

REORIENTING TEACHER EDUCATION
TO ADDRESS SUSTAINABILITY:
THE U.S. CONTEXT

White Paper Series, No. 1



United States Teacher Education for Sustainable Development Network
(USTED Network)
Indianapolis, IN

2013

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Suggested citation:

McKeown, R., with USTESD Network. (2013). *Reorienting teacher education to address sustainability: The U.S. context*, White Paper Series, No. 1. Indianapolis, IN: United States Teacher Education for Sustainable Development Network.

This white paper is available on the following Web sites:

Kappa Delta Pi (KDP), International Honor Society in Education
www.kdp.org/initiatives/pdf/USTESD_WhitePaperOct13.pdf

American Association of Colleges for Teacher Education (AACTE)
<http://aacte.org>

The Association for the Advancement of Sustainability in Higher Education (ASSHE)
<http://www.aashe.org>

National Network for Educational Renewal (NNER)
<http://www.nnerpartnerships.org>

The United States Teacher Education for Sustainable Development (USTESD) Network is a voluntary organization of teacher educators and teacher education institutions. This group focuses on the advancement of education for sustainable development in teacher education institutions in the United States.

Members of the USTESD are affiliated with the following teacher education institutions:

- James Madison University
- Maryville University
- Montclair State University
- North Carolina Central University
- University of Idaho
- University of Vermont
- University of Wyoming
- Webster University
- Western Washington University
- Whitworth University
- Wright State University

And the following nonprofit organizations:

- The Association for the Association for the Advancement of Sustainability in Higher Education (AASHE)
- Kappa Delta Pi (KDP), International Honor Society in Education
- National Network for Educational Renewal (NNER)

The USTESD is a member of the International Network of Teacher Education Institutions (TEI) associated with the UNESCO Chair on Reorienting Teacher Education to Address Sustainability at York University in Toronto, Canada. The International Network comprises TEIs in more than 70 countries.

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PREFACE

A Letter to Deans of Schools, Colleges, and Departments of Education

Dear Dean and Teacher Education Leader:

The term *sustainability* is being used widely in institutions of higher education; however, the term rarely enters the discourse in school, colleges, and departments of education. The National Council for Science and the Environment reported that as of 2012, there was a total of 759 sustainability-focused academic programs in the United States, including 141 sustainability degree programs, 302 degree programs with a sustainability concentration, and 316 minor or certificate programs in sustainability (Vincent, Bunn, & Stevens, 2012). About a dozen responding institutions of higher education have environmental and sustainability academic programs in a school, college, or department of education. Of those, only 6 institutions of higher education mention teacher education programs, none of which have a sustainability focus (personal communication, S. Vincent, September 17, 2013). It is evident that schools, colleges, and departments of education lag far behind other academic departments in incorporating sustainability into academic programs.

Although the awareness of education for sustainable development (ESD) is low in the teacher education community in the United States, the topic is sufficiently important that the United Nations declared 2005–2015 as the Decade of Education for Sustainable Development. Furthermore, teacher education institutions around the world have begun implementing ESD in preservice and inservice teacher education programs (McKeown & Hopkins, 2011). For example, the International Network of Teacher Education Institutions (TEIs) associated with the UNESCO Chair on Reorienting Teacher Education to Address Sustainability has members in more than 70 countries. These TEIs have engaged in ESD related activities, such as creating degree programs and weaving ESD into coursework. The United States lags behind.

At this time, when teacher certification and colleges of education are undergoing tremendous scrutiny and pressure to change, you may be wondering why we are introducing the topic of reorienting teacher education to address sustainability. It is timely, because out of crisis comes opportunity. In part, education for sustainable development provides solutions for current U.S. educational problems within a global context.

Complex issues like improving child health and well-being, eradicating poverty, creating resilient and peaceable multicultural communities, climate change, and globalization require new ways of thinking, collaborating, and solving problems. Colleges of education have a vital role to play in preparing the next generation of teachers, school administrators, counselors, and education scholars who are able to help people of all ages learn how to address these difficult challenges. Yet, colleges of education often feel it is impossible for them to take on this role because of the pressures of accountability, shrinking budgets, and an ever-expanding curriculum. However, it is becoming increasingly clear that the pressures colleges of education experience today are inseparable from these larger global challenges. For example, the global financial crisis caused many colleges of education to have to figure out how to do more with less. To

complicate this financial condition, college and university campuses are also restricted by the ever growing and tightly connected financial and environmental costs of overdependence on fossil fuels. Colleges of education recognize their profound obligation to help schools and communities close opportunity gaps so that all children have access to a productive, healthy life. Yet the factors that create those opportunity gaps in the United States are no different from the factors that create profound poverty and a crisis in child health elsewhere in the world.

Why sustainability?

- Sustainability is a topic of conversation, commerce, and politics around the world. To remain economically competitive and to be relevant actors on the global stage, students of today must be conversant in the language of sustainability.
- Sustainability adds vision to education. In today's society, children and adolescents arrive at school knowing that something is wrong in the world. For example, they see homelessness on television and the Internet or they may be homeless. Sustainability is an umbrella paradigm for addressing inequities and injustice in the world—environmental, social, and economic.
- Sustainability gives purpose to education. Gerry Connelly, former Superintendent of the Toronto Board of Education, stated, "There is no question that literacy and numeracy are extremely important in terms of becoming a competitive society. But the important thing for students is why. What is the purpose of education? And in order to engage students we need to ensure that they are committed to and understand the purpose of learning—whether it be science, math, history, or whatever. Why are they doing this?" (UNESCO, 2012a).

Reorienting teacher education to address sustainability is not a radical concept that presupposes that TEIs have to throw out much of what they are already doing. In fact, many of the pedagogies, dispositions, and practices already taught in colleges of education, when put in an education for sustainable development context, create synergies that improve outcomes for teachers, students, and communities. ESD provides an umbrella for answering the criticisms currently leveled at colleges of education. Victor Nolet (2013) assured that "One need not think of ESD as something new that needs to be shoe-horned into an overcrowded teacher education curriculum. Instead it can provide strategies for addressing the challenges teacher education faces today" (p. 57).

Not attending to ESD is egregious. Such delays allow other countries to advance their schools systems and their economies while the United States is mired in practices commonly used in the previous millennium. John Dewey warned: "If we teach today's students as we taught yesterday's, we are robbing them of tomorrow."

You may be asking what you can do to support ESD in your institution. Here are some recommendations collected from administrators and faculty members at TEIs:

- Revise the mission and vision statement of your school, college, or department to include sustainability or ESD.
- Provide professional development opportunities for faculty members to learn about sustainability and how their disciplines support sustainability.

- Establish and support learning communities for faculty members to explore weaving ESD into their existing courses.
- Create an ESD research agenda for your institution and support it (UNESCO, 2012b).
- Identify the social, economic, and environmental challenges to the well-being of your community and discuss how they can be addressed in your teacher education program.
- Include expertise in ESD in position descriptions for new hires.

If you want to know more about supporting ESD in teacher education, we recommend UNESCO's *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* (2005). The *Guidelines* were written based on action research carried out by TEIs and are internationally well-tested and proven effective.

It is time TEIs in the United States join the ESDS global initiative. Your support is essential to moving forward.

Sincerely,

The United States Teacher Education for Sustainable Development (USTESD) Network

1. INTRODUCTION

“Education for Sustainable Development is seen increasingly as a means to renew education, teaching and learning.” (UNESCO, 2012c, p. 65)

The purpose of this paper is to frame the concept “reorienting teacher education to address sustainability,” which is growing in international acceptance, in the context of the United States. Dozens of other countries have been acting on this concept since the late 1990s.

