FLEXIBILITY, OPPORTUNITY, AND ENABLEMENT:
an elementary school prototype

Bartholomew Consolidated School Corporation
Columbus, Indiana

By: Theresa Scheibe
FLEXIBILITY, OPPORTUNITY, AND ENABLEMENT:
an elementary school prototype

by: Theresa Scheibe

Bachelor of Architecture Degree Thesis Design

Department of Architecture
Ball State University

Thesis Advisory Committee:

Jack Wyman

Andrew Seager

with special thanks to:

Bartholomew Consolidated School Corporation

Mount Healthy Elementary School Staff

W.D. Richards Elementary School Staff

@copyright may 1992
# TABLE OF CONTENTS

**introduction:**
- abstract
  - 01
- thesis proposal
  - 02
- cultural background
  - 03
- design intent/goal
  - 04
- site description
  - 05
- site analysis
  - 06-07

**research analysis:**
- Opportunity and Enablement: flexibility and adaptability of architecture.
  - 08-17

**design inquiry:**
- studies
  - 17-22

**final design plates:**
- site isometric
  - 23
- first floor plan
  - 24
- second floor plan
  - 25
- front perspective: a community embracing
  - 26
- main entry: public accessibility
  - 27
- house entry: identity
  - 28
- reception: accessibility and visibility
  - 29
- library entry: central location of resources
  - 30
- library: non "user-specific" rooms
  - 31

continued
# TABLE OF CONTENTS

walkway: primary / secondary circulation 32
first floor: easily accessible gathering areas 33
second floor: "indoor street" 34
kindergarten: loft / play / conference 35
small group: easily operable sliding doors 36
fourth grade: tertiary classroom space 37
house section: elimination of the endless corridor 38
house isometric: "house concept" 39
house section: sharing and interaction 40

**the model:**
photos 41-45

**in retrospect:**
what i have learned 46

**appendix:**

interviews with columbus area principles
introduction
ABSTRACT

The ultimate goal of this thesis was to find a learning environment which goes beyond today's typical elementary school with concern to flexibility, and adaptability, opportunity, and enablement. The process involved began with research of historical models which led to interpretations and beliefs required to establish a final design solution.

American education is changing in many ways, some of them quite fundamental. The design of school buildings, furnishings, and equipment can facilitate or retard these changes. Presently, schools do not address current curriculum needs of personalization and opportunity due to organization and limiting school designs. Each elementary school student is an individual, therefore, requiring diversity in program methods and design. Old walls should not stifle new ideas.

The program of this facility was to create a new elementary school/learning center for Columbus, Indiana located within the Bartholomew Consolidated School district. The intent was to enhance to learning environments and curriculum of the students as well as enhance the opportunities for the community. The school would become a resource to the members of the community for learning, recreation, and cultural events.

The location of the new facility is at the existing W.D. Richards Elementary School site. The suburban park-like setting with rolling hills and trees created a stimulating environment for the educational needs of the children, staff, and the community members.

The project methodology consisted of various design inquiries involving team teaching, flexibility, adaptability, organization, enablement, and opportunity. Testing and evaluation of existing facilities and design inquiries facilitated conclusions or beliefs about adaptability and flexibility. Therefore, the goal was the generation of an elementary school which will not become obsolete as other educational predecessors.

Columbus' new elementary school/learning center consists of academic areas, community areas, and administrative areas. The academic areas are divided into "houses" to stimulate a family-like atmosphere within the learning environment. The community areas surround the administrative core and are utilized by the public and school children alike. The administrative areas, therefore, become the heart of the facility to allow for control, organization, and orientation.
PROPOSAL

A new elementary school/children's learning center is proposed to be located at the existing W.D. Richards Elementary School site located in Columbus, Indiana.

The existing facility was designed in 1965 by the architectural firm of Edward Larabee Barnes of New York, New York. Although the W.D. Richards Elementary School was a precedent for schools of its time period, the school has become restricting and limiting in regards to education in the 1990's. The needs of teachers and curriculum requirements have outgrown the building shell and the interior organization as well.

Communication with the Richards school principle led me to believe that the school was in definite need of replacement or expansion. Therefore, in order to fully extend the goals of my thesis, I chose to design a new facility upon the existing site. This new facility would become a prototype to test ideas of flexibility. Hopefully, the research and design solution would lead to ideas which could outlast and surpass the historical solutions of flexibility.
CULTURAL BACKGROUND

The story of architecture in Columbus began generations ago when the foundation for a quality community, including buildings, was laid by farsighted city leaders in the mid-nineteenth century. Columbus architecture has been the subject of feature articles in national and international publications, and each year thousands of people visit the city to view the buildings. However, it was the need for new schools to accommodate population and industrial growth in the decade following World War II that provided the sustained thrust for the architectural program in Columbus.

A major proponent of this, the Cummins Engine Company, Inc., offered a unique proposal to the School Board where the Cummins Engine Foundation would pay architectural fees for new schools, with the stipulation that distinguished national architects would be selected as the designers. The school Board accepted the program and eleven schools were constructed. Since then, a number of buildings have been designed by noted architects without the benefit of the Foundation Aid, with building funds provided through contributions by congregations, bond issues, corporations, private funds, business and industry.

Since the consolidation of city and county schools in 1965, Columbus is now part of the Bartholomew Consolidated School Corporation. The Bartholomew Consolidated School Corporation is located in south central Indiana, 44 miles south of Indianapolis on I-65 with a pupil population of 10,525 kindergarten through grade twelve students throughout a 300 square mile district.

Community wealth is diversified amidst Columbus, with it not only being the headquarters for international corporations, but strong as an agricultural and commercial center in Southern Indiana. The economic wealth factor is resultantly higher than the average in Indiana. The community image is unique considering its attitude towards the arts and education, and industrial expansion to contribute to a consistent growth pattern amidst the community.

