Fostering Educational Growth Through Design: Wyneken Memorial Lutheran School Renovation

An Honors Thesis (HONR499)

by

Madeline Albert

Thesis Advisor

Reza Ahmadi

Signed

Ball State University
Muncie, Indiana

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Abstract

Elementary schools are the environments that shape children’s minds and build the foundation of their knowledge. The interior of the education facility can have a great impact on the effectiveness of the teaching and level of student development. Many facilities, such as Wyneken Memorial Lutheran School, have not been fully remodeled to current guidelines. Renovating this elementary school and relocating certain classrooms and activity areas can have a positive impact on the experience had by the faculty and students. The Wyneken facility was examined and research was conducted through the program outlined in this binder. New design concepts were created based on the findings of the programming design phase. The final design concept includes plans for new and additional furniture, new color palettes, materials, and lighting, and also construction drawings which would be used to direct the new construction and renovations of this building.

Acknowledgements

I would like to thank Professor Reza Ahmadi for his continual advisement of this project and his instruction throughout my four years at Ball State University.

I would also like to thank Daniel Bultemeyer, Principal; Janine Albert, Pre-Kindergarten teacher; and the remainder of the faculty and staff at Wyneken for their cooperation and participation in collecting information for the programming phase and guiding the decisions for a new design.
Author's Statement

The purpose of this project for Wyneken Memorial Lutheran School was to renovate their space and provide them with a facility that will be able to foster educational growth. This program is a collection of activities and information that are compiled to serve as a base for the construction plans for the renovated school. The following methodologies listed here are the main ways that information was collected before the design began.

Site Visit and Observation
Observed the school facility while conducting a walk through. I recorded the issues I saw that need to be addressed in the project.

Client Needs Assessment
Interviewed teachers and other employees to determine their needs and issues with the space. I also observed the students as they traveled throughout the school and recorded additional needs that they had as users of the space.

Values and Issues Analysis
Created a list of issues and values based on observations and interviews. These lists will be used to guide the design of the classrooms and other spaces and ensure that they meet the needs of the occupants.

Client Interview
Asked questions of faculty to determine their needs for the space. I also spoke with the principal to gather his opinions of what spaces could be improved, and where he sees the school progressing. This future needs assessment will

Literature Reviews
Conducted research on other school facilities and considerations for elementary school design. Many different articles, books, and websites were used as references in guiding the design of Wyneken Elementary spaces.

Precedent Studies
Observed and studied precedent facilities similar to Wyneken Memorial Lutheran School. I found photos of classrooms, libraries, common areas, and resource rooms in elementary schools around the country. These case studies and successful schools gave me inspiration and evidence for design decisions.

Photo Observation Studies
Gathered and analyzed inspirational photos. These inspirational photos provided many ideas for space planning and furniture layouts, as well as color and use of materials.
Behavioral Mapping
Studied a similar facility to observe traffic patterns and user behaviors. I chose to study the Whiting Business Building on Ball State University campus because it is also a large educational facility with traffic patterns similar to that of Wyneken.

Prototypical Sketching
Created preliminary sketches of the floor plan to be used to adapt the spaces. Planning the use of the spaces and the amount and type of furniture that will be used is a more accurate way to plan the necessary square footage of each space.

After all this information was collected, it was compiled into the document in this binder which is referred to as the program. When the programming phase was completed, the design phase began, which led to the creation of design boards to illustrate the new color palettes, materials, and lighting. These design boards also include the floor plans to demonstrate where certain rooms have been relocated to and also new furniture and design elements in each space. These design boards, floor plans, and many more construction documents created for the Wyneken Memorial Lutheran School building renovation can be found on the enclosed CD.
Wyneken
Memorial Lutheran School Renovation

Madeline Albert
Honors Thesis
Project Advisor: Prof. Reza Ahmadi
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Many thanks to Daniel Bultemeyer, Principal; Janine Albert, Pre-Kindergarten teacher; and the remainder of the Wyneken staff for their continual cooperation and participation in collecting the information for this program and guidance in the design process.

Acknowledgements
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Directory
"Through Jesus Christ, it is the mission of Wyneken Memorial Lutheran School to REACH children with the love of Christ, TEACH them of God’s Word and world, and SEND them out as faithful stewards in God’s Kingdom."

