Learning Communities Research and Practice

An Integrated Interdisciplinary Faculty-Student Learning Community Focused on Water Issues: A Case Study

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Abstract

In response to a request from a campus student organization, faculty from three fields came together to develop and teach an integrated interdisciplinary course on water issues and social activism. This course, *Water as Life, Death, and Power*, brought together topics from the fields of anthropology, biology and chemistry to explore water rights, access to clean water, and water treatment methods. Students enrolled in the course developed projects related to a variety of local and global water issues to present real-world solutions at a university-wide student research showcase. This article describes how we organized the learning community, composed of students, faculty, and staff, and outlines the training process of developing a sense of community, content integration, and interdisciplinary teaching techniques.

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Responding to Student Interests

Universities Allied for Essential Medicines (UAEM) is a worldwide coalition of university students dedicated to providing access to affordable medicines. One goal of the Central Michigan University (CMU) UAEM student chapter is to educate students on issues of global health inequities.

In 2011, the UAEM students petitioned for undergraduate courses combining interdisciplinary teaching and opportunities to solve real world problems, joining theory with activism. In response, three CMU UAEM faculty advisors, Stephen Juris (Biology); Anja Mueller (Chemistry); and Cathy Willermet (Anthropology), participated in a Faculty Learning Community (FLC) to develop an interdisciplinary course (Willermet, Mueller, Juris, Drake, Upadhaya, & Chhetri, 2013). We chose water because it reflects all of our research specialties, combining access to water with water-borne diseases and treatment. In this article, we describe how we developed the learning community of faculty, staff, and students, and how we trained ourselves to teach an integrated interdisciplinary course.

The Call and Creation of Communities

The Faculty Learning Community (FLC)

In 2011, CMU's Faculty Center for Innovative Teaching (FaCIT) launched a new initiative: the development, implementation, and support of FLCs, based on considerable evidence that effective learning communities have important benefits for students and faculty (e.g., Cox, 2004; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Lenning & Ebbers, 1999). FaCIT defined FLCs as interdisciplinary groups who engage in a collaborative, year-long program focused on enhancing teaching practices and learning styles and assessment. A FaCIT liaison ensures that the administrative functions of an FLC are accomplished and offers assistance in recruiting members, reaching FLC goals, solving collaborative group processes, and providing resources on best practices for teaching and learning.

FLC applicants were required to propose a topic and rationale, potential members, preliminary goals, and deliverables. In response, we (Juris, Mueller, and Willermet) submitted a proposal to develop the student-requested interdisciplinary course, focusing on water issues and incorporating activism. We proposed these outcomes: (1) develop a Master Course Syllabus for an interdisciplinary undergraduate water class; (2) learn best practices for teaching interdisciplinary courses; (3) develop interdisciplinary group projects; and (4) develop assessments to measure interdisciplinary thinking and activism.

FaCIT approved the project, titled *Water as Life, Death and Power*, and assigned one of the authors (Drake) to our FLC as a liaison. The three faculty were the co-facilitators. We invited faculty member Shu Guo, Reference Librarian, to join and provide research support. This group was the core of the FLC.

The Student Learning Community (SLC)

Since the vision for this course came from UAEM students, we wanted to include them in course development by incorporating them into the FLC model. This resulted in a combination faculty and student learning community, the FLC/SLC. Two UAEM graduate students (Upadhaya and Chhetri) were particularly involved and eventually taught the seminar portion of the course. Additionally, four undergraduate students actively participated in the SLC. The UAEM students (mostly undergraduates) met separately to discuss and approve student outcomes. The SLC students did not have a background in pedagogy or course development; however, they had a strong sense of purpose, and training and experience in student activism. To enable students to participate as equal partners in the course development and facilitation and ensure that their learning objective of student activism was maintained in a measureable format, Drake provided the students with customized training workshops on instructional design and student learning outcomes as well as one-on-one consultations on best practices in leading a seminar course.

Developing Community

Learning community

Faculty in an FLC benefit from sharing their expertise with each other, broadening their knowledge about pedagogy, promoting active teaching, and increasing collegial trust (Lenning & Ebberts, 1999). This process is enhanced through activities that build rapport. Faculty might be intimidated by students being present while they are learning teaching skills; students might feel constrained by faculty being present when they propose and discuss content topics. To maximize a collegial, supportive environment, we divided the planning meetings into three formats: one meeting for FLC members, one meeting for SLC students, and a combined FLC/SLC meeting, where students and faculty worked on course development together.

