Assessing the Environmental Literacy Requirement at the University of Georgia

Gwyneth Moody, Huda Alkaff, Dawn Garrison, and Frank Golley

ABSTRACT: The University of Georgia (UGA) is one of the first universities in the United States to require that every undergraduate student complete an environmental literacy requirement (ELR). The ELR has been in place since 1993. Three students examined the ELR through formal and informal studies and surveys. Their results showed that students were enthusiastic about the ELR and that they welcomed increased knowledge about the environment. Faculty thought that the ELR was useful but were dissatisfied with the criteria defining environmental literacy. The studies showed that there was wide interest and acceptance of an ELR but that lack of coordination and leadership has resulted in debate about its role in the institution. Although debate threatens the survival of this special requirement, modest changes in the ELR will likely save it. The experiences of UGA will be of value to other academic institutions contemplating a broad environmental requirement.

KEY WORDS: curriculum, environmental education, environmental literacy, human environment

In the late 1960s and early 1970s, there was widespread, intense concern about the human environment, which led to the United Nations–Stockholm Conference and, in the United States, to the formation of the President's Council for Environmental Quality, the Environment Protection Agency, and Earth Day. University or College-age students played a leading role in these environmental movements and, as a consequence, universities throughout the world began to incorporate concerns about the environment in their curricula. By the early 1980s, emotion-driven environmental activity began to decline as the environment was institutionalized within government, business, and academia. Institutionalism frequently involved compromises between the maintenance of the status quo and radical changes that met perceived needs. It became clear to many that the com-

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promises were satisfying local or national needs but were insufficient to deal with global change in climate, loss of biodiversity, loss of soil fertility, soil erosion, emerging global diseases, and so forth. New and powerful messages concerning the need to broaden public education about these problems were attracting attention and support from institutions of all kinds, corporations, and businesses. Environmental education (EE) was increasing in universities and colleges, where it was possible to both research theoretical questions about the human environment and apply contemporary knowledge about the linkages between the environment and economics, food production, human health, and other matters.

The University of Georgia (UGA) has had a long history of environmental research, service, and education, including approximately 400 courses offered by several schools and colleges that treat some aspect of the environment (Alkaff, 1996). In this article, we describe the actions taken at UGA, a state-supported research university with more than 30,000 students, to create a university-wide environmental literacy requirement (ELR) in response to the new call to increase the scale and depth of research, service, and instruction on the environment.

This new program was instigated after Peter Raven, the director of the Missouri Botanical Garden and a distinguished conservationist, came to UGA in 1989 as the inaugural charter lecturer. UGA president Charles B. Knapp created the lectures to present broad, cross-disciplinary discussions of current issues. Raven's lecture and visit to the campus stimulated Knapp to make the environment a centerpiece of his administration. In his State of the University sddress, Knapp challenged the university to extend its role as a national leader in environmental research and education by establishing a program to ensure that every student graduating from the institution was environmentally literate (Knapp, 1989). He explained that the university could "no longer afford to grant degrees to students who were environmentally illiterate. If the issues of our fragile ecology are as important to the future of the world as Dr. Raven told us last month, then we must begin to convey that message loud and clear to our students" (p. 4). Although it is unusual for a president to make such a proposal in a state of the university address, Knapp was not being revolutionary in his challenge but rather was extending the university's efforts in environmental studies already underway in many schools and colleges to the institution as a whole (UGA Office of the President and the Office of Public Information, 1994).

To accomplish this goal, Knapp appointed a task force on environmental studies that was representative of the university's many environmental interests. He suggested to the task force that UGA would even establish an entirely new school and reallocate funds within the university's strategic plan, if necessary, to accomplish the task that he had defined (Knapp, 1989). On January 17, 1990, Knapp gave the task force three directives: (a) To propose a curriculum that would produce "environmentally literate" graduates, (b) To review the university's organization to secure greater focus on environmental issues', and (c) To consider whether additional funds were needed to support the university's environmental activities (UGA University Curriculum Services, 2000, p. 1).

To accomplish these directives, the task force was organized into committees to research how environmental literacy was being taught at UGA and on other campuses in the United States, what kind of policies should be established, and what type of curriculum was required for environmental literacy. On November 26, 1990, the task force presented its report, *Toward an Environmentally Responsible University of Georgia for the Twenty-First Century.* This report included a list of recommendations and two universal goals from which Knapp (2000) made various proposals and policy decisions on March 29, 1991. The first goal emphasized the importance of all UGA undergraduate students having an "environmental literacy experience" (Garrison, 1993, p. 4). The task force acknowledged that this experience might focus on scientific as well as the philosophical, educational, political, social, spiritual, and humanitarian aspects of environmental literacy. The second goal dealt with establishing inter-

disciplinary "focus" courses that would be part of a student's major course of study. For instance, a business student might take an environmental literacy course focused on the environmental side of business (Garrison). The task force also recommended the appointment of a coordinator of environmental literacy and the establishment of new faculty positions and workshops. The estimated cost of these efforts was about $900,000 (Task Force on Environmental Studies, 1990).