The school is located in rural Adams County and serves the families of the 3 supporting churches. The facility offers educational programs for children Pre-School to 8th grade, a Day Care facility, and many sports and musical programs.

Wyneken’s Mission
Decatur
City in Indiana

Decatur is a city in Root and Washington townships, Adams County, Indiana, United States. It is the county seat of Adams County, and a medium sized city with a median household income of $37,234.

Area: 5.792 sq miles (15 km²)
Weather: 42°F (6°C), 87% Humidity
Population: 9,418 (2013)

Wyneken
Students and Faculty
Total Students Enrolled: 190
Total Full Time “Equivalent” Teachers: 11.8
Full-Time Teachers: 9
Part-Time Teachers: 6
Average Student-To-Teacher Ratio: 14.6
Percent Minority Students: 3.2%
Students Gender Breakdown
Males: 84 (44.2%)
Females: 106 (55.8%)

DEMOGRAPHICS

Number of Students Per Grade

Student Ethnicities

WHITE
HISPANIC
BLACK

96.5% 2.3% 1.2%
The purpose of this project for Wyneken Memorial Lutheran School was to renovate their space and provide them with a facility that will be able to foster educational growth. This program is a collection of activities and information that are compiled to serve as a base for the construction plans for the renovated school. The following methodologies listed here are the main ways that information was collected before the design began.

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### Proposed Project Schedule

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<th>SEPTEMBER 2014</th>
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<td>Schematic Design</td>
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<th>MARCH 2015</th>
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<td>W1 W2 W3 W4</td>
<td>W1 W2 W3 W4</td>
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Existing Facility Floor Plan
Existing Facility Images
This facility, at over 70,000 SF, has been innovatively designed to allow for the future expansion. Large common use spaces - cafeteria, gym, and media center - are centrally located, creating a crossroads of accessibility and curriculum for the shared value of both. Designers and educators came together to create a dynamic palette of interior finishes, selected to engage the students in their environment.

Each wing of the building is designated with its own accent color to assist in wayfinding and instill a sense of identity and individuality. As one travels through the space, they experience a gradient of colors shifting from one to the next - blue to turquoise to green as they approach their destination. The selected hues will also support healthy learning as they provide an enriching and welcoming environment that improves visual processing, reduces stress and encourages brain development.
These photos are of the elementary school library. They have the books arranged in a very traditional manner and in linear style, but the arrangement allows for a nice storytime area. The Wyneken library is much smaller than this and does not have any open space for small children to gather, just several small tables, so that could be a nice addition.

These two shots are of the cafetorium, similar to the one in the Wyneken Elementary School. This area is here being used for a school performance with chairs in the audience area for parents, and also an educational speaker with the kids sitting at the cafeteria tables.
This building is located in a very shady area in the front of the site that prevents the extensive windows from taking in maximum light. The rooms on the exterior and especially in the front will have natural light and views, but all the interior rooms have no windows and very little daylight. The interior is brightly lit to make up for lack of artificial light. The building has multiple entrances and circulation is effective. The planning and layout of the building are also effective and the building is easy to navigate.

The systems used in the building are used effectively but improvements could be made in HVAC and lighting. The main issue with these systems is the differences between the hallways and classrooms. The halls are well lit and comfortable but the classrooms are more dim with less pleasant lighting, and also do not have proper circulation with the doors closed and can get very stuffy or too warm.
Observation Information for first visit, December 2, 2014
10:00 AM- 10:30 AM

This day of observation was fairly busy even though it was a time when many people were in
the middle of class. There were about 15 people who passed through the space on the way
to other classrooms, and about 10 people who entered the building individually. There were
also 2 groups of several families on a campus tour that passed through the building. When
there were groups of people in the space or passing through, the area was fairly loud.
1. Boy- student  
   Corner chair  
   10 minutes  
   Watching television-waiting for class

2. Girl- student  
   Double couch by window  
   5 minutes  
   Waiting for class-using phone

3. 2 girl students  
   Couch by display case  
   25 minutes  
   Talking about a class project

4. Girl- student  
   Corner chair after #1 boy  
   10 minutes  
   Studying and eating a snack

5. 3 girl students  
   Couches by windows  
   15 minutes  
   Talking-waiting for next class

Observation Information for 2nd visit, December 3, 2014
11:00 AM- 11:30 AM

This day was a little busier after 11:00, because there were a few groups that came and gathered and talked about final projects or classes. People who were not in groups were either studying, on their phone, or watching the television. The TV was set to a news station, so it didn't hold many people's full attention for long, and was not set loud enough to overpower the individual conversations. Many more people also entered and exited the building during this time, most likely to go to and from lunch.

