

## PLENARY SESSION IV – HOW CAN THE PROMISE OF URBAN ECOSYSTEM EDUCATION BE ACHIEVED?

### **Urban ecosystem and the 21st century - a global perspective** (Keynote Address)

**Frank B. Golley**, Institute of Ecology, University of Georgia

It is widely known that approximately half of the human race will live in cities in the next century. While cities have existed for over 5000 years, they are a creature of human imagination. Cities do not exist in nature. Human adaptation did not prepare us for this built environment. The city demands something new of us.

I have two major points to make in this context. First, in cities, as in other systems, function (or process) creates structure. This point of view is contrary to that of the designer of cities. Second, adaptation to the city requires a different set of mental patterns and skills than does life in the rural or natural landscape. This implies that the education of children in cities also is different.

In the ancient city the structure visibly followed function. Security required walls, which became ever larger over time. Administration and religion claimed a space where imposing structures could be built. Artisans needed space and markets to produce and sell the products of the city.

Cities were sinks of population. The excess rural population moved to cities but the crowding, disease, pollution and lack of clean food and water led to high death rates. Immigration far exceeded reproduction. But cities were equally sources of creativity. In the city the architect, artist, musician, writer, poet, athlete, actor, clown and spectacle maker could find patrons.

While the first cities, created 5000-6000 years ago, were overgrown villages, cities rapidly became special and unique. They formed a new environment and as a consequence, in the city the human was faced with a new set of adaptive demands. The urban environment is social: it is not natural. The skills of the hunter-gather or the rural inhabitant count for little in the city. The modern city demands its inhabitants link to the machine and the market. The rural migrant, the poor, unfortunate and disabled finds a place in the poorest, most dangerous corners of the city and gradually begin a process of urban adaptation. The grand plans of the architects, Le Corbusier, for instance, seldom accommodate these forces.

There is need for the urban citizen to recognize the common good and adjust their life to support and protect it. Concern for others should be the central idea for the urban dweller. Intense competition, individualism and violence destroy the common good. To understand the forces that maintain the city and how its citizens must work together to direct and shape these forces is a function of education. Urban education is different from education in a general sense. It must be an education of values. The success of the city depends upon the creation of an educational system that is an integral part of the system of adaptation to this human built environment.

## **Out the door and down the street--enhancing children's play and work environments as if adulthood mattered**

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This essay takes a broader view of 'environmental' education than appears in most of the literature of environmental educators. The paper does not assume an obligation to make children aware of their environments and concerned about the impact their actions and those of their peers and parents have upon non-human ecological variables. It assumes that children are very well attuned to their environments as their very survival and sources of pleasure and reward depend upon understanding the structure and function of these environments. It further assumes that an animal whose behavior is more directed by learning than by genetic factors is set to cover a whole curriculum of formal learning from 'attitude' to geography to zoology provided by that immediate environment from home to down the street. However, the connections between this intimate ecology of experience, the more systematic forms of learning promulgated in the classroom and the likely demands of adulthood expected in the future are highly selective, depend upon random chance and generally remain unclear at the best.

This separation of learning compartments, this disconnect between experience and learning, self and community, play and work, schooling and knowledge provides a fragmented social ecology. Enhancement of a holistic ecology as experienced by actual human beings within their environment of buildings, lots, streets, parks and other infrastructure, with their associated plants, animals, air and waters is seen as the proper place for capturing learning for adulthood. Yet, this venue where the folk architecture, botany, literature, geometry, chemistry and sociology of the streets is played out is seldom given the dignity and systematization of a learning environment. An alert biosocial ecology can enhance these connections. The paper closes with some trials made, some hopes found and some failures to learn by. The venue for this effort comes from work in developing regions of Asia and the parks and streets of New Haven, Baltimore and Philadelphia.

