators would choose to address these literacies at different points in the curriculum, perhaps even as WAC efforts in content courses, since no one course could likely address all literacies at once. On the other hand, a course focusing upon one literacy exclusively is not likely to be effective. For simplicity's sake, however, the goals of each literacy's instruction are dealt with separately below, as well as some key reasons for the literacy's inclusion in the framework.

Communicative Literacy

Communicative literacy refers to one's ability to understand writing as a communicative exchange (see Laugksch, 2000) and encompasses basic linguistic competence and rhetorical awareness. The most basic goal of instruction in scientific writing, indeed in any composition instruction, is teaching students to communicate well through written texts and to employ their language correctly. Years ago, this basic competence trumped all others in the teaching of scientific and technical writing, because of the need to communicate data and technical information in a concise, correct, and unambiguous manner. Advice on how to achieve stylistic clarity, logic, correctness, etc. still occurs in a few publications on scientific writing, even those intended for professionals (Cowell, 1998; Goldbort, 2001; Spector, 1994). However, a continual focus on basic competence has long been connected with the idea of scientific writing as a windowpane, in which the reporting of scientific knowledge presents an objective vision of reality, not one that is reflective of a given discipline's epistemological beliefs (Miller, 1979) or its ability to influence the ontological views of its audiences.

To a degree, the windowpane idea of scientific writing can serve some purpose for students, in that it can require them to emulate scientists' attention to reality, to emulate their successful communication practices, and to outline their views in an unbiased manner. Yet it can also result in a narrow conception of writing built upon over-attention to mechanical rules and conventions. Any idea that scientific writing is a means to participate in the intellectual life of science is buried. What is more, focusing instruction upon mechanical literacy alone lessens its usefulness, for it obscures the fact that writers are able to influence their audiences' visions, responses, and actions; success is measured by writers' ability to adhere to the rules, nothing more. Teaching students to emphasize mechanical literacy limits their ability to recognize that writing is a complex, interactive process. If students see the rhetorical situation for what it is—a context brought about by an urgent need to resolve a significant problem, through a writer addressing audiences with stakes in the problem's resolution, such that the audiences can be persuaded to act—they will be more capable of understanding how their writing can both influence and be influenced by their audience's norms, values, and beliefs.

Students' progress in scientific writing can be increased when basic competence instruction is combined—layered—with other aspects of rhetorical education. If basic competence is taught as a means to rhetorical awareness, for example, it changes from an absolute set of rules to a flexible system of text production. Students learn to make informed choices about style, grammar, and usage by coming to understand how writing functions in science. Instructors of scientific writing facilitate that understanding by exposing students to scientific literature and discussing the rhetorical options illustrated in that literature—in other words, introducing them to the possible means

by which they may use genres to participate in their fields. Bazerman (1994) determined that genres enable writers "to advance their own interests and shape . . . meanings in relation" to their fields, as well as to "grant value and consequence to the statements of others" (p. 79). Bazerman's rhetorical viewpoint suggests that teachers of scientific writing should provide students with opportunities to see their writing as a means to agency (that is, to legitimate participation in science)—in short, as a rhetorical enterprise.

Teaching for rhetorical awareness moves scientific writing instruction beyond basic competence, resulting in a rich, layered communicative literacy. Students who achieve communicative literacy in science should be able to:

- write competently in the conventional discourse of their field;
- recognize the difference between data, warrants, and claims, and be able to support claims with valid evidence and logical arguments;
- analyze, evaluate, and employ various invention and writing strategies based upon knowledge of audience, context, and purpose; and
- employ genres appropriate to field-specific rhetorical situations, and adapt those genres to suit personal rhetorical goals.

Teachers can assess students' communicative literacy by assigning genres typical for their field and asking students to explain their writing choices. Students can be offered chances to demonstrate their awareness by trying various heuristics and strategies of invention to determine each one's effectiveness, and to defend their choices in discussion. To analyze audiences and purposes successfully, students should be asked to research and report upon various scientific disciplines and their communication styles. To demonstrate their knowledge of data, warrants, and claims, students should be given samples of the scientific literature for analysis, in which they can be directed to identify these features. Communicative literacy can also be evidenced in assignments designed to facilitate other literacies.

Graphical Literacy

Graphical literacy, in the context of scientific writing, can be defined as the ability to understand graphical communication as an integral feature of the production and exchange of scientific information. Traditionally, graphical communication in science has been stressed as an efficient means to communicate large amounts of quantitative data that would be cumbersome when written in prose. Clearly, scientists have taken full advantage of graphics' capacity for efficient communication. A cursory examination of any scientific periodical shows the prevalence of tables, charts, graphs, equations, and photo illustrations in scientific writing. The ubiquity of graphics has resulted in a blurring of boundaries between writing and visual design in the sciences. Technological advances, particularly in computing but also in laboratory protocols, have increased the use of graphics in all spheres of scientific communication. Many textbooks on scientific writing emphasize this point and offer design rules to help student writers present data clearly and efficiently (for example, Day, 1998; Katz, 1985; Pechenik, 2001).

While few would question the need for scientists to understand how to generate graphics that communicate data efficiently, focusing instruction upon rules alone may reaffirm the windowpane idea in graphical form. But doing so would fail to acknowledge the concept- and theory-laden nature of scientific graphics (Rowley-Jolivet, 2002): in other words, the graphics' "highly constructed" rhetoric (p. 22). Understanding graphics as rhetorical constructions, meant to influence how or why readers see what they do in data (Nagelhout, 1999), can help students to overcome the idea that scientific graphics reflect reality objectively. When instructors ask students to consider the kinds and number of graphics needed to communicate data, the aims of each graphic, and the fit of each graphic

into an overall argument, they ask students to consider graphics rhetorically. Doing so helps students to gain a sense of perceptual organization, as well as the ways scientific graphics aid in constructing scientific knowledge. In these ways, instructors facilitate students' awareness of graphics as designed discourse—discourse that draws upon available knowledge (data) in order to transform it into new knowledge (conclusions) (see George, 2002).

Seen rhetorically, it is apparent that reading graphics and communicating graphically requires a sophisticated literacy, including the ability to interpret visual cues, to infer relationships spatially, and to visualize objects represented numerically (Lowe, 2000). Students can indicate their graphical literacy by:

- understanding important design features, such as layout, typeface, lines, and white space;
- recognizing the different graphics (tables, charts, graphs, illustrations) available and the data they are best suited to represent;
- analyzing, evaluating, and using graphics in conjunction with text, to support and develop effective arguments; and
- developing an awareness of audiences' strategies for reading and comprehending graphics.

Teachers can assess students' graphical literacy by requiring graphics in assigned writings. Teachers can offer students chances to demonstrate graphical literacy in assignments to represent data graphically, to determine each graphic's efficiency at communicating those data, and to defend their choices in discussion. Students could learn their audiences' understanding of graphics by reading the scientific literature, noting the graphics present and their function, and analyzing critiques of scientific work available in the literature. Teachers can encourage students to become sensitive to visual communication issues by offering encouragement to consider graphics in the reading and analysis of scientific and technical textbooks.

Technological Literacy

In writing instruction, technological literacy has traditionally been defined as students' abilities to navigate through specific computer applications. This definition has been the traditional measure of technological literacy in science instruction as well. As students are taught to use laboratory and other technologies, they acquire skills necessary to function in science careers. In this traditional view, technological literacy (and technology itself) serves a functional role. It allows students to do that which is expected in classes and professional work.

Yet this functional view of technology and technological literacy can be misguided, in that it, too, can buy into the windowpane view, for it assumes that technology has no fundamental effect on science or writing. Scientists simply use technology as a means of extracting data, and writers simply use it to produce text. However, several authors, beginning with Haas and Neuwirth (1994), have argued that a transparent view of technology does not account for technology's influence on writers, readers, writing, and reading—how, in other words, technology can be understood as a communication and research tool. Within science, the roles of technology in publication and communication are clear, particularly given the rise of online science periodicals, instantaneous distribution of findings via personal and organizational websites, and the increasing number of printed science literature that requires authors to submit camera-ready manuscripts. Taken together, these events call scientists to understand technology as an integral part of their literacy activities. Selfe (1999) characterizes such an understanding as familiarity with the "social and cultural contexts for discourse and communication" that technology creates (p. 11). Understanding the ways technology and communication interact to affect social practice distinguishes technological literacy from mere functional proficiency (Cook, 2002; Selfe, 1999; see also Wahlstrom, 1997).

Following these perspectives, increasing students' technological literacy suggests offering opportunities to read and write in technologically rich environments. Doing so would enable proficiency with common computer applications for generating and manipulating text (word processing), integrating text and graphics (digital imaging and desktop publishing), displaying data and integrating it with text (spreadsheets and presentation software), and communicating with colleagues (email and web development). But to move students beyond functional proficiency, teachers can also create assignments and activities in which students:

- become aware of the uses of technology in scientific communication;
- critically reflect upon the roles of technology in communicating science in various rhetorical situations; and
- assess the value of technological applications for different rhetorical purposes.

Teachers can help students accomplish these tasks by teaching modern trends in scientific publication. Such instruction would likely include familiarizing students with online scientific publications, as well as these publications' content and position in the prestige hierarchy of their field(s). Students can also be asked to investigate how scientists use technology to generate and communicate data and text, either by interviewing scientists or reading research on scientists' writing processes. Finally, students can be asked to reflect upon the successes and failures of different attempts to communicate science through print and other technologies.

Sociocultural Literacy

Contemporary science frequently involves collaborations between researchers with common interests and perspectives, but diverse expertise, ideologies, and professional and ethnic identities. Research, writing, and publication activities all require scientists to negotiate the borders of social and cultural groups. Furthermore, scientists are increasingly called upon to write to audiences outside science entirely (Greenwood & Riordan, 2001; Yore, Hand & Prain, 2002), requiring sensitivity toward community perceptions and understandings of science as an institution, of scientific research, and of scientists as individuals (National Science Board, 2000). For these reasons, "expert science writing involves much more than displaying resolved knowledge to other like-minded scientists and the physical act of putting these ideas into print" (Yore et al., 2002, p. 677); it involves social activity too (see Gilbert & Mulkay, 1984; Latour & Woolgar, 1986; Myers, 1990).

It would be difficult to find scientists who would not acknowledge the importance of peer critique, discussions, colloquia, and meetings, both formal and informal, in their writing processes. However, few would recognize that successful outcomes to these forums require a high degree of sociocultural literacy. In part, this can be traced to scientists' tendency to focus upon communication as a "knowledge-telling," not a "knowledge-building" activity (Yore et al., 2002, p. 689). If communication is seen as telling, then peers, audiences, and, ultimately, others outside science have no influence upon the production of text beyond accommodation to different levels of technical knowledge. Building knowledge requires scientists to consider the role of science and data in the construction of shared meanings, for it requires open acknowledgement of lofty research goals.

Sociocultural literacy has been recognized as an important component of scientists' education. Teachers can encourage the development of students' sociocultural literacy by providing the means by which to consider the epistemology of science, the societal impact of new scientific knowledge, and the social issues to which science can reasonably and productively respond. Forums can be created in which students can deliberate upon the reciprocal interaction of science and society.

Open discussions of scientific culture and the nature of science as an institution can yield a rich understanding among students.

In the Classroom

There have been reports published regarding students' experiences in scientific writing courses that are, in part, based upon a series of related assignments that follow a layered literacies mode (e.g., Carpenter & Krest, 2001). The following section describes similar sequences of assignments that make use of a layered literacies approach.

The examples in this section are drawn from an upper-division scientific writing course taught each semester at the University of Colorado Boulder. While the course is not required of all science majors, it fulfills one element of the university's core graduation requirements. Since its inception, the course has been designed to prepare science majors for the writing tasks they would face as science professionals. Hence, the course's formal assignments are based upon the kinds of documents typically written by science professionals in their work. A genre-based, process-oriented approach (see Coe, 1994) is used to familiarize students with these documents, as well as to advance their rhetorical savvy. As the discussion below will show, the assignment modules meet the goal of instruction in communicative literacy, but advance students' attention to particular aspects of scientific rhetoric:

- reviewing the literature and synthesizing research findings by searching for, reading, and analyzing a large group of scientific papers, resulting in a review essay and an article critique/response;
- communicating science to diverse audiences by considering the social dimensions and applications of scientific work in a deliberative essay; and
- arguing for new research—through design and preparation of a proposal for funds.

Before the modules are described, a few caveats are necessary. First, though it has been my experience that these assignments present opportunities for students to acquire a range of scientific literacies, it cannot accurately be said that all students who successfully complete the modules will acquire a sufficient level of those literacies. Indeed, no course can make such a promise. Second, it is also the case that not all the modules (or any activities that comprise research, invention, drafting, review and revision), need to be incorporated into one course. Layering literacies can be accomplished across majors and in WAC programs as well; and, as mentioned above, it is likely that a curriculum including a number of courses that worked to include students' skills in that way would be more effective than confining instruction in these techniques to one or two courses. Third, the descriptions highlight informal assignments, graded on a credit/no-credit basis, that serve students by assigning longer, more formal genres. In line with commonly held writing-to-learn practices, such assignments are not evaluated for their mechanical proficiency but for their completeness and quality. Finally, other modules and assignments can be designed to accommodate layered literacies; when it is appropriate to do so, such options are mentioned. What is illustrated, then, are samples for reflection, not entrenched rules. As ideas of what can be assigned to students through the layered literacies approach, the modules below can be considered points of departure.

Module 1: Reviewing the Literature and Synthesizing Research Findings

In this module, students are required, through library research, to locate, read, and analyze a large number of scientific papers, in order to acquire subject knowledge on an area of scientific research. Upon completing their research, students synthesize the central findings of the papers into a review of the literature, directed at others in their major field. The literature review is taken through stages of drafting, peer and instructor critique,

revision, and editing. Similar modules have been discussed in Choe and Drennan (2000).

The literature review processes is followed by an article critique/response assignment in which students focus upon a sample paper from the literature they searched, for the purposes of interpreting the research, its findings, and its implications. By incorporating critique, this module requires students not only to read broadly and to think analytically, but also to perform the common scientific task of responding to emergent research. Assignments requiring students to read and critique scientific papers have a long tradition in science and technical communication classrooms.

