

**EDUCATIONAL FACILITIES FOR THE TWENTY-FIRST CENTURY:
RESEARCH ANALYSIS AND DESIGN PATTERNS**

Gary T. Moore

and

Jeffery A. Lackney

**Department of Architecture
and
Center for Architecture and Urban Planning Research
University of Wisconsin-Milwaukee**

**Publications in Architecture and Urban Planning
Center for Architecture and Urban Planning Research
University of Wisconsin-Milwaukee**

EDUCATIONAL FACILITIES FOR THE TWENTY-FIRST CENTURY: RESEARCH ANALYSIS AND DESIGN PATTERNS

Gary T. Moore and Jeffery A. Lackney

ABSTRACT

There is a crisis in education in the United States and in many other industrialized nations--*and* in the infrastructure of school buildings. This monograph examines in detail empirical studies of the building/performance issue and presents an ecological model to summarize the data and bring some clarity to the issues involved. The heart of the monograph is a process for developing design patterns and a presentation in detail of 27 design patterns developed to respond to the empirical literature and to the educational reform movement that suggest ways in which school buildings can better support educational performance. The monograph illustrates a prototypical design that grows out of the patterns, suggests needed new directions for empirical investigation, and offers a critique and reconceptualization of educational facility planning models. The research behind this monograph has been funded by the Johnson Foundation and Scholastic, Inc., with additional support from the Building Research Board of the National Academy of Sciences. Pp. viii + 90; illustrated.

RELATED PUBLICATIONS

Buildings in Use, by Harvey Rabinowitz, 1975.

Case Studies of Child Play Areas and Child Support Facilities, by Uriel Cohen, Gary T. Moore, & Tim McGinty, 1978.

Recommendations for Child Care Centers, by Gary T. Moore, Carol Gee Lane, Ann B. Hill, Uriel Cohen, & Tim McGinty, third revised edition 1994.

Recommendations for Children's Play Areas, by Uriel Cohen, Ann B. Hill, Carol Gee Lane, Tim McGinty, & Gary T. Moore, 1979.

Children and Museums, by Uriel Cohen & Ruth McMurtry, 1986.

PUBLICATIONS IN ARCHITECTURE AND URBAN PLANNING RESEARCH

Center for Architecture and Urban Planning Research
University of Wisconsin-Milwaukee
Milwaukee, WI 53201-0413

Report R94-1
ISBN 0-938744-80-1

Copyright c 1994. All rights reserved.
Additional copies of this monograph are available for \$18.00 prepaid by writing to the above address.

TABLE OF CONTENTS

Preface and Acknowledgements	v
Chapter 1. The Crisis in American School Buildings	1
Chapter 2. School Buildings and Educational Performance	5
Chapter 3. An Ecological Model of Physical, Psychological, and Social Environmental Factors Affecting Educational Outcomes	13
Chapter 4. Giving Form to Emerging Educational Concepts: Responding to the Environment-Behavior Literature	19
Chapter 5. Design Patterns for American Schools: Responding to the Reform Movement	27
Chapter 6. Twenty-seven Patterns for the Design of the Next Generation of American Schools	35
Chapter 7. Prototype Designs for the New American Schoolhouse of the 21st Century	69
Chapter 8. Educational Facility Planning: A Critique and Reconceptualization of Current Educational Facility Planning Models	77
References	87

PREFACE AND ACKNOWLEDGMENTS

Since the mid-1970s the University of Wisconsin-Milwaukee has conducted extensive research on various environments for the developing child.

The earliest research was a post-occupancy evaluation of four school buildings designed by nationally recognized architects in Columbus, Indiana by Prof. Harvey Rabinowitz. A second line of research conducted in the Environment-Behavior Research Institute under the direction of Profs. Gary Moore and Uriel Cohen began in 1976 on outdoor play/learning environments for children with disabilities. That work led to a book, *Designing Environments for Handicapped Children* written with Lani van Ryzin and Jeffrey Oertel and published by Educational Facilities Laboratories. This was followed by a national conference organized by the same group on outdoor play environments that received wide national attention.

In 1978 together with Prof. Tim McGinty, now at the University of Arizona, we spent three years researching child care centers and outdoor recreation for the US Army Corps of Engineers and developed a set of national design guidelines on both child care facilities and associated play areas (from tot lots to regional parks). This work led to a seven-volume report series still available through Publications in Architecture and Urban Planning, two volumes of which, *Recommendations for Child Care Centers* and *Recommendations for Play Areas*, have been reprinted many times (*Child Care Centers* is now in its tenth printing).

