

CHAPTER SUMMARIES

Chapter 1

EarthEd: Rethinking Education on a Changing Planet

Erik Assadourian

Erik Assadourian is a senior fellow at the Worldwatch Institute and director of State of the World 2017 and Worldwatch's EarthEd Project.

Education prepares children for life in the cultures into which they are born, giving them the tools and knowledge that they need to survive in their physical and social realities.

Throughout most of human history, cultural knowledge correlated strongly with the knowledge that was needed to survive and thrive in the immediate environment. Information was passed, for example, for how to identify edible plants and dangerous animals or how to make fire, tools, clothing, and shelter. Today, however, the cultures that most humans are born into are variations of consumer cultures—cultures that are rapidly undermining the Earth's systems.

For humans to thrive, we will need to systematically rethink education, helping students learn the knowledge that is most useful for their survival on a planet that is undergoing rapid ecological changes. Students also must learn how to prepare for and adapt to the ecological shifts that are already locked in to their future—and ideally do this in ways that help both to restore Earth's systems and to preserve their own humanity.

State of the World 2017 explores how education—particularly formal education—will need to evolve to prepare students for life on a changing planet.

"Perhaps tomorrow's students will be not only better equipped for surviving the challenges ahead, but also well on the way to building a sustainable future."

Chapter 2

Outdoor School for All: Reconnecting Children to Nature

David Sobel

David Sobel is the author of eight books on childhood and nature and is Senior Faculty in the Education Department at Antioch University New England in Keene, New Hampshire.

One of the salient problems facing us today is children's alienation from the natural world. They're too creeped out to touch earthworms, they don't know where their food comes from, and they're afraid to walk in the forest alone. Or, if they are walking in the forest, they can't see the forest for their iPhones.

What's to be done? Before students can be taught to 'save the rainforest' they need to love their local forest. Opportunities for nature play and learning need to be an integral part of cultivating adult environmental behavior. Around the world, numerous overlapping movements have this goal in mind: "green schools," education for sustainable development, environmental education, community-based education, nature and place-based education, the farm-to-school movement, and more. And these leaders are implementing a variety of programs, from forest schools to innovative outdoor programs and wilderness trips that are leading to reconnecting children with the Earth.

"Children cannot just learn about the environment through virtual simulations; they need to get wet and dirty in order to fall in love with the Earth."

Chapter 3

Ecoliteracy and Schooling for Sustainability

Michael K. Stone

Michael K. Stone is senior editor at the Center for Ecoliteracy, coeditor of Ecological Literacy: Educating Our Children for a Sustainable Future (Sierra Club Books), author of Smart by Nature: Schooling for Sustainability (Watershed Media), and winner of the Green Prize for Sustainable Literature.

Ecological literacy is the ability to understand the basic principles of ecology—the processes by which the Earth’s ecosystems sustain the web of life—and to live accordingly. Its principles can be distilled into four guiding principles: “Nature Is Our Teacher,” “Sustainability Is a Community Practice,” “The Real World Is the Optimal Learning Environment,” and “Sustainable Living Is Rooted in a Deep Knowledge of Place.”

Education for ecological literacy is, ultimately, about hope—about recognizing that “life creates conditions conducive to life,” and that we can find in nature the guidance and inspiration that we need to design and maintain healthy, sustainable communities. For example, by working to learn about and protect a freshwater shrimp, elementary students in California became more knowledgeable about ecology, the sciences, even how to organize diverse community interests to help protect the shrimp to improve their local watershed.

“Instead of reading about natural processes or looking at simplified drawings, students can encounter nature in the rich, messy ways in which it actually exists.”

Chapter 4

Education for the Eighth Fire: Indigeneity and Native Ways of Learning

Melissa K. Nelson

Melissa K. Nelson is an Anishinaabe/Cree/Métis (Turtle Mountain Chippewa) ecologist, educator, and scholar-activist who serves as an associate professor of American Indian Studies at San Francisco State University and as president of the Cultural Conservancy.

Indigenous education is inherently environmental education. It starts with a cosmological orientation to the sun, moon, and stars in relation to local geography and ecology, which creates eco-cultural landscapes and sacred places.

One cannot learn about the history of *any* place without understanding the first peoples of the land and their unique cultural and environmental practices, as well as the impacts of conquest, and cultural resilience. Indigenous learning is always contextual, starting with exactly where you are.