Opposition to Knapp's (2000) directive and the task force report immediately surfaced within the university, focused partly on the estimated costs of the proposed program and partly on philosophical issues related to the environment. As a consequence, in June 1991, William F. Prokasy, vice president for academic affairs, established an environmental literacy committee to examine the feasibility of implementing the task force report and to devise a less expensive strategy for an environmental literacy program (Knapp, 2000).

In January 1992, the environmental literacy committee presented a report that addressed the operational definition of environmental literacy. This committee established six criteria. It proposed that people are environmentally literate if they comprehend and are able to critically evaluate the following:

1. basic scientific principles that govern natural systems, using these to understand the limits and major factors associated with the earth's capacity to sustain life;
2. linkages among all living things and their dependency on each other as well as the physical environment;
3. consequences of human activity on local, regional, and global natural systems;
4. impact of changes within natural systems of life, health, and welfare;
5. cultural, economic, and political forces—both past and present—that affect environmental attitudes and decision making; and
6. role of ethics and morality in individual and group decision making related to the environment (Environmental Literacy Committee, 2000, pp. 1–2).

On May 14, 1992, Prokasy created an environmental literacy board with the responsibility to review, coordinate, and recommend approval of individual unit literacy plans for satisfying the ELR, which would subsequently be approved first by the University Council's Curriculum Committee and finally by the University Council itself. The first college to have its plan approved by the board was the College of Arts and Sciences. Subsequently, plans for each of the schools and colleges were approved by April 14, 1993. Eight approved courses fulfilled all six criteria. In addition, students could combine 1 course from a choice of 13 humanities and social science courses with another from 18 natural and physical science courses to satisfy the ELR (*Quarter System Environmental Literacy Requirement,* n.d.).

Mixed conclusions of the committees and boards, the absence of active public direction by Knapp, and statewide limits to spending resulted in a highly varied effort. The lack of an environmental coordinator and periodic outcome assessments of the ELR were especially serious. Eventually, some faculty became frustrated and called for a change in the program curriculum. On January 26, 1995, the university council's curriculum committee attempted to resolve the differences of opinion by forming a new environmental literacy subcommittee charged with reviewing the ELR. This committee was mainly concerned about the number of hours necessary to meet the ELR, the cost to faculty and departments, and the overall effectiveness of the requirement (University Curriculum Committee, 2000). The subcommittee proposed that the six criteria be reduced to two, effective in the fall semester of 1998, and remain in place until the advice of an external review panel could be considered. The criteria were (a)basic scientific principles that govern natural systems, and (b) the conse-

quences of human activity on local, regional, and global natural systems (University Curriculum Committee, 2000, p. 1).

The subcommittee also proposed that only one course be required to meet the ELR. Unfortunately, an external review panel has yet to be appointed.

These proposals were approved on December 17, 1997, and the schools and colleges were asked to submit a list of semester courses for approval that, in their opinion, would satisfy the ELR. A large number of courses were proposed and approved (University Curriculum Committee, 2000). The number more than doubled from 39 courses, which partially or completely satisfied the requirement in 1993, to 89 courses, all of which fulfill the requirement, in 2005 (*Environmental Literacy Requirement Courses,* n.d.). Furthermore, the committee agreed that required courses by some departments, such as basic biology and basic chemistry, were approved as meeting the ELR. This decision allowed students taking these courses with the sole intention of satisfying their core requirements to automatically complete the ELR. In 2003, an ELR review committee was appointed by Arnett C. Mace, Jr., senior vice president for academic affairs, and charged to review the ELR. On September 19, 2003, the review committee gave its report to the curriculum committee and recommended that the ELR be continued in the form of a standardized test that all incoming undergraduate students must take on a pass or fail basis. If they failed, they were required to attend a 1-hr remedial course. However, if no funding were available for such a test, then the committee recommended abolishing the requirement altogether (Environmental Literacy Requirement Review Committee, 2003). Because funding was nonexistent, the ELR had reached a stalemate and the University Curriculum Committee asked Mace to appoint a committee, with campuswide representation, "to develop a plan to implement and assess an [ELR] for the University . . . [which the Committee] will provide . . . to the University Curriculum Committee no later than the last meeting of the academic year, March 26, 2004" (University Curriculum Committee, 2003, p. 1). Although a committee was not appointed nor a plan developed, the College of Environment and Design has expressed interest in taking on the responsibility for the ELR.

