Chapter 26:
Kindergarten Through Twelfth-Grade

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The worth of education must now be measured against the standards of decency and human survival—the issues now looming so large before us in the 21st century. It is not education, but education of a certain kind, that will save us.

—David Orr

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een from the lofty perspective of life in these United States, the current world seems to function pretty well. The Cato Institute recently published a book, It’s Getting Better. All the Time, in which they detail a vast array of statistics that point to increasing human well-being. Air and water in the United States are increasingly clean, and the cost of many goods (food, clothing, electronics, telecommunications) continue to decline as their quality increases. Why, then, do we need to think about changing our ways and our educational practices in order to assure a good life for future generations?

The reasons for doing so are accumulating, globally and regionally. Even in this country, if you scratch a little deeper, different truths emerge; other indicators paint a grimmer picture of contemporary American life. Many Americans are caught in a consumption treadmill—during the 1990s, economists and the media constantly bewailed our low savings rate, high personal bankruptcy rate, and historically high rate of credit card debt. Gallup polls and educators both provide evidence of the remarkable, and unprecedented, pessimism of our youth with regard to the future and to their future; this pessimism seems bleakest amongst inner-city, at-risk youth, but many American youth from all classes and all places seem to feel this way. The costs of such despairing views are high: many youth never reach their full potential and don’t contribute their full talents and energy to the growth and development of our society.

In many places outside our borders, of course, the evidence of a sustainability crisis is more readily visible: declining ecosystems, disease-ravaged societies, declining food security and standards of living, widening inequality, looming water scarcity, and disruptively rapid climate change. The list is extensive and terrifying in its implications for the future of human well-being in all nations. Success in the United States in fostering sustainability is crucial for the entire world, as U.S. consumption fuels much of the planet’s environmental damage. Happily, U.S. resources—the tangible and the intangible, the financial and the human—could be instrumental in solving these problems. Primary through secondary (kindergarten through the 12th grade, or K-12) education is a major shaper of the truths, attitudes, ethics, concepts, and behaviors of American society. By reshaping K-12 education in the United States so that it systematically and effectively fosters sustainability, we will be able to make great progress toward the achievement of a sustainable world.

Our potential contribution to sustainable development is great. Our nation attracts the best and brightest in the world who come here to develop their talents in our free, open, and opportunity-rich society. Our businesses and our government are important shapers and determiners of what happens in the world. It is crucially important, therefore, that educators manage to attain the goals of Agenda 21, Chapter 36 in the United States.

Chapter 36 of Agenda 21, crafted from a world’s hopes and dreams in 1992, promulgated many educational reforms and practices to help advance education for sustainability. This document inspired in the mid-1990s some major national entities, conferences, and coalitions in the United States: the President’s Council on Sustainable Development (PCSD), an Office of Education for Sustainability at the U.S. De-
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partment of Education, and a U.S. Environmental Protection Agency (EPA) Department of Sustainable Ecosystems and Communities. Sadly, this national mobilization is at an end, yet communication, mobilization, and educational frameworks development for U.S. sustainability education continues in a few dedicated nongovernmental organizations (NGOs), some far-sighted school districts, and independent schools, as well as an evolving understanding of the principles, skills, knowledge, and practices that constitute appropriate education for sustainability for K-12 students in the United States. There exist independent efforts to teach students the ecological literacy, systems thinking, multiple perspectives, connection to place, sustainable economics, citizenship, and the creativity and visioning they will need to fashion a more sustainable world.

While our educational system works to develop many of the discrete skills that future problem solvers will need to diagnose and solve our global problems, as a nation we lack the systemic understanding that explains these complex threats to sustainability. Our educational system, moreover, is often inappropriately focused on basic literacy and easily testable knowledge, which does not adequately prepare future citizens to understand current world problems and issues or to craft solutions for them. We do not prepare teachers to create experiences for students that help them engage with the rich, complex, interdisciplinary world in which they live. We do not fund the infrastructure needed to support a sustainable and worldwide implementation of an educational program that educates students for sustainability and that connects schools to real-world issues, problems, and social change efforts.

Thankfully, educators are beginning to find support and guidance in teaching for sustainability in emerging real-world practices. Changes in thinking and behavior that foster sustainability are already under way in our society. Increasingly, far-sighted leaders in business and government, learning the truths of sustainability from their experiences and from nascent trends in the thinking and practices of their fields, are making the connections and taking the steps that enable them to design and implement long-term solutions to our current sustainability crisis. Our schools need to prepare students to join this quest by giving them the knowledge, skills, beliefs, and the "habits of the heart" that will enable them to fashion a sustainable world. Some hard work has to take place if schools are to be able to adopt this mission. We need to prepare teachers, understanding sustainability and to see its relevance and importance to what they teach and to their educational mission; we need to prepare society to formally acknowledge the importance of education for sustainability in its educational goals; we need to connect students to real-world efforts to bring about sustainability; we need to create a national infrastructure to develop and support the nationwide practice of education for sustainability in all our schools; and we need to fund the effort and research needed to educate for sustainability. If we do this, we may succeed in successfully providing U.S. citizens with the knowledge, the skills, and the attitudes needed to foster sustainability in their personal, community, and work lives.