DEFINITION OF SUSTAINABILITY

Sustainability is a paradigm for thinking about the future in which environmental, social, and economic concerns are balanced. The sustainability paradigm is a major shift from the previous paradigm of economic development and growth, with its accompanying socially and environmentally damaging consequences. Until recently, these consequences were seen as inevitable and acceptable. Now, however, society realizes that major damage or serious threats to the well-being of humans and the environment while pursuing economic development is not the only way forward (UNESCO, 2012d). Development that takes into account the three Ps—people, planet, and prosperity—is now a viable alternative. (McKeown, 2013, p. 16)

As the term sustainability is being used more frequently in the United States and globally, as challenges to the sustainability of our planet and our way of life increase, and as politicians call for educational reform, the United States Teacher Education for Sustainable Development (USTESD) Network finds it timely to explore what it means to reorient education, especially teacher education, to address sustainability.

To reorient education to address sustainability, a basic understanding of sustainability and education for sustainable development are necessary. (If you are unfamiliar with these concepts, please see Appendices A and B.)

FOUR THRUSTS OF EDUCATION FOR SUSTAINABLE DEVELOPMENT

Education for Sustainable development (ESD) has four thrusts:

- Improving access to and retention in quality basic education
- Reorienting existing education
- Improving public understanding and awareness
- Providing training

ESD allows students to acquire the knowledge, skills, values and perspectives to shape a sustainable future” (UNESCO, 2012d).

This paper is based on more than a decade of action research carried out by dozens of teacher education institutions (TEIs) around the world. The authors of this paper realize that much of this work has not been disseminated in academic circles in the United States. As a result, there is a danger that an American academic reader may dismiss the concept of reorienting teacher education to address sustainability as unrealistic or a pipe dream without reading further to discover the depth of work that has been done by teacher educators and TEIs on six continents. Although the awareness of ESD is low in the United

States, the topic is sufficiently important that the United Nations declared 2005–2015 as the Decade of Education for Sustainable Development.

The authors of this paper realize that this call for ESD comes at a time in which teacher education is under attack at local, state, and national levels. The widespread examination of the effectiveness of teacher preparation programs comes at a time when these programs are facing the same challenges in the K–12 education landscape, including significant budget cuts, standardized testing for entrance to teacher preparation programs, the implementation of Common Core State Standards ([CCSS], 2010), and a plethora of policies leading to the deprofessionalization of teaching.

Implicit among the numerous debates about teacher education policy is the perceived consensus that teacher education is not effective in its current configuration. With the understanding that the most important element in student learning is the quality of the classroom teacher, traditional university teacher preparation programs have come under fire for failing to prepare their graduates for the realities of the diverse students, schools, and communities they will serve, particularly in urban areas, where teachers are expected to overcome the effects of poverty and discrimination without adequate resources or school-based supports. As a result of this perceived ineffectiveness, colleges of education and higher education administrators are increasingly being asked to show evidence of their graduates' capabilities in the classroom.

Currently, multiple teacher education reform policies are being proposed, piloted, or debated by various stakeholders and policymakers, including the Obama Administration's *Our Future, Our Teachers* (U.S. Department of Education, 2011) and the National Council on Teacher Quality's *Teacher Prep Review: A Review of the Nation's Teacher Preparation Programs* (Greenberg, McKee, & Walsh, 2013). What these reform policies have in common is increased accountability. Most models incorporate the assessment of prospective teachers' performance with the achievement of the K–12 students taught by the program's graduates. However, there are controversies about the quality of data/findings using value-added assessments and its use by practitioners and administrators for local-level decisions.

Given these and other challenges, the authors of this paper believe that realigning teacher preparation programs to incorporate sustainable development, while seemingly impractical or additive, can be transformative. By preparing new educators to incorporate ESD in their curricula, their students will be more engaged, will be more likely achieve academically, and will develop critical 21st century skills, which include systems thinking, problem-solving, and a global perspective. Additionally, high-quality sustainability education materials can be aligned to the Common Core State Standards (2010) and the Next Generation Science Standards (Achieve, 2013) to help connect students with real-world issues. Connections and partnerships among teachers, students, and local and global communities can be facilitated through sustainability education by providing an engaging context for service learning and project-based learning requirements.

2. POLICY AND ESD

I have been left with a greater sense of urgency about the necessity to improve the education of our children by better supporting the development of their higher order thinking skills and their ability to apply these skills effectively to a broad range of problems. It is, in part, these skills that will enable them to invent and contribute to the new world. (Wilhoit, 2011, p. viii)

2.1 International Policy Related to ESD

The UN Decade of ESD (UNDESD) has promoted ESD in many countries around the world. Great strides have been made within the formal education sector to incorporate sustainability into all levels of schooling (early childhood education through university). For example, in Sweden all institutions of higher education are mandated to teach sustainability. Finland is reorienting primary and secondary curricula to include sustainability content. Zambia has an 8-point plan for incorporating ESD nationally. Education Manitoba incorporates sustainability into the vision statement for the province. These are only a few examples of ESD policy worldwide. Global progress is best summarized by the monitoring and evaluation report of the UNDESD: “In primary and secondary education, ESD is increasingly recognized as a valuable source of innovation in teaching and learning” (UNESCO, 2012c, p. 66).

2.2 The United States Lags Behind

Unfortunately, the United States lags behind in creating policy to promote ESD. Even U.S. Secretary of Education Arne Duncan acknowledged this in his speech at the Sustainability Education Summit in 2010.

It’s been clear for a decade or more that education plays a vital role in the sustainability movement. In 1996, President Clinton’s task force on sustainable development issued its goals. One of them stated that all Americans should have access to lifelong learning opportunities so they will understand the concepts involved in sustainable development. I think it’s obvious to everyone here today that we’ve fallen short of that goal. . . . Historically, the Department of Education hasn’t been doing enough in the sustainability movement. Today, I promise you that we will be a committed partner in the national effort to build a more environmentally literate and responsible society.

Furthermore, President Obama mentioned the importance of addressing global sustainability in his 2013 State of the Union Address.

We also know that progress in the most impoverished parts of our world enriches us all—not only because it creates new markets, more stable order in certain regions of the world, but also because it’s the right thing to do. In many places, people live on little more than a dollar a day. So the United States will join with our allies to eradicate such extreme poverty in the next two decades by connecting more people to the global economy; by empowering women; by giving our young and brightest minds new opportunities to serve, and helping communities to feed,

and power, and educate themselves; by saving the world's children from preventable deaths; and by realizing the promise of an AIDS-free generation, which is within our reach.

Sustainability is growing in currency and importance in the United States. As a result, ESD is poised for growth.

2.3 ESD Emerging in Teacher Education

2.3.1 Globally

TEIs in countries around the world have carried out action research to create guidelines for reorienting teacher education to address sustainability. The recommendations include programmatic-level activities such as:

- Demonstrate pedagogical techniques that foster higher-order thinking skills, support decision-making, involve participatory learning, and stimulate formulation of questions.
- Discuss social equity (e.g., gender, racial, ethnic, and generational) with student teachers and identify ways in which the local community exhibits social tolerance, societal intolerance, equity, and discrimination. (UNESCO, 2005, p. 44)

These guidelines include recommendations on national, state, institutional, and departmental levels as well as recommendations related to research, funding, communications, and information technology.

Additionally, the Manitoba Faculties of Education ESD Committee drafted "Suggested Actions for Reorienting Teacher Education in Faculties of Education in Manitoba to Address Sustainability." The committee wrote suggested actions for capacity building, policy, curriculum, administration, research, and partnerships (Buckler, 2013).