Building team rapport

FaCIT facilitated an orientation for all FLC facilitators and co-facilitators at CMU. This orientation reviewed FLC requirements, strategies for successful FLCs, and effective leadership behaviors and group processes. Indeed, the challenge for effective FLC facilitators is to balance structure and leadership, ceding leadership and facilitation to members as they develop as a collaborative group (Ortquist-Ahrens & Torosyan, 2008).

The FLC team rapport began through a sense of shared purpose, both in supporting the UAEM student initiative and in exploring interdisciplinary teaching. Juris is a biochemist researching the water-borne disease cholera and cholera toxins. Mueller is a chemist interested in new materials for perchlorate and heavy metal water remediation. Willermet is a biological anthropologist who teaches the microevolution of human populations and diseases. Initially, we discovered several points of contact between our disciplines to explore. Mueller, as lead facilitator, provided oversight for tasks and deadlines. The SLC team was already well organized through their UAEM student activism; interested UAEM students flowed in and out of SLC activities guided by their time, passion, and experience.

In order to ensure that the FLC/SLC was a successful joint venture, we had to be sensitive to different levels of experience and institutional power. The FLC members respected that the SLC students were experts in student activism. Therefore, while FLC members, when asked, provided suggestions for seminar content, the SLC held final control over seminar topics, speakers, and readings.

Each meeting had a specific agenda and deliverables; during the meetings specific tasks were assigned. All FLC/SLC members respected the mutually agreed-upon deadlines, which helped build a foundation of trust.

Increasing curricular integration

While increased curricular integration is a benefit associated with participation in FLCs (Lennings & Ebbers, 1999), the challenge for this interdisciplinary course was figuring out how faculty from three disciplines would integrate their teaching. Interdisciplinarity requires the disciplines to be integrated or blended (Klein, 2010). We felt it necessary to continuously model the integration of fields to our students to support a synthesis of ideas. Therefore, we decided that all faculty would be present and teach during all classes. While this teaching model is challenging, and requires a great deal of trust and cooperation on the part of the faculty involved, it can be more effective in achieving interdisciplinary understanding (Krometis, Clark, Gonzalez, & Leslie, 2011).

Preparing to teach in an interdisciplinary way

For this undertaking, we had two issues to address: what to teach, and how to teach it in an interdisciplinary way. As the overarching goals of this course were to increase interdisciplinary learning and activism, we felt strongly that group work was essential to model collaborative efforts to solve complex problems (e.g., Johnson, Johnson, & Smith, 1998; Prince, 2004). We studied best practices for designing and assessing group projects in an interdisciplinary context.

Faculty Center for Innovative Teaching workshops and instructional design support

Mueller shared materials from a comprehensive FaCIT workshop series on effective collaborative learning strategies. We discussed and expanded these to create a Blackboard cache of best practices in collaborative techniques, interdisciplinary teaching strategies, and assessment resources (e.g., Newell, 1994; Mansilla, 2008; Mansilla, Duraisingh, Wolfe, & Haynes, 2009).

The SLC students asked Drake to facilitate a workshop on developing a master course syllabus at CMU and effective course design. Utilizing a combination of instructional design strategies (e.g., Fink, 2003; Wiggins & McTighe, 1998), SLC students brainstormed student learning outcomes that supported interdisciplinary learning and activism. Drake consulted with Upadhaya on collaborative learning strategies and techniques to implement in the seminar to enhance student learning and awareness of social justice and disciplinary thinking.

Course framework and content

A framework for the course emerged out of our discussions. We decided to structure the course as both lecture and seminar. The lecture section would be interactive and would cover specific anthropology, biology, and chemistry content; the seminar would focus on group work and strategies for activism. While FLC faculty were the primary developers of the lecture part and SLC students were the primary developers of the seminar part, we worked together to build a cohesive course.

Within this framework, FLC faculty developed student learning outcomes and content for the lecture portion, and SLC students developed them for the seminar portion. We then discussed the proposed outcomes and content in joint FLC/SLC meetings. These back-and-forth discussions distilled a long list of learning outcomes to a shared set, with the overarching theme of interdisciplinary problem solving and engaging students in activism.

Interdisciplinary assignment and assessment

Our discussions culminated in developing a key assignment: a collaborative project on a water-related issue with a social justice component. The project's scope was broad, but it required students to include these key pieces: (1) identification of a problem with anthropological, biological, and chemical factors; (2) a proposed interdisciplinary solution; and (3) an action plan for implementation. FLC member Guo developed a course-specific online library student research guide to support student water research. Chhetri and Upadhaya loaded resources onto the course's Blackboard shell to aid students in researching activism.

Since one of the major goals of the course was to increase interdisciplinary thinking in the students, we developed a rubric to measure it. Before designing the rubric, we reviewed articles and sample rubrics in interdisciplinary assessment. The rubric was used to assess different stages of the students' group projects, and is discussed in detail in another article (Mueller, Juris, Willermet, Drake, Upadhaya & Chhetri, in press).