This space was not really decorated in any way and did not particularly draw the eye when passing through. Since it was not loud and busy, I think more people were drawn to it as a place to sit and wait for their classes and relax for a few minutes. There are also small swivel tops on the seating to use for books or laptops.
"A CRITICAL REVIEW OF ELEMENTARY SCHOOL DESIGN" Amy Cole

This information is a master's thesis for interior design, focusing on analyzing the design of elementary schools. The author chooses two schools to compare, an open plan building and a "factory model" school building. The two models are analyzed in how they function on a large scale as a whole institution, and how individual spaces and classrooms function. Also discussed is the importance of understanding the teaching methodologies being utilized in the school and how those relate to the teaching environment. This thesis analyzes each classroom and gathering area and how they are being effectively or not effectively used, and also goes on to discuss each individual element in the rooms, such as windows, artificial lighting and desk layout, and how this effects the teaching methods and children's learning.

"UNIVERSAL DESIGN IN ELEMENTARY AND MIDDLE SCHOOL" Margaret Flores

This article addresses The Association for Childhood Education International's (ACEI) mission to provide all students with access to learning materials in an environment that is beneficial to them. With the increase in diverse learning needs, it is important to design spaces that foster all types of development in students. When designing for the present and future needs of students, it is necessary to incorporate technology and learning utensils in a way that will benefit a wide range of abilities and not leave anyone out. Special additions and design elements can be added to help students reach their full potential and be able to use the learning tools more independently in the future. Volume of space and layout should also offer ease of maneuverability and activity, without having to exert unnecessary energy for those with impairments or who use wheelchairs.

Literature Review
INTERNATIONAL CODE COUNCIL (International Building Code)


"ELEMENTARY SCHOOLS" Ellen Larson Vaughan

This article addresses the design of elementary schools and how these buildings have a profound impact on all children. The primary school environment is what shapes the child from a young age, and can have a positive influence on their learning or an adverse effect. As teachers perform their duties and children are taught, they are influenced and stimulated by the light, color, texture, scale, and navigation of their surroundings. Each age group of students requires different environments and spaces to help them flourish academically and socially, and sometimes spaces must be adaptable to accommodate children of many ages. The navigation and layout of the school must make the students feel comfortable and confident while also promoting safety and security for everyone in the building.

WYNEKEN MEMORIAL LUTHERAN SCHOOL

The website and information about the school I am designing is important to the program because it helps establish essential information for solving the design problems. School information such as number of students, faculty, and current activities will benefit the design. Information on current activities will aide in observing and recording the spaces that are needed for special events. This website can also provide me with photos of how classrooms and other spaces are being utilized on a daily basis by students and faculty.
THE DESIGN OF ELEMENTARY SCHOOLS

This article developed from a presentation EE&K Principal Sean O'Donnell, AIA, LEED AP gave at the Inter-American Development Bank's 2-day workshop in Santiago, Chile in late September. The workshop engaged the vice-ministers of education from the region and top experts on Education and Infrastructure from around the world in a dialogue on the Infrastructure in the 21st Century and Learning. A 21st-century elementary school is a complex system of environments that may need to address a wide variety of educational, social, recreational, environmental, and community needs. This article seeks to explain how we can plan new elementary schools that will be effective now and in the future to serve the children and community. The article discusses how to create a child-scaled environment, foster flexible classrooms, extend learning beyond the classroom, employ subtle security, engage the community, and establish a civic presence.