Indigenous peoples are exercising their self-determination and educational rights to renew Indigenous lifeways and teach them to younger generations. It is clear that peoples of all walks of life are listening to these teachings, decolonizing their minds, and preparing to learn anew to create the New People for a green future.

“Indigenous learning is always contextual, starting with exactly where you are—cosmologically, geographically, ecologically, culturally, and historically.”

Chapter 5

Pathway to Stewardship: A Framework for Children and Youth

Jacob Rodenburg and Nicole Bell

Jacob Rodenburg is the executive director of Camp Kawartha Outdoor Education Centre in Ontario, Canada, and a part-time teacher at Trent University in Peterborough, Ontario. Nicole Bell is Anishinaabe (bear clan) from Kitigan Zibi First Nation and an assistant professor and senior Indigenous adviser at Trent University's School of Education and Professional Learning.

As an environmental educator, it is difficult not to get discouraged. The news about the state of the environment is ever more sobering. Climate change, habitat destruction, species depletion, rising sea levels, pollution, and the list goes on. Teaching about these formidable challenges can seem daunting, overwhelming, and, at times, simply hopeless. And despite our best efforts, things just seem to be getting worse.

Perhaps like a reversed telescope, environmental education is being looked at in the wrong way. Instead of dealing with reactions to problems and

trying to solve environmental issues as they arise, it may be worthwhile to consider what sort of citizens we believe should populate the Earth.

Raising environmentally engaged citizens requires more than just a few educators participating in this work. Rather, it is a collective responsibility: each of us has a stake in fostering the stewards of tomorrow.

“This is a call for educators, parents, community leaders, and youth groups to coordinate their efforts so that they may take collective responsibility for fostering stewardship.”

Chapter 6

Growing a New School Food Culture

Luis González Reyes

Luis González Reyes is an educator and author who is responsible for the “ecosocialization” of schools run by the FUHEM Foundation in Madrid, Spain, including coordinating the ecosocial curriculum, the ecological school cafeteria, and the blog Tiempo de Actuar (tiempodeactuar.es).

Around the world, the commitment to a fair, healthy, and sustainable food model within the sphere of formal education represents a cultural transformation, not just for students but for the broader educational community and for society as a whole.

Getting there is not easy, however. Truly transforming the relationship that schools have with food—and ensuring that food is a vector for lasting societal change—is a multidirectional process of teaching and learning that involves a broad range of stakeholders. This includes students and teachers, cooks and cafeteria monitors, food suppliers and intermediaries, families and neighborhoods, as well as numerous other actors from the communities in which schools are located.

“Schools have, and are, building a higher meaning for the community and are shaping the growers and eaters of today and tomorrow.”

Chapter 7

The Centrality of Character Education for Creating and Sustaining a Just World

Marvin W. Berkowitz

Marvin W. Berkowitz is the Sanford N. McDonnell Professor of Character Education and codirector of the Center for Character and Citizenship at the University of Missouri-St. Louis.

Good character education is good education. When done well, it leads to a caring and fair school climate, pro-social and responsible student behavior, increased academic achievement, and development of character in youth.

Society's future depends upon the character of its youth and how that will manifest when they become adult citizens. Intelligent, comprehensive, effective character education will contribute greatly to the positive future that our world needs. A more sustainable, just, and compassionate world will only happen if there are more people able and motivated to steer the world in that direction.

"Character education ultimately is a process of motivating and equipping all children to more strongly repair the world."

Chapter 8

Social and Emotional Learning for a Challenging Century

Pamela Barker and Amy McConnell Franklin

Pamela Barker is an educational consultant in social and emotional learning and restorative practices in Fort Collins, Colorado. Amy McConnell Franklin is the director of social emotional learning and mindfulness at United World College Thailand.

What does it take to ensure that students are present to learn? What does it take for them to care enough about the world and each other to commit to collective efforts to address one of the major challenges of our time, climate change?

It is no longer enough to simply teach reading, writing, and arithmetic in a one-size-fits-all approach that is useful for finding jobs in industrial societies.

In addition to cognitive skills, our children must learn the necessary social and emotional skills to thrive in an information-rich and climate-shifting society where knowledge, innovation, collaboration, and adaptation are key. Considering the looming threat of climate change, there is no time to waste.

