



SENCER Summer Institute 2008

Poster Session

August 10, 2008



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Welcome to the SSI 2008 Poster Session

The annual SENCER Summer Institute Poster Session has grown over the past few years to provide yet another way to share ideas, build community, and learn from each other. This year, we welcome posters from both alumni and new participants who will share results of their impressive work during a designated session on Sunday, August 10th from 1:15 – 2:15 p.m. in the foyer of the Arts & Sciences building. We invite you to visit the session during this time to speak to the poster developers, who will be on hand to discuss their work. The posters will be available for viewing from the beginning of Sunday's activities until 2:15 p.m. to accommodate participants who would prefer to spend additional time reviewing each poster.

The Poster Session will also feature posters for each new SENCER Center for Innovation – Midatlantic, Midwest, New England, South, and West – during the Sunday session and all day on Saturday in the Arts & Sciences foyer. These posters provide an overview of each Center's leadership, future plans, areas of focus and expertise, and host institution. All SSI 2008 participants are encouraged to affiliate with a Center for Innovation and connect with the co-directors and members of the Leadership Councils.

The co-directors of the Centers for Innovation will be introduced by Richard Keeling during the reception on Saturday evening in the Mission Gardens, and tables will be made available during lunch on Sunday for participants to meet informally with the coordinators of each Center. Contact information for co-directors is available in the "Resource Materials" section of the SSI 2008 program book on the SENCER Centers for Innovation page.

American Museum of Natural History

Resources for promoting conservation biology literacy and civic engagement in environmental problems: NCEP modules and case studies

Michael Foster	<i>Biodiversity Specialist</i>
Ana Luz Porzecanski	<i>Assistant Director for Capacity Development</i>
Dr. Nora Bynum	<i>Project Director of the Network of Conservation Educators and Practitioners</i>
Dr. Eleanor J. Sterling	<i>Director, Center for Biodiversity and Conservation</i>

The Center for Biodiversity and Conservation of the American Museum of Natural History and its partners developed the Network of Conservation Educators and Practitioners (NCEP) to increase university professors, educators, and conservation practitioners' access to high-quality instructional materials relating to biodiversity conservation. The NCEP aims to foster an active approach to teaching and learning that attempts to model the realities of conservation practice. This poster highlights the diversity of modules and case studies already available for use, and their potential to promote student civic engagement in environmental science courses through the study of unresolved local, regional, or global environmental issues.

Arkansas State University

A community survey and study of mosquito abatement for Jonesboro, AR

Dr. Jennifer Bouldin	<i>Assistant Professor, Environmental Sciences</i>
Erik Gilbert	<i>Professor, History</i>
Dr. Gauri S. Guha	<i>Associate Professor, Environmental Economics</i>
Dr. Patrick A. Stewart	<i>Associate Professor, Public Administration</i>
Dr. H. Bill Stroud	<i>Professor of Geography</i>
Dr. Alan D. Christian	<i>Associate Professor, Biology</i>

Riparian bottomlands in the Mississippi Delta have been cleared and replaced with row crop agriculture. Current irrigation practices have reintroduced standing water or ponding where these swamps existed. Stagnant water is a prime mosquito breeding habitat and because of this, fields have replaced indigenous wetlands drained to reduce the risk of mosquito-borne diseases. Standing water on agricultural fields supports large mosquito populations and prime habitat during their breeding season. Past insecticide and larvicide methods included petroleum products to reduce suitable habitat and spraying of DDT. Current methods include organophosphates and pyrethroids. Concern of public officials warranted a public opinion poll for Jonesboro, Arkansas, which revealed that fifty percent surveyed rated the mosquito problem bad to severe.

Beloit College

Slow Food: Taking an ecological approach to learning nutrition and political action

Dr. Marion Field Fass

Professor, Biology

This SENCER model course on Slow Food explores the issues of food, local culture and sustainability, and the paradox of increasing rates of obesity and food insecurity. The Slow Food movement promotes good taste, eating locally, and preserving biodiversity. Students studied what “sustainability” means and learned how governmental policies influence what farmers grow and consequently what we eat. The course, taught as a first year initiative seminar at Beloit College, engages students with the local community, its “food-shed,” and interdisciplinary perspectives on our changing food habits. *Slow Food* offers students an optimistic framework for analyzing a challenging set of issues that bring together, biology, agriculture and ecology with an understanding of the economic and cultural factors that shape how we eat in the United States and possible strategies to build more sustainable practices.