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History of Sustainability Education in the United States

With the publication of Our Common Future, also known as the Brundtland report, in 1987, sustainability (with its close correlate, sustainable development) began to emerge as a useful concept for understanding and tackling a broad array of social and environmental issues. The Brundtland report and the resultant

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United Nations Conference on Environment and Development, or Earth Summit, held in Rio de Janeiro in 1992, were landmark events in the development of efforts to educate for sustainability in the United States.

The Brundtland report and the Earth Summit elaborated a conceptual framework to explain contemporary ecological, economic, and social crises as interrelatedly interlinked phenomena. However, preexisting organizations, understandings, fields, and educational endeavors nourished the new, post-Rio efforts to educate our nation's children for sustainability. Many of the content areas and associated education specializations that contribute to an understanding of sustainable development had already become established academic fields and disciplines prior to the pivotal Earth Summit.

Environmental education, in the wake of Rachel Carson's 1962 Silent Spring and the first Earth Day in 1970, had already become a fairly common element in American education, as well as the 1990 passage of the National Environmental Education Act. Environmental-curriculum frameworks, and national environmental-education organizations were already in existence by the early 1990s. Examining environmental issues, e.g., pollution, species loss, recycling, from multiple perspectives (the natural and human elements and systems involved in an environmental issue) had become common, if not ubiquitous, practice in American K-12 science classes.

Global and development education were also becoming widespread aspects of K-12 social studies education in the United States. By the end of the 1980s, the education departments of most cities and states had either mandated or recommended global education, often involving year-long courses and statewide assessments. The American Forum for Global Education, Global Learning, the Stanford Program on International and Cross-Cultural Education, and the Choices Program at Brown University, and the Center for Teaching International Relations at the University of Denver are among many prominent global education NGOs that existed in the early 1990s, developing frameworks, materials, and professional guidance for effective teaching of multiple perspectives, cross-cultural understanding, historical and world cultures, development, and the interdisciplinary teaching of global systems and issues.

A multitude of other fields, each with its own educational mission and cadre of professional practitioners, also were poised prior to Rio to contribute to a comprehensive effort to educate for sustainability. Ecological design and architecture education, holistic education, futures studies, system dynamics, organizational learning and change, environmental ethics and philosophy, ecological economics, and ecological psychology all existed prior to Rio. All have continued to develop synergistically, and all continue to contribute to sustainability education in the United States. The 1992 Earth Summit proved a galvanizing event for sustainability education. Educators, together with their colleagues in other fields, elaborated a systematic and comprehensive agenda to create a more sustainable world; the understandings and concepts in the Brundtland report informed a comprehensive action plan that became known as Agenda 21. Chapter 36 of this document detailed new actions required for "Promoting Education, Public Awareness and Training."

Chapter 36 clearly states that education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. Education is also stated to be an indispensable means of "achieving environmental and ethical awareness; values and attitudes, skills and behavior consistent with sustainable development and for effective public participation in decision-making." The document put forth comprehensive and new goals for education to "achieve environmental and development awareness in all sectors of society" and to "promote integration of environment and development concepts . . . in particular the analysis of the causes of major environmental and development issues . . . ." The document urged integrating environment and development as a "cross-cutting issue," covered through a "multidisciplinary approach." It also urges the creation of national, interdisciplinary coordinating bodies (composed of environment and development interests), pre-service education for future teachers on environment and development issues, strengthening program development and education research in environment and development education, and cooperation/coordination with NGOs at
work in environment and development. The document implicitly and explicitly acknowledges that human well-being and the health of the planet are inseparable, and it seeks to reform educational systems and practices so that students understand and can act upon this truth.

Agenda 21 and the Earth Summit sparked some major policy and organizational efforts in the early 1990s to implement education for sustainability in the United States. On the national level, these events were catalytic in inspiring several independent and simultaneous conferences, meetings, and forums around the country. At the federal level, they inspired the creation of the PCSD. The 25-member council, created by an Executive Order in June 1993, brought together leaders from industry, government, education, and civil society and developed policy recommendations to enhance the nation's economic, environmental, and social sustainability. One of the PCSD's task forces developed a policy framework, From the Classroom to Community and Beyond: Educating for a Sustainable Future, to enable all learners to become educated for sustainability.

The PCSD also sponsored a demonstration project in the fall of 1994 in conjunction with the National Science and Technology Council (NSTC). The PCSD and the NSTC convened a forum for national leaders from education, the business sector, government, and NGOs to explore strategies for building effective partnerships to support education for sustainability. The "National Forum on Partnerships Supporting Education About the Environment" held at the Presidential Summit on the Environment, brought together 17 individuals with a broad range of expertise to work on this issue, including corporate leaders, university administrators, professors in the field of environmental education, state and federal officials, as well as teachers, scientists, and students.