Given its emphasis on research and writing, Module 1's primary literacy is communicative (the same could be said of all the modules). Emphasizing revision and editing provides opportunities for students to acquire and demonstrate basic literacy skills such as grammatical and mechanical proficiency. Moreover, the literature reviews they produce are designed for specific audiences, and students must identify those audiences, take into account those audiences' need for information, consider the value of their subject knowledge for the audiences, and understand its potential to advance discussion or resolve conflicts within their field. Students must consider the purpose of their literature review and its function within their communication situation.

Alone, these are valuable lessons for science majors to learn. Yet the research and writing process in Module 1 is enhanced by activities designed to incorporate other scientific literacies. At the least, students can be instructed in how to interpret data represented in tables, charts and graphs, so that they are better equipped to comprehend the literature (graphical literacy). Because students can be required to conduct their library research online through a web interface or any of a number of online scientific databases (such as Cambridge Scientific Abstracts, ISI's Web of Science, the National Library of Medicine's PubMed, and others), they can have the opportunity to exercise their technological literacy as well, for they must acquire a certain degree of proficiency at selecting and negotiating through the databases, learning the Boolean logic prevalent in many of these databases, and scanning online screens for command buttons, links, and other icons needed to operate the databases. Students also have opportunities to acquire sociocultural literacy by collaborating in their research, and by learning about their chosen fields' culture through reading professional news magazines.

The course described in this article attempts to layer the four literacies by incorporating two informal assignments into Module 1: a report on "current events," in which students read periodicals and websites directed at their field and identify which issues and research have received recent attention, and a "library research report" which asks students to define and describe the subjects searched for, the databases and journals used, and the results of their searches (see Figures 1 and 2, below). Students are encouraged to display the results of their search graphically in simple charts and tables, as well as textually in an annotated bibliography. In both reports, students are asked to reflect upon what they can tell about their field and about their chosen subject from what they have read.

To complete the two informal assignments, students must work with computers, and they must acquire proficiency at locating materials in the library. More importantly, they are given opportunities to glimpse the culture of their chosen field and consider what that may mean as they move toward life in that field (sociocultural literacy), and to reflect upon how they have used online technologies for better or worse in their research (technological literacy). Reporting results in tables or charts (graphical literacy) helps students learn the tools they will use to display data in later documents. The reports also aid in tracking students' progress in preparing their draft literature reviews, allowing for interven-

Current Events Report

This assignment is designed to help you learn about the current problems and issues facing scientists in your field. It can also help you locate a topic you can research for future assignments.

Begin by identifying the major journals, news magazines, and web resources for your field. Using the library's online card catalog (Chinook), identify a few (3-6) periodicals and/or websites that look to be likely candidates. You can easily access databases in your subject area; these databases may contain periodicals that can tell you the current events, recent news, or social problems that your field is trying to do respond to with its research. (Remember that a few periodicals, such as Science, appeal to many scientists; they can report on issues affecting many different fields.)

Scan the sources you find to get a sense of what topics/problems are driving your field's research. At this point, the idea is to identify trends, not to assimilate vast knowledge—so don't despair if some of the research seems confusing. News reports, interviews, and editorials can provide glimpses into issues. Again, some of it may confuse you, but remember that this assignment is meant to help you identify trends.

When you have completed your scan, write a brief report that describes the current work of your field. Begin by defining the field you are working in and the resources you found. Then describe the issues that your field appears to be addressing; a brief section on each will be ideal. You ought to answer some questions in those sections: Overall, why is that field investigating these issues? Why are they researching exactly what they are? How have they determined those research trends could help alleviate the issues? Finish with another section offering reflection on what you have found: Did the things found fit with your impression of the field? What can be learned about the field, based upon its interests?

Figure 1: Assignment Description for Module 1 Informal Assignments: Current Events Report

tion (e.g., coaching) as needed, thus helping insure that all students are prepared for the writing/review/revising process (communicative literacy).

Module 2: Communicating Science to Diverse Audiences

This module requires students to consider the public dimensions of science—specifically, the context(s) and social exigency(ies) that warrant scientific attention and, in turn, can be addressed by the application of scientific knowledge. Building upon the knowledge gained in Module 1, students investigate (again, through research) the intersecting social issues that inform their fields' work and create warrants for doing that work. They are then asked to write a deliberative essay, again directed at a specific audience, which develops a novel position on one such issue that pertains to

Library Research Report

This assignment asks you to document your library research activities. It's a tool designed to let you reflect upon your literature search: what worked, what didn't, what you could and could not locate, the amount and kinds of papers available, etc.

Since it is intended to tell me what you did, why you did it, and what you have found thus far, you can feel free to use the IMRaD format (introduction, methods, results, and discussion). One paragraph in each section of the report should be sufficient, though you may want to write more.

While compiling your report, be thinking about the databases that you used. What worked? What didn't? What feature(s) make them most useful for persons in your field? Did the interface affect your searching in any way—through the input it required, the look of the screen, anything? What have you learned about searching your field's literature? What did you learn about the literature?

I encourage you to display the results of your literature search in a table or chart (see the online Wizards, and Help files, in MS Word and MS Excel for information on tables and charts).

Figure 2: Assignment Description for Module 1 Informal Assignments: Library Research Report

their research area. (Approaches to teaching writing as deliberative can be found in Lynch, George and Cooper [1997]). The essay is taken through the drafting, review, and revision process.

Like Module 1, Module 2's primary literacy is communicative, for much the same reasons. However, other literacies can be layered into Module 2 as well. Students can be instructed in ways to incorporate visual elements into their essays, for instance, to summarize data in support of an argumentative point (graphical literacy). As in Module 1, students can be asked to research issues using technology and therefore to exercise their technological literacy. But this module lends itself especially well to the development of sociocultural literacy, given its emphasis on context, or to put it another way, on the intersections of science and society. Considering the context of scientific work calls upon students to identify and analyze complex arguments, often made by numerous stakeholders, as they seek out ways in which their scientific knowledge can (and cannot) help to resolve social issues.

Again, informal assignments serve their purpose when designed to increase students' reflection and critical thinking. In Module 2, students first are asked to scan the literature of their field, identifying references or allusions to social issues. Upon locating such references, they are required to write a short analytic paper (see Figure 3, below) that defines the problem, explains how scientists in their field refer to the problem in their research, and discusses the way(s) in which scientists

suggest their research addresses or otherwise helps to resolve the problem. They are instructed, explicitly, to avoid taking sides on any issue they find: rather, they are to identify what is at issue, so that they may come to learn the various aspects of the issue before they develop their own position. This assignment is made due prior to the first draft of the formal essay.

Successful completion of the Issue Analysis requires students to perform more research, again using computers, and to reread the literature they have already found. However, it also lets students see, as fully as is possible, the richness of issues that intersect with scientific practices; that is, they come to see the complexity of these issues while at the same time learning how scientists in their field can, and have, attempted to direct their work toward the resolution of these issues (sociocultural literacy). By encouraging students to identify as many positions on an issue as they can, the assignment can guide students away from simple, black-or-white arguments about complex issues.

Module 3: Arguing for New Research

Many have argued that students benefit from opportunities to apply themselves to solving "authentic" rhetorical problems, most recently Tynjälä (2001). In Module 3, students apply the subject-matter knowledge and communicative skills they have acquired in the previous modules to the writing of a proposal for a research project of their own design. At my university, undergraduate research is supported through a small-grants program, and my students are required to

Issue Analysis

This assignment asks that you search for and identify the public issue(s) that intersect with your field—the social, legal, or professional problems (issues) that scientists in your field are attempting to address with the results of their work. You are already familiar with the concept of a research problem. Now you need to consider what is behind the research problem, or where data from research on that problem could be applied in the future.

Scan the literature you found for your literature review; look back at your current events report, too. Are there any social or political issues mentioned? What are they? Who are the stakeholders? How have the scientists connected their work to the issues?

Once you have identified some of these issues, perform additional research about one issue. Identify, through a range of sources, the various positions that stakeholders have taken. Don't try to evaluate these positions; just try to get a full, detailed idea of each one—who is taking it, what they contend, and why. Write an analytic paper that describes as many of these positions as you can identify.

Figure 3: Assignment Description for Module 2 Informal Assignment

follow its guidelines for proposals and projects. In this way, students have the experience of writing for a "real" audience—not to mention the possibility of a tangible reward (up to $2000 support for their research)—and so the module serves as an excellent exercise in communicative literacy.

However, the funding program requires more than a proposal from the students; they must also have their research "sponsored" by a science faculty member, and their research must complement that of their sponsor. Thus, they must exercise a measure of sociocultural literacy as they seek out a sponsor and discuss their projects with him/her. Furthermore, students are required to submit their proposals both electronically (technological literacy) and in print. Often the proposals, which are required to contain reviews of the literature on which the new project will be based, make use of illustrations to condense data from previous studies (graphical literacy), as the funding program limits proposals to five or fewer written pages.

Faculty Interviews and Synopsis Report

To propose your research project, and to secure a grant to support your research, you will need to collaborate with a faculty sponsor. Your faculty sponsor should play a significant role in your research, responding to ideas, providing advice for new directions and resources, and discussing the implications of the results. Choose wisely, and your collaboration will be fruitful for both you and your sponsor.

This assignment is meant to help you choose a sponsor. It asks you to do three things:

Identify potential sponsors—scan the university newsletter, alumni news magazines, and departmental websites to learn what research is going on at the university. You should also speak with your advisors to learn which faculty in your major department could be looking for research assistants.

Interview two potential sponsors—schedule a short (30 minutes) meeting during which you can learn about the faculty's research and the potential for collaboration. Be prepared to ask questions about current research projects, the lab's personnel, what sort of expertise/skills you'd need to collaborate in the lab, and what the potential sponsor would expect (and provide) from your collaboration.

Write a synopsis report for me—describe, in a brief report, the proceedings of your interviews, and discuss what you have learned about the faculty's research and/or the potential for your project to be carried out with each sponsor. Discuss what steps you may take next, now that the interviews are over.

Figure 4: Assignment Description for Module 3 Informal Assignment

The formal proposal assignment itself facilitates communicative, technological, and graphical literacy, the students' informal assignments require working with sociocultural literacy. In Module 3, students are first asked to identify potential faculty sponsors, through reading the university's newsletter, visiting science departments, and consulting with their curriculum advisors. Then they complete a short interview with two potential sponsors, during which the students ask about the faculty members' current research projects and opportunities for sponsorship. Following the interviews, students write a brief synopsis report (Figure 4, below) in which they summarize the interview and discuss their options for moving forward with their projects. The report is made due approximately one week before the first draft of the formal proposal. Based upon the interviews' outcomes, they may elect to collaborate with one of their interviewees and develop their proposal for submission.

From a practical standpoint, the Interview/Synopsis Report assignment gets students into contact with faculty members who could serve as sponsors for their projects, thus enabling the securing of a grant. Alternatively, it may allow students to learn that there are no such opportunities, because there are no faculty members pursuing research in which the students are interested. But more importantly, the interviewing/reporting process provides another opportunity to develop sociocultural literacy, as it requires students to learn about the work of professionals in their fields and provides them with another vehicle in which students can reflect upon what they are learning about science and scientists, their research interests, and their specific project.

Discussion

When built into a group, the three modules can create a course in which four scientific literacies—communicative, graphical, technological, and sociocultural—are layered. In the above descriptions, informal writing and research assignments account for much of the literacy instruction that cannot be accomplished easily in formal assignments. However, it is not the case that these assignments, or even the modules, should be viewed as necessary components of a layered-literacies framework for scientific writing pedagogies. Nor should the literacies themselves be viewed as independent from one another. As the descriptions show, assignments can be designed so as to emphasize one literacy over the others. But in practice, emphases can be fluid, and an assignment that at one time emphasizes a particular literacy can be used to emphasize others as well, depending upon the course and/or its design.

Some instructors would take issue with the framework as outlined in this paper, as it lacks a specifically "critical" literacy. Indeed, there is good reason to educate future scientists (and, some would say, current scientists) in critical practice, as the advancement of science requires that individuals critique its practices, politics, and ideologies. Commentators from outside science have frequently pointed to its internal power relations as needlessly hierarchical and exclusive, suggesting a need for reflective critique and change. However, upon closer examination, critical literacy becomes a component of sociocultural literacy, in that the latter necessitates examination of the *culture* of science, including its social structure and ideology. Emphasizing critique in the teaching sociocultural literacy can help students to see such things; instructors who wish to encourage change within science may choose such an emphasis.

Others may suggest that this framework is naïve—that no course can hope to develop all the scientific literacies in its students. But no one course can expect all students to master every bit of its material by the end of a semester. In practice, it is likely that a single course could introduce the four literacies to its students, but mastery of all four would be a long-term

prospect. It may be necessary for WAC/WID programs to consider ways to layer literacies across courses and across curricula to adequately address this issue. Yet that would not preclude the framework from acting as a guide for individual courses' design or individual instructors' pedagogies.

It is also important to mention that, although modules from a scientific writing course have served as illustrative examples, the examples in no way are restricted to use within scientific writing courses. Rather, the exemplary course serves as a model by which a layered literacy approach can be implemented within courses focusing upon writing practices within any discipline. For such an implementation to succeed, an instructor would need to adapt the modules' focuses to accommodate the discipline(s) in which their students are majoring, so as to construct appropriate class activities and writing assignments. Different disciplines may require different literacy emphases based upon their typical patterns of discourse. For example, a disciplinary writing course directed to students in engineering, whose discourse makes heavy use of mathematical formulas and graphics, would likely emphasize graphical literacy as integral to communicative literacy. A course directed to students in the humanities, where discourse tends to emphasize the identifying markers of writers' critical capacities as experts, would need to emphasize sociocultural literacy, regardless of the other literacies layered into its activities. Rather than being a weakness, the fluidity with which literacies can be layered helps instructors to design courses that serve the diverse needs of students within a diverse array of academic disciplines.