Evaluation of the Environmental Literacy Requirement

The ELR attracted the enthusiastic interest of many UGA students, and three students conducted formal studies of the requirement. In 1993, Dawn Garrison, a graduate student in health promotion and behavior, completed a graduate paper for the Environmental Ethics Certificate Program on the ELR in the start-up period. In 1996, Huda Alkaff, a graduate student in ecology, completed a master's thesis on the ELR in the middle period of its operation. In 2001, Gwyneth Moody, an undergraduate student in geography and anthropology, completed a study for the Environmental Ethics Certificate Program after the reduction of the ELR criteria. These three evaluations were based on formal and informal questionnaires and surveys of students and faculty completing and teaching the ELR.

Garrison's informal interviews of faculty and students led to her conclusion that *environmental responsibility* was not adequately defined and, therefore, the faculty interpreted the program goals in many contradictory ways. For example, the response from the environmental literacy board members she interviewed ranged from "yes, the ultimate goal of the program is to produce behavior change" to "the professor's job is to convey knowledge *only*. It's up to the student to change" (Garrison, 1993, pp. 9–10).

Alkaff evaluated change in knowledge of environmental literacy and students' perception of their experience using formal survey methods. Alkaff gave comparable self-evaluations to determine students' pre- and postcourse knowledge and retention 8 months after course completion. She studied

242 students enrolled in the three major courses (introductory anthropology, ecology, and geography) approved in the early phase of the ELR. The students in the survey had similar characteristics to students of their age and class at the university as a whole. Students were surveyed on the first day of class, the last day of class, and then 8 months later by mail or e-mail. Each class was distinct. The instructors did not use a common syllabus nor did they coordinate their courses (Alkaff, 1996).

Alkaff's survey showed that there was a significant increase in awareness of the environment (based on the one-sample *t* test) from the precourse to the postcourse period and that this knowledge was retained for 8 months (Alkaff, 1996). She also found significant differences among courses. Students thought they learned more in ecology but retained this knowledge at a lower rate than in geography or anthropology classes. The ecology course incorporated the most information from the natural sciences, and this difference may have been a causal factor in the results.

Moody (2001) considered the perception of the ELR by students and faculty after the requirement had been changed. This study was based on random samples of students and faculty to achieve a sampling error of ± 5%; however, this was not accomplished for faculty, whose sampling error was ± 9.7%.

Of the 408 students surveyed, almost half (43%) were unaware of the ELR. Moreover, the majority of students, regardless of major, did not take a course specifically to satisfy the requirement (61%). This lack of awareness likely resulted from the decision of the University Council's Curriculum Committee to approve a larger number of courses, including some that were only minimally relevant. The survey also showed that most students who had already taken a class that fulfilled the requirement were satisfied that the teacher fulfilled the ELR criteria. However, there was one exception. Almost 43% of the students who took chemistry to satisfy the ELR were not satisfied that the teacher fulfilled the criteria. Finally, about 90% of all students surveyed thought that the ELR was important to their education (Moody, 2001).

Like the students, almost 50% of the 103 faculty surveyed were unaware of the ELR. Only 14% were teaching or had taught a course that satisfied the ELR, and surprisingly, about one third of the faculty was not certain whether they had taught such a course. Of the faculty who had taught or were teaching courses to meet the ELR, only one fourth had to change their syllabi to fulfill the requirement. The majority of the faculty thought that having an ELR was important (94%), but almost half thought that the present criteria were unsatisfactory. This dissatisfaction with the criteria was also reported by the ELR review committee, which stated that "after reviewing a sample of the course descriptions . . . it is hard to see how some of them introduce a student to both [criteria]" (Environmental Literacy Requirement Review Committee, 2003, p. 4).

Discussion

Formal surveys and informal discussions with UGA students and faculty demonstrated a clear and logically consistent result: Both students and faculty support the ELR. Alkaff's (1996) study illustrated that the broad-based environmental literacy courses in anthropology, ecology, and geography were successful because they significantly increased student knowledge and that this new information was retained for at least 8 months. Moody's (2001) survey showed that students were satisfied with their experience overall and considered the ELR valuable. However, students took a course as part of their core curriculum, not realizing that it also fulfilled the ELR, and thus many were never formally introduced to the requirement. In contrast to the students, the faculty members were not satisfied with the criteria for meeting the ELR, although most agreed that an ELR was appropriate and important.