There are many ways to incorporate ESD into teacher education. Here are four examples of faculties of education that have been moving ESD forward:

- University of the Sunshine Coast in Australia offers two sustainability courses in the first year of a four-year Bachelor of Education—at least one is required for teacher certification. In their final year, preservice teachers must take a course focusing on ESD pedagogies (Heck, 2010).
- University of Limerick in Ireland requires all students to address ESD topics in their micro-teaching experience. Additionally, globalization and sustainable development is a key theme in a module on educational policy required of all students.
- Erdiston Teachers' Training College in Barbados has designed modules of approximately 15 hours for various teacher education programs.
- Hanoi National University of Education undertook a four-step process to integrate ESD into teacher education curriculum: (1) review the entire teacher education program; (2) using a matrix, find commonalities between the content of the teacher education program and ESD; (3) integrate ESD into the teacher education program based on the commonalities found in step 2; and (4) implement ESD in diverse

ways (e.g., lectures, blended learning, outdoor activities, and action research (McKeown & Hopkins, 2011).

As “reorienting teacher education to address sustainability” is recognized, understood, and implemented, each country and each TEI needs to define what the phrase specifically means in the contexts of its own education system—environmental, social, and economic contexts. As a result, each teacher education program is unique, addressing local needs, strengths, and challenges to sustainability.

2.3.2 In the United States

Many institutions of higher education are incorporating sustainability in undergraduate and graduate curriculum and changing the operation of campus facilities to be more sustainable (The Association for the Advancement of Sustainability in Higher Education [AASHE], 2012; Vincent, 2010; Walton, 2013). Nevertheless, departments, schools, and colleges of education have been slower to embrace sustainability. Nolet (2013) captured the status of ESD in teacher education in the United States.

Education for sustainable development (ESD) is not yet a prominent feature of teacher education in the United States. However, in pockets of innovation around the country, teacher educators have begun to address ESD in the preservice and advanced professional development of teachers. Viable strategies and models for integrating ESD into the professional development of teachers exist . . . and serve as tangible proof of the viability of a transformed U.S. teacher education system that addresses sustainability. (p. 54)

Although the term ESD is not used in teacher certification requirements in the majority of states, strands of ESD appear in K–12 education. ESD-related content has emerged in several national efforts to define competencies for K–12 students (e.g., Common Core State Standards (2010), Next Generation Science Standards (Achieve, 2013), and Partnership for 21st Century Skills [P21], 2009) (see Appendix C). Furthermore, ESD language has appeared in the InTASC Model Core Teaching Standards (Council of Chief State School Officers [CCSSO], 2011). These emerging ESD-related activities appear to be pointing toward a trend of growing acceptance and implementation of ESD.

2.3.2.1 Model Core Teaching Standards

The InTASC Model Core Teaching Standards were created to help state departments of education discuss and create teacher certification standards (CCSSO, 2011). The document includes standards, performance indicators, essential knowledge, and critical dispositions that are related to ESD. For example:

Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues. (p. 14)

This standard uses terminology consistent with ESD:

- Critical thinking;
- Creativity;
- Collaborative problem solving; and
- Local and global issues.

(For discussion pertaining to dispositions and the InTASC Model Core Teaching Standards, see Section 3.3 Dispositions.) Although Standard #5 does not use the term sustainability, the intent and practice are strikingly similar. Similarly, ESD is called by many names in other countries implementing it so that it is locally relevant and culturally appropriate. Despite the various names, ESD has a core of knowledge, skills, perspectives, values, and issues as well as dispositions and pedagogies that are found in many subfields of education (e.g., environmental education, human rights education, and global education).

2.3.2.2 Major Educational Organization Activity

A number of educational organizations have incorporated sustainability into their ongoing activities. Kappa Delta Pi (KDP), the American Association of Colleges for Teacher Education (AACTE), The Association for the Advancement of Sustainability in Higher Education (AASHE), and the National Network for Educational Renewal (NNER) have all incorporated sustainability in a variety of ways. For example:

- Kappa Delta Pi (KDP), International Honor Society in Education, is a 501(c)(3) organization established in 1911 to recognize and promote excellence in education, provide a reasoned voice for significant issues, and link learning communities of educators. The rollout of the Society's ESD initiative includes publishing articles in the *Kappa Delta Pi Record*, hosting webinars, and promoting the theme at its 49th Biennial Convocation in Dallas, Texas, October 24–26, 2013, with a keynote, workshops, service learning, and practitioner exchanges. Through its programs, services, and strategic partnerships, KDP supports the professional growth and teaching practices of educators throughout all phases and levels of their careers. The organization currently has more than 600 chapters and an active membership of 43,000 worldwide.
- AACTE is the most prominent national organization focusing on teacher education in the United States. Beginning in 2010, AACTE sponsored a Special Study Group (SSG) focusing on Education for Sustainability (EFS). The EFS SSG has included members from more than 30 institutions across the country and has sponsored panel and research presentations at the AACTE Annual Meeting since 2010. In 2013, AACTE initiated the Topical Action Group (TAG) program to replace Special Study Groups. The TAG program will provide greater visibility and some funding for topical groups and the Education for Sustainability TAG is expected to grow considerably in the next several years as more AACTE members become aware of it.
- AASHE has about 850 member institutions of higher education and provides annual conferences as well as a website that supports changes to physical plant operations and academics related to sustainability.

- The NNER comprises P–12 school, university, and community partnerships. The NNER’s Agenda for Education in a Democracy includes goals and strategies for implementation that align closely with ESD (see Appendix C). Many of the partners in the NNER have curricular and professional development activities underway. These include initiatives in Canada, Colorado, New Jersey, New York, Ohio, Washington, and Wyoming. These activities range widely, introducing and infusing ESD concepts in preservice teacher preparation programs, creating specialty tracks within existing graduate programs, offering summer workshops focusing on ESD for inservice educators, and exploring the possibility of a doctoral program to focus on the sustainability in educational practices and its impact on student learning. Transferring concepts into school practice is an overarching goal for the NNER, and partnerships across institutions promote sustainability concepts and actions in schools and places that prepare teachers.

2.4 Policies and Strategies for Moving Forward in Teacher Education

In a review of the few places in the United States where ESD has begun to take root, there appear to be three strategies for moving forward: incorporating ESD into existing TEI structures, state certification and endorsement, and institutional accreditation (Nolet, 2013).

2.4.1 Coursework, Concentrations, Certificates, and Degree Programs

Innovative teacher education institutions have begun to offer coursework related to ESD. For example:

- The School of Education at Webster University offers an emphasis and certificate in *Education for Global Sustainability* (EFGS) as part of the Master of Arts degree in *Education and Innovation*. The school is developing a master’s in EFGS.
- West Chester University offers a four-course (12-credit) certificate in ESD (Nolet, 2013).
- Antioch has begun offering a master’s program with an endorsement in environment and sustainability education for inservice teachers.
- Most frequently, teacher educators integrate ESD into existing teacher education coursework. Integrating ESD into methods courses as well as requirements for practicum and student teaching is increasingly common. Such integration occurs in a wide range of disciplines, including language arts, science, social studies, and mathematics (Nolet, 2009).

Using existing structures and processes within TEIs to address sustainability saves time and energy, which are valuable resources in schools, colleges, and departments of education. For example, a course in sustainability could be a prerequisite for admission to a post-baccalaureate teacher preparation program so that preservice teachers are already familiar with the concept of sustainability. Such a requirement is feasible in the United States because rapid growth has made sustainability part of the curriculum in many institutions of higher education. The National Council for Science and the Environment reported that as of 2012, there was a total of 759 sustainability-focused academic programs in the United States, including 141 sustainability degree programs, 302 degree programs with a

sustainability concentration, and 316 minor or certificate programs in sustainability (Vincent et al., 2012).

2.4.2 Teacher Certification and State Endorsement

The State of Washington Professional Educator Standards Board (PESB), which has responsibility for teacher licensure, has incorporated sustainability into the standards for preservice and inservice levels. The new standard requires that all beginning teachers are able to prepare K–12 students “to be responsible citizens for an environmentally sustainable, globally interconnected, and diverse society” (Program Approval Standard–Knowledge and Skills, 2011; Wheeler, 2013). The goal is to prepare sustainability-literate teachers.

