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An Honors Interdisciplinary Community-Based Research Course

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BACKGROUND

Community-Based Research (CBR) is an important extension and development of existing community service learning (Stoecker). CBR has as its emphasis research questions asked or needed by the community and, therefore, positions students working alongside community members with the purpose of solving a community issue or creating social change. In doing so, it also allows student development of research skills and methods. A hallmark of CBR is collaboration between a community and academicians through all steps in the course design process, including the crafting of the initial research planning stages, implementation of the research, and dissemination of results and knowledge (Israel et al.). CBR is also action-oriented so that the community can use the process and results for positive social change.

CBR is becoming increasingly popular as institutions of higher learning understand that their role is not only to prepare students to enter graduate school or the workplace but also to empower students to become responsible citizens who participate in a larger community (Bringle & Hatcher). The civic engagement of CBR is appealing to institutions for several other important reasons. Undergraduate students have become increasingly goal-oriented as education consumers (Astin et al.). To many students, such real-world learning experiences provide immediate applications for what otherwise would be only abstract theories (Braqbant & Hochman). While such projects, increasingly interdisciplinary, add value to student learning (Davis), opportunities to engage in applied research also directly benefit the communities in which these institutions are situated. Environmental issues, which are both scientific and social in nature, thus lend themselves particularly well to interdisciplinary CBR courses that seek to meld social and natural sciences for both science and non-science majors (Tilbury; Berkes).

At Cabrini College, two faculty members—one from biology and the other from psychology—incorporated interdisciplinary community-based research in an honors course on environmental watershed issues. The course, Environmental

Psychology, was team-taught in partnership with a local watershed organization, the Valley Creek Restoration Partnership (VCRP) in such a way that the students could see first-hand the interdisciplinary nature of many CBR projects (Lutz & Nei; Terlecki et al.; Watterson et al.). The study of watersheds is necessarily an interdisciplinary endeavor, requiring an understanding of natural, social, and behavioral sciences (Bentrup). Additionally, since both faculty were working with the same community partner, they anticipated that they would be able to align and integrate their research designs more closely with one another when team-teaching an interdisciplinary CBR course. An interdisciplinary CBR course would, furthermore, expose more students at Cabrini College to this type of experiential learning opportunity. The course was open to students in any major and at any level in the Cabrini College Honors Program.

The design, implementation, and assessment of our course can serve as a roadmap for others considering teaching an interdisciplinary CBR course in honors, including details about the collaboration between faculty from different disciplines with a community partner, student focus group data on course learning outcomes, the impact of an honors interdisciplinary CBR project from a community partner perspective, and the expansion of the honors model into an institution's general education requirements for all students.

LITERATURE REVIEW

CBR offers faculty the opportunity to combine research and service through community-based engagement in complementary ways not always possible with other types of service or experiential learning (Faculty for the Engaged Campus at <<http://www.ccpb.info>>; Ward). A powerful outcome of CBR noted by other researchers is that it enables faculty to engage students in research projects that involve faculty's areas of professional expertise in ways that benefit community partners and address community-defined needs (Reardon; Chapdelaine & Chapman; Strand, Marullo, et al.; Council on Undergraduate Research; Hofman & Rosing). CBR thus rests on a partnership approach of reciprocity between institutions of higher learning and various community constituents; ideally, it addresses community-based problems through application of skills and extension of knowledge while likewise helping to build capacity among diverse stakeholders (Chapdelaine & Chapman; Stocking & Cutforth; Sunderland et al.).

Several studies have demonstrated the merits of CBR. For example, a survey conducted at a Council on Undergraduate Research (CUR) Conference in the summer of 2004 described student benefits of CBR that included academic, social, and personal outcomes. Other studies have shown that students who completed CBR projects frequently went on to deepen their connection to community work and to broaden their understanding of social justice issues through additional coursework or employment (Kowalewski). Strand suggests that CBR introduces an experiential component that helps students acquire research skills and makes research more appealing and accessible to undergraduate

students. Work by Willis, Peresie, Waldref and Stockmann indicates other benefits of CBR that include real-world experience, a boost in students' confidence to work with diverse groups of individuals, and noticeable effects on their career choices. We have noted that CBR experiences have also directly influenced students' subsequent course of study in their major.

Experiential learning has been a large part of honors undergraduate education for decades (Braid; Braid & Long). Several recent articles have highlighted honors service learning courses and their relevance to honors programs (Strikwerda; Powell; Holman, Smith & Welch; Cundall). However, as indicated by Steward, we still need more detailed research on CBR courses employing service learning as part of an honors education. With the increasing number of students graduating from high schools that have required service learning components, Ross and Boyle suggest that higher education institutions should reconsider the types of service learning experiences for college students, a reconsideration that may have special importance for the highly motivated students in a college honors program.