Seen as broad themes that can be explored in WAC/WID courses, layered literacies can help clarify the goals of these courses to others around the university, aiding efforts to bind writing instruction into university curricula. In this way, WAC/WID can enhance departments' investments in writing instruction, and help to secure writing's place in the university. But more importantly, deploying a layered literacies framework in disciplinary writing courses can help develop science students who are better prepared to participate in a world in which literacy is becoming increasingly complex, to address issues within their discipline's culture, and to communicate with audiences outside the discipline's borders.

References

Ambron, A. J. (1991). Conceptual learning and writing in the sciences. *Teaching English in the Two Year College, 18*, 114-120.

Angelo, T. A. (1997). Seven promising shifts and seven powerful levers: Developing more productive learning (and writing) communities across the curriculum. *Language and Learning Across the Disciplines, 2,* 56-75.

Bamberg, B. (2000). WAC in the 90's: Changing contexts and challenges. *Language and Learning Across the Disciplines, 4*(2), 5-19.

Bazerman, C. (1994). Systems of genres and the enactment of social intentions. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric* (pp. 79-101). London: Taylor & Francis.

Berkenkotter, C., & Huckin, T. N. (1995). *Genre knowledge in disciplinary communication.* Mahwah: Lawrence Erlbaum Associates.

Bizzell, P. (1988). Arguing about literacy. *College English, 50,* 141-153.

Campbell, K. K., & Jamieson, K. H. (1978). Form and genre in rhetorical criticism: An introduction. In K. K. Campbell & K. H. Jamieson (Eds.), *Form and genre: Shaping rhetorical action* (pp. 9-32). Falls Church: Speech Communication Association.

Carpenter, J. H., & Krest, M. (2001). It's about the science: Students writing and thinking about data in a scientific writing course. *Language and Learning Across the Disciplines, 5,* 46-65.

Choe, S. W. T., & Drennan, P. M. (2000). Analyzing scientific literature using a jigsaw group activity: Piecing together student discussions on environmental research. *Journal of College Science Teaching, 30,* 328-330.

Coe, R. M. (1994). "An arousing and fulfilling of desires": The rhetoric of genre in the process era—and beyond. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric* (pp.181-190). London: Taylor & Francis.

Cook, K. C. (2002). Layered literacies: A theoretical frame for technical communication pedagogy. *Technical Communication Quarterly, 11,* 5-29.

Cope, B., & Kalantzis, M. (1993). Introduction: How a genre approach to literacy can transform the way writing is taught. In B. Cope & M. Kalantzis (Eds.), *The powers of literacy: A genre approach to teaching writing* (pp. 1-21). Pittsburgh: University of Pittsburgh Press.

Cowell, H. R. (1998). The use of numbers and percentages in scientific writing. *Journal of Bone and Joint Surgery, 80A,* 1095-1096.

Day, R. A. (1985). *How to write and publish a scientific paper* (5th ed.). Phoenix: Oryx Press.

deCaprariis, P. (1994). A revisionist view of scientific literacy. *Journal of College Science Teaching, 23,* 141-142.

Dickson, D. (1993). Towards a democratic strategy for science: The new politics of science. In S. Harding (Ed.), *The racial economy of science: toward a democratic future* (pp. 472-483). Bloomington: Indiana University Press.

Donnell, J., Petraglia-Bahri, J., & Gable, A. C. (1999). Writing vs. content, skills vs. rhetoric: More and less false dichotomies. *Language and Learning Across the Disciplines, 3,* 112-117.

George, D. (2002). From analysis to design: Visual communication in the teaching of writing. *College Composition and Communication, 54,* 11-39.

Gilbert, G. N., & Mulkay, M. (1984). *Opening Pandora's box: The sociological analysis of scientists' discourse.* Cambridge: Cambridge University Press.

Goldbort, R. C. (2001). Scientific writing as an art and as a science. *Journal of Environmental Health, 63*:7, 22-25.

Greenwood, M. R. C., & Riordan, D. G. (2001). Civic scientist/civic duty. *Science Communication, 23,* 28-40.

Haas, C., & Neuwirth, C. M. (1994). Writing the technology that writes us: Research on literacy and the shape of technology. In C. L. Selfe & S. Hilligoss (Eds.), *Literacy and computers: The complications of teaching and learning with technology* (pp. 319-335). New York: The Modern Language Association of America.

Hazen, R. M., & Trefil, J. (1991). Educators must accept the difference between 'using' and 'doing' science. *Scientist, 5*(6), 11-13.

Hobson, A. (2000). Designing scientific literacy courses. *Journal of College Science Teaching, 30,* 136-137.

Jenkins, E. W. (1994). Scientific literacy. In T. Husen & T. N. Poselthwaite (Eds.), *The international encyclopedia of education* (Vol. 9, 2nd ed., pp. 5345-5350). Oxford: Pergamon Press.

Katz, M. J. (1985). *Elements of the scientific paper: A step-by-step guide for students and professionals.* New Haven: Yale University Press.

Kitcher, P. (1994). *The advancement of science: Science without legend, objectivity without illusions.* New York: Oxford University Press.

Laugksch, R. C. (2000). Scientific literacy: A conceptual overview. *Science Education, 84,* 71-94.

Latour, B., & Woolgar, S. (1986). *Laboratory life: The construction of scientific facts.* Princeton, NJ: Princeton University Press.

Lowe, R. (2000, November). Visual literacy and learning in science. (*ERIC Digest* Rept. No. EDO-SE-00-02). Washington: U. S. Department of Education, Office of Educational Research and Improvement.

Lynch, D. A., George, D., & Cooper, M. M. (1997). Agonistic inquiry and confrontational cooperation. *College Composition and Communication, 48,* 61-85.

Miller, C. R. (1979). A humanistic rationale for technical writing. *College English, 40,* 610-617.

Myers, G. (1990). *Writing biology: Texts in the social construction of scientific knowledge.* Madison: University of Wisconsin Press.

National Science Board. (2000). *Communicating science and technology in the public interest.* Arlington: National Science Foundation.

Pechenik, J. A. (2001). *A short guide to writing about biology.* New York: Longman.

Poe, M. (2000). On writing instruction and a short game of chess: Connecting multiple ways of knowing and the writing process. *Language and Learning Across the Disciplines, 4*(1), 30-44.

Prelli, L. J. (1989). *A rhetoric of science: Inventing scientific discourse.* Carbondale: Southern Illinois University Press.

Rowley-Jolivet, E. (2002). Visual discourse in scientific conference papers: A genre-based study. *English for Specific Purposes, 21,* 19-40.

Russell, D. R. (1997). Rethinking genre in school and society: An activity theory analysis. *Written Communication, 14,* 504-554.

Russell, D. R. (2001). Where do the naturalistic studies of WAC/WID point? A research view. In S. H. McLeod, E. Miraglia, M. Soven, & C. Thaiss (Eds.), *WAC for the new millennium: strategies for continuing Writing-Across-the-Curriculum programs* (pp. 259-298). Urbana, IL: National Council of Teachers of English.

Selfe, C. L. (1999). *Technology and literacy in the twenty-first century: The importance of paying attention.* Carbondale, IL: Southern Illinois University Press.

Shamos, M. H. (1995). *The myth of scientific literacy.* New Brunswick: Rutgers University Press.

Spector, T. (1994). Writing a scientific manuscript: Highlights for success. *Journal of Chemical Education, 71,* 47-50.

Swales, J. M. (1990). *Genre analysis: English in academic and research settings.* Cambridge, UK: Cambridge University Press.

Taylor, C. A. (1994). Science as cultural practice: A rhetorical perspective. *Technical Communication Quarterly, 3,* 67-81.

Tynjälä, P. (2001). Writing, learning and the development of expertise in higher education. In P. Tynjala, L. Mason, & K. Lonka (Eds.), *Writing as a learning tool: Integrating theory and practice* (pp. 37-56). Dordecht, The Netherlands: Kluwer Academic Publishers.

Wahlstrom, B. J. (1997). Teaching and learning communities: Locating literacy, agency, and authority in a digital domain. In S. A. Selber (Ed.), *Computers and technical communication: Pedagogical and programmatic perspectives* (pp. 129-146). Greenwich: Ablex Publishing Corp.

Wright, J. C. , & Wright, C. S. (1998). A commentary on the profound changes envisioned by the National Science Standards. *Teachers College Record, 100,* 122-143.

Yancey, K. B. (1998). *Reflection in the Writing Classroom.* Logan, UT: Utah State University Press.

Yore, L. D., Hand, B. M., & Prain, V. (2002). Scientists as writers. *Science Education, 86,* 672-692.

Designing Learning Lessons for the University Classroom

Mickey Kolis, Emily Krusack, Angie Stombaugh, Robert Stow, and Gail Hanson Brenner

Abstract

To be a university professor typically means having to balance research, service, teaching, and advising. The teaching component is often an area where new instructors feel unprepared, having been trained in their area of expertise but not necessarily on how to teach. The intent of this article is to discuss incorporating the 5E learning cycle into lesson plans as a way to improve teaching efficacy. The 5E learning cycle model is a research-supported process that can promote more powerful student learning and engagement by embedding five phases into the lesson plan: Engage, Explore, Explain, Elaborate, and Evaluate. The 5E learning cycle is a method that can assist instructors in drawing the students into the lesson and promoting active learning.

Keywords

learning cycle, 5E, active learning

Mickey Kolis, EdD, is an Associate Professor in the Department of Education Studies, University of Wisconsin–Eau Claire.

Emily Krusack, MFA, is part of the Academic Instructional Staff in the Department of English. She has taught at the University of Wisconsin–Eau Claire since 2008.

Angie Stombaugh, PhD, RN, FNP-BC, is an Assistant Professor in the Department of Nursing, University of Wisconsin–Eau Claire. She has been teaching in the field of nursing for 5 years.

Robert Stow, PhD, ATC, CSCS, is an Assistant Professor and Director, Athletic Training Education Program, Department of Kinesiology, University of Wisconsin–Eau Claire. He has served as a program director in athletic training education over the past nine years and has been teaching in higher education for the past 15 years.

Gail Hanson Brenner, MSN, RN, has been a Clinical Instructor in the Nursing Department at the University of Wisconsin–Eau Claire for the past six years, teaching in the traditional nursing undergraduate and the BSN completion programs.

Introduction

For most university professors, teaching is considered a major part of the job description. How big a part depends upon their institution, rank, and personal interests as they balance classroom work with research, advising, and service. For those professors whose interests lie in teaching or who are employed at institutions with a strong teaching focus, becoming expert teachers sometimes proves problematic since most university professors receive little-to-no teacher training.

One effort to overcome this lack of teacher training was attempted by the authors, all university faculty members in their first five years of teaching at the University of Wisconsin–Eau Claire who were recruited by the Center for Excellence in Teaching and Learning (CETL) to discuss instructional and assessment methods used in higher education. This interdisciplinary group included two faculty members from the Nursing Department, one faculty member specializing in kinesiology, and one member of the English faculty. The non-tenured faculty were selected on the basis of their interest in improving student learning in their classes. The group was led by a seasoned

Educational Studies faculty member with extensive experience in instructional and assessment methods. We focused on the 5E instructional model, which was flexible enough to fit each of our disciplines, and met weekly for two semesters to learn about the 5E model, to strategize about its implementation in the classroom, and to reflect on its effects on our teaching.

Our group began by reflecting on the ways we currently taught. Without having been given systematic teacher training, we structure our courses to mirror the ways we ourselves were taught. We tend to imitate our past instructors' kinds of assignments, assessments, and programmatic or departmental alignments. Our specific teaching decisions reflect what we saw as students, including the style and extent to which we lecture, use PowerPoint, lead class discussion, divide students into small groups, and rely on individual work, as well as how we assess student learning. The logic behind this approach is understandable: we learned from those courses, and therefore, those same teaching strategies should work for our students. In some cases, they do. In copying what we recall having seen, however, we quickly run into several problems: 1) we base our teaching styles on what we remember, which means we are teaching specifically, sometimes exclusively, to our personal learning styles; 2) the style that worked for our favorite teachers may simply not work for us; and 3) as students, we rarely, if ever, had access to the class planning and other behind-the-scenes structuring that our favorite instructors used. Our group quickly found that trying to become an effective teacher requires an almost "alternative culture" in terms of approach, a shift from teacher-focused to student-focused thinking (Gibbs & Coffey, 2004). The way we approach teaching plays a role in how much content our students will incorporate into their learning.

Research supports our group's approach to improving student learning. We know that there is an important relationship between instructional design knowledge and classroom teaching performance (Hardré, 2003). This need for instructional design training becomes increasingly clear in light of the fact that student evaluations of teaching are remarkably stable over time (Marsh, 2007). In other words, experience alone is not enough to improve teaching from the level where instructors naturally start. Improvement is possible with "systematic intervention that includes consultation with an external consultant" (Marsh, 2007, p. 786).

What, then, are the traits of an effective teacher? Mowrer, Love, and Orem (2004) compiled the top "teacher qualities" based on surveys of more than 300 undergraduate students. Their list reveals a balanced combination of personality traits, knowledge of content area, and instructional skills. The following traits made the "top 10 list" in both of their studies:

- Approachable
- Knowledgeable
- Enthusiastic
- Encouraging/Understanding
- Realistic in Expectations
- Creative/Interesting
- Accessible
- Effective Communicator
- Respectful

This list was consistent over a variety of factors, including the student's GPA, year, gender, and perceived course difficulty. Rossetti and Fox (2009) obtained a similar list of traits when they examined the teaching statements of 35 Presidential-Award-winning university professors. Enthusiasm appeared in their top-four list as well, as did presence, promotion of learning, and being a lifelong learner.

While certain factors of excellence in teaching are personality-based, others, including effective communication, realistic expectations, and "creative" and "interesting" ways of structuring the class, can be learned and improved through instructional design training.

Komarruju (2008) found that after instructional design training, university teaching assistants reported an increased sense of self-efficacy in the classroom and, on a correlated note, liked teaching more. It stands to reason that instructors who enjoy teaching might be perceived as more enthusiastic. These findings serve as an important reminder for instructors who hesitate to add instructional design training to an already full schedule; in addition to improving teaching performance and efficacy and student learning, instructional design training has the potential to increase job satisfaction.