## **Integrating urban ecosystem education into educational reform**

**Rodger W. Bybee**, Center for Science, Mathematics and Engineering Education, National Research Council

Developing an understanding of urban ecosystems requires perspectives from the natural, technological, and social sciences as they specifically apply to humans. In this chapter, I approach the theme of integrating urban ecosystem education into educational reform by first presenting a brief history of human ecology, a theme that clearly expresses my view for urban ecosystem education. I then answer the question: What should citizens know, value, and do as a result of urban ecosystem education? In the final section, I address the difficult issues of integrating urban ecosystem education into the educational system.

### **A new perspective for education**

Although ecologists know the history of their discipline, most educators do not realize that a perspective, such as the urban ecosystem or human ecology, does have a history. A review of that history provides a rationale for the now essential need to integrate this perspective into the educational system. Further, the historical perspective identifies some of the ideas upon which to design policies, programs, and practices for education.

### **What should students know, value, and do as a result of urban ecosystem education?**

What content should educational programs about urban ecosystem include? An answer to this question can be found in the *National Science Education Standards* (NRC 1996) and *Benchmarks for Science Literacy* (AAAS 1993), which provide the essential content and contexts for the design of curriculum materials and professional development experiences. Use of these standards as the core for the design of curriculum should be supplemented by standards on mathematics and social studies.

In addition, knowing about and understanding the urban ecosystem requires incorporating technology as a domain of study. One unique feature of cities is the degree to which humans have relied on technology as a means of adapting to and constructing an environment to accommodate their unique needs and aspirations. The content standards being developed by the “Technology for All Americans” project should be an integral aspect of urban ecosystem education.

### **Implementing urban ecosystem education**

Using the urban ecosystem as a central focus for introducing students to important concepts associated with, for example, population, resources, and environments does, on the face of it, make sense. The largest numbers of students are in urban centers and their cities are the environments they have experienced, know best, and have the most meaning for them. But this clear, and to some, compelling justification does not have the power to compete for space in an already full curriculum. To effectively implement an urban ecosystem perspective requires applying critically important ideas. My first recommendation is to support the extant standards (national, state, or local) that apply to an urban ecosystem perspective. The power of standards lies in their capacity to change all the essential components of the educational system, namely curriculum, instruction, assessment and the professional education of teachers.

A second recommendation is to include the entire educational system, not just schools. For example, museums, science and technology centers, and environmental education programs, all contribute to urban ecosystem education. In brief, recognize the fact that citizens are educated by a divisive array of institutions and groups referred to as the informal community.

Third, although we must initially think broadly and abstractly about urban ecosystem education, implementing this perspective requires us to eventually act narrowly and concretely. For example, there is a need for instructional materials that actually include topics and approaches to urban ecosystem education. What does this theme mean for the professional development of elementary, middle, and high schools teachers? What recommendations could we make for programs in urban museums, science, and environmental education centers? Implementing the urban ecosystem view will be advanced by presenting policies, programs, and practices for those who have responsibility for implementing the theme in the educational system.

Finally, actually bringing about broad-scale educational change based on the urban ecosystem theme is, perhaps, the most difficult challenge. Getting innovations to scale in educational systems is, at best, difficult and almost never occurs. Some specific recommendations that address the problem of getting to scale include (1) establishing the content of the urban ecosystem in key policy documents, e.g., state frameworks and critical leverage points, e.g., state and local assessments; (2) explaining to the public why urban ecosystem education is important; (3) developing educational support for implementation and maintenance of the program; (4) changing the demand for instructional materials; and (5) taking a long-term, steady work, i.e., evolutionary, approach to the implementation of urban ecosystem education.

## **Urban ecosystem education and school reform: creating a democracy of excellence in education for the 21<sup>st</sup> century**

**James Kohlmoos**, Office of Elementary and Secondary Education, US Department of Education

During the past six years education reform has emerged as one of the dominant public policy issues at the federal, state and local levels in the U.S. With the growing complexities and uncertainties of life and work in the 21<sup>st</sup> century, the American people and policy makers alike seem to be appreciating more than ever before just how integral education can be to a community's future economic, social, and civic development. As a long-term investment in human capital, education can, indeed, help define the future.