“Simply leaving the development of social and emotional skills to chance versus deliberately teaching them to all children—particularly those living in communities on the front lines who are most vulnerable and those who may emerge as leaders and policy makers—puts all of our futures at risk.”

Chapter 9

Prioritizing Play

David Whitebread

David Whitebread is the director of the Play in Education, Development and Learning (PEDAL) Research Centre at the University of Cambridge.

Over the last two generations, there has been a dramatic cultural change in the life experiences of our children. The generation of “baby boomers” born just after World War II experienced a childhood in which they played out in the street or in local fields and parks, in groups of children often of very mixed ages. This relative freedom and experience of free play and “unstructured” time has largely disappeared for many children across the world.

By limiting the playful opportunities that are available to our children in the modern world, there is a grave risk that we are reducing the development of the very skills and capabilities that they will need the most in order to confront the challenges of the twenty-first century and beyond.

Fortunately, there are many ways in which children’s play can be supported, resulting in beneficial outcomes for both the individual and society.

“Arguably, our culture, our science, and our technological achievements all arise, at least in part, from our playfulness.”

Chapter 10

Looking the Monster in the Eye: Drawing Comics for Sustainability

Marilyn Mehlmann with Esbjörn Jorsäter, Alexander Mehlmann, and Olena Pometun

Marilyn Mehlmann is a psychologist and management consultant focused on sustainable development and methods development and serves as head of development and training at Global Action Plan International (GAP). Esbjörn Jorsäter teaches the use and practice of comics as an educational tool to teachers and youth leaders worldwide and is codesigner of the Drawing for Life program and book. Alexander Mehlmann is network coordinator at GAP and has long experience in project management, including the Drawing for Life project. Olena Pometun is a professor at the National Academy of Pedagogical Science in Kiev, Ukraine, and introduced the use of comics into lessons for sustainable development in Ukrainian public schools.

Education for sustainable development is no ordinary instructional challenge. To be successful, it needs to encompass transformation and engaged action, which, in turn, presuppose the engagement and empowerment of students. Students need the opportunity to identify their own “monsters” and to find ways to defeat them.

To engage people in action for sustainability, the transfer of knowledge is not enough. Comics—particularly the active creation of them—have demonstrated an educational potential far beyond the mere reading of them. Engaging students in the actual creation and co-creation of works of art has great potential as a tool for sustainability education.

“Comics can play a powerful role in teaching, in engaging students with often abstract concepts related to sustainability, and in enabling them to face and tackle difficult questions.”

Chapter 11

Deeper Learning and the Future of Education

Dennis McGrath and Monica M. Martinez

Dennis McGrath is a professor of sociology at the Community College of Philadelphia. Monica M. Martinez is deeper learning senior fellow at the Hewlett Foundation. This chapter is based on the book Deeper Learning: How Eight Innovative Public Schools Are Transforming Education in the Twenty-First Century (The New Press: 2014).

Many of those who are engaged in reimagining models of teaching and learning are turning to the concept of “deeper learning,” an umbrella term for the skills and knowledge that students must possess to succeed in twenty-first century jobs and civic life.

In deeper learning schools, the school’s leader and its teachers share an educational vision. They purposefully design learning experiences to be aligned to their vision of what students should know and be able to do.

The key to that transformation is reconceiving the role of teachers and revising the relationship between teachers and students: displacing the teacher as primarily a dispenser of knowledge and encouraging students to take responsibility for their own learning.

“There is increasing recognition of the need to transform current educational systems so that they promote critical thinking, problem solving, collaboration, and communication.”

Chapter 12

All Systems Go! Developing a Generation of “Systems-Smart” Kids

Linda Booth Sweeney

Linda Booth Sweeney is an American systems educator, author, and co-founder of the Society for Organizational Learning Education Partnership.

How can education—whether in school, on a farm, in a lab, or at the kitchen table—enable the next generations to live sustainably and navigate the radical changes that they are inheriting in this human-affected epoch?

We do not need a specialized degree to answer this question. Common sense tells us that to understand humanity's impact on Earth's systems, we need to understand *systems*.

The good news is that systems education is happening in schools, nature centers, community meeting rooms, board rooms, and even on playgrounds. As systems become the context for learning, students will move beyond discrete lists to seeing patterns of interaction that more closely match the interdependent, complex world in which they live.