Furthermore, the State of Washington has created a specialty area endorsement in Environmental and Sustainability Education. A number of TEIs in Washington offer the endorsement; others will follow in the near future.

2.4.3 Institutional Accreditation

The accreditation process for colleges and universities as well as teacher preparation programs offers an opportunity to use education for sustainable development for a systemic change process. Regional accreditation (e.g., Southern Association of Colleges and Schools [SACS]) can give universities an opportunity to use a thematic approach to a self-improvement plan. For example, Florida Gulf Coast University chose environmental sustainability for a central theme, thereby addressing existing programmatic problems and needs by using knowledge, skills, and strategies associated with sustainability. This same thematic approach will be used under the new Council for the Accreditation of Educator Preparation (CAEP).

Although ESD is a new term in the teacher preparation community in the United States, there are implementation models, which have been used successful at state and institutional levels.

3. PRACTICE AND ESD: ELEMENTS OF TEACHER EDUCATION

While ESD can address the major educational issues of our times (e.g., dropout rates . . . in the United States and the achievement gap between students of color and white students), it does not mean doing business as usual. It means taking school reform to another level. It will “require a significant shift in our current designs for learning, the beliefs we hold about the purpose of schooling” (Willms, Freisen, & Milton, 2009, p.1). The good news is there are models of schools that have successfully addressed these issues and they are doing it with sustainability as a theme (Tell Them From Me [TTFM], 2011). (McKeown & Nolet, 2013, p.13)

This section of this paper looks at three elements of teacher education programs: pedagogies, assessment, and dispositions. The additional dimensions and depth that ESD brings to each of the three is described. Numerous examples of good practices in ESD

from around the world have been documented by UNESCO, which is the lead agency for the UNDESD (see Appendix D).

3.1 ESD Pedagogies

Pedagogies associated with ESD stimulate pupils to ask questions, analyse, think critically and make decisions. Such pedagogies move from teacher-centred to student-centred lessons and from rote memorization to participatory learning. ESD pedagogies are often place-based or problem/issue-based. ESD pedagogies encourage critical thinking, social critique, and analyses of local contexts. They involve discussion, analysis and application of values. ESD pedagogies often draw upon the arts using drama, play, music, design, and drawing to stimulate creativity and imagine alternative futures. They work towards positive change and help pupils to develop a sense of social justice and self-efficacy as community members. (UNESCO, 2012d, p. 1)

In fact many pedagogical strategies and techniques taught and used in U.S. TEIs today fit the criteria for ESD pedagogies. These pedagogies empower student as learners today and later in life as lifelong learners and active community participants and decision-makers.

Teaching techniques and assignments that allow students to work collaboratively are part of ESD, because many of the environmental, social, and economic challenges of today are so immense that solutions arise from teams of people working together. Pedagogical techniques of today must prepare the students to enter the workforce skilled and ready to collaborate in diverse teams (P21, 2009).

Two ESD teaching techniques that are predicted to become more and more central to teaching as the world grapples with complex issues that arise from globalization and climate change are issue analysis (Clarke, 2000; McKeown-Ice & Dendinger, 2008; Ramsey, Hungerford, & Volk, 1989) and a multiple perspective approach (UNESCO 2012e). Most likely, the hallmark of teachers in the 21st century may be the ability to analyze complex issues in ways that are student-centered and highly participatory (McKeown & Hopkins, 2010; UNESCO, 2012e). Coming out of an era in which the testing associated with No Child Left Behind narrowed both curriculum and teaching techniques, ESD teaching techniques may give classroom teachers a sense of renewal.

A number of good methods of issue analysis are currently being used in schools. Clarke's (2000) demystification strategy is based on four questions:

1. What is the issue about?
2. What are the arguments?
3. What is assumed?
4. How are the arguments manipulated?

These four questions are particularly good for exploring issues as they appear in the media and their effect on the local community. The Clarke method is most appropriate for upper elementary and middle school. The 13 questions posed by McKeown-Ice and Dendinger

(2008) are more challenging and suitable for university-based teacher education programs as well as Advanced Placement classes in upper secondary school.

1. What are the main historical and current causes (i.e., physical/biotic, social/cultural, or economic) of the issue?
2. What are the geographic scale, the spatial distribution, and the longevity of the issue?
3. What are the major risks and consequences to the natural environment?
4. What are the major risks and consequences to human systems?
5. What are the economic implications?
6. What are the major currently implemented or proposed solutions?
7. What are the obstacles to these solutions?
8. What major social values (e.g., economic, ecological, political, aesthetic) are involved in or infringed on by these solutions?
9. What group(s) of people would be adversely impacted by or bear the cost of these solutions?
10. What is the political status of the problem and solutions?
11. What change can you make or have you made in your daily life to lessen the issue?
12. Beyond changes in your daily life, what is the next step you could take to address the issue?
13. How is this issue related to other issues? (pp. 162–164)

MULTIPLE-PERSPECTIVE APPROACH

Pedagogies that encourage cooperation and sharing of knowledge, skills, perspectives, and questions help students prepare for the world of work as well as community participation and decision-making (UNESCO, 2012e). By working in groups, students also learn a variety of social and communication skills (e.g., listening without interrupting and asking questions for clarification) that will be beneficial in higher education or the world of work. Collaborative pedagogies include many forms of structured and semi-structured group work (e.g., cooperative learning structures and collaborative writing projects).

One way to encourage cooperative and collaborative learning is through multiple-perspective analysis. The UNESCO multiple-perspective tool (MPT) uses eight perspectives to look at a common problem, event, or challenge to sustainability:

- Scientific Perspective
- Historical Perspective
- Geographic Perspective
- Human Rights Perspective
- Gender Equality Perspective
- Values Perspective
- Cultural Diversity Perspective
- Sustainability Perspective

The MPT also has recommended that students create their own perspective (e.g., intergenerational and economic) to deepen the analysis (UNESCO, 2012e). One way to use the MPT is to have small groups of students each become familiar with a specific perspective. The students then view a documentary together while analyzing it from their assigned perspective. Next the small groups share their findings in a large group discussion, combining perspectives to gain more in-depth

understanding of the documentary as well as understanding other points of view (UNESCO, 2012f). The overall purpose of the MPT is to help students understand and work with complexity, which is a skill set that will be required in many jobs in the near and long-term future. Admittedly, a multidisciplinary approach to sustainability is often difficult to implement in secondary schools, which are disciplinary based. The MPT, however, does not use specific disciplinary content, but uses broad understanding from science, geography, and history so that a multiple perspective approach can be used in a variety of disciplinary-based courses (e.g., contemporary issues, world geography, or environmental science). (pp. 15–17)

Excerpt from McKeown, R. (2013). Teaching for a brighter more sustainable future. *Kappa Delta Pi Record* 49(1): 12–20. Used with permission.

3.2 Assessment

Complex learning, such as learning related to sustainability, requires assessment techniques that mirror such complexity (McKeown, 2011; Stefl-Mabry, 2004). Simplistic measurement of student gain, such as multiple-choice tests, is not appropriate for assessing gains in knowledge, skills, perspectives, and values associated with sustainability. Furthermore, ESD calls for participatory learning, communicating about complex real-life issues, and critical thinking. As pedagogy and learning evolve, so must assessment (UNESCO, 2012d, p. 1).

Assignments that demonstrate student understanding of complex topics (e.g., essays, projects, speeches, research reports, and multimedia presentations) require depth of thought and original work by the student. In parallel, teachers are confronted with the time-consuming and relatively difficult task of grading. One tool for systematically grading complex assignments is a rubric. Rubrics benefit teachers and students. Rubrics decrease grading time and increase objectivity for the teacher while promoting learning and providing effective feedback for the students (Stevens & Levi, 2005). Teachers can construct rubrics with concepts and skills associated with sustainability as elements of the assignment. Teachers also can add levels of attainment and descriptions of mastery to the rubrics. These rubrics help students assess their own work as they develop and complete their assignments. In general, ESD purports, “assessment for learning practices give students an opportunity to reflect on their work and make decisions about what and how to improve” (Rosemartin, 2013, p. 24). Assessment for learning gives students a more active role in both learning and assessment.

