

**THE USE OF INNOVATIVE DISTANCE LEARNING PROGRAMS AS A MEANS OF DEVELOPING
INNOVATIVE ENVIRONMENTAL PROBLEM SOLVERS FROM INTERNATIONALLY,
ETHNICALLY, CULTURALLY, AND RACIALLY DIVERSE BACKGROUNDS**

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ABSTRACT

Twenty-nine years after earth day, where do we go from here? The world faces a plethora of global environmental challenges from food and water contamination, global warming, manmade disasters, natural disasters, and the enormous societal ills of environmental racism. To settle disputes and reach collaborative solutions to tough environmental issues, these leaders must include ethnic, racial, and cultural minorities from all over the globe that possess the skills to effectively negotiate for mutually beneficial scientific, technical and social solutions, and work to implement those solutions. Several universities have developed distance learning and on-line master's and doctoral degree programs that allow for the development of communities of practice that can include the benefits of diverse ideas, perspectives, and contributions of ethnic, racial, and cultural minorities from around the world.

Key words: Environmental Studies Executive Education, Environmental Studies Diversity.

BACKGROUND

Twenty-nine years after earth day, where do we go from here? The world faces a plethora of global environmental challenges from food and water contamination, global warming, manmade disasters, natural disasters, and the enormous societal ill of environmental racism. Environmental racism can be defined as the intentional locating of hazardous waste sites, landfills, incinerators, and polluting industries in communities inhabited mainly by racial, ethnic, and cultural minorities and the working poor. Racial, ethnic, and cultural minorities and the working poor are particularly vulnerable because they are perceived as weak and passive citizens who will not fight back against the poisoning of their communities in fear that it may jeopardize jobs and economic survival.

The landmark study, Toxic Wastes and Race in the United States (Commission for Racial Justice, United Church of Christ, 1987), described the extent of environmental racism and the consequences for those who are victims of polluted environments. The study revealed something that is not germane to the U.S., which outlines that: Race was the most significant variable associated with the location of hazardous waste site selection.

The greatest number of commercial hazardous facilities in the U.S. was located in communities with the highest composition of racial and ethnic minorities. The report indicated that three out of every five Black and Hispanic Americans lived in communities with one or more toxic waste sites. Over 15 million African-American, over 8 million Hispanics, and about 50 percent of Asian/Pacific Islanders and Native Americans are living in communities with one or more abandoned or uncontrolled toxic waste sites (Commission for Racial Justice, United Church of Christ, 1987).

Bullard (1993) points out that "many of the at-risk communities are victims of land-use decision-making that mirrors the power arrangements of the dominant society". Some real life examples of hazards facing minority communities in the United States include:

1. The largest hazardous waste landfill in the United States is located in Emelle, Alabama, a poor, predominantly African-American community. It receives toxic materials from forty-five states and several foreign countries.
2. Over 300,000 Hispanic farm workers and their families, including a large percentage of women of child-bearing age, are seriously affected by pesticide-related illnesses.
3. An industrial toxic waste site is located in a predominantly Hispanic neighborhood on the South Side of Tucson, Arizona. The air and water are polluted with toxic chemicals which have caused a high rate

of cancer, birth defects, genetic mutations, and other illnesses among the inhabitants of the area. The community is tainted with twenty times the acceptable levels of trichloroethylene.

4. The South Side of Chicago, which is predominantly African-American and Hispanic, has the greatest concentration of hazardous waste sites in the nation. Radiation exposure is a major health problem in the Marshall Islands, Bikini, and other Pacific Islands which have been used as test sites for nuclear and atomic weapons.
5. Pharmaceutical companies, oil refineries, and petrochemical plants are responsible for making Puerto Rico one of the world's most heavily polluted places (Bullard, 1993).

The mainstream environmental movement has been criticized for its glaring lack of minority representation. Critics claim that these organizations fail to recruit minority memberships and have not addressed the daily environmental hazards in minority communities. With the possible exception of organizations like Natural Resources Defense Council, Greenpeace, and Earth Island Institute, mainstream environmental organizations appear to be more interested in wilderness and wildlife preservation, resource conservation, and population control than in human environmental hazards (Baugh, 1991; Adams, 1992).

Opponents of capitalism are convinced that the gap between rich and poor is widening across the world. The debate over the role of institutions in environmental issues, like environmental racism, has become dangerously simplified. The vague concept of "institutions" has become, almost tautologically, the immediate target for all efforts to improve environmental ills. If the environment is worsening, the reasoning goes, something must be wrong with our national institutions. Bullard (1993) argued that institutions explain nearly everything about a country's environmental focus and its resource constraints, economic policies, geopolitics, and other aspects of social structure, such as inequalities between ethnic groups.

