Workforce Sustainability Education and Training: an Assessment of Employers and Post-secondary Educational Institutions in Georgia

Project Overview

In 2008, the Office of Economic Development of the Board of Regents, University System of Georgia commissioned a study on the *Energy and Environmental Workforce Educational Needs: Supply and Demand in Georgia.* The report concluded from an analysis of current job openings that "an array of educational backgrounds are needed, with the most common being business and engineering, followed by information technology, technicians, science, and policy." And while the authors went on to offer several recommendations for increasing the type, supply, and quality of workers graduating from Georgia's two-year, four-year, and graduate programs, the report did not address any education or training that involved students from different disciplines, departments, or schools learning how to work together as a coordinated workforce. In part, it is surmised that the authors framed their analysis within the tenets of the first industrial revolution, mainly the one where "division of labor" and/or "division of work" is a driving organizational force. The introduction of sustainability as a desirable attribute for the "next industrial revolution," however, surmises the need for a different kind of workforce that is more collaborative and more integrated to meet not just an organization's financial goals, but also to meet its environmental and social goals too (i.e. the so called "triple bottom line"). With support from the Ray C. Anderson Foundation, and a core team of researchers from the Georgia Institute of Technology, Georgia Southern University, and the Board of Regents of the University System of Georgia, Vertical Integration of Research, and Technical Undergraduate, and graduate Education for Sustainability (VIRTUES) is a step toward developing a proactive process to incorporate the practice of sustainability throughout the workforce, not in the workplace as is occurring now at great cost to employers, but at earlier stages of educational experiences and workforce development when minds and practices are still forming.

The VIRTUES team used a combination of published literature on the subject of sustainability education, recent surveys of employers and educators including two administered directly by VIRTUES, and roundtable workshops hosted with Georgia industry representatives and post-secondary educators to discern initial findings and reflections from each constituency. VIRTUES consists of four elements:

1. Characterize the workforce needs of employers, and in particular manufacturers, as it relates to sustainability.
2. Assess what colleges, universities, and technical colleges in Georgia are doing to educate and train students to contribute to the sustainability of the organizations that they may work with upon graduation.
3. To identify the "gaps" between #1 and #2 above.
4. To identify possible solutions that can be enacted in Georgia's higher education institutions to close the gaps identified in #3.

This report describes the process of discovery and findings from the first two elements and is intended for an audience of educators and employers to review in consideration of contributing insight that will help the investigators complete the final two tasks. Any deliberations, however, should be bound by the following conditions that define the scope of VIRTUES:

1. Educators have already adopted and integrated the most germane elements of sustainability into their specific disciplines. The corollary to this is that VIRTUES will not address intra-disciplinary sustainable education and training, but will focus instead on the

interactions between persons of different educational backgrounds and how such interactions may enhance sustainability in organizations.

2. Extra-curricular activities are more amenable to change than is course curricula. With this in mind, VIRTUES intends to channel discussion in step #4 above to focus on ideas that can be rapidly implemented in the near term.
3. Sustainability education and training would be enhanced by better student proficiency in any or all of the basic "literacies" (e.g. reading, writing, math, computer, environment, ethics, etc…), but this is beyond the scope of VIRTUES to address. VIRTUES will meet students "where they are" and not "where we wish they were."

Participants discuss sustainability related needs of employers at May 10, 2013 VIRTUES Manufacturers Workshop, Gulfstream Aerospace Corporation, Savannah, GA.

Key Findings: Sustainability and the workforce needs of employers in Georgia

There were four strongly shared themes that emerged from VIRTUES' review of previous work and conduct of new research that are indicative of employer needs and desires for recent college graduates. The first was that **employers greatly value experiences and education activities that occur in "real world" settings**. These may be in the form of curricular and extra-curricular on campus activities, or off campus internships and employment. Other than "written and oral communication skills," organizations appeared to be satisfied with recent graduates' mastery of knowledge but were not as enthusiastic about their ability to apply that knowledge to address

demands of the type found in the workplace. The ability of a graduate to show evidence that he or she was successful in applying knowledge gained in the classroom to an actual work or project experience was perceived to be more important than almost any other measure of academic success including choice of major, GPA, or reputation of school.

The second theme was the importance of **competency in a host of soft skills including the ability to manage multiple priorities, possessing creativity in solving complex problems, and demonstrating the ability to think critically, plan strategically, and act logically**. Skills obtained by rote learning (e.g. knowledge of rules and regulations), guided repetitive practice (e.g. basic welding) and even those more inquiry-based, critical thought skills (e.g. science, technology, engineering, and math) were not considered to be lacking in recent graduates. To the contrary, employers seemed to be quite satisfied with their new employees' hard skills (with the exception of writing and oral communication) and did not suggest that their preparation in this regard should change. While still recognizing the importance of professional and technical education (i.e. business, engineering, computer science, trades, etc.), survey respondents indicated that they also valued education in the liberal arts seeing it, perhaps, as a means to enhance the soft skills they desire in their employees.