3.3 Dispositions

Dispositions are an important element of teacher preparation programs. The dispositions associated with ESD overlap with critical dispositions in the InTASC Model Teacher Education Standards. Highlighted here are several InTASC dispositions and their relationship to ESD (CCSSO, 2011).

- “4(o) The teacher realizes that content knowledge is not a fixed body of facts but is complex, culturally situated, and ever evolving. S/he keeps abreast of new ideas and understandings in the field” (p. 24). This disposition is integral to ESD because sustainability is a rapidly evolving field.
- “4(p) The teacher appreciates multiple perspectives within the discipline and

facilitates learners' critical analysis of these perspectives" (p. 24). This disposition directly ties with the ESD pedagogical technique multiple-perspective analysis.

- "5(q) The teacher is constantly exploring how to use disciplinary knowledge as a lens to address local and global issues" (p. 27). This disposition is appropriate for ESD given that "issues" is one of the five components of an ESD framework (i.e., knowledge, skills, perspectives, values, and issues).

Other ESD dispositions include equity in the classroom and creating a climate of working for the common good.

4. EVIDENCE BASE FOR ESD

Although little research has been conducted in the United States related to ESD, it is a topic of inquiry internationally. The subsequent sections briefly describe two avenues of research that show the promise of ESD to improve education.

4.1 Co-Evolution of Pedagogy and Sustainability Content in the Curriculum

The monitoring and evaluation effort of the UNDESD revealed an interactive co-evolution of pedagogy and sustainability content in the curriculum. As the sustainability content of the curriculum increases the complexity of learning, it becomes evident that traditional methods of teaching and learning, such as lecture, memorization, and recitation, are no longer sufficient. New pedagogies are required. In reverse, as teachers use more student-centered and participatory teaching/learning techniques, the complexity of the curricular content can increase. In this co-evolution of pedagogy and sustainability content, one does not appear to be consistently driving the other. In some places change in pedagogy is the impetus, while in others sustainability is the impetus (Swayze, in press; Wals, 2012).

Lorna Down (in press), a teacher educator at the University of the West Indies, observed this co-evolution in teaching and pedagogy:

ESD has in general re-shaped the way we teach and learn at all levels. . . .

Teacher education in the Caribbean has been significantly influenced by ESD with a particular focus on climate change. . . . Pedagogy for teacher education becomes community centered as in-service teachers are motivated and encouraged to attend closely to the environment.

Consequently, a new relationship between the university and the community is developed. Teaching and learning become "situated" in community with both in-service teachers and community members teaching and learning from each other. There is an emphasis on active and participatory learning and on problem-solving as these teachers learn and are motivated to take action to address problems in the community.

Paralleling and complementing the work in community are reflection and research. Equally important, there is the development of a global view and a heightened moral purpose which form the foundation of this approach.

Down (in press) also observed that student engagement rises along with the co-evolution of pedagogy and sustainability content.

4.2 Student Engagement

Measuring student engagement—academic, social, and intellectual engagement—is growing in importance in secondary education. The Canadian Education Association (CEA) measured engagement of students across Canada. The results showed that engagement declined from grade six through grade 12 ending at 37%. Such diminishing engagement is a concern to teachers, administrators, researchers, and decision-makers, especially with high dropout rates. In the United States, schools are using results of the High School Survey of Student Engagement study by Yazzie-Mintz (2010) to improve student engagement and achievement. Additionally, the Programme for International Student Assessment (PISA) measures engagement (Schleicher, 2009). Engagement scores are in part used as a measure of curricular relevancy.

It is interesting to note that in some places where the co-evolution of pedagogy and sustainability content of the curriculum is going on, student engagement is increasing (Pickard, 2012; Swayze, in press).

5. OUTCOMES

Implementation of ESD is growing in countries around the world. ESD is also helping schools to accomplish their goals related to student achievement. Beijing, China, has 1,000 ESD schools. One ESD school principal stated that as a result of a thematic focus on sustainability, the graduates of his school are being admitted to elite Chinese universities. A school in rural Mongolia is an award-winning school because the faculty uses an organizing theme of ESD.

The Province of Manitoba in Canada included the word sustainability in its vision statement and has undertaken a great deal of professional development for teachers and administrators related to ESD (Buckler & MacDiarmid, 2013). The Sustainability and Education Academy is providing professional development, thereby transforming school systems into sustainable organizations (Connelly, 2013). Canadian schools, especially in Manitoba, are observing the co-evolution of pedagogy and sustainability content as well as increases in student engagement. Furthermore, schools in Sudbury, Ontario, Canada, have shown a leap forward in sustainable practices (e.g., conservation of energy and water), which have resulted in cost savings (Foster, 2013).

ESD has proven effective internationally. It is time that teacher preparation programs in the United States begin to explore ESD and how it can support student achievement.

6. THE COST OF INACTION

ESD is consistent with what the education community knows about good teaching. Furthermore, components of ESD are already being taught in TEIs. Nevertheless, ESD is not part of the teacher education discourse in the United States.

Many TEIs use a social justice theme to underpin the teacher education programs. It is ironic that this commitment to social justice is primarily “past-looking,” focusing on the historical inequities in schools and on current realities with little thought to the future.

Social justice needs to be “forward-looking” to ensure equity in the future. For example, TEIs need to be answering a common question: What right does the current generation have to improve its socioeconomic status at the cost to future generations? In this respect, social justice falls short as a foundational theme for teacher education. In contrast, ESD can provide the missing foundational pieces and perspective to TEIs and teacher education programs.

Not attending to ESD is egregious. Such delays allow other countries to advance their school systems and their economies while the United States is mired in practices commonly used in the previous millennium.

Other countries are building “green” economies based on sustainability. Globally, countries are changing primary, secondary, and higher education to reshape their economies. If the United States wants to remain economically competitive and do so well into the future, then the United States needs to educate its students today so they have the creativity and abilities to meet the challenges and complexities of the future.

To influence the global dialogue, U.S. graduates must understand the vocabulary, principles, skills, values, and applications of sustainability. Without these, the global dialogue will continue without representation from the United States in all sectors (e.g., diplomacy and business) and at all levels (e.g., individuals, corporations, and international organizations). By incorporating the sustainability paradigm and ESD into teacher education programs, such a future can be averted.

7. CONCLUDING COMMENTS

Placing pedagogies and assessment practices, which colleges of education already teach, into a sustainability context creates synergies and improves outcomes for all students, communities, and educational institutions. In this time of attacks on teacher education, we as leaders of TEI and teacher education programs need to remember that realigning teacher preparation programs to incorporate sustainable development, while seemingly impractical or additive, can be transformative.

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APPENDIX A

What Is Sustainable Development?

Excerpt from “Teaching for a Brighter More Sustainable Future” by R. McKeown, 2013, *Kappa Delta Pi Record* 49, pp. 12–20. Reprinted with permission.

Sustainable development is a paradigm for thinking about the future in which environmental, social, and economic concerns are balanced. These three spheres are interrelated. For example, a prosperous society depends on a healthy environment to provide food and resources, safe drinking water, and clean air for its citizens (UNESCO, 2012).

The sustainability paradigm is a major shift from the previous paradigm of economic development and growth, with its accompanying socially and environmentally damaging consequences. Until recently, these consequences were seen as inevitable and acceptable. Now, however, society realizes that major damage or serious threats to the well-being of humans and the environment while pursuing economic development is not the only way forward (UNESCO, 2012). Development that takes into account the three Ps—people, planet, and prosperity—is now a viable alternative. Some businesses and industries are using a triple bottom line in their accounting, creating ledger sheets that look at environmental and societal gains, and losses in addition to the traditional gains and losses in terms of dollars.