When offered as a course to graduate teaching assistants, instructional design training was effective across disciplines. A professional development teaching course was useful for science graduate students, helping them to approach their teaching in a way that was more inquiry-based (Baumgartner, 2007). In math, a three-credit instructional development course helped graduate teaching assistants gain confidence as instructors (Harris, Froman, & Surles, 2009), with positive results in student learning; students reported these instructors were more receptive to questions (approachable), more available for out-of-class consultation (accessible), and more likely to present information beyond the test (knowledgeable).

Even very short-term trainings make a difference, according to multiple studies focused on graduate teaching assistants. Two three-hour sessions increased teacher effrctiveness, student engagement, and students' perceived learning for graduate teaching assistants, according to Hardré (2003). Other effective instructional design trainings occurred during one week of in-service training (Komarruju, 2008) and four weeks among undergraduates (Yalcin & Bayrakceken, 2010). The 5E model of instruction also had an effect on the level of content knowledge in pre-service teachers. Comparing a control group of pre-service teachers to an experimental group of studying acids and bases, the group who taught using the 5E's over a four-week period outperformed their control peers. It appears that almost any type or length of teacher training has a positive impact on student evaluations and teacher self-confidence. What's more, instructional design training provides valuable opportunities to enter into conversation about the complicated relatonship between teaching and student learning.

A Learning Cycle

All learning cycle lesson plans attempt to mirror what the literature says about how people learn (Caine & Caine, 1994; Darling-Hammond et al., 2008; Dewey, 1938; Jensen, 1998; National Research Council, 2000; Sylwester, 1995). There seem to be three learning principles that need to be addressed for effective student learning to take place:

- Learning Principle 1: Students come to the classroom with prior knowledge, which must be explicitly addressed if learning is to be achieved;
- Learning Principle 2: Students need to organize and use knowledge conceptually if they are to apply it beyond the classroom; and
- Learning Principle 3: Students learn more effectively if they understand how they learn and how to manage their own learning (Darling-Hammond et al., 2008; Hanuscin & Lee, 2008; National Research Council, 2000).

In other words, these three learning principles first ask that students access what they think they already know about the subject, some of which will be correct and some of which will need further development. Then students are asked to make connections to a big idea within their area of study, an idea that is found in all disciplines within that area, such as energy in science, all within an environment that helps students manage their own learning.

A learning cycle begins with what students believe they know, creates a question in the student's mind about its accuracy or depth, provides alternative

explanations, and then has the student practice using the new understanding. Any learning cycle lesson plan is designed to help structure or restructure what instructors already do in their everyday classrooms in order to take advantage of this process. The learning cycle is not meant to replace lecturing, but to place the lecture within the process of student learning. Indeed, to leave out the lecture component would be problematic, as lecturing allows the instructor to clarify ideas, mediate student misconceptions, and present important content. The 5E learning cycle, used by our group, suggests that lecture be supported by other thinking and learning strategies.

Creating an environment in which students manage their own learning is perhaps the most difficult learning principle to incorporate, and it is here that learning cycles are particularly useful. In general, a learning cycle lesson plan approach attempts to mirror how people learn by:

1. asking them to examine what they think they know, believe or do – the point being to create cognitive dissonance or curiosity about other interpretations (this process makes learners aware of their current structures of thought, belief, or actions);
2. providing an alternative structure of understanding that explains their prior experiences PLUS the new content more effectively; and
3. allowing them to practice their new structures of thought, belief or action.

There are many types of learning cycle models described in the literature which identify various stages of such a plan. Atkin and Karplus (1962) and Karplus and Thier (1967) identified the stages as Exploration, Invention and Discovery; Gonen and Kocakaya (2010) expanded this to the 7E's: Excite, Explain, Expand, Extend, Exchange, and Examine; and Schwarz & Gwekwerere (2006) labeled the process as EIMA: Engage, Investigate, Model, and Apply. The 5E's lesson design (Bybee et al., 2006) is based on the Atkin and Karplus (1967) learning cycle. The 5E's lesson design: Engage, Explore, Explain, Elaborate, and Evaluate, expands from the three traditional stages. As our group's findings suggest, the 5E learning cycle is a user-friendly structure that provides for an increased emphasis on student thinking and learning.

The 5E Learning Cycle Lesson Plan

The 5E learning cycle was developed by the Biological Science Curriculum Study (BSCS) and has been used since the 1980s in elementary, middle, and high school biology science programs. Students who experienced 5E's lesson design learned more science content and science process skills (Buntod, Suksringham, & Singseevo, 2010; Yalcin & Bayrakceken, 2010), as well as critical thinking skills (Buntod et al., 2010). Students also believed that the 5E's design had a positive effect for engaging them in course content and contributed significantly to their learning and interest in the course (Yalcin & Bayrakceken, 2010).

Taken altogether, a quick summation of the 5E learning cycle lesson plan would be to: 1) get the students interested in the topic of the day, 2) find out what they already think they know, 3) provide more accurate information grounded in research in the field, 4) invite students to apply their new knowledge, and 5) assess the results. This format directly addresses three fundamental learning principles and can help students see their university faculty as exhibiting highly effective teaching qualities.

The student-centered structure of the 5E learning cycle is clear from the first step: Engage. The purpose of the Engage stage is to attract students' attention, recall what they already know, and provide direction for the upcoming lesson. An interactive class opener, the Engage stage helps to create and sustain a positive learning environment, which fosters community build-

ing. Equally important, it offers students a context for their learning. The National Research Council (2000) reports that "Learners of all ages are more motivated when they see the usefulness of what they are learning and when they can use that information to do something" (p. 61). The Engage stage can help students understand how the learning will meet their needs and, ideally, connect them to the lesson.

The Engage stage directly addresses Learning Principle 3, students managing their own learning, since it places their daily learning task within the larger context of units of learning. They are asked to think about what they have already learned, what might come next and how this might lead to deeper and more powerful learning in the future. The Engage stage also allows the students to see the instructor as demonstrating top teacher qualities; instructors are seen as approachable, since they help students connect with that day's class; enthusiastic, since they care about engaging the students and attempting to make the learning relevant; and effective communicators, since they are clear about the learning to come in the future.

The next stage is Explore. In this stage, the students are asked to explore the phenomena being studied before the instructor provides all the answers. Based on social learning theory, which argues that students learn from observing and interacting with each other, the Explore stage is most effectively conducted in small groups in which students are active participants.. "It can be difficult for students to learn with understanding at the start; they may need to take time to explore underlying concepts and to generate connections to other information they possess" (National Research Council, 2000, p. 58). The Explore stage creates space for these connections to happen.

Explore activities fall into two major categories: 1) a new concrete (hands-on) experience can be provided for the students to examine, manipulate, and explore the phenomenon, or 2) the students can be asked to explore what they already know about the phenomenon or concept. In the latter, the students could discuss their understanding, similarities, and differences by accessing their prior experiences and definitions. It is important that each member of the group be able to explore the phenomenon; the more varied the reactions, the more likely the activity will create cognitive dissonance, disequilibrium, or curiosity in each learner. The result, then, is to push the students into wanting to learn more in the lesson. This is the essence of active learning, for the students are in control of their own learning.

The Explore stage directly addresses Learning Principle 1, explicitly addressing prior knowledge, since it asks students to clarify what they think they already know about a topic before providing the answer. They are asked to share their thoughts with others and to see or experience different points of view about the same concept. The Explore stage also allows the students to see the instructor as demonstrating top teacher qualities such as being approachable, since the information is not simply being handed down from on high; being knowledgeable, since the instructor can respond to multiple definitions or conceptions about the topic at hand; and being creative and innovative, since the activities are likely more original or imaginative than a typical lecture.

The third stage, Explain, most closely resembles a normal lecture situation. Teachers in this stage explain the content of the lesson based upon the thoughts of students from the Explore stage. The teacher acts as a guide to develop a collective interpretation of the (new) concept, idea, or experience. New vocabulary may be introduced to label what the students may have already deducted through the Explore phase. This stage incorporates students' prior understanding into a new, more effective structure. A good Explain session uses the Explore answers, thoughts, and/or experiences as the springboard for the new information, model, or schema. In doing so, the Explain stage eases dissonance and provides some resolution to students' curiosity.

The Explain stage directly addresses Learning Principle 2, organizing and using knowledge conceptually, since it takes what students think they already know and explains those ideas with more detail and/or accuracy. It also addresses Learning Principle 3 since asking to learners to reconsider their prior knowledge or beliefs may be a high-risk learning activity. Learning how to deal with new knowledge is a cornerstone to managing one's own learning process. The Explain stage also allows the students to see the instructor as demonstrating top teacher qualities; instructors are seen as accessible and respectful, since they are using student ideas to make their learning point; creative, since they are using student ideas to drive their lectures; and knowledgeable, since they clearly know their content so well that they can explain student thoughts within the scope of more appropriate content knowledge.

The Elaborate stage allows students to build upon the understanding and skills they have just had explained. Elaboration may require students to connect their new understanding to other concepts or to apply their understanding by completing a task. Practice makes permanent, and the opportunity to try out new thoughts, beliefs, or actions can help solidify the learning experience.

The Elaborate stage directly addresses Learning Principle 2, organizing and using knowledge conceptually, since it allows students time and opportunity to ponder and practice those new thoughts. It also addresses Learning Principle 3, since practicing new thoughts, beliefs or actions helps them develop new habits of mind. The Elaborate stage allows the students to see the instructor as demonstrating top teacher qualities; s/he is seen as accessible, since s/he realizes that it takes time to put those new thoughts into action; understanding, since s/he cares about students practicing the material; and knowledgeable, since s/he understand the steps by which material is learned versus memorized.

The final stage is Evaluate. Although it is listed as the final stage, in actuality evaluation occurs informally throughout the lesson design. Each stage provides opportunities to evaluate the students' understanding of the tasks within the learning cycle. Anything from self-assessments to quick scans of student body language can help an instructor evaluate student learning throughout the lesson. The end-point evaluation is usually more summative of the entire learning cycle; here, instructors assess the overall lesson effectiveness and/or provide students with the opportunity for self-reflection. This evaluation could be a quiz, test, performance evaluated using rubrics, or homework assignment. Ultimately, the student learning should reflect the lesson design, so it is critical that the evaluation measures the expected learning.

The Evaluate stage directly addresses Learning Principle 2, organizing and using knowledge conceptually, since students are asked to demonstrate what they now know. Learning Principle 3 is also addressed since they must consider new thoughts and new experiences in relationship to prior thoughts. They must manage their own learning through self-assessment and instructor evaluations. The Evaluate stage also allows the students to see the instructor as demonstrating top teacher qualities such as realistic expectations, since the evaluation compares where students were in the Explore stage with what they know at the end of the cycle; and respectfulness, since they frame the learning cycle based upon what students thought they knew before class began.

In the interest of demonstrating the flexibility of the 5E learning cycle beyond a science classroom, below is an example taken from English Composition 101. The topic of the day: using vivid language to make writing more interesting.

Engage (4-8 minutes):

1. Show the YouTube clip: Taylor Mali - Like You Know.

2. Say: Yesterday we did a peer review of your paper drafts. Remember when Joanne commented about how segue sentences were harder than she thought, and then Joe talked about his strategy for making them easier? Today we are working on using vivid language, which we will incorporate into our papers that are due next class meeting. Remember that those papers will be 20% of your course grade.
3. Say: So you might be thinking, "Why does it matter that I use vivid language?" Vivid words and language paint pictures in your heads that are vibrant, tell a powerful story and communicate what you truly want to say. "Big" is not the same as "gargantuan," "smell" is not the same as "fragrant," and "loud" is not the same as "pounding in your head like a 10-pound sledge." Language is powerful, and to communicate effectively enhances your quality of life in school and in every part of your human experience.
4. (Evaluate - make sure students are watching the YouTube clip and paying attention with their eyes and body language.)

Explore (7-12 minutes)

1. Put students into groups of threes (random assignment).
2. Have them construct a Word Graph using the following terms: says, states, claims, suggests, denies, asserts, insists, thinks, believes, hopes, proves, enumerates, etc.. The x axis spans from negative to positive connotation, and the y axis goes from least to most authoritative.
3. Show graphs on document camera.
4. (Evaluate - check to see that groups are graphing the words and have a rationale for their placements.)

Explain (20-30 minutes):

1. Interactive lecture on shading for meaning.
2. Reference their graphs to drive your lecture. Pick out one area, ask why they graphed them the way they did, and then give your lecture about how your field talks about those ideas.

(Evaluate - ask for two questions/comments about "shading for meaning.")

Elaborate (10-20 minutes):

1. Have students reread their paper drafts and circle the verbs that they used.
2. Have them replace some of those verbs with more vivid language.

(Evaluate - move around the classroom, answering individual questions, and checking on student work-in-progress.)

Evaluate:

1. Using a criterion emphasizing vivid language, grade papers when turned in at next class meeting.

Modifying current lessons to mirror a 5E learning cycle lesson plan is a great way to begin thinking like an expert teacher. You are sharing with students how learning is connected to their daily lives and why it is important to learn. You are asking them to share what they think they know before you start telling them the more accurate and refined answers. You are also letting them practice those new thoughts, beliefs, or actions in a safe learning environment. These are all very positive steps in helping students incorporate their learning into their lives.

Discussion

When teaching is just one part of your workload and you have little specific training, it is difficult to know where to begin the learning journey. Learning to teach is similar to conducting research: you begin with what you know, develop a question to guide you through the process (ie "How can I increase student engagement?"), and add to your knowledge base step by step. The good

news is that even a little bit of training seems to make a difference in students' views of instruction and in helping instructor feel more confident about their work in the classroom.

Based on our personal experiences using the 5E model, the authors participating in the training felt more prepared and more confident, and enjoyed teaching more because of the training. Although each of the faculty members participating in this training group had at least three years of teaching experience at the university level, prior to this training most of the group had never used a formal lesson plan or learned how to create deliberate links through all aspects of a lesson. When discussing the traits of an effective teacher (Mowrer et al., 2004) in our training group, the authors reflected on the ideas that they felt more knowledgeable about the subject being taught and felt they were more effective communicators since the entire lecture was linked together in a process that focused on student learning and was not simply an outline of notes.