"We get into trouble when the desire to make the problem go away outweighs the desire to understand the problem or opportunity."

Chapter 13

Reining in the Commercialization of Childhood

Josh Golin and Melissa Campbell

Josh Golin is executive director, and Melissa Campbell is program manager, at the Campaign for a Commercial-Free Childhood.

As children and as adults, we are routinely taught that success can be measured through consumption, and that the brands and products we buy reveal some truth about who we are as people.

Marketers spend billions targeting children each year, creating a commercialized childhood that is unhealthy, unsustainable, and leaves kids woefully unprepared for a future that will require new kinds of behaviors, skills, and values.

Ending the commercialization of childhood will require strong regulation of the media and marketing industries, establishing schools as commercial-free zones, and helping children spend less time with screens and more time in creative play.

"As an outgrowth of consumer capitalism, the commercialization of childhood has contributed to the rapid changing of our planet."

Chapter 14

Home Economics Education: Preparation for a Sustainable and Healthy Future

Helen Maguire and Amanda McCloat

Helen Maguire is a lecturer of Home Economics, and Amanda McCloat is head of Home Economics, at St. Angela's College in Sligo, Ireland.

As complex societal and ecological challenges increasingly jeopardize the future of the planet, people everywhere will need to develop applicable life skills, appropriate competencies in specific domains, and improved critical and reflective capabilities.

Home Economics, as a discipline, aims to achieve healthy and sustainable living for individuals, families, and societies. To support the achievement of this fundamental aim, Home Economics integrates knowledge, problem solving, and practical skills for everyday life with an emphasis on taking decisive action to enhance the overall health and well-being of learners.

"By uniting the discourses of well-being and sustainability, Home Economics is a critical component of the curriculum that can serve as a key enabler and influencer in this new epoch."

Chapter 15

Our Bodies, Our Future: Expanding Comprehensive Sexuality Education

Mona Kaidbey and Robert Engelman

Mona Kaidbey recently retired from the United Nations Population Fund, where she specialized in comprehensive sexuality education (CSE), among other topics. She continues to speak and write on CSE. Robert Engelman is a senior fellow and former president of the Worldwatch Institute. He directs the Institute's Family Planning and Environmental Sustainability Assessment project.

What are successful outcomes of sexuality education? Happiness and health for the young as they turn into adults, for starters. But the benefits are also catalytically global and long-term—and, as it happens, especially germane to an EarthEd curriculum.

The future of world population and its social and environmental impacts depends largely on the behavior and decisions that today's 2.5 billion children and teenagers will make.

The critical thinking skills that young people develop through sexuality education will enable them to make informed decisions about some of the most intimate aspects of their being: their bodies, their relationships, and their sexuality. And those skills will inform the decisions they make about everything else in their lives, including their environmental behavior, their political engagement, and their decisions about what they buy and consume and how they live.

"Learners who internalize—along with their reading, writing, and arithmetic—*long live love* are likely to become the citizens that the rest of the twenty-first century desperately needs."

Chapter 16

Suddenly More Than Academic: Higher Education for a Post-Growth World

Michael Maniates

Michael Maniates is professor of environmental studies at Yale-NUS College in Singapore.

Colleges and universities are globally distributed, loosely networked around an expanding agenda of sustainability, and open to new ideas. They command respect.

But they also are creatures of the high-growth world from which we must exit: they depend upon economic growth and often promote it, and, as a result, the sustainability efforts that flow from them are often tailored to it.

If how we school our children is an important part of the puzzle of human prosperity in a turbulent twenty-first century, few tasks are more important than reorienting higher education toward a post-growth future.

“By accepting growth as given, higher education undercuts its considerable power to drive lasting sustainability.”

Chapter 17

Bringing the Classroom Back to Life

Jonathan Dawson and Hugo Oliveira

Jonathan Dawson is head of economics at Schumacher College in England, where he coordinates and teaches/facilitates on the innovative Economics for Transition postgraduate program. Hugo Oliveira is a landscape ecologist and permaculture specialist at OrlaDesign and a researcher at the Center for Ecology, Evolution, and Environmental Change at the University of Lisbon in Portugal.