SPACE IMPACTS LEARNING

Trung Le's recommendations for using space to help transform teaching and learning include: change the language; eliminate "classroom" from vocabulary and talk about learning activities and settings; plan a diversity of agile spaces for learning, because no one space can truly be "multipurpose"; accept that creativity isn't just for the arts, and process isn't just for the sciences. Find the collisions; put the users, the teachers and the students in control of their space, furniture, technology and digital tools; create spaces at every level that look more like kindergarten and are experiential, interactive, collaborative, active, and exciting.

LEARN FOR LIFE. NEW ARCHITECTURE FOR NEW LEARNING

This article talks about a diverse collection of inspiring architecture and interiors that support progressive models of acquiring knowledge. New interpretations of kindergartens, schools, universities, and libraries are featured along with architecturally innovative offices and conference rooms. These examples are rounded out by more experimental projects that offer further perspectives on the rapidly evolving topic of how best to learn in the new millennium.

The groundbreaking spaces promote learning by inspiring, providing us with helpful tools, and facilitating opportunities for productive cooperation and the exchange of ideas within groups. This book makes clear that the creative use of architecture and interior design not only provides a new physical framework for acquiring knowledge, but also revitalizes and advances the process of learning as a whole.
RESEARCH BASED DESIGN OF AN ELEMENTARY SCHOOL

This research paper examines current learning styles and teaching methods in order to suggest a new form of learning environment for young students. The author discovered features such as different activity settings and small group activities aimed at enhancing learning that resulted from the participation of students, teachers and parents in the design of the Gibsonville Elementary School. Teachers, working in small groups, compared different classroom arrangements along with criteria to compare and evaluate each alternative and unanimously selected an “L” shape classroom, which became the basis for the design of the school. Another critical design feature that emerged from the teacher workshop was direct access from each classroom to the outdoors, allowing teachers to create outdoor classrooms. He discusses his final design which featured four academic houses of six L shaped classrooms each around an open courtyard to provide a resource for students, parents, and teachers to collectively explore and maintain out-door environmental themes. He also describes how a post-occupancy evaluation helped discover the most effective arrangement for the furniture in the L-shaped classrooms.

10 CURRENT SCHOOL FACILITY FEATURES THAT ARE OBSOLETE

This article looks at school facility features that are obsolete today and yet are still in wide use: departmental organizations; learning in prescribed spaces; school corridors; traditional school libraries; computer labs; gyms without natural daylight; teacher centered classrooms; isolate classrooms; institutional food service; and large gang restrooms. Once we recognize these ineffective features that keep being included, we can change and improve the interiors to better suit the needs of the children and teachers.
Steelcase Active Learning Case Study: How Classroom Design Affects Student Engagement

The success of any student is influenced by many variables. Academic studies have investigated several of them, from socioeconomic background to internal motivation to the influence of different teaching styles. Still often overlooked or underemphasized is the role of classroom design. New data from ongoing Steelcase Education studies shows that classrooms designed for active learning—i.e., where physical space supports a focus on engaging experiences for students and faculty—have a significant effect on student engagement. The results of the beta study and the following term's aggregated data revealed that classrooms intentionally designed to support active learning increased student engagement on multiple measures as compared to traditional (i.e., row-by-column seating) classrooms.

NCEF Relevant Codes and Standards

National Clearinghouse for Educational Facilities (NCEF)—Managed by the National Institute of Building Sciences, NCEF is the largest source of school facilities information in the world. NCEF provides information on planning, designing, funding, building, improving and maintaining safe, healthy, high performing pre-kindergarten through grade 12 schools and higher education facilities.

Planning to Learn: The Role of Interior Design in Educational Settings

American children spend a significant amount of time in a classroom setting. Many of these environments are in older buildings with outdated environmental systems such as heating and cooling, lighting, sound, or other acoustical controls student performance in school has been shown to have a relationship to the quality of the building. Sensory stimulation can both enhance and detract from the learning process of a young child. Visual, tactile, and auditory senses are crucial in learning and need to be considered in the design of the built environment. Many teachers and students, however, are coping with inadequate classroom spaces, outdated buildings, and deteriorating interiors. Poor quality environments can create learning barriers such as impaired concentration for many students who will be distracted by negative attributes in these enclosed interior spaces. These impacts are especially significant for younger children in elementary school settings who are more susceptible to negative environmental stimulation.
The client needs to have an updated space with better functioning HVAC system and bathrooms. Some spaces in the old wing also need to be reconfigured for better use of space and better way finding. The users of the space move around a lot from classroom to classroom but many extra rooms are not used effectively. There are also large multipurpose public spaces that need to be rearranged to be used more effectively without extra equipment getting in the way. One issue that may arise would be budget and timeline. Their budget is going to be very limited and there may also be an issue completing any construction during the short summer months.