Faculty learning Community member self-assessment

To evaluate FLC members' potential growth as a result of the FLC, members assessed their own familiarity with collaborative and interdisciplinary concepts before designing the course and after teaching the course. The self-assessment data indicated that the co-facilitators expanded their knowledge of collaborative learning strategies during their work with the FLC. The greatest change was an increase in skills related to rubric development and group product assessment. Other significant changes included increased skill in developing self-assessments and rubrics to assess individual products, structuring a collaborative learning assignment or task, and assigning effective roles for group assignments or tasks. One interesting finding was a significant decrease in FLC members' assessment of their skills in facilitating student group decision-making. This could be related to challenges faculty members faced managing conflicts and facilitating problem solving within student groups, coupled with an initial over-confidence in their ability to effectively guide and direct effective group decision-making processes.

Teaching and assessing the course

Water as Life, Death, and Power was taught as a special topics course in spring 2013. This three-credit course was designed for sophomores, with no required prerequisites. Twenty-nine students registered for the course under anthropology, biology, or chemistry designators. The course met twice a week in two-hour blocks. Faculty taught one hour of integrated, interactive lecture;

following this, the seminar instructors led discussions and activities for developing student advocacy of global issues for another hour. Faculty and SLC seminar instructors were present for all sessions. Due to its unusual organization, the course generated some buzz within student and faculty groups, and was even highlighted in the student newspaper mid-semester (Harrison, 2013). A full description of the course and its instructional challenges and rewards has been published (Willermet et al., 2013).

Students presented their final projects at a campus-wide forum highlighting student research. Examples include:

- developing a time-release version of an existing anti-worming drug for schistosomiasis in Uganda, along with an educational call-and-response children's song on how to avoid getting sick;
- proposing a modification of city green-lawn ordinances, reducing local water contamination through chemical runoff;
- analyzing strategies to connect Iowa farmers to government programs to promote bioswale buffer zones along the Mississippi River, reducing downriver dead zones; and
- proposing to administrators in Copacabana, Bolivia that totora reed beds be designed to clean wastewater before it enters Lake Titicaca.

We assessed group projects using the interdisciplinary rubric generated through the FLC/SLC activities. Additionally, we assessed students' attitudinal shifts about advocacy. Students showed improvements in both areas (Mueller et al., in press).

Reflections on the Process

Faculty Learning Community members

Through the FLC process, each of us gained perspectives on our colleagues' disciplines as well as the scholarship of teaching and learning. As the FLC was focused on interdisciplinary pedagogy and assessment, the faculty needed time to learn strategies for teaching complicated subjects in a collaborative and interdisciplinary way. We also needed to include the UAEM students as experts in student activism. Students determined to make a difference in the world write compelling learning outcomes—notably, for students to "define or improve a grassroots campaign to address water issues." Originally, faculty members did not include this objective, but everyone agreed it was an important student learning outcome.

Faculty members' time commitment for this course was significant. FLC members needed to prepare in advance for the meetings; this included reading, and content and assignment development. This time was needed to complete the

work and to build relationships that would survive the classroom challenges. It takes confidence and trust to allow other faculty to watch you teach and teach with you. The FLC process allowed us to build solid relationships as well as a solid course design. We will implement the skills and techniques in group work and assessment that we learned in the FLC in other courses we teach.

Student Learning Community members

The UAEM students held separate meetings to maintain their own focus about course objectives. As they progressed, they developed metrics to assess student learning outcomes. UAEM students report that the formal instruction about developing student learning outcomes allowed them to communicate more clearly with faculty about their goals and aspirations. As a team, we worked the SLC members and the goals and objectives they developed into the class. Through the FLC/SLC partnership, both groups learned more about the importance of consistent, meaningful dialog around important social issues and how to explicitly communicate and align them with course goals.

Faculty Center for Innovative Teaching

This FLC was one of the first in FaCIT's initiative to develop and support FLCs. Working with FaCIT's organized reporting structure meant that we kept meeting logs and minutes, which were emailed to members and to Drake promptly after each meeting and posted to the FLC's Blackboard resource site. This record was invaluable in keeping track of decisions and required tasks; it also kept everyone informed and accountable.

The key to the success of this faculty-staff-student collaboration was members' openness to new ideas and approaches. The beginning stages involved identifying common goals and building trust. Upadhaya, one of the UAEM students/seminar instructors, stated,

> I personally think that there had to be a "perfect storm" for all of this to work—the UAEM students were passionate about empowering undergraduate students about global issues via education and activism, and the faculty were open and flexible to work alongside the students. Both groups showed no reluctance in embracing new ideas and learning from each other. There were mistakes and oversights but a strong sense of community prevailed and we kept striving for the ideals we had set to meet.