Our educational systems are in crisis, beset by multiple sources of disruption. These include the growing gulf between the mindsets, competencies, and skills required to address our converging “wicked” crises and those provided by a conventional university education, as well as growing student dissatisfaction with what is being offered.

This is something that cannot be tackled using the old methods alone. Replacing one set of textbooks with another is not going to do the trick.

The revolution that is required in our educational practice needs to be felt on an embodied level as much as understood cognitively. It can be described as nothing short of bringing the classroom back to life.

“New approaches to teaching and learning reject the conventional neat separation between the observer and the observed that is central to traditional, mechanistic, educational philosophy.”

Chapter 18

Preparing Vocational Training for the Eco-Technical Transition

Nancy Lee Wood

Nancy Lee Wood is a professor of sociology and director of the Institute for Sustainability and Post-carbon Education at Bristol Community College in Fall River, Massachusetts.

In the foreseeable future, the role of conventional university and graduate programs as credentialing agencies will undoubtedly continue, but this will become less standard as learners tap into alternative educational venues that offer streamlined instruction within shorter time frames and at relatively lower cost.

Regardless of the venue, the focus most likely will be on eco-technical education: applying science to meet human needs while minimizing ecological disruption.

Tackling the numerous societal and ecological challenges that lie ahead requires a fundamental shift in educational priorities. By providing students with the practical skills and knowledge that they need, we can better prepare them for the very different world of tomorrow.

“Many short-term educational practices and vocational contributions can lead humankind to long-term gains.”

Chapter 19

Sustainability Education in Prisons: Transforming Lives, Transforming the World

Joslyn Rose Trivett, Raquel Pinderhughes, Kelli Bush, Liliana Caughman, and Carri J. LeRoy

Joslyn Rose Trivett is education and outreach manager at the Sustainability in Prisons Project (SPP). Raquel Pinderhughes is a professor in urban studies and planning at San Francisco State University and executive director of Roots of Success. Kelli Bush is SPP program manager, Liliana Caughman is

SPP lecture series coordinator, and Carri J. LeRoy is SPP codirector and a faculty member at The Evergreen State College.

Prisons are designed to contain and control the people they house, and corrections facilities may be the last place where one would expect to find innovative environmental programs.

However, beautiful and productive environmental education initiatives are blooming in such facilities across the United States and around the world.

Extraordinary partnerships have emerged among incarcerated people, corrections staff, nonprofits, visiting students, faculty, scientists, and community groups. Together, they are creating programs that provide environmental education, gardening, recycling, composting, materials repurposing, habitat restoration, endangered species recovery, and job training.

“Environmental education programs have improved quality of life in prison and have energized environmental activism in people outside the environmental mainstream.”

Chapter 20

Bringing the Earth Back into Economics

Joshua Farley

Joshua Farley is an ecological economist, professor in community development and applied economics, fellow at the Gund Institute for Ecological Economics at the University of Vermont, and special visiting researcher at the Universidade Federal de Santa Catarina in Brazil. He is co-author with Herman Daly of the first textbook in ecological economics.

Over recent decades, mainstream economic education has become increasingly obsessed with highly stylized mathematical models populated by rational, self-interested consumers. It has become less open to alternative methods and views, and less relevant to real-world events.

Our economic system and economic education have failed so far to adapt to challenges of the Anthropocene. We must create a resilient economic system that is capable of avoiding critical ecological thresholds while satisfying people’s basic needs; we must design an economic system that is capable of

balancing what is biophysically possible on a finite planet with what is socially, psychologically, and ethically desirable.

“Unlike the laws of physics, economic systems continually evolve in ways that profoundly affect the social and ecological systems in which they are nested.”

Chapter 21

New Times, New Tools: Agricultural Education for the Twenty-First Century

Laura Lengnick

Laura Lengnick is a soil scientist and climate resilience consultant with Cultivating Resilience, LLC, in Asheville, North Carolina. She previously served as the director of sustainability education at Warren Wilson College and is the author of the 2015 book, Resilient Agriculture: Cultivating Food Systems for a Changing Climate.

Widely recognized as a major factor pushing our planet beyond “safe operating-space,” the way that we eat fuels climate change, erodes community resilience, and contributes to many other twenty-first century challenges.