Interdisciplinary CBR, in particular, can be viewed within the context of a wider discussion on interdisciplinarity and integrative learning across higher education. The Carnegie Foundation and the American Association of Colleges & Universities (AAC&U) define integrative learning as those involved activities and courses that "foster students' abilities to integrate learning—over time, across courses, and between academic, personal, and community life" <<http://www.units.muohio.edu/aisorg>>. We argue that foremost among the pedagogies that engage students deeply in integrative learning is interdisciplinary CBR. As López-Chávez and Shepherd point out, honors programs are uniquely positioned to offer interdisciplinary/integrative learning opportunities since they have had a long history of trying to achieve these types of goals with motivated and successful student populations.

COURSE JUSTIFICATION

Among CBR courses that are discipline-specific, CBR has been shown to have a direct impact on students' perceptions of their major (Strand, Marullo, et al.; Lichtenstein et al.). There is a dearth in the literature, however, on the impact of interdisciplinary CBR courses on student attitudes and perceptions or on their understanding of diverse research methods, particularly in disciplines outside their major. Thus, one of our motivations for team-teaching was for students to see first-hand the value of research methods typically employed in different disciplines but used within the same course and thus to explore how different research methods may be employed effectively on a common CBR project. Likewise, the team-teaching approach would best allow the instructors themselves to gain a better understanding of disparate research methods employed outside their disciplines and to synthesize and integrate course research projects successfully. Both course instructors realized the course would be ambitious and so decided to offer it as an honors course. Both Davis

and Welsh point out that, for an interdisciplinary experience to be successful for students and instructors alike, team-teaching that provides experience and instruction in methods within each discipline is essential. As Letterman and Dugan suggest, team-teaching can generate enthusiasm in an interdisciplinary and/or accelerated course for the course instructors and students alike. Likewise, Shibley indicates that team-taught interdisciplinary courses provide a means of focusing more on the process of learning instead of accumulating content knowledge, and such was the goal of our proposed interdisciplinary CBR course.

COURSE BACKGROUND AND DESIGN

Several years prior to course implementation, both faculty members had worked independently with the VCRP and with dedicated undergraduate students conducting research on Crabby Creek, a major tributary to Valley Creek. Valley Creek, located in southeastern Pennsylvania, flows through Valley Forge National Historical Park and enters the Schuylkill River near the Headquarters of General George Washington. The Headquarters has great national, historical value since it was used by George Washington during a winter encampment of the Continental Army during the American Revolutionary War. Due to stormwater issues in major tributaries of Valley Creek, Crabby Creek being one of them, there was and continues to be a real danger that George Washington's Headquarters could be destroyed during a major rainstorm event since it is located only a few hundred yards from Valley Creek. The VCRP received funds to restore a section of Crabby Creek to help reduce the amount of stormwater entering Valley Creek.

For the honors course, biology professor David Dunbar worked with students on conducting macroinvertebrate (stream insect) studies, a proven way to determine stream health, on portions of Crabby Creek that had undergone restoration (Terlecki et al.). Psychology professor Melissa Terlecki, in consultation with the VCRP, developed a watershed attitude survey that was distributed to the Crabby Creek community to gauge community willingness to adopt best practices in stormwater management as well as community awareness of the goals of the VCRP.

Starting six months before the course, both of the faculty members worked with VCRP members during scheduled meetings to develop interdisciplinary, course-based CBR projects and course objectives. Course instructors and VCRP members also developed four learning outcomes:

1. an understanding of research methods across disciplines;
2. an understanding of the merits behind CBR and community service;
3. an enhanced understanding of local and global environmental problems that plague current society; and
4. an increased level of advocacy for environmental justice.

COURSE ACTIVITIES

Through an array of interactive and interrelated projects, students investigated local water quality, land use, and the choices people make about managing their environments in the Crabby Creek community. Students also organized and sponsored the first annual Crabby Creek Earth Day event with educational activities for resident homeowners and their families, and they created educational brochures, highlighting water resource best management practices, for dissemination in Crabby Creek Park. These course activities provided exposure and experience in undergraduate research by focusing on both the science and the psychology of environmental issues. Students were graded on group projects that included the educational brochures, their work on Earth Day, and stream biological/chemistry studies.

Our community partner suggested the educational brochures as a strategy to help lessen stormwater runoff from housing developments in the watershed. In consultation with the VCRP, the students worked in teams of three or four to develop the brochures, which explained how homeowners can implement best practices to reduce stormwater runoff into Crabby Creek and offered strategies such as installing rain barrels and rain gardens. To disseminate the information, students placed copies of the educational brochures on bulletin boards at Crabby Creek Park and at the local township building.