Major principles of sustainability underlie the paradigm, including:

- intergenerational equity—ensuring that adequate resources remain for future generations to meet their needs (i.e., not using all the timber and fossil fuels in this generation);
- equity for all people;
- balance and integration of environment, society, and economy (Cooper & Vargas, 2004);
- precautionary approach—taking action to avoid the possibility of serious or irreversible environmental or social harm even when scientific knowledge is incomplete or inconclusive;
- reduction and elimination of unsustainable patterns of production and consumption, and promotion of appropriate demographic policies;
- cost of pollution, in principle, is the responsibility of the polluter;
- participation of all concerned citizens in environmental issues;
- full participation of women; and
- avoidance of warfare, which is inherently destructive of sustainable development (Rio Declaration, 1992).

Sustainability principles originally were codified in the Rio Declaration, which resulted from the Earth Summit held in Rio de Janeiro in 1992. The list of principles continues to grow as the concept of sustainability evolves and new challenges and threats to people and planet emerge.

Creating a more sustainable world involves addressing the global and local threats to sustainability. Some threats, like climate change, affect every country. Other threats are local (e.g., famine and pollution). Each country or municipality should create sustainability goals to address threats to national or local sustainability. These goals, of course, should be based on local environmental, social, and economic contexts. Education programs created to address sustainability goals are specific to each local context and, therefore, cannot be imported from other regions.

Values of Sustainable Development

Efforts of the United Nations are underlain by values related to human dignity and rights, fundamental freedoms, equity, and care for the environment. Sustainable development takes these values and extends them to future generations. Sustainable development means valuing biodiversity and conservation as well as human diversity, inclusivity, and public participation. It also means working for the common good.

The Earth Charter (n.d.), for example, is a “universal expression of ethical principles to foster sustainable development” (www.earthcharter.org). The Earth Charter is the result of a five-year global consultation process. It includes statements such as:

Respect Earth and life in all its diversity. (a.) Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings. (b.) Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity.

Promote a culture of tolerance, nonviolence, and peace. (a.) Encourage and support mutual understanding, solidarity, and cooperation among all peoples and within and among nations. (b.) Implement comprehensive strategies to prevent violent conflict and use collaborative problem solving to manage and resolve environmental conflicts and other disputes. (Earth Charter, n.d.)

Though teaching values is often viewed as controversial (e.g., whose values are you teaching?), the Earth Charter is being used by schools worldwide.

What Is the Difference between Sustainable Development and Sustainability?

Sustainability is often thought of as a long-term goal (i.e., a more sustainable world), while *sustainable development* refers to the many processes and pathways toward that goal (e.g., education and training, sustainable agriculture, sustainable production and consumption, good government without corruption, research, and technology transfer) (UNESCO, 2012).

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APPENDIX B

What Is ESD?

Education for sustainable development, ESD, is also called education for sustainability (EFS) in United States. Although ESD is implemented in many different ways around the world and regionally in the U.S; it contains some core elements. The *Education for Sustainable Development Toolkit* posits that a curriculum reoriented to address sustainability should have content, skills, perspectives, values, and issues related to sustainability (McKeown, et al., 2002). Tilbury (2011) conducted an ESD literature review noted that ESD conveys more than knowledge about sustainability. Additionally, it involves:

- Learning to ask critical questions
- Clarifying one’s own values
- Envisioning more positive and sustainable futures
- Thinking systemically
- Responding through applied learning
- Exploring the tension between tradition and innovation.

Other publications have identified characteristics of ESD (e.g., interdisciplinary: addresses all three realms of sustainability—environment, society, and economy; locally relevant and culturally appropriate) (UNESCO, 2005).

ESD is not about simply “knowing” but also about “doing” as well as valuing. It implies acquiring and applying knowledge and skills to become personally engaged with the challenge of helping to bring about sustainability—an equitable balance of environmental, societal and economic concerns. In this respect, ESD is “action oriented,” ESD is aimed at enabling personal and collective action to improve outcomes for all, now and in the future. ESD should be created for and responsive to the local cultural and economic contexts as well as environmental conditions. Thus, there are many ways to implement ESD successfully to help communities and countries meet their sustainability goals and attend to the well-being of the planet and all its living inhabitants. (McKeown & Nolet, 2013, p. 7)

ESD was first described in 1992 Chapter 36 “Promoting Education, Public Awareness and Training” of Agenda 21.¹ Chapter 36 calls on all of the world’s education systems, public awareness systems, and training systems to educate all citizens of the world in ways that would lead to a more sustainable future.

ESD, in its broadest sense, is education for social transformation with the goal of creating more sustainable societies. ESD touches every aspect of education including planning, policy development, programme implementation, finance, curricula, teaching, learning, assessment, administration. (UNESCO, 2012, p. 1)

¹ Agenda 21 is the official document of the United Nations Conference on Environment and Development, also called the Earth Summit, which was held in Rio de Janeiro in 1992. Agenda 21 is a comprehensive blueprint for action to be undertaken globally, nationally and locally by organizations of the UN, governments, and major groups.

Since 1992, ESD has evolved. In some places, ESD has become an overarching paradigm for education

ESD has four basic areas or thrusts. Those four thrusts are:

- Improving access and retention in quality basic education
- Reorienting existing educational programs to address sustainability
- Increasing public understanding and awareness of sustainability
- Providing training to all sectors of the workforce (UNESCO, 2005, IIS)

The first two primarily involve formal education and the third and fourth primarily involve non-formal and informal education. The first thrust is the primary concern of school districts and school board across the United States. Keeping kids in school and providing them with a quality education that will prepare them for work and community life. The second thrust is primarily where teacher preparation program in the U.S. focus (see Box B.1.).

Box B.1. Improving Access and Retention in Quality Basic Education

Enrolling and retaining both boys and girls in quality basic education is important to their well-being throughout their lives and to the communities in which they live. Basic education focuses on helping pupils gain knowledge, skills, values and perspectives that encourage sustainable livelihoods and to live daily in a sustainable manner. Although both Canada and the United State are hugely successful in enrolling children in school, keeping them there is a problem. Dropout rates in both countries have risen dramatically recently (i.e., 31% in the U.S with some provinces in Canada experiencing similar statistics) (Bridgeland, Dilulio, & Morrison, 2006; Richards, 2009). Compared to many nations, the high school completion rates are good, however, compared to recent history the dropout rate has given the public cause for concern (see chapters 2 and 4). Providing a quality education that retains adolescents in school is a large ESD related challenge in both the United State and Canada.

Defining quality education in a rapidly changing world is difficult so it is not surprising that school administrators and school boards struggle with this issue. What was quality education at the end of the 1990s would not be considered quality today. Community demographics, technologies, ecosystem integrity, economic stability, and social well-being are all changing and in some cases, deteriorating. Education has to respond to the complex changes in society and at the same time prepare students for the world they will encounter in the near future.

Increasingly, a key element in evaluating the quality of an educational experience is preparation of students for employment. A quality education addresses issues of employability by ensuring that students stay in school, complete high school and are prepared to join the workforce or continue their education in a post-secondary program. In the switch to a green economy, this component of quality education is of growing importance. It is not surprising, then that the green economy and creation of green jobs was a key theme for the Rio+20 conference in 2012 and is a core component of both Canadian and U.S. national policy.