Stemming from the community's attitude and support of education, a new elementary school is a wise investment in this area. The new elementary school/learning center would be an asset to the entire community for resources, entertainment, and recreational use.
DESIGN INTENT

The design intent of this project is to question various teaching methodologies and the environment in which it is undertaken. More importantly, how the design of a building can change the levels of flexibility, opportunity, and enablement within the educational curriculum. As can be proven, the traditional school of the past with double loaded corridors is a thing of the past. The question here deals with how design can create new and better opportunities which previous flexible school designs do not allow for or ignore.

As the methods of teaching have continued to grow throughout the years, it is imperative that the school be able to allow for rapid alterations in order to fit the unforeseen needs of the future. Modifications and improvements are taking place all the time, but many teachers are still left with the problem of how to make the best use of an obsolete space. The schools of yesterday were planned on the basis of the whole class unit, in which it was intended that children should remain at their desks all the time with equipment and books distributed and collected by the teacher. Children are now expected to move about the entire learning area and collect their own books and materials as needed. Therefore, current educational needs have become reliant upon first-hand experience, that a child will learn more easily if he is allowed to see and handle materials and make his own deductions.

The goal was to design a facility which would not become obsolete in the future and would make provisions for easy adaptation and flexibility within design. (the confines of the terms adaptation and flexibility will be defined later.) More importantly, a facility which meets the needs of present and future teaching methodologies.
SITE DESCRIPTION/LOCATION

The new Elementary School/Learning Center will be provided for the Bartholomew Consolidated School District located in Columbus, Indiana. The new Facility will be located within the suburban context of the community. The community will provide a park type surrounding as well as a source of support, use, and innovation.

The site itself is located atop a hill and directly across from an existing Baptist Church. The church becomes a type of landmark guiding the community members along the winding road towards the site. The church sits upon a pedestal made of earth and seems to "rise above" the surrounding elements. Everything is serene and peaceful.

Trees and natural landscaping can be seen in the background but are not in surplus on the existing landscape. The trees become increasingly dense along the Northwest side of the site surrounding an existing par three golf course.

The relationship the site has with the surrounding houses is unique. Because of its relatively "private" surroundings the school site is only visible to those who are part of the community surroundings which would create feelings of safety and identity.
SITE ANALYSIS

Gently rolling hills cascade along the existing facility walls and would be used to the full extent within the new building. The implementation of new vegetation would be integrated into the design to create exterior "classroom" spaces and private areas. The playground equipment would be located so that use is encouraged by all community members.

The building should be sensitive to the surrounding scale of the suburban houses as well as the adjacent church. The building should exemplify an image of "community" which invites all members to participate in the facility.

Unfortunately, the existing W.D. Richards facility does "speak" as a community resource. The building lacks identity and character. The dark and barren walls seem to push people away instead of inviting them inside. The existing school facility does not pronounce itself as a public resource, but a self-contained element.

It therefore, become important to allow for flexibility and adaptability with concern to the Columbus community. A design which embraces its public and provides ease in use. Many schools today are opening up to Recreational Department uses and nighttime classes for adults as well. This thesis will hopefully find a balance between community and student use.
SITE ANALYSIS

The physical layout and design of the existing building creates "outdoor classrooms" between each two classroom spaces. However, through conversation with the Richards' school principal, these areas are rarely used. I feel this is due to the level of privacy these spaces offer in addition to their physical treatment as well. The area is limited to grass as a surface. I feel that if these areas were designed to have a combination of surfaces and seating possibilities, these spaces would be used on a more regular basis.
research analysis
INTRODUCTION:

purpose/intent:

The purpose of this paper is to define the role and meaning of flexibility and adaptability in architecture using elementary school facilities as a building type for comparison and study. In addition, to understand the historical development and progress of flexibility in architecture. Furthermore, to analyze how previous architectural designs and methodologies of flexibility can limit the opportunities a space allows for its users. Finally, to prescribe a new methodology of flexibility for the future.

The notion of flexibility and architecture has been developed and researched for most of this century. The open-plan offices we see around us today are a primary example of what flexibility has become in today's society. However, our perceptions and beliefs must be questioned when looking toward the future. The manner in which we define the role of flexibility and adaptability in architecture may not be enough when looking towards the future needs of society.

For example, flexibility does not need to always concern folding partitions, movable furniture, grid structures, and movable walls. Curiously enough, that is what almost always comes to mind when thinking of flexibility. I am not interested in limiting my definition of flexibility to simply this. There are many additional roles in which flexibility can play a part in. Most importantly, the role of providing opportunity. But in order to understand the theory of flexibility as opportunity, it is necessary to look at its historical development.

Historically most inquiry dealing with flexibility and architecture was focused upon office design. Flexible school designs simply became a reaction to what was established in office design. Therefore, in order to understand the path in which architects have developed their notions of flexibility, I will compare the history of office and elementary school design with concern to flexibility.
THE MODERN OFFICE: a historical role in flexibility

In order to understand the theory behind the modern office, it is important to understand how they became what they are today. It all began with the Industrial Revolution during the late 18th and 19th centuries which induced changes in the modes of our society. The emergence of iron and steel, new energy and machines, new transportation and communication, and in expansion in commerce, banking and management are just a few of the changes which took place. Consequently, this industrial growth required more and more offices. These new machines also required support staff which created a new clerical industry. Yet, in spite of the expansion of offices during the Industrial Revolution, more people were involved in manufacturing than traditional office functions. (Klien p. 12)

Therefore, it is no surprise that the atmosphere of most early offices took on a "machine-like" aesthetic. One of production and assembly with very little regard to personal or private space. These offices were vast open areas and would accommodate various functions within this homogeneous space. However, it was a warm, natural light beaming from large windows that illuminated these early office spaces. These grand windows also served the function of providing fresh air and ventilation. It wasn't until after World War II that the technologies for heating, ventilating, air-conditioning and lighting became available as an economically feasible choice. (Klien p. 15) It was a time when the steel column grid began to take over. Allowing "flexibility" of interiors, structures, and systems. Steel construction became the solution to many previous architectural problems, most importantly, the lack of land which led to the skyscrapers we see today.