The intention of this article was to introduce the use of the 5E's learning cycle as a means of engaging students in the instructional activity. Learning is always in students' hands, as only they can control whether they will incorporate their learning into their thoughts, beliefs, and actions. We have put forth the qualities, as perceived by the students, of what makes an effective instructor. As outlined in the example, the 5E learning cycle not only incorporates multiple learning styles but also involves the students in the learning process. Students are introduced to the new content and allowed to play and interact with the material while developing new ideas, concepts, and questions. The instructor has the opportunity to step in and assist students in pulling the material together and to contribute new ideas and material. The process is finished up with the students taking the teacher's new material and mixing it with what they have created, thus producing the final outcome that can be assessed. Altogether, using the 5E learning cycle design model will meet students' needs and obtain the desired learning outcomes in a creative and intuitive manner, making teaching more engaging for all involved.

Students' comments in course evaluations supported the effectiveness of the 5E learning cycle in the authors' classes. Students felt their instructors had significantly more enthusiasm and were more creative when using the 5E instructional model. They also reported feeling more engaged with the material and more comfortable in the class learning environment. When each learning unit is bookended with students exploring their own understanding, rather than simply swallowing and repeating information, the result is a vibrant environment with long-term learning results. Because the instructors learn and share along with the students, this joint immersion in the 5E model makes instructors more approachable and accessible to the students. In the case of the authors of this article, a year of discussing learning cycles and implementing the 5E's in our classrooms has unquestionably improved our teaching.

Acknowledgments

The authors would like to thank the Center for Excellence in Teaching and Learning at the University of Wisconsin-Eau Claire for their support.

References

Atkin, J. M., & Karplus, R. (1962). Discovery of invention? *Science Teacher, 29*, 45.

Baumgartner, E. (2007). A professional development teaching course for science graduate students. *Journal of College Science Teaching, 36,* 16-21.

Buntod, P. C., Suksringam, P., & Singseevo, A. (2010). Effects of learning environmental education onscience process skills and critical thinking of

Mathayomsuksa: Three students with different learning achievements. *Journal of Social Sciences, 6,* 60-63.

Bybee, R. W., Taylor, J. A., Gardner, A., Van Scotter, P., Powell, J. C., Westbrook, A., & Landes, N. (2006). The BSCS 5E instructional model: origins, effectiveness and applications. Retrieved from www.bscs.org

Caine, R. N., & Caine, G. (1994). *Making connections: Teaching and the human brain*. Menlo Park, CA: Innovative Learning Publications.

Darling-Hammond, L., Barron, B., Pearson, P. D., Schoenfeld, A. H., Stage, E. K., Zimmerman, T. D., Cervetti, G. N., & Tilson, J. L. (2008). *Powerful learning*. San Francisco, CA: Jossey-Bass.

Dewey, J. (1938). *Experience and education*. New York, NY: Touchstone.

Gibbs, G., & Coffey, M. (2004). The impact of training of university teachers on their teaching skills, their approach to teaching and the approach to learning of their students. *Active Learning in Higher Education, 5,* 87-100.

Gonen, S., & Kocakaya, S. (2010). A physics lesson designed according to 7E model with the help of instructional technology. *Turkish Online Journal of Distance Education, 11,* 98-113.

Hanuscin, D. L., & Lee, M. L. (2008). Using the learning cycle as a model for teaching the Learning cycle to preservice elementary teachers. *Journal of Elementary Science Education, 20,* 51-66.

Hardré, P. L. (2003). The effects of instructional training on university teaching assistants. *Performance Improvement Quarterly, 16*, 23-39.

Harris, G., Froman, J., & Surles, J. (2009). The professional development of graduate mathematics teaching assistants. *International Journal of Mathematics Education in Science and Technology, 40,* 157-172.

Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: ASCD.

Karplus, R., & Thier, H. D. (1967). *A new look at elementary school science.* Chicago: Rand McNally.

Komarraju, M. (2008). A social-cognitive approach to training teaching assistants. *Teaching of Psychology, 35,* 327-334.

Lawson, A. E., Abraham, M. R., & Renner, J. W. (1989). *A theory of instruction: Using the learning cycle to teach science concepts and thinking skills* (Monograph, No. 1). Manhattan, KS: National Association for Research in Science Teaching.

Marsh, H. W. (2007). Do university teachers become more effective with experience? A multilevel growth model of students' evaluations of teaching over 13 years. *Journal of Educational Psychology, 99,* 775-790.

Mowrer, R. R., Love, S. S., & Orem, D. B. (2004). Desirable teaching qualities transcend the nature of the student. *Teaching of Psychology, 31,* 106-108.

National Research Council. (2000). *How people learn*. Washington, DC: National Academy Press.

Rossetti, J., & Fox, P .G. (2009). Factors related to successful teaching by outstanding professors. *Journal of Nursing Education, 48,* 11-16.

Schwarz, C. V., & Gwekwerere, Y .N. (2006). Using a guided inquiry and modeling instructional framework (EIMA) to support preservice K-8 science teaching. *Science Education, 91,* 158-186.

Sylwester, R. (1995). *A celebration of neurons*. Alexandria, VA: ASCD.

Wiggins, G., & McTighe, J. (1998). *Understanding by design*. Alexandria, VA: ASCD.

Yalcin, F. A., & Bayrakceken, S. (2010). The effect of 5E learning model on pre-service science teachers' achievement of acids-bases subject. *International Online Journal of Educational Sciences, 2,* 508-531.

Teaching Sexual and Gender Identity in College Courses

Nathan W. Pino and Amber Blazek

Abstract

This paper explores the teaching of sexual identity and orientation in college courses, particularly in the academic areas of sociology, gender studies, psychology, and education. While there has been an increase in tolerance toward and even acceptance of lesbian, gay, bisexual, and transgender (LGBT) persons and increased support for the civil rights of LGBT individuals, survey data indicate that a majority of Americans still believe that homosexuality violates norms, and LGBT persons suffer various forms of verbal harassment, discrimination, bullying, and other forms of violence. We discuss the importance of teaching LGBT issues in college courses while also taking care to challenge stereotypes and avoid heterosexist language. We then present various topics for class discussion and identify various activities, assignments, and films that can enhance student learning.

Keywords

sexual identity, gender identity, LGBT students, social science courses, course activities

Nathan W. Pino is an associate professor of sociology at Texas State University. He teaches courses in deviant behavior, delinquency, criminology, and globalization, and conducts research on policing in an international context, sexual violence, and the attitudes and behaviors of college students.

Amber Blazek is a graduate student in Sociology at Sam Houston State University. She earned her bachelor's degree in sociology at Texas State University, and her scholarly interests include deviant behavior and family issues.

Introduction

In this paper we present the benefits of covering lesbian, gay, bisexual, and transgender (LGBT) issues in college courses, particularly in social sciences such as sociology, psychology, gender studies, and education, and present ideas for incorporating these issues objectively and with sensitivity. Few articles on pedagogy address this subject, but some have covered the following topics: teaching of transgender issues in sociology of gender and sexuality courses; avoiding moral dichotomies when teaching controversial topics such as homosexuality; and teaching heterosexism and LGBT experiences in sociology courses in general (see Eichstedt, 1996; Hedley & Markowitz, 2001; Martinez, 1995; Wentling, Windsor, Schilt, & Lucal, 2008). It is interesting to note that the above articles discussed these topics without reference to courses in deviant behavior, which the first author teaches in a sociology department, even though they are covered in deviant behavior courses and textbooks across the United States (for examples of textbooks see Adler & Adler, 2012; Clinard

& Meier, 2011; Goode, 2011; Pontell & Rosoff, 2011; Thio, 2010). As we will see below, while U.S. residents are more likely to support the civil rights of LGBT individuals than in the past, a majority still find LGBT persons to be deviant based on powerful norms surrounding gender and sexuality.

We contend that there are many benefits to the teaching of sexual identity and sexual orientation in college courses, including courses on deviant behavior, for a number of reasons. 1) It places sexual identity and sexual orientation within a social context by discussing norms and societal reaction to LGBT behavior and identity and emphasizing the point that nothing is inherently "normal" or "deviant." As with attitudes toward sexual and gender minorities, deviance is relative in that it varies over time, by culture, and by social situation. 2) We can show how LGBT behavior and identity are viewed historically and cross-culturally to further illustrate how norms are socially constructed. 3) By providing students with sociological research on LGBT behavior and identity, we are able to confront stereotypes directly and work to deconstruct them. 4) We can demonstrate how one develops a sexual or gender identity and how the LGBT subcultures benefit their members; we can also make connections between the stigmatization of LGBT individuals and other individuals who are stigmatized, such as those with physical and mental disabilities and mental illnesses, atheists or members of new religious movements, and those who experience addiction and obesity. 5) We can illustrate how all of these behaviors, acts, or conditions are considered deviant for different reasons and from different perspectives, that individuals and groups labeled deviant are stigmatized differently according to their socially constructed deviant status, and that stigmatization can have a negative impact on individual and societal well-being. 6) Discussions on the history of the social control of LGBT persons and social movements to normalize behaviors and conditions considered deviant from a sociological perspective can be liberating, even within the context of a deviant behavior course. 7) If an academic department offers criminology or juvenile delinquency courses (or both) in addition to a deviance course it would be advisable as Pino (2003) instructs to cover LGBT issues and numerous other non-criminal "deviant" behaviors in the deviant behavior course in order to avoid content and theoretical overlap. This way, students are exposed to numerous examples of groups that, while not criminalized, experience hardship as a part of everyday existence; to the social movements in support of these groups; and to the ways in which the treatment and stigmatization of these groups has changed over time and varies by culture and social situation.

It is imperative that instructors approach these issues with care and from a sociological perspective in order to avoid perpetuating harmful stereotypes or the sanctioned use of heterosexist language in the classroom. Understandably, some may think that covering sexual orientation and identity in social science courses such as Deviant Behavior sends the message that sexual minorities deserve to be treated with disdain. However, this argument is based on the assumption that these courses are based on absolutist conceptions of gender, sexuality or deviance that promote a black-and-white, or right-and-wrong view.

Most students enter a university classroom with an absolutist point of view (see Perrin, 2001), but most instructors and popular textbooks promote critical thinking by presenting various ways of conceptualizing concepts involving sexual orientation and identity from different perspectives. At the same time, while an instructor would obviously want to avoid using heterosexist language or promoting stereotypes in the classroom, it would also be inadvisable to present an exclusively one-sided appreciative view of LGBT issues from an activist or "ally" standpoint. Teaching the course in such a way might alienate those who at least

initially hold absolutist and/or negative views of sexual and gender minorities, which can hinder the potential for fostering critical thinking among all students. Any student should still be challenged to think critically, and covering LGBT issues presents an opportunity to enlighten and educate students about a topic they likely know less about than they think they do. While this sociological approach easily conforms to the way in which sociology and gender studies students are exposed to LGBT issues, psychology and education students would also benefit from this approach as a way to learn more about social causes of psychological distress or the ways in which public school teachers can create a safer and more positive learning environment for their LGBT students.

Major Concepts

It would be prudent at this point to define different groups under the term LGBT. While much of the terminology used here may be familiar to many of those reading this article, we cannot assume that everyone will be familiar with all of the terms presented herein and there is understandable confusion regarding some of these concepts for those who are not familiar with them. There are multiple ways to categorize and define sexual and gender identities but we will provide what is presented to students in the first author's classroom, which is partially based on the ally training manual of a local university's LGBT organization (Allies of Texas State, 2011). First of all, rather than being based on the number of sexual experiences of a certain kind one has had or the labels imposed by others, it is assumed here that one must have the self-concept and identity of a homosexual, bisexual, or transgendered person to be considered to have that status. Furthermore, the self-label a person provides to others may not fit neatly into the definitions provided below. Terms such as "bisexual" and "transgender," for example, are umbrella terms for various identities (Lucal, 2008), and the well-known Kinsey scale demonstrates that sexual identity is based on a broad continuum rather than on two ideal-type categories (straight and gay).

We will first discuss definitions concerning *gender identity*, which refers to a person's inner sense of being a particular gender. An increasingly used term in the literature is *cisgender* ("cis" is a Latin term that can be translated as "on the same side"), which refers to those who have the socially approved gender identity corresponding to the sex they were assigned at birth, such as a female who sees herself as a woman (Schilt & Westbrook, 2009). *Transgender*, on the other hand, is a broad term that refers to those whose identity, appearance, or behavior does not conform to normative definitions of male and female (Vidal-Ortiz, 2008; Wentling et al., 2008). Under this umbrella term are those who are transsexual, gender variant, intersex, and even those who are drag performers and cross-dressers (transvestites), regardless of sexual identity. *Transsexuals* are those whose gender identity does not match that of the sex they were assigned at birth (see Schilt, 2006; Vidal-Ortiz, 2008). For example, some may have been born male but see themselves as female (transwomen) or born female but see themselves as male (transmen). Transsexual individuals may seek sex affirmation surgery and/or hormonal treatments in attempts to change their bodies to more closely match their gender identity, and it is important to note that transsexual persons vary in their sexual identities. Gender variant, or *genderqueer* individuals have a gender identity that is not exclusively male or female (Lucal, 2008). Persons who are genderqueer, for example, might feel that they are genderless or a combination of genders, and some use non-gender-specific pronouns such as "ze" and "hir" instead of the more common him and her. *Intersex* replaces an older term now largely considered offensive: hermaphrodite. Intersex individuals are born with "ambiguous genitalia, sex organs, or sex chromosomes" that do not conform to medical standards for females

or males, and like other transgendered persons vary in their gender and sexual identities (Preves, 2003, p.2). In terms of sexual orientation, *homosexuality* refers to a general preference for intimacy with someone of the same gender, while *bisexuality* describes someone who is sexually and emotionally attracted to both men and women. Owing to the fluidity of sexuality, bisexuality can encompass a number of different self-labels, such as "bicurious," "heteroflexible," and other terms. Some may find bisexuality too limiting because they may also be attracted to those who do not neatly fit into male and female categories, such as transgender or intersex individuals. *Pansexual* or *omnisexual* are terms often used to describe such individuals. A term increasingly used to refer to those who are straight is *cissexual*, which refers to a cisgendered individual who prefers to be intimate with those of the opposite sex.