This national forum developed a blueprint for education for sustainability: Education for Sustainability: An Agenda for Action. This document detailed a plan of action to integrate education for sustainability into broader educational curricula and to develop partnerships, cooperative relationships, and the involvement of nonformal educational organizations to attain this goal. From these two parallel processes—the National Forum and the PCSD—came a clear recognition that creating an effective education for sustainability would require new educational content and processes and the involvement of a broad set of stakeholders in setting and accomplishing educational goals. The PCSD's report, From the Classroom to the Community and Beyond, developed goals and recommendations and detailed examples of promising practices and programs. An Agenda for Action charted a clear course for a new spirit of collaboration and focused on the interconnections among the natural and built environment and the changing and fluid ecological, social, economic, and political forces that influence the world around us. Unfortunately, these two policy documents did not send forth ripples that revolutionized our educational system. They remain, however, beautifully crafted recommendations on the content, skills, and policies needed to educate Americans for sustainability.

In addition, an Office of Education for Sustainability was formed by the U.S. Department of Education. Carol Wee and Lynn Mortensen, of the White House coordination office for the PCSD, while lacking a budget to fund or develop programs or curriculum, heroically worked to network existing efforts at education for sustainability. The office was disbanded after less than two years in operation. EPA's Department of Sustainable Ecosystems and Communities also arose as a national response to Rio; it remained in existence until the late 1990s and funded several educational programs and curricula.

The Earth Summit, the National Forum, and the PCSD have inspired several educational organizations to undertake the work of fostering education for sustainability in the United States. Most post-Rio K-12 sustainability organizations, however, are small, although a few are medium-sized and some are connected to county agencies or university centers. While these organizations often strive to create material suitable for a national audience, they are in different parts of the country and often work regionally. Others focus on specific services or issues. The Sustainability Education Center works in New York, primarily New York City; the Center for a Sustainable Future works in Vermont and Georgia; Global Learning works intensively with New Jersey schools; the Northeast Initiative, a three-year funded project, focused on independent schools; Creative Change Educational Solutions works in Michigan, as does the Sustainable Futures Group, which also offers an online K-12 sustainability curriculum clearinghouse; Second Nature, primarily a higher education sustainability education organization, also included K-12 sustainability curriculum in their online curriculum database. Facing the Future focused on the Center for Geography and Environmental Education conducts research and develops programs, frameworks, tools, and models to support geography, environmental, and sustainability education; Science Education for Public Understanding Program (SEUP) focuses on the science and public policy aspects of sustainability.

Many areas in the United States lack a local sustainability education organization, and the United States has not yet developed national forums, specialized government agencies, conferences, or an initiative to refine and advance education for sustainability per se. There is no large-scale source of funding at the federal or state level to support the work of these NGOs. These organizations have functioned as the core specializations that provide ways to implement education for sustainability in their programs. In the fall of 2000, a fledgling Sustainability Education Network (SEN) was formed to foster the understanding and practice of sustainability and facilitate the work of these NGOs. These organizations have functioned as the core specializations that provide ways to implement education for sustainability in their programs. In the fall of 2000, a fledgling Sustainability Education Network (SEN) was formed to foster the understanding and practice of sustainability amongst North American K-12 educational organizations. Currently an unfunded effort focused on the Sustainability Education Office in San Francisco, brought together 17 professionals and officials in the field of environmental education, state and federal officials, as well as teachers, scientists, and students.

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Connection between science, technology, and society, and national social studies standards are organized into sections on "Science, Technology, and Society," "People, Places and the Environment, Action, Interaction, Distribution, and Consumption," and "Global Connections." Performance standards, moreover, are often built capacity for understanding sustainability in the thinking, skills, and abilities students are asked to demonstrate.

Most states then crafted or adopted tests to measure student achievement of some of these standards—some even tying promotion or graduation to successful test outcomes, and other making decisions about principals, teachers, and schools based on these test scores.

Throughout the 1990s, the implementation of government-sanctioned standards in K-12 classrooms became a ubiquitous occurrence, as did the shifting of emphasis and curriculum in order to prepare students for "high-stakes" tests that would have important implications for students and for schools. Sustainability education, like all K-12 education, would be shaped by these developments.

Alongside standards and standardized tests, new ideas about how students learn, how to teach, and how to assess learning began to percolate through the U.S. K-12 educational system. These ideas increasing dominated schools of education and increasingly took center stage in state and district school reform efforts.