A third theme is that **return on investment is of paramount importance**. Other than cost and ROI, there appeared to be few barriers to organizations adopting and implementing sustainable practices. A particularly expressed and repeated comment in the VIRTUES workshop, however, was that young employees do not seem to be cognizant of how their actions impact the financial bottom line.

The final theme was that **workplace sustainability initiatives were largely started and led by management**. They were not "bubbling up" from line employees or being injected into the organizations by consultants, suppliers, customers, or other outside forces. Once initiated, however, all levels of the organization were engaged, often in well defined, but ad hoc, teams to implement the directive.

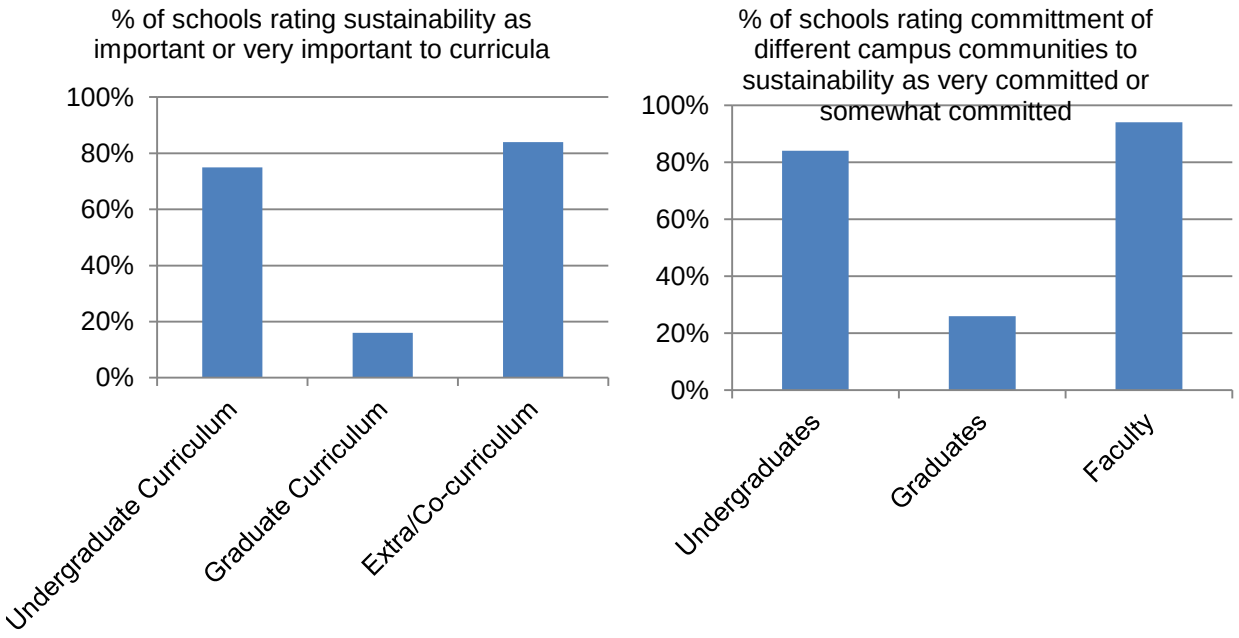
Key Findings: Sustainability and higher education in Georgia

Turning to higher education in Georgia, VIRTUES' researchers found seven recurring topics in the published literature, in surveys, and in discussions with educators. First, **there is wide variation in sustainability education at Georgia's colleges, universities, and technical colleges**. This runs counter to the widespread adoption of sustainability advances and practices on the facilities and operations side of many of Georgia's higher education institutions, and where the pervasive sense of a "culture of sustainability" felt to exist on most campuses seems to originate. When it comes to instilling sustainability concepts and principles in technical, undergraduate, graduate, and professional education, however, there are large disparities in commitment, content, and delivery from one school to the next.