As the development of tall steel skyscrapers continued to grow, there became an interest in human environment. As we moved away from natural light and ventilation, the built environment seemed to become stark and depressing. The relationship that the movable partitions and column grids created for its users began to be questioned. The readiness and construction ease of these new offices left the interiors without character and sensitivity. The walls began to take on a paper-like appearance and the columns had lost their bulkiness and character. Although the needs of society required its architecture to respond, modern construction and architecture may have moved too far away from the beginning. Therefore, studies on office "landscaping" and ergonomics became, and still is, an important issue in office designs.

Today, people are becoming more involved with their personal spaces, walls, and doors within these so-called "open" offices that the notion of a "flexible" office is becoming less and less apparent.
QUESTIONING THE ROLE OF FLEXIBILITY:

Interestingly enough, I feel our schools have responded architecturally in a similar manner in which the modern office has responded to the needs of society. Our schools have changed dramatically within this past century alone; from the move away from the one room school house, to the community school, and to the large community institutions. Throughout time, capital and investments guided the construction of America's school buildings. Therefore, it was economics and technology which drove us to the school "grid" system of repeating classrooms along an endless corridor.

It is in this sense that the elementary school can be compared to the modern office. Both have adapted themselves throughout time to become more flexible, easy to reconfigure, reconstruct, change, and renovate. However, as a result, both have become a non-user oriented type of solution. The traditional office partitions and folding walls in schools were not designed with a specific relationship to its user. However, in an office environment, the need for change and adaptation is less in comparison to the elementary school. The elementary school requires a different type of attention and care. In an office, one is able to "decorate" and adjust their own office habitat. In a school, this opportunity does not always exist. Therefore, the role of flexibility becomes less an issue of a "grid-like" column and walls system, and more so an issue of adapting to the needs of its users. It is this principle that has guided my questioning of flexibility's role in architecture.

It is my feeling that we must look at flexibility as an opportunity supporter or restricter. The manner in which we evaluate a flexible building should concern the opportunities it can create for its users. This notion of opportunity can be evaluated by how a building adapts to its users, and enables itself to offer various options.
FLEXIBILITY AS OPPORTUNITY???

Before discussing the issue of flexibility as opportunity, it is important to distinguish the confines of several terms with relation to design.

adaptability: refers primarily to the case with which spaces designed for a given function can be transformed to accommodate changes in methodology, groups, and function. Generally, the concept of adaptability is confined to internal conversion. More importantly, how easily the facility can be transformed to accommodate a new activity or function. (Castaldi p. 172)

historically: The installation of uniformly spaced standards (structures, systems, walls, etc.) would allow someone to convert a space into another space without having to change the overall "boundaries" of the space.

flexibility: historically, flexibility was sometimes referred to as fluidity. This methodology conceived all walls of a building, with the exception perhaps of the outside envelope as a temporary space dividers. Ideally, allowing the design for the relocation of all internal partitions without jeopardizing the structural system of the building. (Hamdi p. 51)

While adaptability makes it possible to accommodate new functions in given spaces; flexibility makes it possible to redesign old spaces to satisfy new needs.

 opportunity: can be defined as the amount of "allowance" a building provides for activities, users, and adaptation without large amounts of time or work invested by doing so. (p. 89)

enablement: To provide with the means, knowledge, or opportunity; make possible. (p. 88)
FLEXIBILITY IS OPPORTUNITY:

One of the most difficult criteria to satisfy in elementary schools is that of the unknown. It is very difficult to provide opportunities for activities which will be determined in the future. The plans of any educational facility must provide not only for the instructional practices of today, but for those that will be conceived by and for generations yet unborn. Such provisions must be made for: changes in enrollment, technological advances, and changes in teaching methods.

The historical solution to the above criteria was to design a "flexible" building with the following assumptions:

1. All instructional spaces should be capable of being altered in size and shape at a reasonable cost.
2. All utilities should be easily accessible to all parts of a school building.
3. Mechanical and electrical elements should be installed so as not to impede to the relocation of interior partitions.
4. Ceilings should be designed so as to facilitate changes within a school building.
5. The type of luminaires employed should not restrict the placement of interior walls within the building to any major extent.
6. The design of the building should facilitate the installation of electronic devices in all parts of the structure. (Castaldi p. 167)

Although the above criteria are important and useful, I feel that they should be re-evaluated.

I agree with this methodology, but only to an extent. I agree that the reconstruction of the interior should be allowed for within design. However, I do not feel that this should be the only method in which to use. The relocation of walls and systems can often prove to be very expensive, even when allowances have been made accordingly. It seems interesting to me that the above principles are focused upon architectural changes of construction, service, or adornment. The principles do not focus on the smaller scale: the student, the teacher, the community member. Flexibility and enablement must also consider the types of activities and users which will inhabit the spaces designed. The focus of how to adapt to a changing curriculum and teaching methodology should drive the building design as well. Instead of allowing the function of the room change the architectural design, the design should "allow" for these various functions separately. Therefore, opportunities are created by designing for the specific instead of the general.