Many schools, for instance, came to embrace constructivism—the idea that learning takes place when learners transform preexisting understandings—so their educational philosophy. New learning, in this formulation, is a modification of a model rather than the acquisition of a fact. The spread of constructivism in this theory, is a modified version of constructivism in which students research questions of important questions, critical thinking is not a constant, and project-based, student-centered learning that affords students opportunities to pose questions, design, and construct the desired knowledge. Student work in these classrooms, is more likely to be a project, a presentation, or an in-depth analysis of a complex issue.

These new ideas and practices of course also have implications for sustainability education in U.S. schools.

Emerging Understanding of Education for Sustainability

Simultaneously, and synergistically, an elaboration of an understanding of what sustainability education should be has developed throughout efforts to implement sustainability education in the United States. These efforts, the essays, themes, and ideas that have been brought to the forefront of the conversation on education for sustainability. Each of the many essays has informed a particular aspect of this transformation. In its current, real world, education for sustainability is its content, its institutional aspects, and its connections to the current, real world. Also influential have been Education for Sustainability and Education for a Sustainable Future, both of which are comprised of articles that contain case studies, research, and proposed frameworks.

More specific frameworks, some tied to particular projects, have arisen. Various organizations have evolved and refined their own set of principles and standards for sustainability education. Through all these efforts, it can be seen among the goals of sustainability education for sustainability: a broad consensus has emerged about the nature and characteristics of an ideal education for sustainability. The broad consensus includes a focus on some key student outcomes and some essential knowledge, skills, and dispositions.

Ecological Literacy

Ecological literacy includes an understanding of carrying capacity; the basic facts about how the planet works encapsulated in "the Natural Step," the resilience and yet the vulnerability of the earth's many self-regulatory systems and cycles; the value and irreplaceable nature of biodiversity; the management of renewable and nonrenewable resources; the reliance of humans upon precious and irreplaceable ecosystem services; and the interconnectedness of humans and all the earth's systems.

Sustainability educators value and utilize all the concepts, techniques, frameworks, and standards developed by environmental educators. In addition, sustainability educators concentrate on the elaboration of the connection between humans and natural systems. Though most if not all educators for sustainability would agree that ecological literacy and love of place and nature should be at the heart of education for sustainability, sustainability educators believe that the social and economic dimensions of our impact on the planet need extensive exploration as well. The goal is to develop practical, workable, upstream solutions that will move us toward sustainability, to interest and involve all sectors of society in making the vast array of human activities more sustainable, and to meet human needs more sustainably.

System Dynamics and "Systems Thinking"

System dynamics and systems thinking includes the ability to conceive of and model complex, interconnected "systems of systems," with complex feedback loops and dynamic equilibria; the ability to see beyond short-term benefits to long-term (seventh generation) consequences of an action; the ability to understand the connection between ecological, economic, and social systems in human history and human actions; and the ability to understand the complex, interconnected aspects of globalization and the relationship between science, technology, and society.

Multiple Perspectives

Multiple perspectives includes the ability to truly value and learn from the life experiences and cultures of others; the ability to profoundly understand and respect, if not agree with, the conclusions of others, and to see the relationship of those conclusions to the person's experiences, needs, values, and goals; the ability to understand the needs that underlie many seemingly unreasonable human demands and behaviors; and the ability to work with people who present different perspectives and to negotiate and cooperate to create shared visions, understandings, and policies far richer than anything that could have been achieved alone.

Place

The knowledge of place includes understanding the profound and complex way that the geography and ecology of a place interact with the people who live there and their culture; knowledge and appreciation of the many ways that people have lived in places, with an ability to analyze those ways of living through the lens of sustainability; abandoning the idea that we can always move on if a place seems too boring or damaged to provide a good life; valuing the local knowledge of a place; and becoming committed to restoring and improving the beauty, integrity, and health of one's native place.

Sustainable Economics

Sustainable economics includes an understanding of appropriate and accurate indicators of well-being; an understanding of market dynamics, market failures, and common-pool resources; life-cycle analysis and full-cost accounting; a rich understanding of progress and capital (natural, social, manufactured, and financial); the ability to see the human needs that underlie modern market behavior, and the ability to envision more sustainable ways of meeting those needs; understanding the resources and constraints the earth's natural systems provide to our economy; understanding the importance of equity and universal human development as a human right but also a crucial necessity if humanity is to attain sustainability; and
An Evaluation of Current U.S. Efforts to Educate for Sustainable Development

Overall, as of 2002, the United States has not adopted sustainability education as a clearly stated, broadly applied, national goal. Very few K-12 educators in the United States have ever heard of any sustainability education policy efforts, and fewer have worked explicitly to implement education for sustainability in their classrooms. The institutional support for K-12 sustainability education is poor. There are no journals, associations, state or federal agencies, national conferences, organizations or networking/activity groups to support education for sustainability in the United States apart from the individual efforts of select NGOs and disparate dedicated schools and educators. Agenda 21 is not a “household word” in the United States and it is hardly referred to in any official documents at the federal or state levels. Agenda 21 has virtually no official influence over the goals or operations of U.S. K-12 public or private schools. Only a single state, Vermont, has educational standards that explicitly address sustainability. Even environmental education, an important and well-established component of sustainability education, is increasingly eclipsed in importance as education agencies adapt to funding. In early 2002, President George W. Bush’s proposed federal budget offered no funds for environmental education.