<table>
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<tr>
<th>Requirements</th>
<th>Preferences</th>
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<tbody>
<tr>
<td><strong>Students</strong></td>
<td>Clean, safe places to learn. Rooms need effective HVAC systems</td>
</tr>
<tr>
<td><strong>Teachers</strong></td>
<td>Plenty of useable space for teaching purposes and storage. Activity specific spaces. Design that promotes innovative teaching</td>
</tr>
<tr>
<td><strong>Parents</strong></td>
<td>Safe, clean, and healthy environment for their children to learn. Building that is easily navigable</td>
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### Client Issues and Goals

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<th><strong>ISSUES</strong></th>
<th><strong>GOALS</strong></th>
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<tbody>
<tr>
<td><strong>COMFORT</strong></td>
<td>Students and teachers should feel comfortable and at ease to promote better learning and interaction</td>
</tr>
<tr>
<td><strong>MOOD/AMBIENCE</strong></td>
<td>Students, teachers, and parents should have a positive response upon entering the building that promotes learning in the facility. People who are in the space should feel calm and have a positive change of attitude, which ties in with the school's goals of welcome and ministry.</td>
</tr>
<tr>
<td><strong>ECONOMY</strong></td>
<td>Quality of construction and new materials should create pleasant and productive spaces that are completed in timely fashion within budget.</td>
</tr>
<tr>
<td><strong>FLEXIBILITY</strong></td>
<td>Spaces should allow flexibility of use for multiple purposes unless they are a devoted classroom. People in the space will be able to change the space to their needs.</td>
</tr>
<tr>
<td><strong>CIRCULATION</strong></td>
<td>Circulation of students, teachers, and parents throughout the building will be simple and effective. Circulation in the large multipurpose spaces will be set up effectively for when large events are held.</td>
</tr>
<tr>
<td><strong>BEHAVIOR SETTINGS</strong></td>
<td>Physical settings of classrooms and teaching spaces will not be distracting to users but promote further education.</td>
</tr>
<tr>
<td><strong>MAINTENANCE</strong></td>
<td>Design of spaces and new materials need to be easily cleanable to maintain quality and cleanliness throughout the whole building.</td>
</tr>
<tr>
<td><strong>INTERACTION</strong></td>
<td>Arrangement of newly designed spaces will promote learning and collaborative interaction between students. Spaces for teachers and parents will foster social interaction and sharing of ideas between those adults, which will in turn help the students and school community.</td>
</tr>
</tbody>
</table>
ISSUES

COMFORT

FACTS

Many spaces that are not classrooms are very sterile and smooth-surfaced and not very welcoming.

MOOD/AMBIENCE

The sterile environment doesn't always promote a positive mood, except for the classrooms, which the teachers adapt and decorate to make more welcoming.

ECONOMY

The school doesn't often have a large budget for remodeling, and they also have a very small timeline for construction and improvements, because the building is often used for events throughout the summer.

FLEXIBILITY

The large multipurpose areas are used for many reasons and have a lot of equipment and tables that need to be stored. Many tables are just stored along side the wall and can be an eyesore.

CIRCULATION

Circulation from the classrooms to the main area where the kids are picked up is often overcrowded and chaotic. Traffic to the 2 large event areas is clear from the entrances but the vestibules and waiting areas by the entrance are overcrowded and block the entrance.

BEHAVIOR SETTINGS

Students don't always react well and can be uncontrolled in a large space without smaller activity pockets.

MAINTENANCE

Regular maintenance is already performed on existing VCT flooring but a large amount of maintenance is not possible, because there is usually just 1 janitor for the whole facility.

INTERACTION

Interaction in the public areas for waiting can be difficult because there is virtually no seating. People waiting have to stand and large groups of students waiting for their parents have to sit on the floor in the lobby.