The future of *Water as Life, Death, and Power* is secure. It has been accepted into CMU's curriculum as an elective course in the Departments of

Biology; Chemistry; and Sociology, Anthropology, and Social Work. It is also listed as an elective in the proposed Environmental Studies major in Geography.

Faculty and students found it helpful to have FaCIT facilitate the development of this course by providing coaching; workshops; and $1,000 for the purchase of teaching/reference materials, field trips, guest speakers, or faculty development. It is certainly possible that the faculty and students would have come together to develop and teach this course regardless of the FaCIT program. However, it was efficient to have resources and advice on collaborative and interdisciplinary teaching easily at hand. Faculty development programs provide the learning community faculty needed support and structure (Eisen, Hall, Lee, & Zupko, 2009; Friedman et al., 2010). We encourage interdisciplinary teaching teams that integrate student-centered learning strategies. Through our curricular integration of faculty and students, we developed a sense of community and shared purpose, and a fresh look at our own disciplines, which keeps us engaged and enthusiastic as teachers.

References

Cox, M. D. (2004). Introduction to faculty learning communities. In M. D. Cox & L. Richlin (Eds.), *Building faculty learning communities* (pp. 5-23). New Directions for Teaching and Learning, 97. San Francisco, CA: Jossey-Bass.

Eisen, A., Hall, A., Lee, T. S., & Zupko, J. (2009). Teaching water: connecting across disciplines and into daily life to address complex societal issues. *College Teaching, 57*(2), 99-104.

Fink, D. (2003). *Creating significant learning experiences.* San Francisco, CA: Jossey-Bass.

Friedman, D.B., Crews, T. B., Caicedo, J. M., Besley, J. C., Weinberg, J., & Freeman, M. L. (2010). An exploration into inquiry-based learning by a multidisciplinary group of higher education faculty. *Higher Education, 59*, 765-783.

Harrison, A. (2013, April 8). New course at CMU hopes to educate on clean water access issue globally. *Central Michigan Life*, p. 5B.

Johnson, D.W., Johnson, R.T., & Smith, K.A. (1998, July/Aug). Cooperative learning returns to college: What evidence is there that it works? *Change, 30*(4), 26-33.

Klein, J. T. (2010). A taxonomy of interdisciplinarity. In: J. Frodeman, J. T. Klein, & C. Mitcham (Eds.), *The Oxford Handbook of Interdisciplinarity* (pp. 15-30). Oxford, England: Oxford University Press.

Krometis, L-A.H., Clark, E. P., Gonzalez, V., & Leslie, M. (2011). The "death" of disciplines: Development of a team-taught course to provide an

interdisciplinary perspective for first-year students. *College Teaching*, *59* (2), 73-78.

Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates. (2005). *Student success in college*. San Francisco, CA; Jossey-Bass.

Lenning, O.T., & Ebbers, L.H. (1999). *The powerful potential of learning communities: Improving education for the future*. (ASHE-ERIC Higher Education Report, *26*(6). Washington, DC: The George Washington University, Graduate School of Education and Human Development. Office of Educational Research and Improvement. (ED428606).

Mansilla, V. B. (2005). Assessing student work at disciplinary crossroads. *Change*, 14-21.

Mansilla, V. B., Duraisingh, E.D., Wolfe, C. R., & Haynes, C. (2009). Targeted assessment rubric: An empirically grounded rubric for interdisciplinary writing. *The Journal of Higher Education, 80*(3), 334-353.

Mueller, A., Juris, S.J., Willermet, C., Drake, E., Chhetri, P. Upadhaya, S. (In press). Assessing interdisciplinary learning and student activism in a water issues course. *Journal of the Scholarship of Teaching and Learning.*

Newell, W. (1994). Designing interdisciplinary courses. *New Directions for Teaching and Learning, 58*, 35-51.

Ortquist-Ahrens, L., & Torosyan, R. (2008). The role of the facilitator in faculty learning communities: Paving the way for growth, productivity, and collegiality. *Learning Communities Journal, 1*(1), 1-34.

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education, 93*(3), 223-231.

Wiggins, G., & McTighe, J. (1998). *What is backward design? Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

Willermet, C., Mueller, A., Juris, S.J., Drake, E., Upadhaya, S., & Chhetri, P. (2013). Water as life, death, and power: Building an integrated interdisciplinary course combining perspectives from anthropology, biology, and chemistry. *Journal of the Scholarship of Teaching and Learning, 13*(5), 105-123.