

## **RUNNING HEAD: Collaborative Teaching on Regional Campuses**

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### **Introduction**

In the fall of 2011, Biology professor Dr. Orianna Carter and Communication Studies professor Dr. Purba Das collaborated on the creation of a set of interdisciplinary courses at Ohio University Southern campus regional campus, including development of a new course in Health Administration, HLTH 4930. This new course, titled, “Environmental Health and Media Perception” investigates the gap between scientific knowledge and media dissemination of information on health perspectives. The course received internal funding, as part of the Undergraduate Teaching and Learning Pool of the Ohio University 1804 Endowment Fund. The primary focus of the project is to review environmental health through an examination of media theoretical frameworks including topics of environmental stress and pending health impacts due to our modern life style in local and global communities.

### **Faculty Collaboration as a Pedagogical Approach**

Faculty collaboration has long been a tradition in university settings. It is a “cooperative endeavor that involves common goals, coordinated effort, and outcomes or products for which the collaborators share responsibility and credit” (Austin & Baldwin, 1992, p. 1). This type of collaborative can encompass a broad range of work depending on the needs, goals, and disciplines of the faculties. Our endeavor is a team-taught collaboration in teaching that sought to integrate two very different disciplinary perspectives. To understand how collaborative dynamic develops, Gray’s (1989) theory of negotiated order explain that participants negotiate with each other to come to consensus about the project. Austin and Baldwin (1992) cite four basic stages of collaborative process. They are, “(1) choosing colleagues or team members, (2) dividing the labor, (3) establishing work guidelines, and (4) terminating a collaboration, the way

collaborators execute each step influences the evolution and outcomes of the team's effort" (p. 3).

The reasons behind such collaborative work that conjoins scientific understanding of environmental issues with communicative processes and dissemination of information to the public are to: a) provide an in-depth analysis of the environmental health issues; b) understand the gaps of knowledge perpetuated and its roots; c) explain how faculty can provide enriching and innovative teaching strategies; and d) create an academic resource for developing Environmental Studies programs. Evidence-based teaching and research of health communication interventions and scientific findings disseminated into the community will provide first hand examination of the impacts to community knowledge and action. The collaborative work serves to enhance both long-term classes and infrastructure, and may provide a platform for Teaching and Learning Center assessments that cross disciplines as more of our educators are drawn to the importance that we take a closer look at how we teach and how students learn.

Two major outcomes of this collaborative project respond to regional needs; specifically, by providing/imparting knowledge on the ways in which environmental health risks and health issues are constructed by the media and dissemination of information to the residents of Appalachia and by enabling the transfer of information for utilization by our health communicators, Lawrence County Health and Wellness Initiative. Thus, this project facilitates better design, implementation and dissemination of environmental health based information to the people of Appalachia, and more specifically, to those residents in our underserved region. The inspiration for this approach came from our involvement in the Kanawha Place-based discourse, sponsored by Ohio University's Kanawha Environmental Education Project (KEEP). The goal of the Kanawha Project, named for the physiographic region in which Ohio University is situated, is to develop the environmental literacy of undergraduate students and to enhance the undergraduate curriculum through faculty professional development. Knowledge of environmental sustainability issues gives graduates a competitive advantage in the workforce. In addition, environmental literacy enables them to make wise consumer choices that can positively contribute to environmental quality and sustainability (The Kanawha Project, 2007).

### **Conceptual Insights Gained from Kanawha Project**

The most important concept we took away from the Kanawha Project involves understanding Ohio University Southern (OUS) as a *place*. OUS campus service area as a place is uniquely situated geographically, ecologically, socially, and communally in the Appalachian region, and the knowledge of this *place* needs to be communicated to the students to better understand their environment. The physical and natural environment of OUS begins with observation and learning. As members of a broader educational institution, OUS's students need to understand their surrounding environment to fully comprehend the social, cultural, economic and environmental ramifications of the region. The Kanawha Project of Place-Based Sustainability Discourse session we participated in has helped us to establish this sense of place throughout our course development. Many southern Appalachians pursue professional health careers, which benefit from skilled training in science disciplines and a broader understanding of health risk implications. This new project requests equipment and assessments adapted to undergraduate science curriculum with activities surrounding a common, unifying theme in environmental health and sustainability. Using a team-taught approach between biology and communications, we are able to bridge both disciplines while emphasizing the utility of investigative and problem-based approaches. Student-driven research in learning communities heightens interest, demonstrates relevance, and fosters critical thinking skills in the classroom.