It would be almost impossible to list, even in elementary fashion, the many ways to provide for the unforeseeable in planning a school. Ideally, a school building should be capable of modifications in many forms. Historically, this expansion was provided for by the containment of internal partitions and supporting columns that facilitate the reshaping and re-sizing of interior spaces without functional limitations. Oddly enough, this led to the repetition of classrooms along a corridor which were all exactly the same. Each classroom, therefore, provided the same opportunity as the next. Some may argue that their similarity is what makes them flexible. I feel that it is their likeness that restricts the types of opportunities which can happen.
OPEN-PLAN SCHOOLS: an attempt at providing opportunity

One of the most heroic attempts at providing opportunity through architecture was that of the open-plan school. This design notion, similar to the modern office, was trying to respond to the changing needs of society. However, in a school building, various activities must be delineated in a careful fashion due, for the most part, to noise control and privacy. Many open-plan schools were unsuccessful for this very reason. For the most part, they may have been unsuccessful, it is very important to look at the developments and criticisms that have been made throughout the years.

Despite the great deal of national interest in the design of school buildings without walls, some educators were very sceptical. They had as many strong arguments favoring the open-plan and an equal number of good reasons against it. Those in favor of the open-plan felt that it facilitated the grouping and regrouping of students and tends to encourage change, experimentation, and innovation. More importantly, it was likely to have a greater intermingling of both students and teachers. However, frustration for teachers and students became apparent in these schools without walls. Since there are no corridors under the open space plan, students simply roam from area to area, passing from one teaching space and through another. However, with this advantage there came to be two major shortcomings: student concentration and noise control. (Graves p. 28)

Those who favored the more open-plan schools were committed to far more than the concept of change in educational content and techniques. They believed that children learn more effectively in open space. They believed that self-direction and self-motivation will prepare a student better for additional learning and for a fuller, more satisfying life. They believed that learning in the open-plan environment would lead the individual to be more innovative, self-assured, intelligent, and understanding.

It is easy to understand why no other educational philosophy caused more controversy during the past 30 years than that of the open-plan school. The concept was heralded as the answer to the needs of flexibility. The open-plan promised flexibility to change space almost at will; to adapt to large, small, and individual group instruction; and to react to the needs of the teacher and the student. Not only were new schools built to house the open-plan concept, but the walls in existing schools were also knocked down to accommodate the new approach. To some, an open-plan school meant vast, wide-open areas of undivided space. The essence of their value was that they released those who use them to "do their own thing."

Today, there are few open-plan schools. In some of those remaining, the addition of walls has resulted in awkward interior environments. (Graves p. 29) Some blame the open-plan's demise to teachers refusing to work in the environment, making certain it did not work, returning to educational basics and, therefore, returning to a more traditional classroom. However, I feel this only supports my notions about flexibility and opportunity. The open-plan became a restriction or barrier in ways that the advantages were often pushed aside.
A SOLUTION: classroom opportunities

The proposed solution is to design a room which contains designated areas for various activities without having to change the design of the room itself. Instead, the children roam and move throughout the space to participate in the various activities. Spaces designed to incorporate various technological and electrical equipment could be separated from other areas of focus. Rather than equipping the entire room for electrical equipment, the provision of an entirely different space could be advantageous.

For example, computers are becoming more and more a part of the elementary school system. However, placing them in the center of the classroom or along the walls may not be the proper solution. Perhaps, there could be a computer "nook" within the room itself that was defined by ceiling height, illumination levels, and color. The advantage to this solution is that the opportunity to participate in computer activities is not physically separated within the room, however, it is given a more appropriate environment. This area could also be designed to accommodate other activities as well such as small group activities, conferences, and tutoring. The issue, therefore, becomes more focused upon how to adapt a space suitable for different types of events.

Another example is that of kindergarten play areas. In most cases, kindergartens are designed so that play areas are simply a part of the traditional classroom. I feel that it would be more advantageous to break apart the classroom itself in accordance to activity. The provision of a separate play "zone" within the classroom could create opportunities for several activities to take place at once. A group of children could be reading in one zone with a level of privacy, while another group of children are playing noisily in a different zone.

The most important opportunity concerning flexibility is that of overflow. The notion of this concept allows for additional space outside the traditional classroom for additional activities to take place. These may be housed in small or large group gathering areas to create various activities to overflow outside the classroom and, therefore, creating opportunities. The capability of adapting to large and small groups was the main goal of previous unsuccessful open-plan schools. I feel this was because these types of areas were not separated enough from the entire plan to create different levels of privacy, noise control, and illumination. Therefore, by combining the notions of open-plan and closed-plan schools many possibilities can happen. The success would depend upon the ability of opportunity to change from an open environment to that of a closed environment with ease.
A NEW ELEMENTARY SCHOOL
BARTHOLOMEW CONSOLIDATED SCHOOL DISTRICT

WHAT ABOUT THE FUTURE ???

People are beginning to realize that architecture for education can make a difference in the quality of learning they and their children can enjoy. More importantly, schools are being used as community centers; serving the public in areas of education, culture, and recreation. The educational facility will no longer stand alone, fenced off from neighbors, serving just a few grades of students on a rigid schedule, five days a week, nine months a year. Tomorrow's school will serve as a continuing education center for all those people within walking distance or a short drive, people of all ages. Schools will be open earlier in the day and later in the evening to serve adults as well as children. (Graves p. 50)

Schools are no longer owned by the students and their teachers and administrators. Schools must allow for and design themselves for opportunities serving the communities as well. In the daytime, functions may vary than those at night, but the architecture should allow so accordingly. Schools must provide an image that creates an identity for the community members; something which welcomes all who surround it. In addition, community spaces such as the library, gymnasium, commons, music, and art areas should be located to facilitate orientation and ease of movement. If a resource is located within reach, the people will use it.

More importantly, there should be rooms which are allocated as non "user-specific." To explain, rooms which create opportunities by their resources, location, and size, but are not designated for only one use. The implementation of non "user-specific" rooms does not allow for space to become wasted due to a room title. For example, teachers offices are workrooms. For the most part, a teacher's work can be achieved in the classroom. An office is required at times of privacy. It would be advantageous to provide several conference rooms in which the teachers could use as the need arises. The provision of such spaces would also create opportunities for community member use at night.