Collection and Analysis of Facts
## Prototypical Sketches and Criteria Matrix

**Wyneken Memorial Lutheran School, Decatur, IN**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>RM 101</td>
<td>915 SF</td>
<td>Lobby</td>
<td>Yes</td>
<td>Daylight and view</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>RM 404</td>
<td>669 SF</td>
<td>Library, 8th Grade</td>
<td>No</td>
<td>Both</td>
<td>None</td>
<td>Computer/electrical</td>
</tr>
<tr>
<td>RM 207</td>
<td>500 SF</td>
<td>Pre-K thru 2nd grade rooms</td>
<td>Yes?</td>
<td>neither</td>
<td>Yes</td>
<td>Toilets, sinks</td>
</tr>
<tr>
<td>RM 205</td>
<td>510 SF</td>
<td>Pre-K thru 2nd grade rooms</td>
<td>Yes?</td>
<td>neither</td>
<td>Yes</td>
<td>Toilets, sinks</td>
</tr>
<tr>
<td>RM 204</td>
<td>1125 SF</td>
<td>Pre-K, 1st, 2nd grade rooms</td>
<td>No</td>
<td>Daylight, no view</td>
<td>No</td>
<td>Toilet and sink</td>
</tr>
<tr>
<td>RM 211</td>
<td>946 SF</td>
<td>Pre-K thru 2nd grade rooms</td>
<td>No</td>
<td>Daylight, no view</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>RM 203</td>
<td>924 SF</td>
<td>K, 1st, 2nd</td>
<td>No</td>
<td>Daylight and view</td>
<td>No</td>
<td>Toilet and sink</td>
</tr>
<tr>
<td>RM 403</td>
<td>908 SF</td>
<td>Classrooms</td>
<td>No</td>
<td>neither</td>
<td>No</td>
<td>Computer equipment</td>
</tr>
<tr>
<td>RM 210</td>
<td>967 SF</td>
<td>Classrooms</td>
<td>No</td>
<td>Daylight, no view</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>RM 201</td>
<td>930 SF</td>
<td>Pre-K, K, 2nd, RR 205/207</td>
<td>No</td>
<td>Daylight, no view</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>RM 202</td>
<td>920 SF</td>
<td>Pre-K, K, 1st, RR 205/207</td>
<td>No</td>
<td>Daylight and view</td>
<td>No</td>
<td>None</td>
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<tr>
<td>RM 303</td>
<td>112 SF</td>
<td>Child Care</td>
<td>No</td>
<td>neither</td>
<td>No</td>
<td>None</td>
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<tr>
<td>RM 310</td>
<td>602 SF</td>
<td>Door #10</td>
<td>Yes</td>
<td>Daylight, no view</td>
<td>Yes</td>
<td>Toilet and sink</td>
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<tr>
<td>RM 302</td>
<td>200 SF</td>
<td>Upper grade classrooms</td>
<td>Yes?</td>
<td>Daylight, no view</td>
<td>Yes</td>
<td>Toilets, sinks</td>
</tr>
<tr>
<td>RM 301</td>
<td>170 SF</td>
<td>Upper grade classrooms</td>
<td>Yes?</td>
<td>Daylight, no view</td>
<td>Yes</td>
<td>Toilets, sinks</td>
</tr>
</tbody>
</table>
Prototypical Sketches
After information was collected by all the previous methods shown in the program, this bubble diagram was created to begin the design process. The various colors and bubbles show how the spaces may be arranged based on the information learned about Wyneken and the needs of the faculty and students.

Bubble Diagram of Spaces
In conclusion, many of the problems discovered and captured in this program can be solved by the reallocation of spaces to create a more functional school. Expansion of essential spaces and creation of seating areas will improve the useability of the spaces, and material and finishing updates will improve the space as a whole. Research and interviews continued to be employed during the design process in order to create a space that fosters educational growth for all students and teachers at Wyneken Memorial Lutheran School.

The completed design and construction documents for the renovation can be found on the enclosed CD for reference. The use of color, texture, and new materials brought the new spaces to life and created learning environments that are pleasant to occupy. I believe these plans would serve Wyneken well in years to come, as they expand their horizons with new teaching methods and are able to educate as many children as possible.

Conclusion
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References