

# How Best Practices in School Facility Design Effect Student Outcomes

A presentation based on “Effects of School Architectural Designs on Students” Accomplishments: A Meta-Analysis (Tanner, 2015) <http://www.efc.gwu.edu/?s=Tanner>



Crow Island School

Presentation at the

- ✦ National Facility Masters Conference
- ✦ February 21-24, 2016
- Embassy Suites at Kingston Plantation, Myrtle Beach, SC

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706 614 1338

<https://www.youtube.com/watch?v=TpUACqt0nM8>

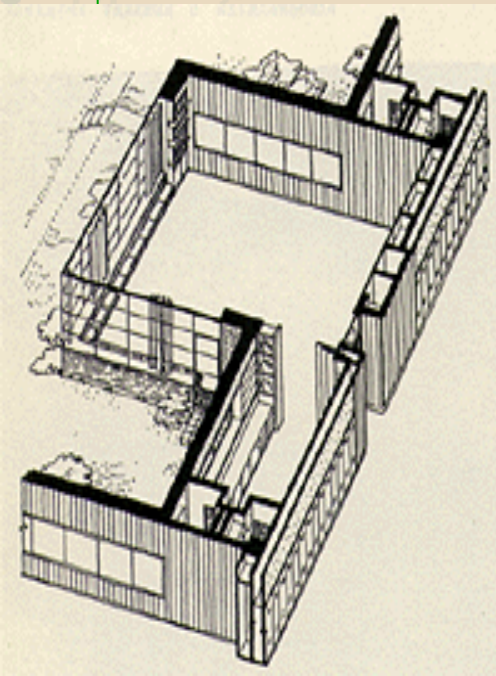


## How Best Practices in School Facility Design Effect Student Outcomes

Family of Design Groupings*	Statistically Significant	Best Practice
Pattern 1 – Movement and Circulation	YES	YES
Pattern 2 - Natural Light – Day Lighting and Views	YES	YES
Pattern 3 - Safety and Security	YES	YES
Pattern 4 - Display Spaces and Places for Student Artifacts and Mini-Museums	YES	YES
Pattern 5 - Storage Places for Personal Artifacts	YES	YES
Pattern 6 - Quiet Places and Spaces	YES	YES
Pattern 7 – Green Space	YES	YES
Pattern 8 – Outdoor Rooms	YES	YES
Pattern 9 – Instructional Neighborhoods	YES	YES
Pattern 10 – Technology for Teaching and Learning	YES	YES
Pattern 11 – Public Areas	NO	YES
Pattern 12 - Color Configurations	YES	YES
Pattern 13 - Climate Control	NO	YES
Pattern 14 - The Roof System as a Major Factor in School Design	NO	YES
Pattern 15 - Overall Impression	YES	YES

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School Design Groupings	Best Practice	Influences Student Outcomes & Describes Effects on Behavior and Learning
Safety and Security	YES	Belonging, <b>A Sense of Place</b> , Freedom From Fear
Vistas of Green Spaces	YES	Esthetics, Physiological Influence, and <b>A Sense of Place</b>
Color Configurations	YES	Esthetics, <b>A sense of Place</b> , Correlates with Lighting
The Overall Impression	Yes	Clean Place, Safety and Security, Esthetics, <b>A Sense of Place</b>
The Roof System	YES	Safety and Security, Esthetics, Orientation, Health, Protection from Weather, <b>A Sense of Place</b>



<http://sdpl.coe.uga.edu/schooldesign.html>

Crow Island Illustrates  
**A Sense of Place**

Images of Crow Island School Used by Permission of Roger Shepard Perkins & Will

## How Best Practices in School Facility Design Effect Student Outcomes

School Design Grouping	Examples I	Examples II	Sources *
Safety and Security	Starts with site location, Location with natural barriers, &	Blends pleasantly into terrain.	Castaldi, 1994 Earthman, 2009
Vistas of Green Spaces	Provide a transition from one focal length to another, &	Assumes windows in the classroom.	Tanner & Lackney, 2006 Alexander et. al., 1977
Color Configurations	Effect motivation. Cool colors tend to convey a reassuring effect, while	Hot colors influence rapid physical activities. Color effects blood pressure.	Castaldi, 1994 Wurtman, 1975
The Overall Impression	Includes a clean, Well organized facility,	Presents a welcoming entry, & Creates a sense of place.	Earthman, Cash, & Berkum, 1995 Greenman, 1988
The Roof System	Correlates with safety and security factors, &	Prevents some types of indoor air pollution.	Liska, 1988 Alexander et. al., 1977