A quality education also responds to research on teaching and learning to meet the needs of historically marginalized populations, such as minority language speakers, children of migrant families and students with disabilities. For example, students in need of special attention in school—those with learning disabilities, physical impairments, and emotional disturbance—are on the rise (U.S. Department of Education, n.d. & 2011). About 13% of students in the US receive special education services. This raises questions about how schools are staffed and equipped to handle such needs in these times of budgetary cuts. Early interventions are often successful, leading to more positive outcomes throughout students' careers as learners and throughout their lives. Students, who do not adequately receive special education services,

disengage from school disproportionately. Such disengagement affects the quality of their daily lives now and in their futures.

In both Canada and the United States, the issue of education quality is closely linked to issues of access and equity. Both countries have struggled to ensure that poor children and students from ethnic, racial, and language minority groups have the same educational opportunities as students from middle class and wealthy families and students from the dominant culture. In Canada, education is recognized and legislated as a fundamental social good and considered a significant human right under international human rights law. A publicly funded education system, accessible to all, is recognized as a core constitutional responsibility of provincial governments and access to education cannot be denied because of one's gender, ethnic origin, disability or age.

In the U.S., the 1954 *Brown vs. Board of Education* decision created the expectation that equal access to an education is a Constitutional right. The Brown decision affirmed that denial of access to the social and economic benefits of an education would be tantamount to denial of equal protection under the Equal Protection clause of the Fourteenth Amendment. After Brown, schools were no longer allowed to segregate students on the basis of race. The provisions of Brown were extended to students with disabilities under federal special education legislation in 1975. (p. 8-9)

McKeown, R & Nolet, V. (2013). Education for sustainable development in Canada and the United States. In R. McKeown & V. Nolet (Eds.), *Schooling for sustainable development in Canada and the United States* (pp. 3–21). Dordrecht, The Netherlands: Springer. Published with kind permission from Springer Science+Business Media B.V.

What does sustainability add to primary and secondary education?

The U.S. Network of Teacher Education Institutions realizes that the using the sustainability paradigm as an overarching concept for teacher education or primary and secondary education makes little sense to educators in the United States. Therefore, we draw on the international literature to explain the benefits of sustainability to improving education.

Not only does education contribute to sustainable development and the transformation of society; the reverse is also true. Sustainability improves education and has the potential to transform education. As countries and communities struggle to cope with contemporary challenges accompanied by major life-changing events (e.g. climate change-induced drought or the rise in sea level), the purpose and relevance of education itself have been questioned.

Sustainability adds purpose to education. Perceptions of the purpose of education vary according to the role and perspective of the person responding to the question. Teachers often say that the purpose is to help children develop their full potential. However, the reality of a teacher's job is that s/he must also prepare students to pass end-of-the-year exams for promotion to the next year of schooling. Parents often hope that school will prepare children for jobs that will provide economic security for their families. Some politicians claim that the purpose of education is to ensure national economic competitiveness. Others say that global stability is the goal of education.

For years, many countries have used education as one of several investments to increase economic growth. Unfortunately, such economic growth has brought with it unprecedented environmental challenges as well as large gaps—both economic and societal—between the “haves” and the “have-nots.” It is evident that economic growth as the purpose of education no longer serves the planet well. From the perspective of sustainable development, it is time to rethink, reorient and restate the purpose of education. Education that promotes sustainability, global stability and resilient societies could help create a more sustainable future for the planet.

Sustainability gives a common vision. Many children and adults know that something is not right in their community and in the wider world. They see environmental deterioration, social injustice, and economic inequity around them and learn about it in the media. Children and adults can easily identify what is unsustainable in the world around them. They also want a better world and some can even envision that world. Sustainability also positions education to make a concrete contribution to a better world.

Sustainability gives relevance to the curriculum. The relevance of many primary and secondary curricula has also been called into question. The disconnection between the curriculum and life in the community is a factor in children and adolescents dropping out of school. Unfortunately, retention in school is a problem for countries around the world. One of the causes of dropout is that pupils or their parents do not perceive education as being relevant to the lives they lead or would like to lead. Making the curriculum more directly related to the lives of children and adolescents is important to retention. Education that is reoriented to address sustainability examines real-life problems in the community and explores solutions, thereby adding relevance to the curriculum by connecting it to learners’ felt needs.

Sustainability in the curriculum raises economic potential. Another factor in dropout is economic. If education were perceived as contributing to a child’s or the family’s current or future economic well-being in a tangible rather than abstract sense, some children would stay in school longer. Developing a curriculum that increases the economic potential of pupils is facilitated when sustainability as a crosscutting curricular theme is added. Creating and living in a more sustainable world requires knowledge and skills for living sustainably and having sustainable livelihoods. Preparing pupils to fill the “green jobs” of tomorrow is an important part of education today.

Sustainability gives concrete examples of abstract concepts. All too often, education is criticized for being theoretical and abstract. The cross-cutting themes of sustainability and its related issues (e.g. climate change and biodiversity) that challenge local communities provide excellent real-life examples of abstract concepts contained in the curriculum. Such local examples also increase the relevance of the curriculum.

Sustainability can save pupils' lives. Natural disasters threaten the lives of school children and their families. By adding topics related to local natural disasters (e.g. the ways that human activity can exacerbate or ameliorate conditions in disaster prone areas) to the curriculum, the lives of children and community members will be more secure. Such security will be enhanced by adding lessons on what do to when natural disasters strike (e.g. following safe evacuation routes) as well as constructing safe schools. (UNESCO, 2012, pp. 36–37)

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(IDEA), Part B, and number served as a percentage of total public school enrollment, by type of disability: Selected school years, 1980-81 through 2008-9. Retrieved September 11, 2011 from <http://nces.ed.gov/programs/coe/tables/table-cwd-1.asp>

APPENDIX C

Emerging Pieces of ESD in K–12

In spite of a lack of national policy, ESD appears in isolated pockets of innovation in the United States—and these pockets of innovation are growing in number. ESD advocates and pioneers are being invited to sit on advisory committees for important educational initiatives. As a result, some major educational initiatives and emerging trends in education are compatible with ESD.

Common Core State Standards

The Common Core State Standards (CCSS), although proscriptive in one sense, also leave a great deal of leeway for states, school districts, and teachers to implement those standards. ESD Pedagogies, described in Section 3 Practice and ESD, are excellent for implementing CCSS. For example:

- Reading Standards for Literacy in History/Social Studies 6–12 include “Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources” (CCSSO, 2010, p. 61). This standard lends itself particularly well to studying challenges to sustainability—which are complex with roots in social, economic, environmental, and political realms—through ESD pedagogical strategies such as issue analysis.
- Speaking and Listening Standards Grades 6–12 Comprehension and Collaboration include “Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented” (CCSSO, 2010, p. 50). This standard lends itself to an ESD multiple perspective approach, which was designed to deal with diversity of perspective and interdisciplinarity (see Section 3.1).

Two nationally prominent nonprofit organizations (NPOs)—Facing the Future and Creative Change Educational Solutions—are addressing CCSS in conjunction with sustainability content knowledge and ESD pedagogies. These two NPOs and others are creating classroom materials related to ESD and CCSS.

Next Generation Science Standards

The Next Generation Science Standards include eight practices of science and engineering that are essential for all students. They include:

1. asking questions (for science) and defining problems (for engineering);
 2. developing and using models;
 3. planning and carrying out investigations;
 4. analyzing and interpreting data;
 5. using mathematics and computational thinking;
 6. constructing explanations (for science) and designing solutions (for engineering);
 7. engaging in argument from evidence; and
 8. obtaining, evaluating, and communicating information.
- (Achieve, 2013, Appendix F, p.1).

These eight practices are aligned with ESD skills. For example, learning to ask questions is central to ESD, as well as obtaining, evaluating, and communicating information. The Next Generation Science Standards ([NGSS], Achieve, 2013), like the Common Core Standards, emphasize building arguments based on evidence.