One of the first steps toward addressing the problem of environmental racism was the establishment of minority fellowships. Non-governmental organizations (NGOs), think tanks, non-profits, and governmental agencies are facing challenging times in this current global economic crisis. They are facing a wave of retirements from members of the "Baby Boomer" generation and are attempting to develop the next generation of global environmental leaders. Shouldn't this next generation of environmental scholars and practitioners include more ethnic, racial, and cultural minorities?

The world is facing tremendous growth and development pressures in some of the most environmentally sensitive areas. Resource extraction, urban and industrial development, and agricultural production can result

in diminished resource and environmental quality. These increasing pressures place a premium on natural resource management and innovative leadership problem solving capacity. Yet, management of our natural resources and the environment is plagued with controversy. Increasingly, disputes arise over such issues as endangered species; private property rights; forest, nutrient, and wetland management; industrial recruitment; air and water quality; and recently, floodplain management (Baugh, 1991; Adams, 1992).

Solving these problems will require a new diverse and innovative cadre of leaders, innovators, and activists representing many interests and diverse backgrounds. The influence of collective individuals, not institutions, can provide new insights and ideas into solving today's complex environmental problems. To settle disputes and reach collaborative solutions to tough environmental issues, these leaders must include ethnic, racial, and cultural minorities from all over the globe that possess the skills to effectively negotiate for mutually beneficial scientific, technical and social solutions, and work to implement those solutions.

EMERGING DISTANCE LEARNING OPTIONS FOR ENVIRONMENTAL STUDY

Several universities have developed distance learning and on-line degree programs that allow for the development of communities of a practice that can include the contribution of ethnic, racial, and cultural minorities from around the world. The newest and sought after emerging study areas of management science are in sustainability, corporate social responsibility, environmental management, natural resources management, and green business. These programs have missions to prepare students from diverse backgrounds to build leadership capacity that is influential, community oriented, socially responsible, and environmentally sustainable. These programs are focused on developing change agents that are bright, mature, capable, and committed to building a better world (Nagappan, 2008).

Several distance learning programs have been developed in these areas, like the Green Master of Business Administration (MBA) at Green Mountain College in Vermont, U.S.; the on-line MBA in Sustainable Development at Marylhurst University in Oregon, U.S.; Virginia Tech University's on-line Master of Natural Resources Management in Virginia, U.S.; the University of Maryland University College's on-line Master of Environmental Science in College Park, Maryland, U.S.; A.T. Still University's 2 year on-line doctorate of Health Education with an available focus in Environmental Health in Missouri, U.S.; and the most innovative distance program is an individually designed PhD in Sustainability Education at Prescott College in Prescott, Arizona, U.S.

The University of Maryland at College Park School of Engineering is offering a new Master of Engineering in Sustainable Energy Engineering, as was developed by faculty from the departments of mechanical, nuclear, reliability, chemical, and systems engineering and is offered both on-campus and on-line. The curriculum is designed to cover core topics in renewable energy applications, energy conversion for stationary and mobility applications, environmental risk analysis, advanced fuel cells and batteries, and solar energy. The student will then customize their educational experience according to their individual needs by selecting from three elective sets: nuclear engineering, energy systems, or reliability engineering. The Duke Environmental Leadership Master of Environmental Management uses relevant curriculum through individual and group coursework, and a master's project, and will tackle real-life case studies, containing problems and solutions directly related to the professional world.

COMMUNITIES OF PRACTICE

The concept, diverse global community of practice, refers to online communities with diverse organizational members sharing knowledge nationally and internationally through student membership from different genders, ages, races, cultures, and countries (Hildreth, 2004). On-line and e-programs create opportunities for professionals to have access to education through the development of communities (Kamenetz, 2009). These communities of students do not exist in the traditional sense, interacting with classmates through weekly face to face class meetings. The implication of these communities is an eclectic and diverse learning environment that benefits from collective knowledge and the broadest range of students, from a variety of organizations and professions from lawyers, to nurses, to government officials, to ministers, to social workers, to public school educators, to community activities, to academics, to public policy advocates, to public health executives, to business professionals, to biologists, to park rangers, to conservationists, and etc.

According to Di Meglio (2009) these sustainable and environmentally focused programs have some unique common benefits:

1. They focus on the integration of interdisciplinary knowledge and analyze trade-offs to solve environmental problems.
2. They explore a range of policies, technologies, and institutions that promote sustainable livelihoods, environmental innovation, and environmental protection.
3. They strengthen skills in collaborative public policy development, community activism, and social change.
4. They provide a forum for knowledge transfer and experiential learning from a cross section of peers around the world.