LGBT as Minority Statuses

In addition to covering definitional issues, it is important to discuss with students in college courses that despite an increase in tolerance for homosexuals and the progressive social changes that have been won by the Gay Rights Movement, LGBT individuals are still considered deviant based upon dominant norms concerning sexuality and gender, and continue to be targets of bullying, harassment, and hate crimes (Bronski, 2008; Herek, 2000, 2009). On one hand, American adults are becoming increasingly supportive of basic civil liberties for sexual minorities. For example, in a Washington Post-ABC poll, support for homosexual marriage increased from 37% in 2003 to 53% in 2011, the first year a majority of Americans were in favor (Somashekhar & Craighill, 2011). On the other hand, based on a variety of data sources including national surveys, heterosexuals' attitudes towards homosexuality "continue to reflect moral condemnation and personal discomfort" (Herek, 2000, p.255). In Herek's (2000) study on affective responses to various groups, heterosexual women felt equally cold toward lesbians and gay men while heterosexual men had a colder response toward gay men than toward lesbians. "Overall, respondents described their affective response to both gay men and lesbians as colder than their reactions to various ethnic, racial and political groups," and "clear majorities" of men and women regarded homosexuality (both male and female) as "wrong and unnatural," though heterosexual men had significantly more negative responses than heterosexual women (Herek, 2000, p.260). When assessing attitudes toward both homosexual and bisexual individuals, heterosexual males expressed their coldest feelings toward gay men, followed in order by bisexual men, lesbian women and bisexual women. In contrast, heterosexual women expressed colder feelings toward gay men and lesbians than toward bisexual men and women, with "similar levels of warmth within sexual orientation groups" (Herek, 2000, p.264). More recent data show that acceptance of homosexuality may be increasing, however. According to the Gallup Poll, only 40% of Americans found homosexuality to be morally acceptable in 2001, but by 2008 it had risen to 48% (Saad, 2008).

While tolerance has increased, this does not mean that a majority of Americans openly and fully accept LGBT persons. Members of the LGBT community still experience stigma that is expressed at the individual level through hate crimes, verbal assaults, and bullying, and at the macro level through societal institutions that promote discriminatory laws and policies (Herek, 2009). Lesbians and gay men are denied various legal protections, face violence and verbal harassment, and encounter other social obstacles that are not experienced by heterosexuals (Bronski, 2008). When these social and legal restrictions such as those regarding marriage are challenged on state voting ballots, the majority consistently votes against them, thus denying homosexuals full citizenship rights. Since 1998, voters in the U.S. have denied same-sex mar-

riage rights in referenda in 28 states. State and federal courts, not voters, have granted same-sex marriage and adoption rights, and a Supreme Court case (Lawrence v. Texas) in 2003 was needed to strike down all state laws criminalizing homosexuality itself (Koppelman, 2006). The federal constitutional right of marriage is not available to same-sex couples in the United States owing to the Defense of Marriage Act, although it is increasingly being granted to same-sex couples in European countries (Bronski, 2008). Regarding military service, it was not until recently, in 2011, that the "Don't Ask, Don't Tell" policy of the U.S. military was repealed, allowing homosexuals to serve openly in the armed forces. President Barack Obama publicly withdrew his support for the federal Defense of Marriage Act in 2011 as well, stating that it was unconstitutional.

Various psychology, sociology, and other social science courses cover mental health, and observers have noted that historically, LGBT individuals have been stigmatized as mentally ill. The removal of homosexuality from the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1973 due to political pressure from civil rights groups is but one example of changing social awareness on this issue (Clinard & Meier, 2011). Transgender individuals, however, are still labeled as mentally ill (diagnosed with illnesses such as Gender Identity Disorder) and are required to be diagnosed as such and to undergo extensive therapy before receiving written permission to have sex affirmation surgery (see Harry Benjamin International Gender Dysphoria Association, 2001). Stereotypes associated with physical illness have also been utilized to stigmatize LGBT individuals. For example, HIV/AIDS continues to be strongly associated with gay men in the larger society and it carries a stigma that is attached to those individuals diagnosed with the disease, regardless of their sexual identity.

Heterosexist language is still prevalent in American language use as well: people nonchalantly call each other "fag," "homo," "queer," "dyke," etc. for the purpose of insult, humor, or bullying (Pascoe, 2005). Gay teens (or those thought to be gay due to gender stereotypes) face bullying as a result of power struggles between heterosexual and homosexual teens, as well as between popular and unpopular teens, which has led to many teen suicides (Bronski, 2011). LGBT individuals also continually face the threat of hate crimes because of heterosexism and homophobia, or as Herek (2000) terms it, "sexual prejudice" (p. 252). Heterosexism is the "ideological system that denies, denigrates, and stigmatizes any non-heterosexual form of behavior, identity, relationship, or community…and it is manifested both in societal customs and institutions" (Alden & Parker, 2005:89). Homophobia or sexual prejudice is the result of heterosexism, and it is embedded in a variety of domains within society (Alden & Parker, 2005; Bryant & Vidal-Ortiz, 2008). Alden and Parker (2005) found that beliefs about the morality of homosexuality are significant predictors of hate crimes, and Herek (2009) found that nearly 25% of LGBT individuals have experienced violence, a property crime, or an attempted crime at some point in their life due to their sexual orientation. Forty-nine percent have experienced verbal abuse (Herek, 2009). Gay men are the most likely to experience anti-gay violence, property crime, or attempted crime (39%) when compared to lesbians (15.4%), bisexual men (20.1%), and bisexual women (14.6%) (Herek, 2009).

Among transgender individuals, 63% have experienced a serious act of discrimination such as being fired, evicted, bullied, physically or sexually assaulted, denied medical care, or incarcerated, and 23% have experienced three or more serious acts of discrimination (Grant et al., 2011). Transgender individuals are also four times more likely to live in extreme poverty with a household income of $10,000 per year or less and two times more likely to be homeless than the general population (Grant et al., 2011). Anti-LGBT

victimization can lead to psychological distress and mental health problems for these individuals (Herek, 2009). As a result, there are higher rates of suicidal and other self-harming behaviors among the LGBT population than among the general population.

Attitudes concerning sexual identity and orientation vary within and between societies. While issues such as gay marriage, military service and adoption receive significant attention in the United States, some lawmakers in Uganda are seeking the death penalty for homosexuals (Thio, 2010). Currently, Mauritania, Sudan, Iran, Saudi Arabia, Yemen, twelve northern states in Nigeria, and the southern part of Somalia already treat homosexuality as a capital offense punishable by death (Ottoson, 2010). While homosexual acts themselves are legal in 115 countries, they are illegal in 76, and in a number of those countries sexual activity between males is criminalized while sexual activity among females is not (Ottoson, 2010). The 76 countries outlawing homosexuality are concentrated on the African continent, in the Middle East, and in the Caribbean. Based on the above discussion we can see that heterosexism and sexual prejudice still exist today. Furthermore, they are located within the context of other forms of stratification such as class, race, and gender, which cause some LGBT individuals to face more stigma than others.

Pedagogical Suggestions

In the remainder of this paper we discuss topics one could cover in a course and present examples of class exercises, films, and other techniques that can enhance student learning and critical thinking.

Course Content

Class exercises are an excellent way of engaging students to think critically. We will present a potential set of topics that we have found helpful, particularly in the first author's social deviance course, followed by a discussion of class activities, assignments, and films that can be utilized to enhance the learning experience in a variety of courses in different disciplines. First, the instructor could explore the various concepts of sexual and gender identity along the lines of the definitions we presented above and introduce the Kinsey scale or one of the more recent adaptations of it. (For an example of the Kinsey scale, see Clinard & Meier, 2011.) Instructors could then discuss the stigma associated with being an LGBT individual in American society and elsewhere and why the majority still tends to see homosexuality as violating norms, particularly those surrounding gender, even if attitudes are increasingly tolerant and there is increased support for the civil rights of LGBT persons. That being said, accepting, celebrating, and being an ally of LGBT individuals is different from just being tolerant, and that point can be discussed as well. The sources of homophobia/gender prejudice and heterosexism (in religious teachings, gender norms, etc.) could be highlighted, as well as research on the characteristics of individuals more likely to be homophobic, and rates of hate crimes, verbal harassment, bullying in schools and the like against LGBT individuals. Another source of sexual prejudice is the stigma of HIV/AIDS, so a discussion of health issues might be warranted in addition to demonstrating that HIV/AIDS should not be considered a "gay" disease, particularly if one examines the issue globally. Numerous other stereotypes, including those based on gender expression and occupational choice, as well as those found in the media can be challenged, by pointing out the myths and realities of LGBT persons.

In order to view these issues from the perspective of those stigmatized, it would be advantageous to cover the coming-out process, how LGBT persons manage stigma, and the benefits of the LGBT subculture for its members. Instructors could also examine LGBT and ally activism as well as counter-movements over time, the contributions of famous LGBT individuals to social change, sciences, the arts, the treatment of LGBT per-

sons in the media, and debates surrounding the ordination of LGBT clergy. Students would also benefit from learning about legal issues and changes in the law over time in the U.S. and elsewhere. Examples could include the Lawrence v. Texas case; "Don't Ask, Don't Tell" and its recent repeal; the Defense of Marriage Act; legal issues concerning marriage/civil unions and adoption (for current legislation on these topics, refer to the Human Rights Campaign website at www.hrc.org.); and the medicalization of sexual and gender norm violation, including the categorization of LGBT persons over time in the various editions of the Diagnostic and Statistical Manual of Mental Disorders.

Course Activities

Regardless of the topic being covered, in-class exercises, assignments, and films provide a great opportunity to bridge the gap between the material being taught in the classroom and real-world experiences, allowing for a more in-depth study and understanding of the issue at hand. They also "enable[s] students to begin articulating their own beliefs and experiences and then to link them explicitly to the course material" (Eichstedt, 1996, p.386). While one must be mindful of her or his student population, course goals, time constraints and the like, one can utilize the exercises, assignments, and films presented below to enhance student understanding of LGBT issues, keeping in mind that these subsequently discussed ideas are only a few examples from the vast array of possibilities.

"The Heterosexual Questionnaire," available from multiple sources online, can be used to illustrate the social construction of sexual identity and orientation as a deviant behavior (Rochlin, 2003). It is a series of questions that are typically asked of homosexual persons in everyday conversation, but that in this survey are targeted at heterosexual persons. Examples of questions include the following: "When did you first realize you were heterosexual?," "Why do you insist on flaunting your heterosexuality?," "Can't you just be what you are and keep it quiet?," and "Is it possible your heterosexuality is just a phase you may grow out of?" This goal of this assignment is to challenge stereotypes and demonstrate the social construction of heterosexism by asking questions of heterosexuals that are often posed to homosexuals.

Specific discourses are sometimes used to teach heterosexual students about the coming-out process and the positive and negative effects of "coming out," but heterosexual students have difficulty relating to this topic from their own personal experiences. Therefore, DeWelde and Hubbard (2003) suggest that for heterosexual students to experience the fear of being identified as homosexual, an experiential written assignment can be used in which heterosexual students write a "coming-out" letter to a person of their choice. Even though the letter is never sent, it becomes a means by which the student can examine his/her reaction to the coming-out process and the negative effects of coming out, and it enables students to understand as closely as possible what the coming out experience might be like for homosexuals. Subsequent discussions encourage heterosexual students to examine their sexual prejudice and heterosexism, which might facilitate empathy for LGBT students (DeWelde & Hubbard, 2003).

The first author currently uses a similar exercise in his deviance course to teach students about the coming -out process. During his lecture on sexual identity and orientation, he discusses the coming-out process, from their first realization and denial of their sexual orientation to their acceptance and public acclamation of their sexual identity, as well as the positive and negative effects of coming out. After the lecture, students engage in an in-class writing assignment in which they are required to tell the story of an individual who went through the coming-out process stage by stage.

The prompt for the in-class writing assignment is as follows:

> Tell a story about a person going through the 'coming-out process' as mentioned in class and in the textbook. Explicitly link the experiences and feelings of the person in your story to the different stages of the coming-out process.

The individual can be fictitious or based on someone the student knows. The first author has received positive feedback from some heterosexual students about this assignment because it encourages critical thinking, elicits unrecognized emotions concerning the stigmatization of LGBT individuals, and facilitates empathy. He has also received positive feedback from openly lesbian and gay students, who have over the years shared their own coming-out stories through the assignment. The exercise helps provide meaning to the past experiences and struggles of gay, lesbian and bisexual students, and it places their own personal experiences within the broader context of a common experience among the entire LGBT community. Some of these students have written that it was liberating to learn that they were not the only ones who had gone through the coming-out process in a similar manner.

Another method for enhancing the learning experience that can work in a variety of courses involves inviting a panel of LGBT individuals, such as representatives from an "Allies" organization or a "Gay-Straight Alliance" that might already exist on campus, to discuss sexual identity and orientation and answer students' questions in a secure and open environment. As suggested by Martinez (1995), this is "one way in which students can meet LGBT individuals in a neutral setting where stereotypes and myths about LGBT individuals can be challenged" (Martinez, 1995, p.415). Panelists can discuss their feelings and experiences before coming out, during the coming-out process, and after coming out. Subsequent group discussions among students about many controversial topics concerning LGBT individuals, such as the legality of homosexuality, gay marriage, and same-sex adoption, just to name a few, can further facilitate the challenging of stereotypes and myths about LGBT individuals in a neutral setting. In addition, panelists can discuss discrimination against LGBT individuals and ways in which they have or other students could work against that discrimination on a daily basis.

Forms of popular culture such as popular music and music lyrics can be utilized as well (Martinez, 1995). "One" by U2 can illustrate the complex tensions of coming out, especially between parents and children. One popular interpretation of the lyrics is that they reflect the voice of a young gay man dying of AIDS and speaking bitterly towards his father, who failed to accept his son's sexuality and encouraged him to live the straight life for religious reasons (Martinez, 1995). The exercise is carried out by playing the song while students read the lyrics, and it is followed with a discussion of the lyrics in relation to the topic of sexual identity and orientation. This exercise encourages open discussion and provides students with an opportunity to question their beliefs and assumptions about lesbians and gay men, as well as the definition of deviance itself and the relationship of power to deviance, all while depicting lesbians and gay men as a genuine part of humanity (Martinez, 1995).