Butler University

Exploration of current environmental issues as a tool for stimulating civic engagement in a cross-disciplinary junior-senior capstone course

Dr. Olujide Akinbo

Associate Professor, Chemistry

Stacy A. O'Reilly

Associate Professor, Chemistry

Dr. Joseph L. Kirsch

Professor and Associate Provost, Chemistry

Students' reactions to environmental issues can be loosely categorized into three groups: indifference, engagement based on shallow knowledge acquired from secondary sources, and engagement based solely on narrow disciplinary perspective. When there is engagement, issues are often debated as if there are easy solutions. A course was developed to bring awareness to, and stimulate student engagement in current environmental issues; to emphasize that resolution requires multidiscipline and multifaceted compromise; to engage stakeholders who are active in the local environment; and to initiate a habit of critically analyzing issues, researching facts before civic engagement. The course structure, implementation, and students attitude will be presented.

Butler University

A general education program encouraging civic engagement

Dr. Joseph L. Kirsch	<i>Professor and Associate Provost, Chemistry</i>
Dr. Phillip Villani	<i>Associate Professor, Biological Science</i>
Dr. Meredith Beilfuss	<i>Assistant Professor, Education</i>
Olujide Akinbo	<i>Associate Professor, Chemistry</i>
Tara Lineweaver	<i>Assistant Professor, Psychology</i>
Dr. Robert Holm	<i>Director, Institute for Research and Scholarship</i>
Stacy O'Reilly	<i>Associate Professor, Chemistry</i>
Donald Braid	<i>Assistant Director, Center for Citizenship and Community</i>
Margaret Brabant	<i>Professor, Political Science</i>

Butler University is in the process of implementing a new general education program called *The University Core Curriculum*. The core curriculum focuses on student learning objectives, and it can address civic engagement in a number of its elements. The core curriculum components are a first-year seminar, global and historical studies, capstone courses, social world courses, natural world courses, analytical reasoning courses, a university cultural requirement, and an Indianapolis community requirement. Civic engagement at the University is also supported by a Center for Citizenship and Community. The poster presents SENCER courses; past, present, and future, in the context of this new core curriculum.

Butler University

Water quality in the urban environment

Dr. Robert Holm	<i>Director, Institute for Research and Scholarship</i>
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Water Quality in the Urban Environment is being offered to introduce undergraduate students to the present and past aquatic environments of Indianapolis and surrounding areas. Undergraduate students will learn about the impacts that urbanization has had on these environments. Topics explored will include land use and its impact on the aquatic environment, riparian fringes, wetlands, water quality and water quality impacts, aquatic ecosystems and will be covered from an interdisciplinary perspective. Field observations will be made, data will be collected and both group and individual projects concerning biologic and physical analyses of select aquatic environments will be performed.

Butler University

Food: Pasture, Table, Body and Mind, an interdisciplinary course taught from the viewpoints of biology and psychology

Dr. Phillip Villani	<i>Associate Professor, Biological Science</i>
Tara Lineweaver	<i>Assistant Professor, Psychology</i>

Food is deeply woven into the fabric of our lives. It affects the way with think and act and it affects our long-term well being. This course examines the effects of food as it moves from pasture to mind. It looks into the relationship between a healthy environment and growing healthy food (pasture), the factors that influence our foods choices (table), the constituents of food and how they contribute to our physical well being (body), and the ways in which society and culture influence our eating habits (mind). In addition, students will be taught how the relationship between people and food involves an interaction among the chemical, biological, and social sciences.

Christopher Newport University

Achieving an excellent research-rich education for all CNU undergraduate students

Dr. Andrew Velkey	<i>Associate Professor, Psychology</i>
Tarek Abdel-Fattah	<i>Associate Professor, Chemistry</i>
Rob Atkinson	<i>Professor, Biology</i>
Dr. Bobbye Bartels	<i>Associate Dean, Liberal Arts and Sciences</i>
Nicole Guajardo	<i>Assistant Professor, Psychology</i>
Quinton Kidd	<i>Professor, Political Science</i>
Gihan Mandour	<i>Assistant Professor, Computer Science</i>
Kip Redick	<i>Assistant Professor, Philosophy</i>
Mark Reimer	<i>Director, Music</i>
Lori Underwood	<i>Professor, Philosophy</i>
Edward Weiss	<i>Professor, Biology</i>

Through the Project Kaleidoscope Leadership Initiative, Christopher Newport University is developing and nurturing an institutional culture that invests in a research-rich learning environment by acknowledging, celebrating, resourcing, and fostering student-faculty research both within and across all disciplines arts, humanities, sciences, and business. A historical timeline from July 2005 to the present is presented to highlight some of the problems addressed, issues confronted, solutions developed, and outcomes achieved. Also highlighted, is the paucity

of methods for assessing the process and outcomes of undergraduate research programs with suggestions as to the development of future metrics.