Like most developed nations, our country faces a challenge in developing environmental and ethical awareness; we are buffered from many of the consequences of unsustainable development. The consequences of such global inequality do not appear on our doorstep and do not dominate the image of the world served to us by our media. In addition to our challenge of awareness and knowledge, we face the challenge of citizenship. Education for sustainability requires not only abstract knowledge, but also the energy and the will to examine and change social and economic practices to bring them more in line with the long-term needs of society and the planet. This necessitates a certain amount of civic interest and capacity to join with others to promote the common good. In Bowling Alone, Robert Putnam ponders a comprehensive and compelling picture of declining citizen involvement and diminishing social capital in the United States; voting rates are among the many measures of citizen involvement that are at historic lows. Thus, sustainability educators must seek to contribute to developing effective citizen participation as we strive to demonstrate why we must alter our social and economic practices to promote sustainable development.

Yet, in spite of this bleak broad picture, the recent history of education in America reveals some spoty improvement in our ability to educate our citizens for sustainable development. Recent school reform efforts, many of which involve an increased emphasis on student skills, capacities, and dispositions, increases skills, attitudes, and habits of the heart in addition to new content knowledge. As we do not yet fully synchronize knowledge from various fields, must be able to analyze and design new behaviors, and must be able to work with others and learn from them, the pedagogies that develop these student attributes—pedagogies that are becoming more common—are likely to contribute to this improvement. Education for sustainability requires the development of new knowledge to live more sustainably, students must be able to create new knowledge, must be able to analyze and design new behaviors, and must be able to work with others and learn from them, the pedagogies that develop these student attributes—pedagogies that are becoming more common—are likely to contribute to this improvement.
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tices and the relationship between businesses, society, and the ecosystem—with the knowledge and skills necessary for the understanding and practice of sustainability. Such major commitments to the integrated, overarching framework of sustainability, however, remain rare.

In 2002, education for sustainability still has only a toe-hold in the dialogue and literature of the mainstream K-12 educational community in the United States. It is unclear whether we parallel our national vision and the better equipped our communities will be to move toward a sustainable future. Our schools do not currently lead the movement toward sustainability in the United States; however, in spite of the absence of a clear national mandate and explicit national agenda, some work has been done to implement the goals of clear national mandate and explicit national agenda, some work has been done to implement the goals of

ecological literacy

Many excellent environmental education programs exist that help students understand natural systems and the ways that humans affect these systems. Recycling curricula and programs are popular in American schools, as are programs to understand and preserve local forests, waterways, and natural resources. Many American students learn about the value and beauty of rainforests and other biodiverse systems and learn about specific actions to take in order to minimize damage to ecosystems and endangered species through standards-supported curriculum, textbooks, and even semester and full-year courses. Teachers through standards-supported curriculum, textbooks, and even semester and full-year courses. Teachers

place

Many curricular and programmatic efforts are underway to help American students value and heal their place. Watershed explorations abound, and many local environmental and historical groups are producing interdisciplinary curricula that celebrate and inform about local ecology, heritage, and culture. The Rural School and Community Trust is a major, multistate effort to help schools lend their values places and

system dynamics and systems thinking

School districts are increasingly adopting system dynamics and systems thinking as explicit educational goals. STELLA modeling software provides the K-12 community with an age-appropriate systems modeling tool. Creative Learning Exchange also offers a website with an amazing array of curricula and system models applicable to a broad range of subject areas. Students have implemented systems thinking and system dynamics in their educational programs. Students have implemented systems thinking and system dynamics in their educational programs.

Sustainable Economics

An evolved understanding of economics is crucial to sustainable development, yet the teaching of economics in K-12 education has not substantially changed over the last 30 years. Neoclassical models of the market do not include externalities, the "tragedy of the commons," the special needs and requirements of diverse and biodiverse populations, or any contribution of economic understanding of how an economy does, and should, function. If students understand that the economic system is sustainable, they "know" that land, labor, and capital are finite and critically interdependent; they "know" that resources are not always readily available; they "know" that the economy is sustainable, they "know" that land, labor, and capital are finite and critically interdependent; they "know" that resources are not always readily available; they "know" that the economy is sustainable.
and innovation will solve all our problems and substitute for all depletions—provided the market is al-
lowed to work unfettered from "outside" constraints such as regulations. The role of natural and social sys-
tems in supporting and maintaining our economy remains a largely unexplored and underemphasized concept in
most K-12 economics education; most entrepreneurship textbooks have isolated chapters on responsibil-
ity to society, usually at the end of the book and rarely covered because the teacher did not have enough
time to "get to it." Some excellent curriculum units have been developed to teach sustainability economi-
cies to youth and communities: The Paper Trail and Ecological Economics for Life (Sustainability Educa-
tion Center); The Shape of Change (Creative Change Educational Solutions), and Education for a Sustain-
able Future's several online ecological economics units for students. However, these units currently are
used by only a small vanguard.