Films are another form of culture that can be used to enhance student learning. There are too many relevant films to allow for an exhaustive discussion, but there are a few we can highlight. See the Appendix for a list of websites and potential discussion questions for each of the following films. The documentary *Word Is Out: Stories of Some of Our Lives* (1977) is a collection of in-depth interviews with openly gay and lesbian individuals and their families of all different ages and backgrounds that discusses many different aspects of LGBT life, shattering widespread stereotypes. *Small Town Gay Bar* (2006) is a documentary about a gay bar in a small Mississippi town, its positive functions for the town's LGBT community, and the negative reac-

tions to having a gay bar there. The film emphasizes the importance of the LGBT subculture and the stigmatization of LGBT individuals. *Toilet Training* (2003) is a documentary that addresses the discrimination, harassment, and violence that gender-variant people face when using gender-segregated bathrooms in public, at schools, and at work, as well as the influence of gender norms on such stigmatization towards gender variant people (Wentling et al., 2008).

There are also a number of recent feature films that address LGBT issues concerning civil rights activism, stigmatization, and families. The movie *TransAmerica* (2005) is the story of a male-to-female transsexual who has not undergone sex reaffirmation surgery. She learns that she has previously fathered a son, who is now a teenage runaway hustling on the streets of New York. Before her psychiatrist will consent to her operation, she is forced to meet her son and deal with the situation. It tells the story of a family trying to define and redefine itself in reaction to her sex-change process while depicting the stigmatization of transsexuals. The movie *Milk* (2008) tells the story of Harvey Milk, the first openly gay man to be elected to public office in California, and his career as a gay rights activist and politician and ultimate assassination in 1978. It illustrates the past and present fight for legal rights among the LGBT community and the stigmatization of LGBT individuals. It is an excellent example of social movement activism while providing a historical analysis of the LGBT movement. Finally, the movie *The Kids Are All Right* (2010) is the story of two children of lesbian parents conceived by artificial insemination bringing their birth father into their family life, and the subsequent redefinition of their family. It illustrates how children from same-sex relationships can be just as healthy and "normal" as those from opposite-sex relationships and can stimulate discussion on the issue of children seeking their birth parents in general.

Conclusion

In this paper we have attempted to demonstrate that LGBT issues are appropriate and essential for inclusion in university courses, assuming that the topic is presented from a sociological perspective and in a manner that avoids heterosexist language and the perpetuation of stereotypes while demonstrating the social construction of norms and how they are historically and culturally contingent. There are benefits to teaching this subject in a variety of academic disciplines. In sociology and gender studies, students can learn about the social construction of sex and gender norms; psychology students can be exposed to social causes of psychological distress for LGBT persons and how LGBT persons have been viewed in the psychological and psychiatric literatures over time; and education students can learn how to create a safer and more positive learning environment for their future LGBT pupils. These learning goals can be met by exposing students to a variety of topics, class activities, assignments, and films that can enhance student learning and challenge conventional stereotypes. If the tolerance and acceptance of LGBT persons continues to be normalized over time, we may eventually find that LGBT issues are no longer relevant in courses such as those covering deviant behavior; but until then, if we do not approach the topic with care and a sociological perspective, we may miss the opportunity to teach important lessons concerning gender and sexuality: how actors within social institutions reflect and reinforce dominant norms regarding those issues, and how individuals and groups resist and challenge those norms in order to spark social change.

Acknowledgments

The authors would like to thank Patti Giuffre, William L. Smith, Deborah Harris, Gayle Bouzard, and Robert F. Meier for the helpful comments on earlier drafts of this paper.

References

Adler, P. A. & Adler, P. (2012). *Constructions of deviance: Social power, context, and interaction* (7th ed). Belmont, CA: Cengage.

Alden, H. L. & Parker, K.F. (2005). Gender role ideology, homophobia, and hate crime: Linking attitudes to macro-level anti-gay and lesbian hate crimes. *Deviant Behavior*, *26*(4), 321-343.

Bronski, M. (2008). Quo Vadis Culture Wars? *Z Magazine*, *21*(11), retrieved from http://www.zcommunications.org/quo-vadis-culture-wars-by-michael-bronski.

Bronski, M. (2011). 'Glee' and Queer Bullying. *Z Magazine*, 24(1) Retrieved from http://mobile.zcommunications.org/glee-and-queer-bullying-by-michael-bronski.

Bryant, K. & Vidal-Ortiz, S. (2008). Introduction to retheorizing homophobia. *Sexualities*, *11*(4), 387-396.

Clinard, M. B. & Meier, R.F. (2011). *Sociology of Deviant Behavior* (14th ed). Belmont, CA: Cengage.

DeWelde, K. & Hubbard, E. (2003). 'I'm glad I'm not gay!': Heterosexual students' emotional experience in a college classroom with a "coming out" assignment. *Teaching Sociology, 31*(1), 73-84.

Eichstedt, J. (1996). Heterosexism and gay/lesbian/bisexual experiences: Teaching strategies and exercises. *Teaching Sociology 24*(4), 384-388.

Goode, E. (2011). *Deviant Behavior* (9th ed). Boston, MA: Prentice Hall.

Grant, J., Mottet, L., Tanis, J., Harrison, J., Herman, J., and Keisling, M. (2011). *Injustice at every turn: A report of the National Transgender Discrimination Survey*. Washington D.C.: National Center for Transgender Equality and National Gay and Lesbian Task Force.

Harry Benjamin International Gender Dysphoria Association. (2001). *Standards of care for gender identity disorders*, 6th Version. Minneapolis, MN: World Professional Association for Transgender Health.

Hedley, M. & Markowitz, L. (2001). Avoiding moral dichotomies: Teaching controversial topics to resistant students. *Teaching Sociology, 29*(2), 195-208.

Herek, G. (2000). Sexual Prejudice and Gender: Do Heterosexuals' Attitudes Towards Lesbians and Gay Men Differ? *Journal of Social Issues 56*(2), 251-266.

Herek, G. (2009). Hate crimes and stigma-related experiences among sexual minority adults in the United States: Prevalence estimates from a national probability sample. *Journal of Interpersonal Violence*, *24*(1), 54-74.

Koppelman, A. (2006). *Same sex, different states*: When same-sex marriages cross state lines. Ann Arbor, MI: Sheridan Press.

Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Lucal, B. (2008). Building boxes and policing boundaries: (De)Constructing intersexuality, transgender, and bisexuality. *Sociology Compass*, *2*(2), 519-536.

Martinez, T. (1995). Where popular culture meets deviant behavior: Classroom experiences with music. *Teaching Sociology*, *23*(4), 413-418.

Ottoson, D. (2010). *State-sponsored homophobia: A world survey of laws prohibiting same sex activity between consenting adults*. Brussels: International Lesbian, Gay, Bisexual, Trans and Intersex Association.

Pascoe, C.J. (2005). 'Dude, you're a fag': Adolescent masculinity and the fag discourse. *Sexualities*, *8*(3), 329-346.

Perrin, R. (2001). When religion becomes deviance: Introducing religion in deviance and social problems courses. *Teaching Sociology*, *29*(2), 134-152.

Pino, N. (2003). Reclaiming deviance as a unique course from criminology re-revisited: Adding delinquency into the equation. *Teaching Sociology*, *31*(2), 182-194.

Pontell, H. & Rosoff, S. (2011). *Social deviance: Readings in theory and research*. New York: McGraw Hill.

Preves, S. (2003). *Intersex and identity: The contested self*. New Brunswick, NJ: Rutgers University Press.

Rochlin, M. (2003). The Heterosexuality Questionnaire. In M. Kimmel & A. Ferber. (Eds.) *Privilege: A Reader (pp. 75-76)*. Cambridge, MA: Westview Press.

Saad, L. (2008). Americans equally divided on the morality of homosexuality. *Gallup Online*. Retrieved from http://www.gallup.com/poll/108115/americans-evenly-divided-morality-homosexuality.aspx.

Schilt, K. (2006). Just one of the guys?: How transmen make gender visible at work. *Gender and Society*, *20*(4), 465-490.

Schilt, K. & Westbrook, L. (2009). Doing gender, doing heteronormativity: 'Gender normals,' transgender people, and the social maintenance of heterosexuality. *Gender and Society*, *23*(4), 440-464.

Somashekhar, S. & Craighill, P. (2011). Slim majority back gay marriage, Post-ABC poll says. *The Washington Post* (March 2011). Retrieved from http://www.washingtonpost.com/politics/slim-majority-back-gay-marriage-post-abc-poll-says/2011/03/17/ABhMc7o_story.html.

Thio, A. (2010). *Deviant behavior* (10th ed). Boston: Allyn and Bacon.

Vidal-Ortiz, S. (2008). Transgender and transsexual studies: Sociology's influence and future steps. *Sociology Compass*, *2*(2), 433-450.

Wentling, T., Windsor, E., Schilt, K., & Lucal, B. (2008). Teaching transgender. *Teaching Sociology*, *36*(1), 49-57.

Appendix

Movie Websites and Discussion Questions

Word Is Out: Stories of Some of Our Lives (1977) http://www.wordisoutmovie.com/

» What are some of the common elements of the coming out process? What stages do individuals go through when developing a homosexual identity?

» What types of discrimination do homosexual individuals experience based on their sexual identity? What stereotypes do they have to contend with?

Small Town Gay Bar (2006) http://www.smalltowngaybar.com/

» How does the LGBT subculture help members develop an identity and form a community?

» What difficulties did members of the subculture have to live through in the film and how did they manage the stigma they faced?

Toilet Training (2003) http://srlp.org/films/toilettraining/

» What is the difference between gender identity and sexual identity?

» What types of institutional and individual-level discrimination do gender variant individuals experience based on their gender identity? What stereotypes do they have to contend with?

TransAmerica (2005) http://www.bacfilms.com/site/transamerica/

» What are some possible effects on a family when one of its members is gender variant? In what ways does a family have to redefine itself because of this?

» The same questions associated with "Toilet Training,"

Milk (2008) www.filminfocus.com/focusfeatures/film/milk/

» Has the gay rights movement made progress since the time depicted in the film? Why or why not?

» Compare Harvey Milk to another human rights activist you know of. How are they similar? How are they different?

» What types of institutional and individual-level discrimination do sexual minorities experience based on their gender identity? What stereotypes do they have to contend with?

The Kids Are All Right (2010) www.filminfocus.com/the_kids_are_all_right

» Discuss how the family depicted in this film is affected when family members attempt to involve the biological father in the children's lives.

» What issues did this family face that families with opposite-sex parents do not?

» It is a commonly held belief that same-sex parenting is dangerous to the well being of its children. After seeing this movie, how you feel about this issue? Did your beliefs change after watching this movie? If so, how?

» It is also a common belief that relationships in which one or both individuals are bisexual cannot work because fluid sexuality always leads to unstable relationships. After seeing this movie, how do you feel about bisexuality? Did your feelings change after watching this movie? If so, how?

Current Clips and Links

A list of links to interesting, non-commercial websites related to teaching and learning, compiled by Elizabeth Kappos and Josna Rege. *Currents* invites reader recommendations.

Faculty Learning Communities is a website hosted by Miami University, in Oxford, Ohio, for developing Faculty and Professional Learning Communities (FLCs), communities of practice in higher education. The site includes definitions of an FLC, recommendations and guidelines for initiating and implementing FLCs, information and documentation on the annual FLC International Conference and Summer Institute and planning and design documents available for free download.
http://www.units.muohio.edu/flc

Adbusters is a global network of culture jammers and creatives working to change the way information flows, the way corporations wield power, and the way meaning is produced in our society. *Adbusters* magazine and the site's link to various campaigns, videos, and blogs will be of broad interest to teachers and students in disciplines such as communications, political science, economics, and cultural, urban, and environmental studies.
http://www.adbusters.org

Jorum: Learning to Share is the place where users can find, share and discuss learning and teaching resources shared by the UK Further Education (FE) ad Higher Education (HE) communities. Jorum brings together thousands of free, online, learning and teaching resources for all educational purposes. Hosted by Mimas at the University of Manchester, UK, and funded by JISC (Joint Information Systems Committee), the UK's expert on information and digital technologies for education and research.
http://www.jorum.ac.uk

The Internet Archive, a 501(c)(3) non-profit, is building a digital library of Internet sites and other cultural artifacts in digital form. Like a paper library, it provides free access to researchers, historians, scholars, and the general public. It includes information in a variety of media, including audio, video, and text, and it engages in a number of open-access archival and educational projects.
http://archive.org

The Association of American Colleges and Universities (AAC&U) is a non-profit organization whose membership comprises institutions of higher education dedicated to ensuring that the advantages of a liberal education are available to all students, regardless of background, enrollment path, academic specialization, or intended career. Its rich website has a variety of resources on AAC&U programs and publications (many available as PDF downloads), including liberal education and the LEAP initiative, general education, curriculum, institutional & academic change, faculty work, student success, diversity & inclusive excellence, women, global learning, civic learning, assessment, science & health, and STEM education.
http://www.aacu.org

CALL FOR COLLABORATORS

Electronic Portfolios: A Multi-Campus Project on Student Formative Assessment

David Stoloff

Electronic portfolios, or ePortfolios, have the potential to serve as a tool for organizing all forms of learning into a personalized, creative, and reflective display of an individual's university experiences. This potential is hindered by ever-changing technology, faculty and student reluctance to make use of methods of direct assessment, and the uncertainties of confidentiality and security while using social media.

At Eastern Connecticut State University we are developing an ePortfolio system that would assess learning through student reflection on the value added to their education from liberal arts and major coursework, from on-campus events and activities, and from off-campus service learning, community service, and international field experiences. Limited by financial resources, we have explored the use of Google Sites, Google Pages, the SkyDrive in Windows Live, and WordPress, all no-cost web tools, as platforms for student development of their electronic portfolios. Some exemplary student ePortfolios may be accessed at http://stolofd.wordpress.com/eportfoliosfall2011/.