Calls for a transformation of the global industrial food system have grown over the last decade as it has become increasingly clear that sustainable food systems are the only way to achieve food security in a world of 9 billion people. This push for a fundamental shift in agriculture comes amid growing concern about the capacity of institutions of agricultural higher education to drive such a transformation.

Educators in sustainable agriculture, agroecology, and food systems have led the way in innovating student-centered teaching and learning strategies in higher education. At the heart of these innovations is a transformation of agricultural education that changes both what we teach and how we teach it.

“Farmer, scientist, student, educator, activist, administrator, business owner, policy maker, or parent or child, we are all teachers and learners. We all can play a role in transforming agricultural education.”

Chapter 22

Educating Engineers for the Anthropocene

Daniel Hoornweg, Nadine Ibrahim, and Chibulu Luo

Daniel Hoornweg is Richard Marceau Chair at the University of Ontario Institute of Technology. Nadine Ibrahim is a post-doctoral researcher and lecturer, and Chibulu Luo is a PhD student, both in the Department of Civil Engineering at the University of Toronto.

Design conditions are no longer static and stationary. In this changing environment, infrastructure must be more sustainable as it meets the needs of people, equitably support the fulfillment of human potential, and be appropriate for its specific location and culture.

Educating engineers to be more forward looking so as to develop new technologies and help build cities and society within this uncertainty is a crucial challenge. It is a challenge that the engineering profession is just starting to grapple with.

The profession must tackle this head on, especially in an era of both climate change and continuing population growth.

“Even more important than graduating more engineers around the world is the need to educate better engineers.”

Chapter 23

The Evolving Focus of Business Sustainability Education

Andrew J. Hoffman

Andrew J. Hoffman is Holcim (U.S.) Professor of Sustainable Enterprise at the University of Michigan Stephen M. Ross School of Business.

There is great interest and energy in bringing sustainability more deeply into the norms of business education—moving from Business Sustainability Education 1.0 to 2.0. This shift is critical. If society is to adequately address sustainability, the solutions must come from the market, and, more specifically, from the corporate sector.

Without business, there will be no scalable solutions.

That does not mean that only business can generate solutions, but rather that the powers of innovation, production, and distribution that business possesses must play an essential role in making the necessary changes in our lifestyles.

“Where students who wanted to change the world once turned to graduate schools of public policy and nonprofit management for their training, many now turn to schools of business management.”

Chapter 24

Teaching Doctors to Care for Patient and Planet

Jessica Pierce

Jessica Pierce, PhD, is a bioethicist and faculty affiliate at the Center for Bioethics and Humanities, University of Colorado Anschutz Medical School.

Scientists and public health experts have long understood the crucial links between the natural environment and human health, but only in the past several decades has the true significance of these interconnections become apparent.

With climate change and other environmental threats taking center stage in discussions of future health and survival, it is perhaps surprising that this issue remains largely absent from medical curricula.

Medicine will need to adapt to an environmentally challenged planet and to learn to protect and sustain health without causing further damage to overstressed ecosystems.

The medical educators of today and the doctors of tomorrow need to foster a revolution in how medicine is taught and practiced, how hospitals and clinics are designed, and how patients are treated and counseled.

“Given the immediacy and seriousness of our planetary situation, it is critical that medical education begin preparing doctors for the Anthropocene.”

Chapter 25

The Future of Education: A Glimpse from 2030

Erik Assadourian

Erik Assadourian is a senior fellow at the Worldwatch Institute and the director of State of the World 2017 and Worldwatch’s EarthEd Project.

It’s 2030. The world’s population has now grown to 8.5 billion people. Global temperatures are now an average of 1.2 degrees Celsius higher than in 1880. Flooding and disasters routinely cost tens of billions of dollars a year in damages, which has depleted the coffers of many national governments and diverted spending away from critical social investments, including schools.

In many places, this has caused education to take a major step backward, with governments shuttering schools, laying off teachers, cutting instructional hours, and even reducing total years of schooling.

In other places, however, the convergence of economic, environmental, and social crises has led to a flurry of educational innovation: new programs, new curricula, new priorities, and new types of schools, perhaps revealing the first steps on a new educational path that is better adapted to life on a changing planet.

“On a changing planet, these pioneers realized, education must prepare children—and students at all levels—with the skills, knowledge, and wisdom necessary to navigate the turbulent future ahead.”