In the real world, the movement toward sustainability is a significant business trend that will continue to
have profound implications for competitive strategy, business governance, and the products and services
that businesses deliver. Businesses are adopting sustainability-fostering business practices to protect their
brand, minimize risk, protect their "right to operate," build customer loyalty, experience cost savings from
resource efficiency, and get a jump start on emerging markets. A growing number of businesses also pro-
cede a "triple bottom line" report, which details their social and ecological impacts as well as their
financial success. Unfortunately, most of the growing number of business and entrepreneurship educa-
tion programs in the United States are not teaching our future business leaders about these increasingly
common business and entrepreneurship practices. The Sustainability Education Center is developing
Business and Entrepreneurship Education for the 21st Century as a full year high school entrepreneurship
course for the New York City Board of Education; this course teaches about these emerging business
trends. For the sake of business competitiveness, as well as for the sake of the ecological and social systems
impacted by business practices, our business and entrepreneurship education programs need to reflect the
changes occurring in our increasingly sustainability-conscious world.

Citizenship

A sustainable community is a place where the vision for the future is created not by pitting conflicting in-
terests against one another, but by building a consensus around each individual's and organization's shared
stakes in the long-term sustainability of the community. A study of successful American community
initiatives and the correlated qualities of leadership and participation embedded in them revealed the
following common characteristics:

- ecological/natural systems are protected and/or enhanced;
- ecological economic security;
- just and equitable social systems develop;
- cultural integrity is honored and evolves;
- documentation of historical and current assets and liabilities;
- development of catalytic, servant, participatory leadership solutions, plans, and designs; draw
  on citizens' intuition, memory, and wisdom;
- systems approach to planning and decision making;
- local/regional indicators of sustainability are developed and linked to macro indicators of
  sustainability;
- community consensus building/dialogue;
- fosters community education, i.e., skills, knowledge, ecological literacy, etc.;
- systems thinking: ecological design of systems, energy flows, and material;
- thinking and planning with material cycles in mind;
- efficient energy use;
- future based vision (seventh generation);

Creativity and Visioning

Creativity exercises are becoming increasingly common in schools (especially in entrepreneurship pro-
grams). The popular "Spaceship Earth" scenario, used in classrooms and corporate training around the
world, helps people understand the interdependence of ecosystem services and human societies as well as
the need for societies to involve the talents and meet the needs of all. Education for a Sustainable Future
success, however, in helping students learn how to develop multi-stakeholder shared visions. Ideally, this
could be accomplished through student participation in local sustainable community initiatives—a prac-
tice that would certainly foster the preparation of future sustainability visionaries. Visioning as a practice
in planning is becoming increasingly common in America, so the possibility for this kind of collaboration
between students and real-world visioning efforts is growing.

Food Systems Education: A Promising Trend

Food systems education is an interdisciplinary and increasingly popular element in education for sustain-
ability in the United States. Teaching about food touches upon most of the skills and understandings
described above. New curricula exist to explore hunger in a systemic way that educates about sustainability. Gardens and natural habitats are becoming increasingly common on U.S. American
school grounds; garden projects recreate history, display the specialness of a place through nurturing its
unique plants and recreating its local ecosystems, and help children "taste the deliciousness of other cul-
tures." Food systems education also offers multiple opportunities for students to take action to contribute
to the sustainability of their own food system or the food systems of hungry people in the world.

In Summary

Overall, in spite of isolated and local progress in implementing specific components of sustainability edu-

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- moving from reactive to pro-active;
- creative, holistic solution-oriented, not problem driven (solutions solve more than one problem
  at a time); and
- inclusive participation in planning and decision making.

While these skills will be crucial to the creation of sustainable communities, the majority of civics text-
books teach that policy is a battle of charismas, wills, and opposing constituencies. The vast majority of
the federal government. Some well-developed curricula exist, but they are only slowly being implemented in
the U.S. classrooms.

On a more positive note, during the 1990s, many schools began to implement conflict resolution pro-
grams and to train students to be mediators in peer conflicts, thereby providing some training in "civics
for sustainability." The Program for Young Negotiators, which is becoming increasingly popular, helps
youth to resolve conflicts through understanding and finding ways to meet the underlying needs that give
rise to conflicting issue positions. Additionally, service learning, which offers students community ser-
vice experiences that are integrated with educational objectives, creates promising opportunities to actu-
ally change leadership. The state of Maryland has made service learning mandatory for K-12 students; service
learning has increased in popularity (over 80% of all U.S. high schools, and is mandated in an in-
creasing number of districts). At the same time, however, many service learning programs (particularly
for younger grades) are being reduced or straight-jacketed as schools conform to new demands to focus ed-
education on tested reading and mathematical literacies.