La Salle University

The Digital Person: A core computer literacy course, the first year

Dr. Jane Turk

Assistant Professor, Computer Science

The Digital Person, CSC153, was offered for the first time to freshman non-computer science majors, at La Salle University during the 2007-2008 academic year. Topics include data collection and privacy, credit reports and FICO scores, social networks, disposal of computers, problems with electronic voting, strategies to find information online and evaluate its accuracy and multitasking. The course uses a variety of teaching strategies with emphasis on explicit development of critical thinking skills and active learning. Designed to incorporate SENCER ideals, the course will integrate civic engagement and highlight ethical use of the technology in year two.

Lipscomb University

Trans-disciplinary course sequence for general education science

Dr. Ben Hutchinson

Dean, College of Science

Dr. Jim Arnett

Professor, Biology

Dr. Alan Bradshaw

Associate Professor, Physics

Dr. Autumn Marshall

Associate Professor, Family and Consumer

Services: Nutrition

Dr. Linda Phipps

Assistant Professor, Environmental Science

Dr. Marcia Stewart

Professor, Education

In Fall 2008, a two-semester, trans-disciplinary science course will be introduced at Lipscomb University that will satisfy the general education science requirement for undergraduate students. The course will cover essential concepts in biology, chemistry, physics, nutrition and environmental science. The initial plans for the course, which will employ hands-on civic engagement, service-learning and laboratory exercises to engage students in real-world problems, are presented with their accompanying assessment tools. The goal of the course is to develop in each student an appreciation of the role of science in societal development and a subsequent predilection toward lifelong learning in the sciences.

Macon State College

Evolution and race: Dealing with definitions of race and its impact on education policy

Dr. Sumitra Himangshu	<i>Assistant Professor, Education</i>
Dr. David Fuller	<i>Assistant Professor, Education</i>
Dr. Shamani Shikwambi	<i>Assistant Professor, Education</i>
Mr. Malav Shah	<i>Assistant Professor, Arts and Sciences</i>

Economic and racial demographics within schools define the nature of educational policy as well as the varied resource allocation towards teaching science content. The course proposes to connect understandings of race to educational policy development and the teaching of science. The objective is to model for student teachers the need for multidisciplinary approaches in order to provide students with a solid understanding of (i) the basis of evolutionary evidence and (ii) the evaluation of educational policy regarding race issues that lead to resource allocations and its implications for science education.

Middle Tennessee State University

Navigating the path to a general education SENCER course

Dr. Judith Iriarte-Gross	<i>Professor, Chemistry</i>
Dr. Martha Riherd Weller	<i>Professor, Physics and Astronomy</i>

The path to an effective general education science course is long. It is important for students to not just learn science, but learn how science impacts them. Changing the laboratory course to connect science to everyday experiences was not enough to affect either attitudes or overall performance of non-science majors; it is necessary to engage students and encourage them to assume responsibility for their learning. This goal was approached through modifications in both course content and structure, in the development of a course that focuses on the science and civic issues associated with energy and the environment. The course schedule was re-designed to include less lecturing and more group learning in extended activity periods (labs). More writing and critical thinking were also introduced into the curriculum. This poster exemplifies what was learned, what obstacles were encountered, and what there is still left to be learned on the search for the right path for non-science majors.

Oglethorpe University

Stuck in traffic

Dr. Michael Rulison	<i>Professor, Physics and Astronomy</i>
Dr. Keith Aufderheide	<i>Professor, Chemistry</i>
Dr. John Cramer	<i>Professor, Physics</i>
Dr. Lynn Gieger	<i>Associate Professor, Mathematics Education</i>
Dr. John Nardo	<i>Associate Professor, Mathematics and Computer Science</i>

The SENCER team at Oglethorpe University is in the process of developing a fully SENCERized seminar for second semester freshmen, built around the topic of traffic. This poster reviews activities that have been undertaken to plan for this seminar, and summarize progress to date in the seminar's development. One of the goals in presenting the poster is to solicit input and critique from the participants at the 2008 SSI. In order to maximize efforts in constructing this course and its successors, the collective wisdom of the SENCER community is sought.