5. They bring together people from the public and private sectors and representatives of environmental activist groups in an atmosphere conducive to the constructive exploration of controversial environmental issues.
6. Provide academic experiences focused on environmental decision making on policy negotiation, facilitation, and mediation services to manage conflict over environmental issues.
7. They explore environmental actions by all sectors of society - government, business and industry, private foundations, educational institutions, citizen groups, and the general public - that are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial to create an equitable and sustainable future for all humankind in harmony with nature.
8. They explore research on the complex interaction of human activities and the environment through an examination of strategies, technologies, policies, and institutional behavior that is required to establish a new ethos to stabilize population, promote the efficient and sustainable use of energy, water, and other natural resources, repair damage, and prevent pollution and wastes.
9. They explore research on how the different types and levels of economic development among the nations of the world that is critical to government and industry environmental policy formation.
10. They explore international cooperation between developed and developing countries focused on environmentally sustainable development strategies (Di Meglio, 2009).

The following diagram (Figure 1, below) outlines the benefits of diverse communities of practice in providing new approaches in addressing environmental problems.

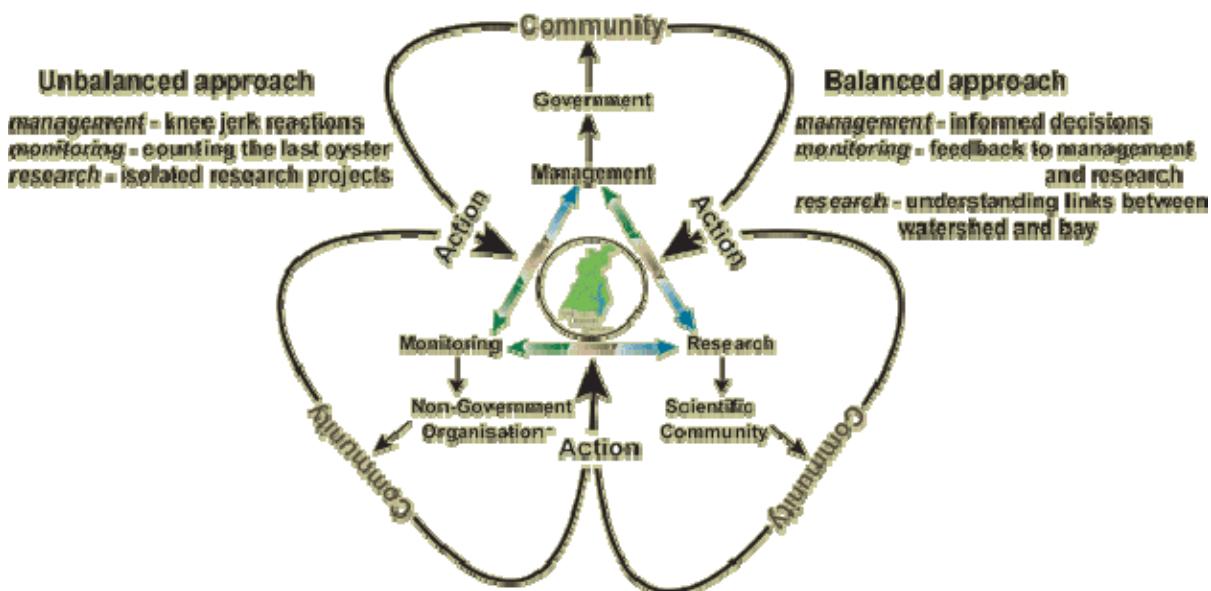


Figure 1: Developed by the Integration and Application Network (IAN)

The future sustainability of environmental movements and leadership capacity development relies on the ability to pool and share large amounts of knowledge and expertise that exist around the world. The collaboration of diverse communities of innovators provides opportunities of innovative knowledge developments and breakthroughs (Friedman, 2007).

According to Tapscott and Williams (2008, p. 153), people's ability to collaborate, innovate, and use technology to develop new processes and inventions is often a key driving force behind the kind of developments that keep citizens, businesses, and commerce from languishing. In the past, before the "world became flat" (Friedman, 2007), organizational and community stakeholders operated in closed, individualistic, rigid, inbred, and hierarchical systems where decisions were strategies were developed and implemented in a vacuum absent of peer benchmarking and review. Collaboration and technological innovation are critical to innovative, global, multinational, and knowledge driven economies (Friedman, 2007). Knowledge can build more rapidly within shared and collaborative networks of community stakeholders that use technological innovation to communicate, distribute ideas, benchmark, and share lessons learned from both successes and failures (Brown & Duguid, 2000).

