Chapter 5
Enhancing Building Performance and Environmental Learning: A Case Study of Virginia Beach City Public Schools

Shannon M. Chance
Hampton University, USA

J. Timothy Cole
Virginia Beach City Public Schools, USA

ABSTRACT

School buildings directly affect their natural and socio-cultural environments. They do this through their construction, maintenance, operation, and demolition. Most of the school buildings we have in stock today drain natural resources and inadvertently perpetuate a culture of environmental, social, and long-term economic ignorance and misuse. When approached thoughtfully, however, the design of school buildings can help inform and enrich society. Well-designed buildings can impart environmental knowledge and values. They can foster more effective behaviors among the people who learn in and from them. Effectively designed buildings can also conserve natural resources and—at their best—even help replenish the natural environment. For many school leaders today, participation in green certification programs represents one important step toward improved building and learning performance. This chapter provides a case study of successful learning approaches developed by Virginia Beach City Public Schools (VBCPS).

INTRODUCTION

Aimed toward educators and school administrators, this chapter provides a broad overview of design issues related to sustainability. It proffers concrete examples drawn from Virginia Beach City Public Schools (VBCPS) to enhance performance at the level of the building, classroom, district, and region. VBCPS’s environmental approach integrates educational planning with facilities planning. Its facilities department has been driving change in school design, classroom
pedagogy, purchasing, transportation, and even regional design standards.

The examples in this chapter provide a snapshot of one moment in an ongoing process. They illustrate how one innovative school system is generating and applying new knowledge for the benefit of its buildings’ users, the local public, the wider education community, and the world. Overall, VBCPS strives to provide the best possible environments for learning teaching and living. Its efforts include:

- Integrating environmental issues throughout the curriculum
- Preparing students to bring new knowledge into the community and share it with their families and employers
- Introducing new construction techniques to the region
- Encouraging architects and builders to reach for higher standards
- Monitoring the division’s environmental performance and continually seeking to improve
- Disseminating their research and techniques for broad adaption
- Monitoring its own (and its community’s) energy and waste flows
- Striving to achieve net-zero carbon emission

In this chapter, we provide rationale and theoretical underpinnings for green school design, and we share successful practices developed by VBCPS. Knowledge in the realm of environmental design and education is continually evolving. As such, any list of “best practices” is in constant flux. In writing this chapter, we seek to provide a description of some of the best practices we have discovered and/or created up to this point in time.

Most environmentalists have adopted the World Commission on Environment and Development’s (1987) definition of sustainable development as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs” (p. 43). The “green building” movement fosters new strategies to help overcome outdated construction practices that require vast material resources and cause tremendous waste and pollution. Today, North America’s over-reliance on cheap energy has reached crisis proportions (Steffen, 2008; Wackernagel & Rees, 1996). All told, buildings consume 65% of the electric power used in the United States (Landsmark, 2008). They use 36% of all energy used and 30% of all raw materials. Buildings are responsible for half of greenhouse emissions from the US (Gifford, n.d.; Udall & Schendler, 2005). Educational facilities have been among the worst, although higher education buildings seem to waste more energy than K-12 because control systems are looser (Leslie & Fretwell, 1996).

Recently, VBCPS analyzed all sources of emissions within its control, using data from 2006-2010. It found that even though its overall energy consumption had steadily declined across the five-year period, its building-related activity still accounted for 65% of VBCPS’s overall emissions. Its second largest source of emissions related to transporting people and goods. Its calculations considered electricity use, combustion from paper/stationary waste, and losses related to the transmission and distribution of electrical power. School leaders are working to address the division’s primary sources of emissions, through integrated strategies that involve enhanced building performance, revised vehicle fleet policies, and more informed commuting habits of students and employees. Leaders are also creating strategies to control the 1% of its greenhouse gas emissions that resulted from solid waste, refrigerants, chemicals, and wastewater.

Developing new strategies is vital because, as our nation’s population continues to grow, so