Ohio State University

Superbugs, Science and Society: A SENCER-based high school science and health curriculum

Dr. Nicole Kwiek	<i>Clinical Assistant Professor, College of Pharmacy</i>
Joseph Babcock	<i>Student</i>
Senmiao Zhan	<i>Student</i>
Dr. Rochelle Schwartz-Bloom	<i>Professor, Pharmacology and Cancer Biology</i>

The Superbugs curriculum was created as an interdisciplinary infectious disease curriculum for the high school science classroom. Using a problem-based learning format, the standards-based curriculum investigates the science of six contemporary infectious diseases amidst cultural, ethical, and geographical issues. The course was developed with input from a mixed team of high school teachers, a high school student, an undergraduate student, and SENCER-trained university scientists. The course has now been pilot-tested in North Carolina high school science classrooms to impressive student learning gains and teacher approval. In the future, the course will be expanded for use in the health classroom.

Rutgers University

Creating a controlled vocabulary for applications in science education

Kerri Hueftle	<i>Undergraduate Student</i>
Melody Townley	<i>Undergraduate Student</i>
Krista White	<i>Training Coordinator, Instructional Technology Services</i>

The aim of this independent study was to make the SENCER site more searchable and user friendly by using information architecture techniques. SENCER's site contains a number of resources, and is intended to be a place where science educators can find information and models of courses that suit the needs of their schools, students and disciplines. It is also useful as a site for educational administrators, curriculum developers, and science policy analysts who need are interested in science education and its connection to civic engagement. The Rutgers team is breaking the content of the website into usable chunks of information; creating taxonomies of terms that can be assigned to the subject matter, and choosing metadata and subject terms to categorize the information on each page of the site. The RU researchers (two students in the Information Technology and Informatics major and led by a graduate student in the Master of Library Science program) will transform static Adobe PDF documents – models, backgrounders, and e-Newsletter articles – into searchable html web pages, uploading the new pages to a Content Management System located at Carleton College. The model developed by Rutgers researchers can potentially be used by others who wish to create a searchable, accessible website. The taxonomies will also provide a foundation for assigning metadata in future work on the website.

Texas Woman's University

SENCER at Texas Woman's University: *Introduction to Environmental Chemistry*

Dr. Richard D Sheardy	<i>Professor & Chair, Chemistry and Physics</i>
Cynthia Maguire	<i>Lecturer II, Chemistry and Physics</i>
Kerise L. Owens	<i>Undergraduate Student</i>
Angelia Spurgin	<i>Graduate Student</i>

A new SENCER course, *Introduction to Environmental Chemistry*, was developed at Texas Woman's University to help students understand environmental issues from a global perspective in the context of related chemical principles. Students learned through various activities such as field trips, laboratory exercises and guest lecturers. Pre- and post-surveys measured changing opinions on environmental issues. As a civic engagement project, the class submitted a proposal to the University administration describing how paper recycling on our campus would benefit the University and the community. As a result of that report, TWU is planning to initiate paper recycling this fall.

University of Maryland

The Marquee courses in science and technology: A signature program of courses in science and technology for non-majors

Dr. Ann C. Smith	<i>Instructor, Cell Biology and Molecular Genetics</i>
Donna B. Hamilton	<i>Associate Provost, Academic Affairs and Dean, Undergraduate Studies</i>
Spencer Benson	<i>Director, Center for Teaching Excellence</i>
Robert M. Briber	<i>Professor & Chair, ENGR-Materials Science & Engineering</i>
William W. Dorland	<i>Associate Professor, CMPS-Institute for Research in Electronics & Applied Physics</i>
James Farquhar	<i>Associate Professor CMPS-Geology</i>
Jordan A. Goodman	<i>Professor, CMPS-Physics</i>
David J. Hawthorne	<i>Associate Professor, Entomology</i>
Dr. Robert D. Hudson	<i>Professor, Atmospheric and Oceanic Science</i>
Wesley G. Lawson	<i>Professor and Associate Chair, ENGR-Electrical & Computer Engineering</i>
Steven L. Rolston	<i>Professor and Associate Chair, CMPS-Physics</i>

A campus initiative from the Office of Undergraduate Studies at the University of Maryland has yielded six new general education science courses for non-majors; the Marquee courses in Science and Technology. The Marquee courses are large lecture discussion courses taught by highly respected science research faculty from biology, physics, engineering and atmospheric science. The Marquee courses reveal to students the process of science and how science and technology can provide solutions to world problems through engaging pedagogies that focus student learning about current topics. Some of the topics covered are global warming, medical technology, biodiversity, and weather.