In helping to plan and implement the inaugural Crabby Creek Earth Day celebration on April 17, 2008, our students joined with the VCRP to bring awareness to the community about issues affecting the health of Crabby Creek and to show the community what the VCRP represents as an organization. Students assisted the VCRP in training Crabby Creek community residents to gauge stream health through both chemical testing and macroinvertebrate analysis. Local residents also had the opportunity to sign up for a Backyard Ecology program. Currently, over thirty homeowners have signed up for the program and have had rain gardens and rain barrels installed at their residences along Crabby Creek.

Also as part of the course, students collaborated with the Stroud Water Research Center (SWRC) in testing stream nitrate/nitrite, phosphate, and pH levels in order to monitor stream health in sections of Crabby Creek that had previously undergone major restoration to address stormwater damage. The SWRC is one of the premier centers for watershed research and education. Students reported their stream chemistry results to the VCRP, which used these results to determine the efficacy of its restoration efforts as it plans future restoration on additional tributaries to Valley Creek.

COURSE ASSESSMENT

Twenty-seven honors students were enrolled in Environmental Psychology as an elective. The course attracted students from varied academic majors, but the majority majored in psychology (ten) and biology (eight). Due to the small number of participants, only focus-group data could be assessed. A facilitator

(Lisa Ratmansky), Director of the Cabrini College Center for Teaching & Learning, conducted two one-hour focus-group sessions of five students each. The focus group work was conducted during the fall semester after the course was taught so did not include recently graduated seniors. Of the returning students who had been enrolled in the course, ten out of fifteen took part in the focus group work, during which anonymous student responses were audiotaped and transcribed by professional transcription services. The student focus groups were semi-structured (Anfara, Brown, & Mangione) with the facilitator asking a list of questions constructed by the course instructors.

To analyze students' focus group responses, we used a directed content analysis of qualitative data to identify recurring statements linked to specific learning outcomes (Hsieh & Shannon). Student statements linked to particular learning outcomes were coded individually, and then the results were compared to produce a coding consensus. Student statements linked to specific learning outcomes (either positive or negative attributes) were tabulated and included in Table 1.

COURSE FINDINGS

The highlights of student focus group data are depicted in Table 1 with statements, both positive and negative, attributed to the first three of the four student learning outcomes developed for the course. We received limited focus group data on the fourth outcome so did not include it in Table 1 results.

Every student taking part in the focus group reported an understanding of research methods across disciplines. One student from the focus group added that "it was a cool concept to have teachers team-teaching and then really approaching the same subject from two different standpoints". The same student went on to explain that "there was constant collaboration between the two professors with their different disciplinary research methods throughout the entire semester" and that "looking at a CBR project from different standpoints enriched the class".

Another attribute of the first learning outcome was that all students agreed they benefitted from the interdisciplinarity of the course and thought that learning the material from two different viewpoints was enriching. One student "liked that the course made us choose how we felt on issues—and that was more the psychology side of the course—but then we got to see the issue in action by going to Crabby Creek, which was the more biological side of the course." Another student "hated science" but nonetheless took away from the class "an understanding that [for] the things that do happen in biology, we have to react to somehow, and our reaction is the psychological aspect to it." One student believed "that the psychology part was somewhat absent from the course and was a little overwhelmed by the biological aspect of the course," but most indicated a fair balance between the two disciplines, a balance that was a significant goal of the course in order to demonstrate that two seemingly disparate disciplines could work together to create a better understanding of environmental issues. Despite some complaints, the student outcomes conform

to the ideal of interdisciplinary courses defined by Davis “as the work that scholars do together in two or more disciplines by bringing together and to some extent synthesizing their perspectives” (5).

In addressing the second learning outcome, the students reported gaining a worthwhile experience in working with residents in the local Crabby Creek community and with our community partner, the VCRP. One student said about the Earth Day event that “the community helped out and we did a lot of hands-on work and what we learned about was finally being put into action.” Another student “had never heard of Crabby Creek . . . so to actually see a group of people who are committed to this and that they are trying to make a bigger awareness, I think, made a pretty big impact.” Students also responded positively to the VCRP’s scheduling of one of their monthly community meetings as part of our class, with one student commenting “it was interesting when we had the VCRP meeting held during our class because that’s something that none of us would’ve had the opportunity to experience otherwise”.