The new collaboration between biological sciences and health communications features a series of course modifications that is truly interdisciplinary in nature. We offer modifications to our offerings in biological sciences and communications, by adding a learning community component in which BIOS and COMS students may tackle a civic issue from differing perspectives. The interdisciplinary nature of these courses allows our students to make connections between topics discussed in the classroom with ongoing research using the SENCER (Science Education and New Civic Engagements and Responsibilities) approach. SENCER's teaching philosophy is based on active engagement in matters of civic importance in the community and stimulates student involvement in a value-based, multidisciplinary learning experience (SENCER, 2011).

This approach has been approved and supported by the National Science Foundation, and most recently by the National Research Council seeking a new teaching framework which emphasizes measuring what students will be able to do with their knowledge upon completion of a

course of study. Dr. Carter is a SENCER Leadership Fellow and is devoted to training academic staff and instructors on the usefulness of this approach. Application of case studies and locally relevant issues allow students to connect lecture material and concepts with hands-on real world investigations. By providing flexibility in student research based on interests generated in the group work, we also retain the ability to update and extend our curriculum. Another benefit of this approach is that our non-biology students have an opportunity to see what field studies can be done and how biological concepts are expressed in the real world through interaction with experts from professional organizations. Cross-disciplinary learning communities open new avenues to addressing problems by encouraging students from different disciplines to apply and think globally in their respective fields. Our program emphasizes problem-solving strategies in a manner not previously explored at Ohio University Southern regional campus and which exemplify the principles of SENCER. We are currently exploring the role of communication campaigns to promote health and reduce health risks. Dr. Das currently leads students in an examination of the intersection between media, gender and body image.

### **Objective behind the Collaboration**

The primary objective of evaluating efficacy of inquiry-driven and case study-based education is to improve the quality of the learning experience. This project is particularly significant because regional environmental concerns include toxic waste; occupational exposures; and effluent from farms, mines, and factories that impact air and water quality (Behringer and Friedell, 2006). Susan Marmagas, who grew up in rural Appalachia and is a consultant for the Appalachian Community Cancer Network, addressed the regional health concerns to the American Association of College of Nursing Research Symposia in 2009, stating “Environmental epidemiologists are constantly responding to community claims that cancer clusters have been identified” (Marmagas, 2009). Our goal is to address the needs of our population of Appalachian students who have an aptitude and inclination towards science, health issues and/or global responsibilities, but have not been given the opportunity to explore the interconnectedness at our small rural campus, partially due to low enrollments and/or lack of funding for meaningful, superior learning experiences. The primary aim of the new collaborative teaching project focuses on implementing interactive classroom and field laboratory experiences, which provide undergraduate students with the opportunity to

conduct inquiry-based investigation and independent study across disciplines. This strategy fosters student skills for critical analysis in learning communities and interpreting professional research supporting materials. The study materials strive for long-term continuous projects 'owned' by individual students, and include frequent collaborative discussions and student presentations. We continuously evaluate the usefulness of the proposed research and coursework on student learning from diverse educational backgrounds through pre- and post-course assessment testing of content, process and application skills. Another attractive feature of an applied learning environment is that our students will be able to contribute to *real world* data used for water analysis baselines within our county, as part of a larger study being conducted by Voinovich School of Leadership and Public Affairs. Further, the data will be made available to the Lawrence County Health and Wellness Initiative to help with design of health campaigns in our region. Currently, we offer incentives through independent study in which our students may collaborate with professional advocacy agencies to conduct a field study (Clean Water Program, Sierra Club Ohio) or design media material around environmental issues and gain valuable practical experience (OEC).