Technology is often the driving force behind knowledge transfer, knowledge creation, change, progress, and innovation (Lipnack & Stamps, 1997). Consider how the internet and e-mail allows people with various backgrounds that are separated by geographical distances to collaborate, network, and even complete executive and academic education together (Junco & Mastrodicasa, 2007).

"Online education is nevertheless becoming more widespread. In 2007, more than 3.9 million students took at least one online course, a 12 percent increase from the previous year. That's according to the Sloan Consortium, an online education advocacy group" (Choi, 2009).

According to Saint-Onge and Wallace (2003), Communities of Practice (CoP) are characterized as being informal in nature and are based upon a professional's specific area of expertise. According to Wenger (1998) CoPs or a Community of Interest (CoI) has the following characteristics:

- Members have common interest, affinity, or goals;
- Members of the community are often self-grouping;
- Members seek to share information;

- Members seek to further their understanding of the practice or area of interest;
- Membership must be relatively large to be self-sustaining (new content is always needed);
- Large communities are often moderated, facilitated, or edited;
- All members are encouraged to both participate and absorb the participation contribution of others; and
- Rules of engagement or appropriate behaviors for the community are often well defined (Wenger, 1998).

The role of communities, as part of knowledge management initiatives in global organizations, is increasingly becoming the rule, not the exception (Wenger, 1998; Hildreth, 2004). Traditional learning communities that typically did not allow full time working professionals to participate relied heavily upon face to face interaction; however, distance learning and computer technology has extended these communities across geographical boundaries that play a critical role in sharing knowledge (Hildreth, 2004). Diverse global communities have the ability to play an important role in providing access to a pool of expertise needed by professionals that often work in environments with limited resources and limited access to a broad range of subject matter experts (Wenger & Snyder, 2000). Another role that diverse global communities can play is to develop leadership and expertise capacity (Rao, 2003). Research reviews that exemplary communities entice members to continue participating by discussing the most cutting edge innovations and ideas in the community's participant's areas of collective expertise and interest (Wenger, 1998). Sandrock (2004) researched a number of CoPs and their efforts reveal that communities added value in several distinct ways: building knowledge capacity gaps of members, preventing the "reinvention of the wheel" through the sharing between CoP members of knowledge of lessons learned in organizational strategic successes and failures, and collaboration of intellectual capital to generate innovative ideas.

Diverse global communities of practice provide value to participants and their affiliated organizations by reducing the time it takes to solve complex problems and through the development of solutions that can be developed from groups of diverse backgrounds (Jones, Hershel, & Moesel, 2003). The benefit of diverse groups of problem solvers is that different people and different backgrounds will ultimately bring different perspectives and ways of solving problems (Saint-Onge & Wallace, 2003). The most effective ways to make these global communities more diverse is for these universities to use resources to recruit and retain more diverse students into these distance learning programs.

Data Collection

Focus groups were conducted related to recruiting more minorities into these programs with the idea that having more minority students in these programs would create a natural army of change agents that would

have natural direct interests in environmental social change issues like environmental racism, community pollution, and environmental public policy issues affecting their own communities. Focus groups of 20 total participants were gathered that included minority students currently studying in graduate and doctoral programs in environmental issues (10 participants; all African-American; 8 females and 2 males), university environmental science and natural resources faculty (5 participants; two African American; three Caucasian; all males), government and public policy employees in environmentally oriented government agencies (5 participants; three African American; one Afghan American; one Latino American; all female). The goal was to consider the best ways to recruit minorities into these new distance learning programs with the goal of creating the most diverse learning and knowledge sharing communities of practices. The focus of this approach for data collection is not to reconstitute theory but provide important practical information that can influence the world of practice.

There are a plethora of traditions in which focus groups provide a viable way to develop collective new knowledge, solve problems, and produce data. Vaughn, Schumm, and Sinagub (1996) outline quite a few practical values for using focus groups:

1. Focus groups can help to generate solutions to real organizational problems through their collective shared experiences.
2. Focus groups are often conducted to assist with program development, program implementation, and program development.

Focus groups can provide avenue to investigate how opinion and feedback are assembled, as well as how they are articulated (Barbour and Kitzinger, 1999). Focus group information can unravel relationships and nuances of how experiences, ideas, and attitudes function within a specific certain cultural setting.

Focus groups have the ability to function as an effective inquiry method if the research queries to be addressed:

1. Entail collecting a variety of experienced viewpoints.
2. Can offer a road map to solving real world problems, based on feedback gained from the collective knowledge and experiences of the group's participants.
3. Suggest that group brainstorming and group discussions would help people to be more honest and more collaborative in the context of their responses (Barbour and Kitzinger, 1999).