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cation, substantial barriers exist to the full-scale development of education for sustainability in the United States. The infrastructure is woefully inadequate, and the will to commit to broad and deep implementation of sustainability education is lacking. This is largely because sustainability’s emerging collection of ideas and understandings are still relatively unknown to the American public. If it is considered at all, sustainability often is viewed as a particular subject and as imparting a partisan and partial opinion about the relationship between humans and nature, instead of being viewed as the overarching framework that should shape all human actions and decisions. The American public does not yet acknowledge the urgency and comprehensiveness of the changes we must make, and thus the urgency to change our educational system is not yet commonly felt. Current educational goals and assessments also get in the way: sustainability educators frequently report that schools often perceive education for sustainability curriculum as additional programs. In order to be relevant, additional burdens they have not the time or resources to bear given their requirements to achieve impressive “high-stakes” test results. Teachers also are often weary of teaching through broad, interdisciplinary projects instead of smaller, discreet, “testable” facts; sometimes these interdisciplinary projects require collaboration with other teachers and departments, which, in turn, requires resources, skills, and time.

Furthermore, very little substantial research has been undertaken to establish effective methodologies for attaining sustainability education goals, to monitor the implementation of education for sustainability in the United States, and to establish the overall suitability of sustainability education or even environmental education in the attainment of K-12 educational goals. This data would substantially increase the credibility of the efforts of sustainability educators.

Recommendations

Should the K-12 education community be able to progress in a few key areas, U.S. children should be able to make substantial gains in their ability to understand and advance sustainability. What follows are specific recommendations for action to create this progress.

Teacher Education, Pre-Service and Inservice

Schools of education need to embrace two goals in their teacher education programs:

- ensuring that teachers understand sustainability and are equipped with the content knowledge and skills that will help them contribute to a more sustainable world;
- ensuring that teachers can apply this knowledge and these skills to the way they do their work with students.

Teachers must have the skills, insights, and desire to ensure that their students are able to contribute to the ways their communities are working to advance the transition to sustainability. A research agenda needs to be developed in concert with the development of this goal so that schools of education may develop effective means of educating teachers about sustainability and preparing them to be effective educators that enable their students to understand and foster sustainability. At this stage, research and reports are "generally descriptions of action at the level of the individual institution." Some resources for the professional development of educators exist to inform this process:

- the Toolbox in-service education project conducted by the National Consortium for Environmental Education and Training in the United States (EPA-funded);
- the Environmental Education Initiative of Teacher Education in Europe;
- the United Nations Educational, Scientific, and Cultural Organization’s Learning for a Sustainable Environment-Innovations in Teacher Education Project in the Asia-Pacific region;
- the Indian national in-service education program conducted on a "cluster-model" (and incorporating workshops delivered by satellite) by the Centre for Environmental Education in India; and

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- the Environmental and Development Education Project for Teacher Education in Australia and the Teaching for a Sustainable World module.

Our teachers need training to ensure that they understand the need to educate their students for sustainability and understand the connection between the knowledge, practices, and goals of sustainability and their chosen disciplines. Teacher training and professional development for teachers need to be adapted to include these goals.

Standards and Assessment

While many of the content and performance standards used in U.S. schools develop skills and capacities that make possible education for sustainability, the knowledge and skills needed to foster sustainability are not usually among the knowledge and skills assessed in U.S. school systems. Sustainability educators must mobilize to persuade their state education organizations to adopt standards, e.g., the National Council for the Social Studies, the National Research Council, the National Council on Economic Education, to incorporate the skills and knowledge necessary for the attainment of sustainability into the standards they develop and promulgate. Of course, this can only happen if these content area groups, which usually contain prominent expert practitioners of the subject in question, field and best support future work in their field. Sustainability educators must rely upon sustainability practitioners and theoreticians in these fields to advance the infusion of sustainability ideas and practices into these fields.

A growing consensus is building that students need to be able to evaluate information, construct effective arguments from sources, participate effectively in public policy and democratic action, synthesize facts from various fields to construct valid models of the world informed by knowledge from several academic subjects, see patterns and deduce larger truths from smaller events and continue to learn as they develop these skills. In developing these skills takes time; educational priorities must change so that students spend sufficient time in school activities to develop these skills and the other capacity-building skills that a people must have if they are to move their society toward sustainability.

Statewide assessments of student learning must change to reflect the new high priority for these goals. Example, asks students to design and carry out a scientific experiment; the New York State History Regents answer a historical question. The current ascendancy of "high-stakes" testing of less complex skills often crowds out the opportunity to develop the skills future workers and citizens will need to tackle multifaceted problems and successfully navigate the intertwined social and environmental situations that will arise in the future; and the education for sustainability will be enhanced if that tail-wagging supports the understandings and to reform assessments; sustainability educators need to find and support appropriate allies in this movement.