The second finding is that **in terms of curriculum, it is at the undergraduate individual course level where offerings are most abundant and a large number of students are most engaged.** With the exception of two degree programs – a Sustainable Technology Diploma from Savannah Technical College, and a Master's of Science degree in Conservation Ecology and Sustainable Development from the University of Georgia – VIRTUES found scant evidence of the existence of the type of comprehensive and vertically integrated curricula that leads to certified two year Associate's, four year Bachelor's, or multi-year Master's or Doctorate's degrees in sustainability. There is considerably more – though still limited – structuring at the undergraduate minor, concentration, or certificate level in which a few sequences of sustainability relevant courses, labs, and research / internship experiences have been organized into a certifiably recognized program of study at several schools. But while these programs of study are available to most students,

comments from those on campus indicate that they may have small participation rates, mostly attracting student learners and faculty instructors that are already predisposed to sustainability. Most student exposure to sustainability concepts within the formal curriculum then, occurs within individual courses that are either provided as electives or are requirements of the student's chosen major. Deriving from this is the third resultant finding that sustainability is being presented from many diverse perspectives (e.g. manufacturing, policy, ethics, business, engineering, biology, or health) and **there is no common core of knowledge or skills for which all students are expected to obtain, and by extrapolation, can find common ground over later in their careers.** (The exception is at Georgia Southern University where every undergraduate student is required to take a 4-hour environmental science course with lab that includes content directly related to environmental sustainability.)

In spite of these shortcomings in undergraduate sustainability education, this still far exceeds the penetration of sustainability into the graduate education curriculum. With no general education requirements, more narrowly focused degree major mandates, and perhaps more single-minded students pursuing specific knowledge related to explicit career objectives, the graduate school experience seems to be largely impervious to the organic forays of sustainability that are infiltrating the undergraduate experience. Such structural barriers suggest a fourth general conclusion that **graduate education may be the most difficult segment of higher education for sustainability to gain traction.**



Results from VIRTUES survey of higher education in Georgia, Summer 2013.

In contrast to graduate education, and perhaps even further accepting of sustainability than undergraduate education, **extra-curricular and co-curricular activities present tremendous opportunities for introducing students to and engaging them in sustainability**. Absent most of the accreditation, degree, and other academic and bureaucratic constraints, higher education's extra / co –curriculum can be flexible and quick, adapting to the varying and changing interests of the transient student population. Further whether intentional or not, "active learning" – a more hands on pedagogical approach to learning that can include problem based learning, experiential learning, and service learning; and thought to be more conducive to the uptake of sustainability

concepts is a natural byproduct of many extra / co –curricular activities occurring outside of the traditional classroom.

For any sustainability education effort – curricular, co-curricular, or extra-curricular – at any level – undergraduate, graduate, or professional – **there is very limited assessment by which to determine if any of the activity that is occurring is having any lasting effect**. The few objective assessments that have been completed suggest that sustainability education efforts tend to overemphasize the environmental aspects of sustainability and pay less attention to the economic and social elements.

The final finding is that **the clear return-on-investment that is pushing more funding for sustainability in campus capital projects and operations has not carried over to the education side.** A small minority of Georgia schools have been able to pass and implement a mandatory student "green fee," some of which may be used for sustainability education. But most schools have not considered it, and others that have, have determined that any increase in student fees at this time is not feasible.

Connections Emerging from these Findings

VIRTUES investigators will continue to collect and analyze data and information about the needs of employers and the teaching of sustainability by higher education institutions in Georgia. At this point in the project, however, the team is most interested in understanding where these two constituencies are, what the gaps are between them, and soliciting ideas about how Georgia's colleges, universities, and technical colleges can help close those gaps. In this regard and in an effort to seed discussion with employers and educators about the results presented thus far, the following three "connections" between employers and educators are presented for consideration. With this, the team is openly soliciting feedback and for more ideas.

1. Employers greatly value experiences and education activities that occur in "real world" settings. Likewise, educators believe that active learning – a more hands on pedagogical approach to learning that can include problem based learning, experiential learning, and service learning – is the most effective pedagogical method for teaching students about sustainability.
2. The business case for sustainability might be an important priority for education efforts, not to the exclusion of environmental and social issues, but to get the attention of employers, workers must be able to understand and articulate the economic, financial, organizational, and market implications of sustainability. In contrast, educators may be presently overly emphasizing the environmental implications.
3. Direct degree programs in sustainability are not a priority for either employers or educators, but both consider it important for students/employees to be competent in a host of soft skills that affect an organization's ability to be more sustainable. These include the ability to manage multiple priorities, possessing creativity in solving complex problems, and demonstrating the ability to think critically, plan strategically, and act logically. While still recognizing the importance of professional and technical education (i.e. business, engineering, computer science, trades, etc.), educators and employers alike indicated that they also valued education in the liberal arts seeing it, perhaps, as a means to enhance the soft skills they desire in their graduates / associates. Sustainability education should complement a person's abilities, and should not substitute for other hard skills.