Basically, whatever the classroom function may be, designers must also think of the community implications upon design. Flexible provisions should be made to allow for the maximum amount of opportunity a space can provide.
IN CONCLUSION:

The manner in which we, as designers, think of flexibility should be redefined and articulated. The world is changing at an unprecedented rate. We must think of the future as well as the present with concern to users, activities, and the like. The education of children in the next century will bring about new ideas in which we cannot even fathom today. Our architecture should portray the same type of energy and hope. Moveable partitions and vast open-plans may not be the proper choice for this upcoming century.

An architect should be satisfied if a design allows itself to change and adapt for new opportunities. A design should allow for maximum opportunity in modes of construction, adaptation, users, and environment. And by doing so, hopefully, we, as architects, will create a better place in which to live.
BIBLIOGRAPHY


design inquiry
• Each "house" has its own identity and feeling.
• Module creates opportunities with expansion and reconfiguration.
• Circulation path along the front creates a sense of arrival (better than typical corridors which are dark and gloomy).
• Views into the interior become more inviting and less like an institution.
A type of pattern language creates space and void, positive vs. negative.
The stepping out of space can create dynamic effects of funnelling, focusing, flowing, bending to a vested space.
The dynamics of circulation such as a ramp system could affect the space as well, focusing on a division of activity.

The hallway... A never-ending corridor. You walk and walk waiting for your destiny. When you reach the destination, it becomes no different than where you were before. You move in monotony and travel in circles. The process never ends. Every classroom becomes a photograph of the last - A constant.
A NEW ELEMENTARY SCHOOL

BARTHOLOMEW CONSOLIDATED SCHOOL DISTRICT

- Flexibility and adaptability within a school
- How can this be achieved?
  - the use of modules
  - moving panels/partitions
  - moving furniture/equipment
- How can a school expand?
  - provide a formula for the future

- How do you break away from the classroom module along the corridor?

- A circulation space
- An element which ties up to center house. A new module element.

- Signals a house entry and delineates importance in accordance to a circulation path.
A NEW ELEMENTARY SCHOOL

BARTHOLOMEW CONSOLIDATED SCHOOL DISTRICT

- Feeling of "Forbidden" nature
- Does Not pull people into the architecture
- Enclosure
- Feeling
- Repetition
- Symmetry
- Movement
- Character

- Movement
- Understanding
- Excitement
- Energy
- Flowing

- The balcony becomes hole.
  A transition.
  The gray matter between black and white.

- Balcony which can look into the gymnasium.
  A connection.

- The balcony may be open so it can allow for various activities.
  Ie. folding chairs, stacking platforms.
Sections or smaller areas can increase the size of the classroom.

Shared space can be reconfigured to certain teacher needs.

"Blocks" can be added to a room to add diversity to a room in the 3rd dimension.
A NEW ELEMENTARY SCHOOL

BARTHOLOMEW CONSOLIDATED SCHOOL DISTRICT

Main Entrance Entry

This Entrance Allows for Easy Pick-up of Children After School.

The Solution: Create small "courtyards" on the exterior with a circulation system independent of the houses.
final design plates
SITE ISOMETRIC

The form of the building was meant to embrace the site and welcome community members inside. More importantly, to create a type of landmark which can be seen as driving up along the curving suburban roads. The appearance of the school was to "speak" as a school, a community resource. In addition, access to the school is clearly delineated and the main entry becomes a focal point of the design. This contrasts the existing facility which does not pronounce itself as a public resource, but a self-contained element.
FIRST FLOOR PLAN

The plan was divided into sections based upon function and activity. The classrooms are surround the central core in individual "houses." The "houses" function as a source of identity and inducer of group interaction. Each house contains two grade levels, two small group areas, and one large group area.

The administration and community areas are located in the center of the facility to allow for ease in orientation and use.

The handicap facilities (LDC) are located along the Northwest side of the facility to allow ease in drop-off and access to art, music, library, commons, and gymnasium facilities.
SECOND FLOOR PLAN

The second floor plan is very similar to the first in layout. However, the ceiling height is raised within the classroom houses to accommodate the older children. The barrel-vaulted ceilings also delineate the indoor "streets" and circulation paths of the houses as well.

The library also contains an open barrel-vaulted ceiling enclosing the balcony areas looking downward into the main library area.
FRONT PERSPECTIVE

The building is intended to welcome its community inside. In contrast to the existing facility which seems to keep people out. People are drawn towards the facility and are encouraged to utilize it as well. The profound statement in which the school makes creates opportunities of function. The most important function being one of encouraged community use.
MAIN ENTRY

The main entry is clearly distinguished by the angular circulation path which leads you into the building. Upon entering the facility, the administration is clearly distinguished because of the glass wall which looks into the administration office from the circulation path. The circulation path, therefore, becomes an opportunity to establish orientation and wayfinding. This is a major point of orientation for first-time visitors and it was crucial that the administration offices were easy to find.
HOUSE ENTRY

The use of individual "house" entries allows for an opportunity to create a family network within the school itself. By simply creating different entrances, each student will feel as if they belong to something which is theirs. More importantly, an opportunity is established by allowing for students to wait and watch for their parents after school within this small entryway. The advantage moves away from the traditional corridor of classrooms without any type of distinguishing entry statement.

objective:
identity
RECEPTION

The overall layout of the plan allows for ease in orientation. The reception desk at the administration facility achieves this through visibility. The open desk design creates an opportunity for receptionists to welcome their visitors immediately after they enter.