We seek collaborators on other campuses who would be willing to participate in a blog discussion on the applications and evaluation of ePortfolios on their campuses, with a view to possible collaborative publication in the future. If you might be interested, please contact Dr. David Stoloff, Director, Center for Educational Excellence, Eastern Connecticut State University, at stoloffd@easternct.edu.

David Stoloff is a professor of Education and the director of the Center for Educational Excellence at Eastern Connecticut State University. He teaches courses in educational technology and international and cross-cultural education in Eastern's First-Year Program and Educational Technology Graduate Program.

From the Book Review Editors: Wholeness and Integration in Education

Matthew Johnsen and Sean C. Goodlett

The book reviews in this issue of *Currents in Teaching and Learning* respond to the sense of disconnectedness that many college and university students experience. Connections between courses, even within their own major, are often lacking and the authors of both of these books lament the impact of this fragmentation on today's students in higher education.

In *The Learning Paradigm College,* John Tagg (2003) provides a detailed and influential explication of the learning-centered model of education. This book, reviewed by Tona Hangen, highlights a variety of specific approaches that have been used by colleges and universities as they work toward becoming Learning Paradigm institutions.

In *The Heart of Higher Education*, reviewed by Amy Ebbeson, co-authors Parker Palmer and Arthur Zajonc (2010) issue a broad call for a curriculum that focuses on wholeness and integration. This call resonates for a variety of disciplines (Palmer is a sociologist and Zajonc a physicist), urging faculty to begin conversations that lead them to recognize their own role in education and make clear the connections with other lines of inquiry.

If you are interested in writing a review for *Currents*, please contact Matthew.Johnsen@worcester.edu or sgoodlett@fitchburgstate.edu.

Turning up the Learning Thermostat

Tona Hangen

The Learning Paradigm College. By John Tagg. Anker Publishing, 2003. 400 pp., $40.00 (HC), ISBN 978-188298258-5.

Tona Hangen is an Assistant Professor of US History at Worcester State University and the author of a book on religious radio. Her interests include the digital humanities, media history, and American pop culture.

The Learning Paradigm College is a book-length exploration of the ideas John Tagg articulated, along with Robert Barr, in an influential 1995 article for *Change*, "From Teaching to Learning: A New Paradigm for Undergraduate Education." Tagg is Associate Professor of English at Palomar College in San Marcos, California and a frequent speaker on organizational transformation in higher education. Throughout the book, Tagg focuses on the shift from a model of education as content delivery (completed when content has been delivered) to a learning-centered model (completed when students have learned). This shift—from teaching to learning—implies a fundamental reorientation of the underlying structures and assumptions of higher education, including different metrics for success and a revised approach to course design.

Two useful contrasts early in the book are in his description of students' orientation towards learning and the temperature of an institution's "cognitive economy." Students who are oriented more toward learning than toward grades both learn and perform better than those looking simply to complete the course or get the degree. Deep, lasting learning is active, holistic, incremental, and mindful, while surface learning or learning that is poorly retained is inert, atomistic, and reinforces mindlessness. "Hot" rather than "cool" cognitive environments can foster deep learning, by offering intrinsic rather than extrinsic goals, activities that demand higher-order cognition, higher ratios of feedback to evaluation, longer time horizons for learning, stable communities of support for students' intellectual risk-taking, and aligned messages rather than contradictory ones (see e.g. Table 8.1, p. 81).

While an individual instructor might adopt a learning-centered approach in his or her own classroom, Tagg argues that the necessary larger paradigm shift cannot be accomplished piecemeal, classroom by classroom. He hopes that "individual teachers can design their classes around the kind of things they want students to do rather than simply the information they want students to know" (164). But students encountering student-centered learning in some of their courses and not others are likely to be confused or even resistant because such courses demand a quite different level of student

responsibility and engagement and they disrupt students' expectation that "good" courses demand little and are "easy." In addition, such efforts scattered throughout the college or university have a high probability of being undermined what he calls the "theory-in-use," or the embedded, persistent patterns that characterize the instruction paradigm. His critique of the status quo is quite pointed:

> Courses…define the educational mission in the Instruction Paradigm. The mission of colleges became putting more students in more classes. For most colleges in a highly standardized and interdependent system of transferable credit, a means—offering courses—had become the end, if not the definition, of higher education. Experiments around the edges rarely touched this central theory-in-use… Innovations that explored other means, alternative processes of doing what colleges claimed to be doing, could survive on the periphery, but such experiments could not gain purchase on the core of the institution—not because they were good or bad but because they were simply irrelevant to what colleges had come to be: factories for the production of full-time-equivalent students (FTES), transcript-generating machines. (17)

Much of the early part of the book is devoted to describing this "Instruction Paradigm" that is the dominant and well dug-in model for American higher education and contrasting it with the "Learning Paradigm." The instruction paradigm is so thoroughly entrenched that it becomes invisible; in most institutions of higher learning it is simply the water we swim in, the taken-for-granted environment, the underlying framework. It is precisely because the instruction paradigm is not consciously articulated and has not been collectively assented to, that it proves so tenacious and hard to dislodge. Indeed, many colleges and universities have adopted mission statements that affirm and celebrate aspects of the learning paradigm, but the totality of students' experience testifies otherwise. One key insight is that any definition of a college's "learning environment" should be broadened beyond its classrooms and courses to include, for example, its campus services, student organizations, study spaces, and communication systems. Tagg shows that the Instruction Paradigm extant at the vast majority of institutions of higher education creates a "cool" or cognitively less-challenging learning environment, which encourages students (who are portrayed as rational actors) to disengage while a Learning Paradigm raises the temperature of the cognitive economy because learners have to actively engage.

Lest some readers protest that maintaining a "hot" cognitive economy is just too expensive, Tagg won't let his readers dismiss the Learning Paradigm as resource-heavy, the luxury of well-endowed or private universities. Instead, the book is profusely illustrated with nineteen real-world examples of the Learning Paradigm in action on the ground in different settings and vastly diverse institutions of higher learning from well-endowed private liberal arts to large state institutions to cash-strapped community colleges.

In chapters 11-16, which form the heart of the book's detailed profiles in institutional courage, Tagg analyzes what unites successful Learning Paradigm colleges. They promote intrinsically rewarding goals; they require frequent, continual, connected, authentic student performances. They provide consistent, continual, interactive feedback to their students. They provide a longer time horizon for learning, and they create purposeful communities of practice. Finally, they align their activities around the mission of producing student learning. Tagg concedes that "all Learning Paradigm colleges will not be alike. Indeed, the standardization of external forms that we find in the Instruction Paradigm colleges should diminish as colleges come to experiment more deeply with alternative approaches" (154).

What sparked change at these notable institutions? Some were motivated by deep crisis, whether accreditational or financial, as in the case of Olivet, Wagner, and Alverno. Others had the opportunity to build a university from the ground up, as at Cal State University Monterey Bay. But just as many undertook significant paradigm shifts without being compelled by dire circumstances, and Tagg applauds such efforts of institutions to collectively rethink and reorient voluntarily and with their own students in mind. What has happened at these institutions, writes Tagg,

> is indeed magical—wonderful—but hardly impossible. Indeed, contrasted with the task of carrying the burdens of incoherence and waste that drag us down daily, it is not even difficult. What it requires is a certain kind of vision, held in common: a vision of an undergraduate college as a whole, as a coherent community acting from a consistent and unifying purpose. A vision of integrity. (282)

Accomplishing such a paradigm shift is neither easy nor quick. Implementing the Instruction Paradigm requires far more than cosmetic changes. But Tagg encourages readers to begin by simply seeing how things are, and envisioning how they might be different. He ends with a clarion call to educators to become what they want their students to be, and as they collectively approach curriculum design, assessment, governance, and planning, to model learning that is deep, active, integrated, incremental, mindful, self-directed, and collaborative (349). After all, he asks, are not these the very habits of mind we dream of our students developing?

Tagg's book is meaty and thought-provoking. It should be widely read, not only by faculty but by stakeholders across campus communities. It is somewhat densely written (educators not familiar with the scholarship of teaching and learning may find some unfamiliar language). Maybe a student version is in order. As some institutions begin to lead out as innovators, and to look and act distinctive, how are prospective students to judge among them, to compare their apples and oranges? One unanswered question is how Learning Paradigm colleges can create the necessary near-instantaneous paradigm shift in student expectations of college (and how they might differ from the dominant models in K-12 education), which would seem to need to happen either in the admissions process or very soon thereafter, to quickly bring new learners up to speed on locally meaningful definitions, structures, and expectations. We need a more efficient ways to identify Learning Paradigm enthusiasts in the job market pool and help match them with places where the Instruction Paradigm no longer reigns supreme; otherwise, profound misalignment will create friction and conflict. But perhaps that is the real value of *The Learning Paradigm College*: to empower a new generation of internal advocates for change, rising clear-eyed to the forthcoming challenge of remaking higher education around deep and real student learning.

Conversations that Matter

Amy Ebbeson

The Heart of Higher Education: A Call to Renewal. By Parker J. Palmer and Arthur Zajonc, with Megan Scribner. Foreword by Mark Nepo. Jossey-Bass, 2010, 237 pp., $24.95 (HC), ISBN 978-0-470-48790-7.

Amy Ebbeson, MSW, teaches in the Health Sciences Department at Worcester State University and coordinates the Next Step Program serving nontraditional students. She is interested in mental health, spirituality, and social justice.

Palmer and Zajonc's recipe for reinvigorating higher education is derived from a simple question: "How can we help our colleges and universities become places that awaken the deepest potential in students, faculty and staff?" (p. 5). The authors believe that when people from different backgrounds and disciplines talk about things that truly matter, it awakens the "heart." Conversations in this spirit can lead to change at the individual, institutional, and societal levels. Palmer offers conversation as a path to engaged and integrated learning.

The Heart of Higher Education: A Call to Renewal sprang from such collegial conversations. Those of us in higher education are being called upon to be more accountable to the public we serve. What are we doing here? What do we want for our students? These questions lead to expansive conversations through which educators can share what brought them to this work and what sustains them as educators. Students, faculty, and staff need to cultivate both critical thinking and compassion—both mind and heart. Transformative conversations lead us to teaching and learning together in ways that create connections. These include connecting course content with life purpose, connecting science with art, and connecting the haves with the have-nots. To the authors, this is the essence of integrative education.

Like many others, the authors call for integrative education. This means finding those connections, the threads that run through all disciplines. Palmer and Zajonc state, "Academic Culture has long made a false distinction between the 'hard' virtues of scholarship, and the 'soft' virtues of community…in truth, the soft virtues and the hard virtues go hand in hand when it comes to good pedagogy" (p. 30). Standing on the sidelines and remaining entrenched in the status quo are no longer options. "Objectivism is no longer a viable way to frame knowledge, teaching or learning. It's not about keeping our distance, it's about moving in closer" (p. 31). The authors argue that integrative education is about connection, building community, working for social justice and connecting the college or university to the larger community. When one pursues

connections, one is sure to find them in synchronistic ways that call one back to purpose.

Readers may be familiar with Palmer's *The Courage to Teach* (reviewed in *Currents 1*(2)), which describes teaching as a spiritual calling. He was inspired by teachers with whom he felt connected and engaged. For me too as a student, academic achievement was a consistent by-product whenever I felt heard and valued. Education can be seen as a vehicle for bringing people together for positive social change. According to Palmer, we must find our purpose as educators and support our students in finding theirs. Education is, and needs to be, about our hearts and spirits as much as our heads. Relationships are at the center of the educational process, and when they are cultivated many other things fall into place.

Based on this work, the author's charge to educators is clear. We must enter into meaningful conversations with our students and co-workers. Mindful attention paid to bringing the college or university together and building a community of collaborative integrative learners and practitioners will pay dividends well beyond the financial. By attending to our humanity, and responding to the needs of our students and our community, we will increase our credibility, our status, and our capacity to be agents of change.

At a recent Youth Worker symposium, Shawn Ginwright, a noted author, Professor of Education at San Francisco State University, and leading national expert on African American youth, youth activism, and youth development, described a study conducted by a colleague about plant response to environmental toxins. In this study, each time a single plant was confronted by an environmental toxin, the plant died. However, the researcher noted that when a number of plants were exposed together to the toxin, they were more likely to survive. His conclusion was that even in the plant world, we stand together or fall apart. Let us stand together like Ginwright's plants. Palmer and Zajonc suggest that together, through conversation and connection, we can defeat the social toxins that threaten our collective well-being.

About Us

Currents in Teaching and Learning is a peer-reviewed electronic journal that fosters exchanges among reflective teacher-scholars across the disciplines. Published twice a year, *Currents* seeks to improve teaching and learning in higher education with short reports on classroom practices as well as longer research, theoretical, or conceptual articles and explorations of issues and challenges facing teachers today. Non-specialist and jargon-free, *Currents* is addressed to both faculty and graduate students in higher education, teaching in all academic disciplines.

Subscriptions

If you wish to be notified when each new issue of *Currents* becomes available online and to receive our Calls for Submissions and other announcements, please join our *Currents* Subscribers' Listserv. Subscribe Here.

CALL FOR SUBMISSIONS
Volume 5, Number 1, Fall 2012

Currents invites submissions for its Fall 2012 issue, including:
Short reports from different disciplines on classroom practices (2850-5700 words).
Longer research, theoretical, or conceptual articles, and explorations of issues and challenges facing teachers today (5700-7125 words).
Book and website reviews.
We welcome both individual and group submissions.
All submissions must be original, previously unpublished work.

EXTENDED Submissions Deadline: July 31, 2012

Submissions Deadline, Volume 5, Number 2, Fall 2013: November 15, 2012.

Submissions and Contact Information

Please address all submissions and inquiries to Josna Rege via e-mail: currents@worcester.edu
For further information and submissions guidelines see our website: www.worcester.edu/currents.

Please address all postal inquiries to

Josna Rege
Editor, *Currents in Teaching and Learning*
Associate Professor, Department of English
Worcester State University
486 Chandler Street
Worcester, MA 01602-2597
U.S.A.

Currents in Teaching and Learning is a publication of Worcester State University, Worcester, Massachusetts, U.S.A.
ISSN: 1945-3043