Although the NGSS mentions human sustainability in several places, sustainability is not considered a crosscutting concept. Rather than addressing sustainability directly, the framework alludes to sustainability through phrases such as “relevant factors (e.g., economic, societal, environmental, ethical considerations)”:

Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and logical arguments regarding relevant factors (e.g., economic, societal, environmental, ethical considerations). (Achieve, 2013, HS-ESS3-2 Earth and Human Activity)

EdSteps Global Competence

EdSteps is an initiative of the Council of Chief State School Officers. It grew out of international concern and urgency to educate students of today for life and work in a globalized world. Mansilla and Jackson (2011) defined global competence as “the capacity and disposition to understand and act on issues of global significance” (p. xiii) and described it as follows.

Globally competent individuals are aware, curious, and interested in learning about the world and how it works. They can use the big ideas, tools, methods, and languages that are central to any discipline (mathematics, literature, history, science, and the arts) to engage the pressing issues of our time. They deploy and develop this expertise as they investigate such issues, recognizing multiple perspectives, communicating their views effectively, and taking action to improve conditions. (p. xiii)

Student performance includes:

1. Investigate the world beyond their immediate environment, framing significant problems and conducting well-crafted and age-appropriate research.
2. Recognize perspectives, others’ and their own, articulating and explaining such perspectives thoughtfully and respectfully.
3. Communicate ideas effectively with diverse audiences, bridging geographic, linguistic, ideological, and cultural barriers.
4. Take action to improve conditions, viewing themselves as players in the world and participating reflectively. (Mansilla & Jackson, 2011, p.11)

The similarities between the ESD and Global Competencies are numerous. Both approaches to education are interdisciplinary and require students to investigate and use multiple perspectives.

21st Century Skills

The Partnership for 21st Century Skills (P21) is a national organization that advocates for new millennium skills for all students. P21 posits that in a globalized world the 3Rs should be fused with the 4Cs (critical thinking and problem solving, communication,

collaboration, and creativity and innovation). The P21 Framework “describes the skills, knowledge and expertise students must master to succeed in work and life; it is a blend of content knowledge, specific skills, expertise and literacies” (Partnership for 21st Century Skills, 2009, p. 1). P21 also publishes a document to help states and schools implement the Common Core State Standards while supporting 21st century skills, thereby dovetailing the two initiatives.

Although many aspects of P21 align with ESD (e.g., participation in civic life, investigating and analyzing environmental issues, and working creatively with others), ESD experts point out that the P21 goal of success in work and life can lead to furthering the behaviors and mind-sets that have created the environmental, social, and economic crises of today. If, however, the purpose of the P21 framework would be to work toward a common good and create a more sustainable future for all as opposed to individual gain, then ESD and P21 would align more closely.

Agenda for Education in a Democracy

The Agenda for Education in a Democracy (AED) is:

- providing access to quality and relevant knowledge for all learners, ensuring that institutions of learning engage learners with nurturing and challenging pedagogy,
- understanding the responsibilities as stewards of the education profession, and
- engaging students so that they can advance democracy on informal and political dimensions.

This Agenda is promoted by the National Network for Educational Renewal (NNER).

According to NNER, ESD clearly overlaps with AED. Following are examples of how the NNER’s Agenda tracks closely to the four thrusts of ESD:

- Access to Knowledge parallels ESD’s first thrust, improving access to and retention in quality basic education.
- Stewardship parallels ESD’s commitment to educators creating a sustainable future and reorienting existing education toward a sustainable future.
- Enculturation of the Young into a Democracy focuses on commitment to social justice and equity for everyone and parallels ESD’s third thrust, increasing public awareness and understanding related to sustainability.
- Nurturing Pedagogy provides training in pedagogical approaches (e.g., inquiry based and student centered learning) that educate in ways that will allow today’s youth to lead sustainable lives and parallels ESD’s fourth thrust, providing training for the workforce.

The AED is implemented through partnerships among K–12 public schools, institutions of higher education, and communities. These three partners work together through teaching and research to create novel teaching strategies, which are useful to classroom teachers.

Summary

A number of recent U.S. educational initiatives contain elements that are similar to components of ESD, such as concern with globalization, use of higher-order thinking skills, and collaborative learning. ESD brings together many conceptualizations of

education in the new millennium, acting as an umbrella paradigm. The ESD paradigm allows for synergies as well as weaving disjoined initiatives into whole cloth.

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APPENDIX D

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APPENDIX E

Frequently Asked Questions

Is ESD an add-on?

It is well known that state-mandated curriculum already fill—perhaps overfill—the school year. It is not possible to add another set of concepts and skills related to sustainability to the curriculum. ESD is not another add-on to the curriculum. In a number of countries, ESD is viewed and embraced as a guiding philosophy that provides purpose and quality to education.

Furthermore, most primary and secondary curricula already contain strands of sustainability (e.g., natural resources, civil and human rights, and separating fact from opinion) in the core disciplines (i.e., mathematics, science, language arts, and social studies). However, the strands are not taught as being related to sustainability.

ESD is **not** just another adjectival education [such as fire safety education, global education, and character education], which can get lost in the competition for a place in primary and secondary curriculums. ESD is an overarching paradigm that guides and transforms the core disciplines, second-tier disciplines, and adjectival educations so that they can all contribute to a more sustainable future. (UNESCO, 2012, ESD and Adjectival Educations, p. 38)

Is ESD a fad?

Although education for sustainable development (ESD) is not a term frequently used in the United States, ESD is practiced globally. The UN Decade of ESD: 2005–2014 has greatly advanced ESD around the world. A Google search of ESD in July 2013 resulted in about 126 million results on the World Wide Web.

Is place-based learning the same as ESD?

Although place-based learning is one approach to teaching and learning that is used in ESD, it cannot substitute for the broader concept of ESD.

Subfields of education, such as environmental education, global education, human rights education, ecological economics are all considered “adjectival educations.” They contribute through their own perspective to creating a more sustainable world. ESD is an umbrella paradigm for the adjectival educations.

The semester is only 14 weeks, which is barely enough time to have students learn questioning skills and lesson planning for quality thinking and quality content-specific thinking. Adding the sustainability lens is one step too far.

What is the current lens that you are using? Using a sustainability lens rather than the current lens will be all of the change necessary. Questioning skills and lesson planning using a sustainability perspective can be efficiently taught using existing ESD tools.

Candidates are learning to teach in local schools, where few even know ESD exists much less support it.

Colleges, schools, and departments of education have traditionally been on the leading edge of educational renewal and new trends. For generations, student teachers have arrived in schools with current teaching techniques and mind-sets, which were not readily accepted by the existing teaching staff. ESD is no different.

How can we require ESD when school teachers feel so much pressure to cover their curriculum?

Granted, teachers feel a great deal of pressure to cover the mandated curriculum. ESD resources exist that show how to teach ESD within the mandated curriculum and the new Common Core Standards. NPOs such as Facing the Future and Creative Change Educational Solutions have activity guides and offer workshops addressing this particular concern. The magazine *Rethinking Schools* also addresses teaching social, environmental, and economic justice in school settings.

I am in an elementary and/or early childhood setting. I don't want to frighten the children, so how can I address sustainability?

ESD pedagogies attempt to avoid the mistakes of the 1980s when lessons on the environmental and social ills of the world left feelings of “doom and gloom” as well as helplessness. ESD pedagogies today empower students to make changes in their neighborhoods and around the world as well as instill hope.

Countries, from China to Ireland, are basing ESD in early childhood and primary education on respect and caring—two essential elements to create a more sustainable world.

The parents in my school accuse me of indoctrination because they don't recycle at home. How can I reply? If they fight this hard about recycling, then how can I bring in anything more substantial?

ESD is far from indoctrination; it is the opposite of indoctrination. ESD fosters critical thinking and higher-order thinking skills, which counteract indoctrination and propaganda.

Many communities have controversial trigger issues, which can be avoided in early stages of ESD. Choosing less controversial themes like equity may be a good starting point.

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