Table 1. Student Focus Group Data Summary

| Learning Outcome | Positive Attributes | Negative Attributes |
|--|---|---|
| An understanding of research methods across disciplines | Community-based research was an important and valued aspect of the course (7/10 students) Students benefitted greatly by interdisciplinarity of course and thought teaching a course from two different standpoints was enriching (10/10 students) | Community-based research was too time consuming (4/10 students) Several students had research embedded in their courses during the same semester (3/10 students) Some students indicated they just don’t like biology (3/10 students) |
| An understanding of the merits behind CBR and community service | Working with a Community Partner had a great student impact (8/10 students) | A couple of students wished to have more interaction with Community Partner (2/10 students) |
| An enhanced understanding of local and global environmental problems that plague current society | Course made students aware of conflicting views and ideas of an individual regarding environmental choices (10/10 students) | Critiquing different perspectives every class period is very time-consuming and becomes mundane (6/10 students) |

About the third learning outcome, one student commented on the experiential aspect of the course that encouraged a different way of learning than a typical science course: “we just learned about how we can protect our environment by thinking about it differently.” Another student indicated that “when you brought in the psychological aspect, it actually showed the conflicting views on a subject you can have yourself.” Every student indicated awareness of the sometimes conflicting environmental views and choices, some of which are at variance with the scientific evidence and can be illuminated by knowledge of psychology. Focus group data indicated students’ understanding and appreciation of the integrative complexity of environmental problems on both a local and global perspective, which we have attributed to the team-teaching approach.

Although the focus group moderator did not directly prompt students to address the fourth outcome, a former student was inspired by the course to begin working with a non-profit environmental group to prevent energy companies from drilling for natural gas in a way that negatively impacts watersheds in the state of Pennsylvania.

Student focus group data also showed a benefit not included in the learning outcomes in that students believed the course influenced their environmental stewardship practices. One student said, “I made changes like turning off the water, the lights, and recycling more and driving less.” Another student “didn’t really give recycling much thought” until after the course, claiming to “now recycle everything.” Another student commented that “there are so many options available to promote environmental stewardship, such as using solar energy and installing rain barrels to reuse water for watering your lawn.” Overall, students indicated that the course had an impact on their personal lives and that they are now more fully aware of environmental issues.

LESSONS LEARNED

Based on our student assessment results, our efforts in developing an interdisciplinary CBR course focused on environmental and watershed issues have been successful. One of the most promising outcomes of our interdisciplinary CBR team-taught approach is that it gave students a greater understanding of how disparate disciplines can come together to work on a community-based watershed issue; students came away from the course with a greater appreciation of research methods across the different disciplines

Student focus group feedback was informative, but we realize the limitations of this preliminary analysis since only ten students participated. Based on the results, though, we have learned lessons about community partnership that should be helpful to faculty at other institutions in planning and implementing an honors CBR course, whether or not it is interdisciplinary and/ or team-taught.

Interaction with a community partner was a major asset of the course, with several students suggesting that we offer more opportunities for working with the community in future course iterations. In hindsight, the course instructors

feel they spent too much time on the research task instead of the process that took place outside of class between course instructors and community partners in planning the CBR. Additionally, both course instructors tried to “squeeze in” too much content coverage of their disciplinary research methods, making meaningful meetings and discussions with our community partner problematic. As pointed out by Israel et al., the balance between process and task in a CBR project can be challenging, but involvement of the community enhances both the process and the research.

We have also gained perspective on the merits of our interdisciplinary CBR course from the community partner perspective. Members of the VCRP indicated that the interdisciplinary nature of the course allowed a wider range of students from different disciplines to gain exposure to outside professionals and volunteers who have experience in watershed issues. Additionally, the constant dialogue between the VCRP and course instructors allowed for interdisciplinary research that partnership members did not have the expertise to conduct themselves.

CONCLUSIONS

A powerful advantage of our honors Environmental Psychology course was that it was designed to match the goals of our college’s honors program, giving honors students ample experiential learning opportunities and demanding more from them than in a typical course at our institution. Equally as important, the course allowed both faculty members to be creative in developing and co-teaching the course even though neither had prior experience teaching a CBR course.

Our honors course also served as a compelling example of what Paul Strong advocates, namely honors programs can serve as laboratories for innovation, he refers to as “honors as skunkworks.” For course development, we needed approval only from the Chair of the Honors Program and the Dean for Academic Affairs and not our institution’s curriculum committee since the course was not being proposed as part of the core curriculum. Because of our success with the honors course, it has now serendipitously evolved into two related interdisciplinary team-taught CBR courses: Watershed Citizenship, which meets a sophomore-level writing-intensive requirement in our core curriculum, and Watershed Ecology, which satisfies one of two science course requirements for non-majors. Students are encouraged either to take both courses simultaneously if their schedule allows or to take the courses sequentially, thus experiencing interdisciplinary integrative learning. Again as Strong argues, “when such efforts are demonstrated to be successful, they may well become institutionalized, thereby raising the general level of education within the college or university.” Our experience has demonstrated that honors programs are an effective means for faculty to experiment with teaching a team-taught interdisciplinary CBR course and that such an experiment is highly worthwhile.

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