In addition, the library, commons, gymnasium, art room, science room, and staircase and elevator become clearly visible as well. The design allows for wonderful opportunities to look inside these rooms and become a part of what is going on inside.

solution:

accessibility and visibility
LIBRARY ENTRY

The physical layout of the library creates several opportunities as well. The most important one being that of visual understanding. The open design of the library allows for one to completely comprehend the space. The stairway leading to the second level is also clearly visible as well.

solution:
central location of resources
LIBRARY

One of the unique aspects of the library is that of a community resource. The flexibility of the library becomes the use of non "user-specific" rooms. These create opportunities for different activities and users. The flexible use can be found in the conference rooms and teacher resource areas which flank the library core. By this I mean that each teacher is not assigned a resource area. There is a central resource area and work room located next to the library. Here, the teacher would find his/her personal needs and perhaps have an individual storage space. The flexible use arises because they can take their materials into the work room, or into a conference room. Therefore, space does not become wasted due to a room title limiting its function or use. More importantly, these conference rooms could also allow for opportunities of community use in tutoring, night instruction, or group interaction.

solution:
non "user-specific" rooms
WALKWAY

The design of the walkway creates several opportunities within the design of the school. Firstly, it allows light into the main circulation path with views to the exterior. Secondly, it reduces the amount of noise disturbance when students move from one place to the next. Finally, it creates a more personal environment when making the transition between the primary and secondary circulation paths. The secondary paths are focused more upon the daily user and less upon the general public.

solution:
primary/secondary circulation
FIRST FLOOR

The design and layout of the houses creates opportunities for easy access to large and small group areas. The circulation system simply ends in the central large group space which acts as a node before entering the individual classrooms. (establishing an area for morning meetings and so on)

The design also creates opportunities of flexibility through what I define as "overflow." By this, I mean that each classroom has the opportunity to allow various activities to flow outside the classrooms into these group spaces. These additional spaces allow for the types of activities which may not be suitable inside the typical classroom such as: lectures, presentations, singing, and playing.

solution:
easily accessible gathering areas
SECOND FLOOR

The design and layout of the houses creates opportunities of visual interaction as well. The secondary circulation system which leads into the houses becomes a type of "indoor street." The implementation of windows along the classroom walls allows for people to look inside and become a part of the classroom activities. Additionally, the "indoor street" creates an opportunity architecturally. The architectural design or adornment of the "indoor street" could become very playful and energetic.

solution:
"indoor street" and large group
KINDERGARTEN

Within a kindergarten, several activities may be taking place at the same time. Therefore, an opportunity is created with the addition of a loft/play/conference area. This area is open to the rest of the classroom but serves very important functions. For example, the loft area is a play area designed only for a child. This allows the child to escape if needed and have some "alone time."

solution:
loft/play/conference
SMALL GROUP

This view portrays the concept of "overflow" which was discussed earlier. This space allows for a place for teachers to interact with their students on a different level or basis than in a typical classroom. The environment is more relaxed and easily adapted with the use of moveable cubes for sitting and working. This space is a wonderful opportunity giver which combines the spirit of both the open and closed-plan schools.

The sliding doors can open into the small group space to let various activities "overflow" outside the classroom. In contrast to the open-plan, the teacher has the opportunity to separate the small group room from the classroom if need be. The interesting factor is that the doors are transparent which allows for visual access into the small group area. I feel this is a positive movement forward to solve the problems of noise control and opaque folding partitions.
FOURTH GRADE

Within each classroom an opportunity is created through the use of tertiary classroom space. At the fourth grade level, these spaces could function as conference and computer access areas. The lowered ceiling level in this tertiary space separates it from the traditional classroom space. This space is wonderful for inducing team activities and presentations. In addition, this also gives the teacher some flexibility in her teaching methods. Hopefully, this area would give way to self-instruction and learning from others.

solution:

tertiary classroom space
HOUSE SECTION

The design of the individual "house" allows for opportunities of group interaction, identity, and team teaching. More importantly, it moves away from the traditional repetition of classrooms along an endless corridor. This type of environment lacks character and interaction with the various classrooms. One moves along the corridor from one classroom into another classroom which is exactly the same.

advantages:

elimination of the endless corridor
HOUSE ISOMETRIC

The "house" isometric clearly shows how the spaces function. There are two grade levels within each house. Each grade level shares a small group area, and the entire "house" shares the large group area. The function of the sliding doors to separate and open up space are also clearly shown.

The most advantageous feature of the "house" is that it creates an opportunity to establish a smaller school within a larger facility. Today, schools are becoming larger and larger, and it is necessary to break-up the space to induce feelings of identity and understanding. As shown, it would be very simple for a kindergartner to find his classroom once he entered the proper "house" entry. This makes it easier for the younger children and also separates them from the older ones as well.
HOUSE SECTION

The design of the individual "house" allows for opportunities of group interaction, identity, and team teaching. This section clearly shows the atmosphere and relationship that each classroom has with the "indoor street," the large group, and the small group spaces. Also, this section also shows the feature of the balcony space which overlooks the kindergarten reading area. This space would be housed in glass to control noise, but would allow visual access to below. This balcony area also provides an opportunity for teachers to gather and discuss daily events as well as a space for students.
the model
MODEL PHOTOS
MODEL PHOTOS
MODEL PHOTOS
in retrospect
IN RETROSPECT

When I look back upon this project, I feel great satisfaction and happiness. I know that I have gained an immense amount of information and knowledge throughout the past year. I also conclude that the thesis was a success.

However, for me, this thesis will never be completely finished. The ideas and hypotheses stated in this book have become a part of me, and always will be. I plan to continue this path of research upon receiving my bachelor's degree in Architecture and Environmental Design at Ball State University.

The future education of the world's children deserves much more attention and care than is presently given. Therefore, whatever my professional endeavors may lead me, I plan to pursue, support, and research new educational methods and the architecture in which it is housed.

As for the results of the thesis design solution presented here, I am satisfied. I am also grateful for the suggestions and criticisms received upon its final completion and presentation. Some of the most helpful criticisms were:

1. The establishment of an additional walkway system along the North side of the building.
2. Identity establishment upon classroom entry.
3. Orthogonal interpretation.
4. Re-evaluate the amount of square footage and use of space.