Utilizing a team taught interdisciplinary approach bridging environmental sustainability and health communications, we provide credits toward completion of an Environmental Studies certificate. Dr. Das reviews media dissemination of information through an examination of the gaps between scientific knowledge and media perception on health perspectives. Students are expected to review environmental health through an examination of media theoretical frameworks, media campaign designs and understand sources of water contamination and health implications. Dr. Carter guides students through a survey of our state of knowledge concerning natural and anthropogenic mechanisms of air and water contamination and how it pertains to human health risks. Students then investigate and critically assess the effectiveness of government policies aimed at mitigating, or helping people adapt. Topics, which are investigated, include the potential long-term impact of contaminated water sources and correlations of human practices to emerging sources of environmental toxicology, e.g. hydrofracking and water pollution. Sustainability topics include growing health concerns from disparate resource consumption. The learning outcomes of this interdisciplinary course include demonstration of proficiency in critically understanding the scientific literature and how knowledge reaches the public.

**Student Leadership:**

To be most effective in building a learning-centered community, our new courses involve multiple opportunities to share ideas and experiences with peers and outside organizations. For COMS 4900 students, leadership includes collaborating with OEC to design media material around hydrofracking by applying strategies of media campaign. BIOS course topics are designed so that students take leadership roles by coordinating with the Voinovich School regarding water test sites and database entry. Students in biology and communications independent studies, stemming from the interdisciplinary venture, are expected to disseminate their findings at Ohio University Research and Creativity Activity Fair beginning in the Spring of 2013.

Throughout the fall of 2012, first year biology students were tasked with designing a research proposal on local water quality analysis with the goal to instill hypothesis formation, experimental method and scientific communicative skills through application of their new understanding of the issues at play in local and global environmental sustainability issues. This project was remarkably successful, in that not only did students provide pertinent research background toward continuation of planned fieldwork the following term, but a number of additional students chose to sign up for independent studies to help lead the first year biology class regarding site selection and other decisions necessary to implement the proposed field study (chemical testing, type, periodicity). Working with an environmental studies graduate student from the main campus and a member of Sierra Club Ohio, we were also able to arrange a spring quarter Skype presentation (prepared by the graduate student) on water quality issues, as well as a trip to Columbus where students met with professionals at the main headquarters of the aforementioned organizations involved in helping us establish a water quality baseline for Lawrence County and disseminate the findings within the community.

Measuring the potential impact of this approach toward forming a strong science foundation for early science majors, we report that biology (and non-majors) exhibited a deepened understanding of the issues through demonstrated interest and team involvement, retention in the class (everyone passed with a C or above) and enrollment into independent studies for in-depth analysis. Further, class evaluation scores increased from an average of 3.9 over the five previous years to 4.7 during the first year of implementation.

Dr. Das has designed a capstone COMS course that explores the role of communication campaigns to promote health and reduce health risks. The course looks at how health campaigns and communication interventions regarding risky health behavior are designed, implemented and evaluated describing the critical role of communication research throughout the campaign process. Students are encouraged to utilize recent data to identify, and analyze environmental, social and physical factors that contribute to the difference in morbidity and mortality among the population. Further, the collaborative nature of the course allows cross-disciplinary sharing of information of water quality between biology and communications students. COMS students can utilize this valuable information to design health campaign that informs community members of potential environmental risks.

**Significance of Undergraduate Research and Coursework:**

The coursework provides opportunities for students to become directly involved with the research process through enrolling in independent credit relevant to campus research. The individual courses provide a seamless, integral project of study for students, but are designed to remain self-sufficient and taught separately. This strategy is appropriate for regional campuses, which realize small enrollments. By seeking projects which engage students in this manner, we achieve several STEM initiatives, including a better understanding of how the principles of research are used to answer a scientific (or social) question, applications of statistical procedures, an awareness of regional health risks, and an opportunity for students to disseminate findings through professional presentation and/or publications. The course HLTH 4930, previously taught online by the co-PIs, now offers interactive classroom learning communities among their biological science peers pursuing a career in the sciences. This empowers health career students with a broader understanding of factors that protect or challenge our region's environmental health status and human risk, as well as, realize their capacity to become involved in future public health policy.

In summary, the coursework is interdisciplinary and innovative in nature, while critical analysis is advanced in learning teams and undergraduate research at our campus. This offers immediate benefit for student resume building and graduate applications, and provides life-long awareness of civic issues relevant to their discipline. Students can apply credit linking service and learning to the Environmental Studies Certificate.

Ultimately, we hope this new endeavor succeeds in constructing a pedagogical framework to establish a mutual understanding of how environmental issues and scientific knowledge are effectively disseminated to the public and how the combined knowledge of science and communications could be beneficial to people of Appalachia about environmental risks.

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