The focus group sessions where run by three professionals. One ran the focus group while the two others functioned as observers to serve as a validity measure by providing member checks for the data collection process. The focus group was conducted over a four hour session for one day.

The groups were asked a series of questions. With each question, each group was required to brainstorm and come up with answers based on their viewpoints, opinions, and experiences concerning recruiting more students of color into distance learning communities of practice. Answers were recorded on flip charts and each group provided a presentation to explain their answers. After the answers were explained they were divided into similar categories. Duplicate responses were eliminated. Focus group responses were recorded and grouped around key labels which were in turn categorized into broader concepts. Categories were then deconstructed to examine the connections between labels and categories. The final stage of analysis involved establishing core categories to which all other categories are related and integrated into connected groups that were listed on flip carts for reference. Each focus group participant was then asked to select from the final response categories listed on the flip charts after the duplicates had been eliminated. This is a method outlined as effective by Vaughn, Schumm, & Sinagub (1996).

The analysis process included summarizing the discussions immediately. Because people can forget important details so easily, reviewing the flip charts, notes, and topic selections as soon as possible after the focus group has ended was imperative. Merriam (1998) refers to the same process as 'pile-building', in which the focus group data are first read 'vertically', usually in chronological order, to identify common themes and relations which are then coded.

RESULTS

The focus groups were allowed to brainstorm and engage in discussions for 30 minutes for each question. The groups recorded their brainstorming results on their individual group flip charts. Each group presented, explained, and clarified the conclusions that were recorded on the flip charts. Duplicates from the groups were eliminated to create a final list of the collected responses. In the final step, the focus group participants picked the top 3 responses to each question. The questions and final responses were as follows and are based on participants making selections of what they felt were the top three options, based on a collective vote of the group:

- Why is it important to have more racial, ethnic, and cultural minorities in these environmental oriented programs?
 1. It provides a richer learning experience by including the perspectives of a diverse group and creates opportunities for dialog for developing cultural competence capacity through interactions with people from different backgrounds, races, and cultures.

- 2. It provides participants with diverse experiences with a wider range of views that might even challenge the status quo.
- 3. It stimulates social, intellectual, and emotional growth for faculty and classmates.
- How do these on-line distance learning programs provide opportunities for new breakthroughs in problem solving?
 - 1. The programs provide a forum for collaboration of ideas and perspectives from students from a variety of professions, varying levels of professional experiences, an assortment of academic backgrounds, and from a mixture of geographical areas. These different perspectives provide different viewpoints for problem solving.
 - 2. Program participants have the ability to bring ideas and resources of their own professional work organizations to the classroom environment but outlining what their organizations are doing to solve problems.
 - 3. The more diverse the classroom participants, there more diverse the thinking and solutions are to environmental problem solving.
- Why strategies can be used to recruit more racial, ethnic, and cultural minorities in these environmental oriented programs?
 - 1. Partnerships with faculty and administrators at minority serving institutions. These partnerships include allowing minority faculty at these institutions to teach as adjuncts in these distance learning programs because they have access and relationships to minority students. Even include these faculty members on admissions committees. Use these faculty members to form a diversity advisory board.
 - 2. Partnership with minority serving associations like Black Engineering Association, Society for Advancing Hispanics/Chicanos & Native Americans in Science, Association of Blacks in Energy, National Association of Black Geologists, Hispanic Association of Corporate Social Responsibility, Black MBA Association, Society of Hispanic MBAs, and Association of Minority Public Administrators.
 - 3. Advertise in engineering, science, public policy, and environmental journals, magazines, and media outlets that have the ability to reach minority populations.

CONCLUSIONS

Amplified globalization, enlarged technology, and increased immigration can yield substantial benefits to solving environmental problems. Diversity brings differences in styles and in ways of looking at doing things can help organizations and universities find new ways of problem solving. Diversity means differences, and differences create challenges, but differences also open avenues of opportunities (Blank & Slipp, 1994). Based

on the discussions of the focus groups, the benefit of culturally and racially diverse student populations in these distance learning environmental programs include:

1. Enables a wide range of views to be present in a learning community, including views that might challenge the status quo from all sides.
2. These programs can be instrumental in social and community change.
3. These programs stimulate collaboration and discussions concerning social, cultural, economic, and emotional values.
4. Student participants with a vested interest in researching and solving environmental issues like environmental racism that directly influence their own communities.

Academic programs that allow the participation of working professionals from a variety of culturally, racially, and ethnically diverse student bodies allows the creation of communities of practice that creates a community of practitioner scholars that apply book knowledge to real world problems, who are interested in solving, not just studying, environmental problems.

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