As for me, I look back and perceive some ideas which could be taken further and questioned once again. Some of these ideas include:

1. Making the "indoor street" more literal and playful with the use of street lamps and street facades as an interior design solution.
2. Establishing various names and "store fronts" to distinguish the various classrooms, small, and large group spaces.
3. Use the large group space to function as a "town square."
4. Create a more playful situation within the small and large group areas by incorporating additional level changes.
5. Use the tertiary spaces located within the classroom as an opportunity to "move away" from the orthogonal nature of the present design solution.

In summary, I am thankful for what I have learned and all the people who helped and supported me throughout this long, stressful, and strenuous semester.
appendix
Questions for Thesis:
Columbus Area School District
School Name: Mt. Healthy
Principal: Dr. Quirky
Phone:

Describe the basic format of your school.
- child-oriented school
- team approach
- flexibility: good = + classrooms
  - non-functional
- special education

What makes your school different than others.
- close knit school = focal pt. of community
  - location
  - pragmatically = +
- average income families
- teachers, quality
  - environment is conducive = flexible
  - low teacher turnover level

Chapter 1 -
remedial reading
(free lunch #s -
due to community
people)

How do you feel your school tries to relate to the varied needs of elementary school children?
- contact w/ parents
- pupil services teacher = counsel + families
- home visits & better in smaller school
- good PTA
- full time nurse Skating party - once a month (are funds needed)
Do you believe that the physical environment of your school affects the learning abilities of the children? (positively or negatively)

5 of seniors & high school came from Mt. Healthy

Do you feel your school relates to the needs of the community?

• facility for meetings, 4H, farm bureau, voting
• trustees = multiple township - work together
• volunteers = fire department

What types of activities does your school offer for community use?

• intramural activities
• special classes - thru school

How would you describe your kindergarten program?

• full day program
• total child oriented = learning centers

Does your school offer an early childhood program, and, if so, what are some of the characteristics?

Head start = 80% participation by parents - parents aren't part of 4-5 year olds.
10 are totally free - fed. government
local foundation education.

* skip ahead: T-Fri 8-1
ride bus, eat lunch, pick-up/
parents pick up by 4 for fees,
parents stay with for fees
in area of class.
What types of learning do you feel are effective at this stage of development?

- Playing games = learning how to do something.
- Reading centers = can be moved.
- Inv. structured vs. child.

Does your school use interactive teaching methods, and if so, can you describe some of those methods.

- Team teaching (5th & 6th = team)
  - Children & teachers move
- Outdoor lab a nature trail, wildlife area
  - Outdoor amphitheater

Science high emphasis

Do the teachers in your school practice group teaching methods?

- Children more involved in learning
- # of activities on video

Do the children ever come together in groups besides recess and gym to work together?

- Fine arts, drama
- Fire protection - safety - gymnasium
- Young Authors Conference - presentation for students
- Science day - Science fair

What type of roles do computers and technology play in your school and what type of roles will they play in the future?

- ILS - integrated learning system
- Support system
- Comp in each class - comp lab also
- Problem solving program
- Children type own papers.
If you could change one thing about your school what would it be and why?

IBM lab = needs assistance
staff dev = field visits in service training
adjusted sched & dismissed @ 1:00 on Wednesday.

Do you feel that children's museums are good sources of learning opportunity, and do you feel that you could incorporate some of those teaching opportunities within your school?

PTA supports field trips
bringing outside people into school.
E PRINCIPAL AS CONSULTANT

There is only one principal in each building it would be better for a number of principals from different buildings to act as a group in responding to the multiple instrument given in Figure 5.3, which covers areas that principals know. Certain portions which require specific information such as media, health, and cafeteria functions would necessitate calling in people from those areas.

FIGURE 5.3

ASSESSING PRINCIPALS' LEARNING ENVIRONMENT PREFERENCES

PART I

Instructions: The board of education and superintendent would like to know what you would like to see in the new school being planned. Seriously think about each item below and select one choice from those offered which seems most pleasant to you.

---

1. A school should look like:
   a. a big house with many rooms
   b. a school like: _______________________________(Name)

2. Bookshelves
   a. Should be built flat against the wall
   b. Some bookshelves should extend into the room to form alcoves

3. Should there be trees around the school?
   a. Yes
   b. No

4. Should there be flowers and shrubs?
   a. Yes
   b. No

5. Should there be a big grassy area around the school?
   a. Yes
   b. No

---

6. Should there be a fish pond on the school grounds?
   a. Yes
   b. No

7. Should the playground have basketball courts?
   a. Yes
   b. No

8. Should the playground have softball diamonds?
   a. Yes
   b. No

9. Should the playground have equipment like swings, slides, seesaws, go-rounds, etc.?
   a. Yes
   b. No

10. Should the playground have picnic areas?
    a. Yes
    b. No

11. Should there be a place for student vegetable gardens?
    a. Yes
    b. No

12. Should the playground have sheltered areas so students can still go outside in inclement weather?
    a. Yes
    b. No

13. The classrooms should have:
    a. a tile floor
    b. a wood floor
    c. a thin carpet
    d. a thick soft carpet
    e. half of the room should be carpeted

14. The walls in the classroom should be:
    a. red brick
    b. light wood
    c. dark wood
    d. painted concrete block

15. Should the classroom have windows?
    a. Yes
    b. No
16. Should the windows have curtains? (Leave blank if you marked Number 15 "No")
   a. Yes
   b. No

17. Should there be places in the room where students can be alone to study, read or rest?
   a. Yes
   b. No

18. Should there be bathrooms attached to each classroom?
   a. Yes
   b. No

19. Writing surfaces for students should be:
   a. single desks
   b. tables
   c. pull-downs hidden in the wall when not in use