After reviewing the history of this effort, the deficiencies in the development of the ELR become evident. The faculty committees appointed to implement Knapp's proposal that each graduate of the university have an introduction to the human and natural environment worked hard and produced

thoughtful reports on how to proceed. They established criteria for evaluating environmental literacy and proposed steps to satisfy the needs of the various constituencies within the university. However, some of these steps were never taken. For example, no individual was appointed to coordinate the ELR, which resulted in a lack of central leadership to implement the requirement. Moreover, an external review panel to periodically assess the ELR criteria and courses was never established.

Many scholars contend that the primary purpose of environmental education is to develop environmentally literate citizens who can demonstrate responsibility and take action on critical environmental issues (Alkaff, 1996; Garrison, 1993). Yet, Garrison's interviews with environmental literacy board members demonstrate that greater coordination is needed between departments to clarify the definition of environmental responsibility, which the university is committed to, according to the University of Georgia Environmental Policy Statement (Environmental Literacy Committee, 2000). Environmental responsibility is an essential component of environmental literacy.

It seems clear that the absence of a coordinator and commonly agreed-upon definitions and goals prevented successful implementation of the environmental literacy program. The persistent criticism of the ELR within the faculty eventually caused the university council to find a compromise between those who were committed to implementing Knapp's proposal and those opposed to an ELR. The compromised position was that the university should retain the ELR but that any course a group of faculty, or their administrators, declared met the requirement should be accepted. Not surprisingly, the ELR was under further scrutiny in Fall 2003, when the continuation of the program was in dispute because of its ineffective nature. This was exemplified by a 2003 review committee report that stated that many of the courses that fulfill the ELR "do not appear to have environmental issues as a core of the class" (Environmental Literacy Requirement Review Committee, 2003, p. 4).

The data and surveys from UGA suggest that not only is an environmental literacy coordinator needed but so is an external review panel to determine whether the ELR classes actually fulfill the criteria effectively and whether the criteria in and of themselves are sufficient to produce environmentally literate graduates. Because financial resources are limited for the creation of a coordinator position and an external review panel, and perhaps, as Alkaff noted, there is "no coordination between the schools, departments, not to mention the instructors teaching the environmental literacy courses," it is essential that attention is focused on enhancing cooperation and coordination among the various university constituencies to create and maintain an effective and productive environmental literacy program (Alkaff, 1996, p. 123).

A failure of the ELR will likely have serious consequences. Although UGA has a substantial reputation in environmental work of all kinds and plays a role as leader nationally and internationally in the quality of its research, numbers of graduates, and significance of its service to the state and nation, it must continue to be creatively active to retain its leadership. Knapp's imaginative proposal is an example of this creativity, and it brought UGA wide attention (Brett, Brouwer, & Brett, 1999). Other institutions of higher education will continue to bring environmental knowledge to their graduates as well. The University of Wisconsin–Stevens Point also has developed a university-wide environmental requirement, for example (Wilke, 1995). These experiments are role models for the rest of the nation, and if they fail, they will not only lower the morale of the large number of students and faculty concerned with the environment but will also deny all students an introduction to a complex subject that is central to their future.

Unfortunately, the overall understanding of the human environment and humans' interactions with the environment is inadequate and reduces people's capacity to maintain health, productivity, and sustainability of nature. This understanding must be built on knowledge of natural and physical science, social science, and relevant subjects in the humanities and arts. The concept of environ-

mental literacy is not yet fully developed, although several books and articles examine the concept (see Elder, 2003; Golley, 1998; Orr, 1992; Roth, 1992; Schneider, 1997). Thus, there are numerous opportunities for environmental scholarship throughout a university. Each region has its own special needs and challenges. No part of scholarship, application, or learning is excluded, although not every element of knowledge is relevant at every occasion. As Knapp surmised, environmental literacy has the potential to link parts of a large multiversity and focus it on an issue of wide concern.

Keeping UGA's ELR in place has been a difficult challenge. By strengthening the ELR, Knapp's challenge to the university to maintain national leadership in seeking solutions to environmental problems through its teaching, research, and service programs could truly be fulfilled. As other universities and colleges seek to extend and broaden their environmental stewardship, it is important to keep in mind the process and results described. Students have been enthusiastic about the effort. Faculty showed mixed responses. To be successful, it is essential that environmental literacy is linked to conventional scholarship and not presented as ideology or as an alternative to culture and patterns of society. The basic concepts of environment and interconnectedness are so rich that they can illuminate almost any subject. We hope that this account of the development of an environmental literacy program will be broadly useful as we create an environmentally literate population to face the challenges of the future.

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