Over the intervening years, we have continued to be active in sponsored research and design on a range of children's environments, including children's museums, inner-city recreation areas, group homes for mentally retarded and for emotionally disturbed children, creative, adventure, and comprehensive playgrounds, play facilities in children's hospitals, and playground safety. Our work has included empirical research, demand and location analyses, facility programs, prototypical designs, and design advice to many community organizations, colleges and universities, hospitals, and other private and public sector agencies and groups.

Our work has been supported by the Wisconsin Humanities Committee (National Endowment for the Humanities), US Army Corps of Engineers, National Endowment for the Arts, Graham Foundation for Advanced Studies in the Visual Arts, General Services Administration, Health and Welfare Canada (Child Care Initiatives Fund), and the University of Wisconsin System, both UW-Extension and the School of Architecture and Urban Planning at UW-Milwaukee.

In 1991 the work of the Center branched into another domain critically important to the developing child--elementary and secondary educational facilities. The impetus for this new line of research and research dissemination was a national conference of educators and architects held at Northwestern University and the Crow Island School (designed 50 years

ago by Eliel and Eero Saarinen with Wheeler and Perkins, now Perkins and Will) at which Gary Moore was invited to be a workshop leader and panelist.

For the second national conference on Architecture for Education, held at Frank Lloyd Wright's Wingspread and the Prairie School (designed by Taliesin Associates), Gary Moore was commissioned to review and comment on the state-of-the art in educational facilities and to present the results as a keynote address. He invited Jeffery Lackney to help conduct the literature search and prepare the slides used to illustrate the central ideas. We were supported by the Johnson Foundation in this research effort. Inviting Jeff Lackney was not a random event. Jeff is a registered architect and Ph.D. student in environment-behavior studies at UW-Milwaukee. He has had many years of experience as an architect working on educational facilities, and is preparing a dissertation on educational facility planning. Many very thoughtful people were at the Wingspread/Prairie School meeting. To us, the most important was Edward Fiske, the former education editor for the *New York Times* and now an important author on the reform movement in American education. We both learned a tremendous amount from Ted Fiske, both at that meeting and subsequently from his book, *Smart Schools, Smart Kids*. After that meeting, Anne Meek, Assistant Superintendent of the Virginia Beach School System, invited us to prepare a paper on facilities that would support school reform for a book being published by the Association for Supervision and Curriculum Development. We were also invited to prepare a prototypical design for *Agenda*, a Scholastic publication and, subsequently, a comprehensive paper for a special issue of *Children's Environments* on School Design. Meanwhile, Gary Moore was invited to become a member of the Building Research Board of the National Academy of Sciences and to prepare a position paper on the plight of educational facilities in America.

All of this research support gave us the opportunity to work together and to develop our thoughts together. This monograph is the result of that process, and serves as a final report to those various groups and individuals who have supported our work. It is intended to advocate for new ideas in educational facility design, and to disseminate the results of our work to date to the architecture and education profession. We are both most interested to receive your thoughts and criticisms as we continue with the work.

We would like to acknowledge the stimulation and support--financial and intellectual--of many groups and people who contributed to this research. First the organizing committee of the Wingspread/Prairie School Conference, Henry Halsted the Vice President Emeritus of the Johnson Foundation, and Bill Brubaker the Chairman of Perkins and Will for challenging us and funding our work to review of the state-of-the-art of educational facilities (see especially Chapter 2), for giving us a year to do it, and for their encouragement and confidence. The results of that support are represented in the 27 patterns that make up the heart of this work. Ted Fiske for his thoughts, and his writings which have been most influential in helping us understand the reform movement. A one-hour discussion on the topic that for the most part the reform movement is progressing along with

been most influential in helping us understand the reform movement. A one-hour discussion on the topic that for the most part the reform movement is progressing along with no awareness of whether physical facilities matter, while formal architecture blithely moves along oblivious to the reform movement and to current environment-behavior findings, was the single greatest catalyst to our work. The editors of the Association for Supervision and Curriculum Development, *Children's Environments*, and *Rethinking Schools* for their helpful criticisms and editing on draft papers that are chapters in the current monograph. Scholastic, Inc., the publishers of *Agenda* for commissioning the development of the prototypical design that appears as Chapter 7. Andy Lemer, former Director of the National Research Council Building Research Board and Charles Achilles of the Tennessee STAR and LBS Projects for information that is included herein. Finally our colleague Herb Childress for valuable comments on earlier drafts of several of the chapters.

Gary Moore
Jeffery Lackney
September 10, 1993