University of South Carolina Sumter

Hand washing and global diseases

Aubrey Hughes	<i>Student, Division of Science, Math and Engineering</i>
Dr. Pearl Fernandes	<i>Associate Professor, Biology</i>
Dr. Kajal Ghoshroy	<i>Assistant Professor, Biology</i>

In the *Microbiology for Allied Health Majors* course, both civic and laboratory components were included in order to help students comprehend the consequences of clean hands. The Take Action Clean Hands Campaign of the American Society for Microbiology was implemented and through it, students learned the proper hand washing technique from community outreach personnel. To comprehend consequences of clean hands, students engaged in research projects to test the importance of hand washing on campus and in the community. In their research, students tested various contact sites and public areas for presence and transferability of microbes through touch. At the conclusion of their research, students presented papers on the impact of hand washing on newly emerging global diseases. This information, which emphasizes the importance of hand washing, was disseminated among families and friends.

University of South Carolina Sumter

Down the drain: Effects of a waste water treatment plant on the Pocotaligo Swamp

Robert Soos	<i>Student, Division of Science, Math and Engineering</i>
Dr. Pearl Fernandes	<i>Associate Professor, Biology</i>
Dr. Jeff Steinmetz	<i>Assistant Professor, Biology</i>

The Pocotaligo River and Swamp is a blackwater river system with its headwaters in Sumter County, South Carolina. The Sumter Waste Water Treatment Plant adds 45 million liters per day of treated sewage into the Pocotaligo Swamp and has plans for further expansion of the treatment plant. A long term study was conducted on the effects of the effluents on biological and chemical indicators along with physical parameters. Samples were taken from an upstream, downstream and the effluent release site. Results indicate that there were significant differences (p 0.05) in dissolved oxygen, temperature, pH, TDS, hardness (Ca) and phosphorous at the effluent site as compared to the upstream and downstream sites. Results further revealed that there were significantly fewer organisms with low tolerance values than those with medium or high tolerance values. Presently, the treatment plant has no significant effects on the water quality of the Pocotaligo Swamp. However, continuous monitoring is crucial in order to maintain a healthy ecosystem in the Pocotaligo Swamp.

University of Wisconsin at Fox Valley

Beyond recycling: Advancing towards sustainability

Dr. Martin Rudd	<i>Associate Professor, Chemistry</i>
Dr. John Beaver	<i>Associate Professor, Astronomy and Physics</i>
Dr. George Waller	<i>Assistant Professor, Political Science</i>
Dr. Gregory Peter	<i>Assistant Professor, Sociology</i>
Dr. Kimberly Dirlam-Schatz	<i>Associate Professor, Chemistry</i>
Dr. Teresa Weglarz	<i>Professor, Biology</i>

Following participation at the SSI 2005, faculty from the biology, chemistry, political science, sociology and physics departments at the University of Wisconsin-Fox Valley, developed a new course; *Beyond Recycling Advancing Toward Sustainability* (BRATS). The BRATS course focuses on the issues of energy sustainability. The goal of the BRATS course is two-fold; to examine energy sustainability from multiple disciplinary perspectives and to promote a better appreciation for the connections among these disciplines. This poster examines the workload, administration, evaluations and assignments of the course.

Harrisburg University of Science and Technology is the home of the National Center for Science and Civic Engagement. A private, not-for-profit teaching institution, the University offers an applied science and technology education for students who want a degree and a dedicated pathway to a career. Harrisburg University's focus is to educate career-minded individuals in the areas of science, technology, engineering and math (STEM careers), giving them the tools to succeed, while helping to shape their communities, locally and beyond. To that end, the University offers bachelor of science and master of science degree programs in the nationally critical STEM-disciplines.

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The National Center for Science and Civic Engagement inspires, supports, and disseminates campus-based science education reform strategies that strengthen learning and build civic accountability among students in colleges and universities. The Center serves as a national resource for the improvement of undergraduate science education and provides a platform enabling faculty and administrators to broaden the impact of their innovations and reforms beyond their campuses. The Center is affiliated with Harrisburg University of Science and Technology, a private and not-for-profit technology focused institution.

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Science Education for New Civic Engagements and Responsibilities (SENCER) is the signature program of the National Center for Science and Civic Engagement. Initiated in 2001 under the National Science Foundation's Course, Curriculum, and Laboratory Improvement Program's national dissemination track, SENCER applies the science of learning to the learning of science, all to expand civic capacity. SENCER has established and supports an ever-growing community of faculty, students, academic leaders, and others to improve undergraduate STEM (science, technology, engineering and mathematics) education by connecting learning to critical civic questions.

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