While controversy still surrounds jurisdictional issues in educational policy development at each governing level, there are two interrelated strategic aims that are now guiding most every reform effort: 1) to ensure equitable access to educational opportunity for all populations, particularly those that have been underserved and put at risk of failure; 2) to improve the quality of teaching and learning to rigorous, "world class" standards. These goals of equity and excellence were, during other periods of reform, often separated into opposing schools of thought and practice and thereby encouraging a political polarization of educational policy. But what is distinctive and unique about this current era of elevated reform activity is the common recognition that equity and excellence are inextricably connected to one another in the reform process. Educational excellence can no longer be the exclusive domain or aspiration of a few. Rather, our educational delivery systems need to be transformed into laboratories of high quality opportunity in which all students are given a chance to achieve to high standards. In his persistent calls for educational reform at all levels, US Secretary of Education Richard Riley has referred to this notion as the "democracy of excellence" in education for the 21<sup>st</sup> century.

The sense of urgency for systemic reform is at its greatest in urban centers where the school systems have long been plagued by gross resource inequities, bureaucratic entrenchment, low expectations and poor academic performance. Spurred by greater public accountability, virtually every urban school system in the country has now aggressively mobilized some form of high profile, systemic reform. In a number of areas, there is some recent encouraging evidence of progress in both improving academic performance and reducing the achievement gaps among various populations. But the immense challenges still remain in bringing improvement to scale and more effectively addressing the unique learning needs, interests, and conditions of urban student populations.

Within this context of systemic change, there are at least four strategic opportunities for urban ecosystem education to become integrated into the reform process and make a meaningful contribution to the goals of equity and excellence. First, urban ecosystem education could utilize its interdisciplinary, experiential approach to problem solving, as a method for developing new curricula and guiding innovative instructional practice for the classroom. In this regard, improved academic performance in the relevant disciplines would need to be the primary objective and assessed accordingly. By demonstrating a positive tangible effect on student academic performance, urban ecosystem education would then likely gain greater access to the resources and support structures of the formal education system.

A second strategic opportunity would be to develop urban ecosystem education as a comprehensive school re-design model. The concept of cities as ecosystems could be used as the central organizing theme for a school's entire academic program and operating system. More than an instructional approach, urban ecosystem education would be integrated into every component of the school's operations. In effect, the school itself would become a first hand case study of an ecosystem and its relationship to the surrounding community. For example, by incorporating service learning methodologies into the school program, direct connections could be created between classroom-based academic study and community-based issues and problems. While aiming to improve academic performance and foster civic competencies, this strategy would also position urban ecosystem education as a vehicle for whole school change.

A third strategy would be to launch a school-based public information effort similar to those now being used in AIDS education and programs for safe and drug free schools. While certainly not without controversy, both of these initiatives have been developed as cause-oriented responses to perceived national crises. In a similar way, a clear and strong case would need to be developed for the importance of urban ecosystem education as a response to impending ecological disaster. While on the surface this strategy may not seem relevant to the reform issues of equity and excellence, it can ultimately lead to a serious examination of civic values and priorities which are essential elements of a student's overall learning experience.

Fourth, urban ecosystem education could focus priority attention on the informal education structures in community-based organizations outside of the school setting. In this case, there would likely be a more direct involvement in immediate community issues with greater opportunities for constructive action. While the resources would initially be more limited, the programmatic flexibility would be greater than functioning within the formal structures of the education system. If the current trend of increased community involvement in schools persists in the coming years, this informal education strategy could eventually lead back to the school setting and its various reform efforts.

In sum, this historic period of educational reform with its unique focus on equity and excellence is indeed a way of responding to the essential human resource needs of an increasingly interdependent, technologically advanced world. In urban settings where concentrations of poverty and disenfranchisement have been most severe, education reform holds the promise of breaking the self-perpetuating cycle. Urban ecosystem education—whether as a curricular innovation, a whole school change model, a school-based public information initiative, or an informal education strategy—can make a significant contribution to this “democracy of excellence” in education in the years ahead.