A change in the skills and knowledge that colleges expect from entering students also could help forward K-12 education for sustainability in the United States. Independent schools often do not focus on or even offer standardized tests, yet many of those schools feel that college entrance requirements leave them as constrained as their public school counterparts in the education they can offer their students. As college entrance requirements align themselves more with the requirements of sustainability education, more K-12 schools will be able to focus on developing the skills and knowledge that foster sustainability in their students.
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Community Education, School Partnerships, and Real-World Knowledge

Much work needs to be done to connect students with real-life, existing, on-the-ground work that is ongoing in their community to foster sustainability. How better to help students understand sustainability than to ask them to learn from people trying to create it? Students can critically analyze the physical plant of their schools and the state of their communities and work with others to make real improvements in these areas.22 This would necessarily involve the work of community members and organizations—NGOs, architects, businesspeople, gardeners, farmers, etc. Outreach, support, and training must exist to help these people and groups effectively work with schools and students.

Community education is crucially important in that education is notoriously conservative, often reflecting status-quo values and understandings rather than serving its true purpose of preparing students for the new, different world they will inhabit when they graduate. Communities educated about sustainability will support educating their children for sustainability; these education efforts can be a partial overview of efforts to revitalize American civic life and counter civic apathy. K-12 educators, therefore, have a vested interest in either starting community education themselves or supporting the efforts of community educators who develop the capacity of parents and citizens to understand sustainability and to understand the need to educate children so that they can create a more sustainable world. The Center for Geographical and Environmental Education has an excellent resource for community education, the ESD Toolkit,23 the Sustainability Education Center has an online training in Ecological Economics for Life24, the Northwest Earth Institute25 produces, in print, a series of community discussion courses on sustainability-related topics. ESD Magazine covers a broad array of sustainability-related issues for the general public.26 Funding should be sought to bring this material to American communities.

Curriculum Development and Distribution

While many first-rate units exist that educate for sustainability, and some entire courses have been developed and are in development, many more need to be created. More importantly, resources and time must be dedicated to market, diffuse, and distribute these units and to help teachers use them effectively in their classrooms. Funding the creation of a curriculum unit is never easy, but funding its national distribution and dissemination is currently nearly impossible. Sustainability educators need to convince school districts and funders of the indispensability of funding to support the widespread and effective use of curriculum units that educate students for sustainability.

Funding

Sustainability educators in the United States are still in the position of establishing the need and utility of their approach and educational goals. We stand, therefore, in need of public and private funding to support this effort, which must include the production of policy reports, the lobbying of educational organizations, the gathering of research data to demonstrate the efficacy and outcomes of sustainability education curricula and programs, the involvement of teachers and students in the creation of sustainability, and the time- and labor-intensive networking efforts needed to work out effective strategic partnerships between sustainability educators and individual districts, schools, and teachers. Support for the further development and dissemination of sustainability education through journals, conferences, symposia with sustainability practitioners, and contact with developers of sustainability thought would also enhance the success of efforts to educate U.S. students for sustainability.

Conclusion

Groundwork has been laid in the 10 years since Rio for sustainability education in the United States. Some recent changes in educational practices help to prepare our youth to understand and implement sustainable development, e.g., service learning, a focus on literacies and skills, standards that support interdisciplinary understanding and complex thinking, and growing recognition of the importance of "system thinking." Several organizations and a network for those organizations now exist that attempt explicitly and effectively to bring the diverse and emerging understandings of what sustainability looks like, in its multifaceted aspects, to our young people, and to define and develop skills and dispositions in youth that will enable them to create a more sustainable world as future workers and as active citizens. However, like our counterparts in business, design, architecture, and agriculture, our endeavor is still in the chrysalis stage. All of those interested in fostering sustainability still must work to convince the American people that our current practices are interfering with the ability of all people, now and into the future, to have fulfilling, secure lives and that the needed changes can produce more options, more fulfillment, and more fun.

When this understanding flowers, our entire society can be mobilized to fashion new ways of living and being that no longer hamper the awesome restorative and life-giving resources of this planet from abundantly supplying us with all we need. Daily, the evidence mounts that we are systematically undermining the supports all societies need to pursue their variously conceived destinies. When the pursuit of sustainability ceases to be a visionary crusade and becomes an obvious and inescapable goal of all our endeavors, educating for sustainability will necessarily become a primary goal of our school systems. Until then, we can work to share our truths about our species' interdependence with the planet; about the qualities and requirements of our planet's systems; about ways to work together that create consensus and that produce new knowledge for a new world; about creating real growth in all our capital—natural, human, and financial; about thinking upstream, systemically, and for the seventh generation; and about having the hope and courage to dream of a just, restored, and abundant world filled with treasured, special places.