20. Should there be a studio-type balcony in the room for students to do independent work?
   a. Yes
   b. No

21. Should there be a large clock on the room wall?
   a. Yes
   b. No

22. Should there be an intercom system in each room?
   a. Yes
   b. No

23. Should there be a bell system for signaling recess, or lunch period, or dismissal times?
   a. Yes
   b. No

24. Should each teacher have his/her own desk?
   a. Yes
   b. No

25. Should there be a television in each room?
   a. Yes
   b. No

26. Should there be background music in the room?
   a. Yes
   b. No

27. Instead of ceiling lights, should there be desk lights, or table and floor lamps?
   a. Yes
   b. No

28. Should there be plants and flowers in the room?
   a. Yes
   b. No

29. Should each student have his very own storage area?
   a. Yes
   b. No

30. Should there be a door to the outside in each room so that students can learn outdoors when the weather is nice?
   a. Yes
   b. No

31. Which way of furnishing a room sounds best to you?
   a. Every student has his own metal desk
   b. Bean bag chairs, large pillows, some chairs and couches
   c. Large tables with chairs
   d. A combination of b and c

32. Should the media center be in easy access to each classroom?
   a. Yes
   b. No

33. The media center should be large enough to accommodate:
   a. 10% of the student body at any one time
   b. 25% of the student body at any one time
   c. 40% of the student body at any one time
   d. 55% of the student body at any one time
   e. 70% of the student body at any one time
   f. 85% of the student body at any one time

34. Should the media center have soundproofed rooms for students to view movies, play records or tapes, or type, etc.?
   a. Yes
   b. No
35. Should there be a large indoor play area for children?
   a. Yes
   b. No

36. Should there be a separate art studio for children?
   a. Yes
   b. No

37. At lunchtime, students should eat:
   a. In a big cafeteria
   b. In their classroom

38. Should students be allowed to eat their lunch out of doors during good weather?
   a. Yes
   b. No

39. Should students and teachers have facilities in the classroom for preparing some meals?
   a. Yes
   b. No

40. In general, a classroom should look like:
   a. A nice livingroom
   b. A room with desks for each student, a teacher's desk, a chalkboard, a bulletin board and some shelves

41. Storage of classroom materials should be mainly:
   a. In filing cabinets
   b. On open shelves
   c. In closets

42. Should there be a door to the outside in each classroom?
   a. Yes
   b. No

43. Should there be a teacher's lounge with individual planning areas for each teacher?
   a. Yes - units of teachers
   b. No

44. Each classroom needs how many chalkboards?
   a. 1/2 a wall
   b. 1 wall
   c. 1 1/2 walls
   d. 2 walls

45. Each classroom needs how much bulletin board space?
   a. 1/2 a wall
   b. 1 wall
   c. 1 1/2 walls
   d. 2 walls

PART II

Instructions: Perhaps Items 1-45 have given you some new ideas. Keep the "flavor" of your former responses in mind as you respond to the following areas. Please feel free to draw diagrams when it seems necessary to make clear your intentions. Please keep student population data in mind as you plan. Be specific and comprehensive.

1. What functions are necessary to the front office?
   After school detention - in library (lunchtime)

2. What kind of space allocations are necessary to carry out these functions?

3. What office furniture is needed?

4. Suggestions for a pleasant and functional reception/foyer area?

5. What type of school bus loading and unloading areas are necessary, functional, and attractive?
Questions for Thesis:
Columbus Area School District
School Name: Parkside
Principal: Dr. Charles Ellis
Phone:

Operable windows

Operable windows

Describe the basic format of your school.
- Not uniformly organized across all grade levels
  Cooperative teaching - no team teaching (staff time; effort)
  Teachers work together; brainstorm
  Do not move kids around (helps with everything)
  Primary level → teachers don't move either
  3rd; 4th - more classroom switching
  (no special grouping as far as levels of education)

4 classrooms/grade
Prime time = limited class size.

What makes your school different than others?
Every school has a personality
- Friendly & supportive
- Drive for success in a positive manner
- Strong academics for lower economic class
  (not a Chapt. 1 school)

How do you feel your school tries to relate to the varied needs of elementary school children?
- Physically handicapped → service to other communities
  Mentally Challenged as well
  Assume parents → workshops for other students & handicapped
  (handicapped preschool 3; 4 yr. olds) 10 per room
- Good mainstreaming
  Multiply Challenged (behind level)
Do you believe that the physical environment of your school effects the learning abilities of the children? (positively or negatively)

Affects achievement (grouping)
  - Ability for teachers to expand what they can do due to facilities capability

Do you feel your school relates to the needs of the community?

Scout Groups
  - Strong program (use various locations)
  - Catholic school uses gymnasium
  - EPS meetings

What types of activities does your school offer for community use?

  * Electives program for students
  * Teacher acceptance & parental support

How would you describe your kindergarten program?

  Developmental level
  - (varied level of learning vs. same)
  - Kids learn from each other but they don't segregate except for special occasions.
  - Need more grouping (activities together = teachers)

Does your school offer an early childhood program, and, if so, what are some of the characteristics?

  Most students come from preschool — but not all should't be located here
What types of learning do you feel are effective at this stage of development?

Does your school use interactive teaching methods, and if so, can you describe some of those methods.

* Academic Challenge -> talented -> elite attitude (better than others)
  Causes some friction

\[ \text{mixture of students from grade level} \Rightarrow \text{helps kids enjoy that.} \]

Do the teachers in your school practice group teaching methods?

- Open fields entire school
- \( \frac{1}{2} \) school can be held in Harrison room = group room

Do the children ever come together in groups besides recess and gym to work together?

What type of roles do computers and technology play in your school and what type of roles will they play in the future?

- Computers on every teacher's desk — assess student achievement
- One computer lab vs. computer curriculum
- Computer in each room