\* See: <http://www.efc.gwu.edu/?s=Tanner>



# How Best Practices in School Facility Design Effect Student Outcomes

## Drones in planning and construction: School Management Strategies

		<u>Tools &amp;</u>	<u>Technology</u>
School Design Grouping	Examples	Drone	APPs: Land Glide, Hover Air Space Maps
Safety and Security	Site location, Location with natural barriers	Google Earth Pro	Imaging Instrumentation

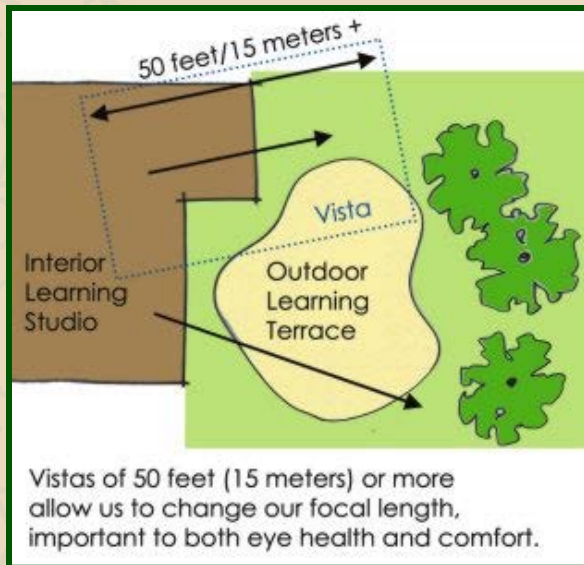


Using a drone in site location



## How Best Practices in School Facility Design Effect Student Outcomes

		<u>Tools &amp;</u>	<u>Technology</u>
School Design Grouping	Examples	Research	Computer models of plant growth and relationships among various forms of vegetation.
Vistas of Green Spaces	Provide a transition from one focal length to another, & enhances curriculum.	Specifications	Topography Models



## How Best Practices in School Facility Design Effect Student Outcomes

			<u>Tools &amp; Technology</u>
School Design Grouping	Examples	Examples	Knowledge of the relationship between natural light and color combinations
Color Configurations	Effect motivation. Cool colors tend to convey a reassuring effect, while	Hot colors influence rapid physical activities. Color effects blood pressure.	Know the effect of natural light on student behavior and learning



Honeycutt Elementary, NC, Shuller, Ferris Architects



Fielding: [www.designshare.com](http://www.designshare.com)

# How Best Practices in School Facility Design Effect Student Outcomes

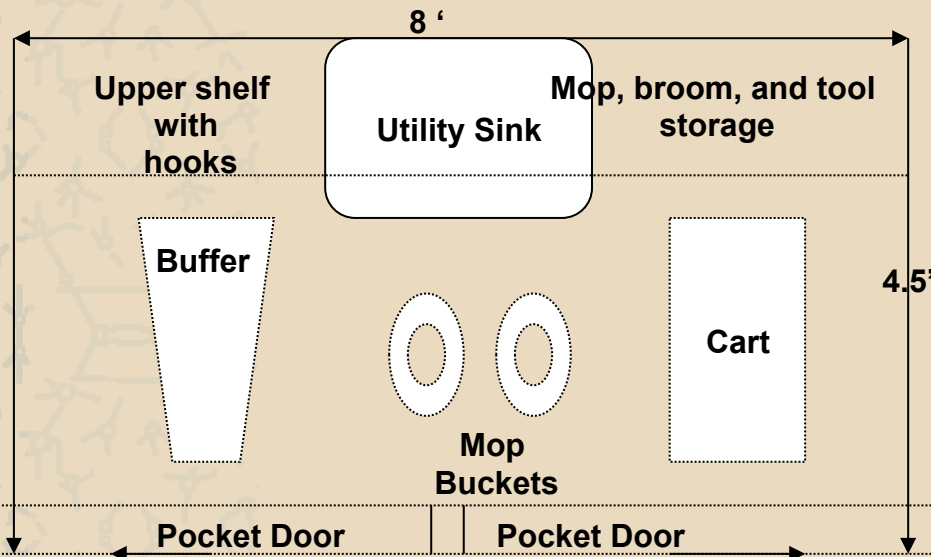
## The Link Between Managers, School Principals, and Custodians

- 💡 **Essential Question:**
- 💡 Does the **cleanliness** of a school make a difference in students' accomplishments?

💡 Black and English summarize their remarks about custodians and principals:

- The real basics are always custodial.
- The best custodians run your school like it were their own home.
- When a student gets sick in the hall, slops ink on the walls, whom do we call? *The grime busters!*
- The chief custodian is *your chief* or there are too many chiefs in your school.
- Ineffective custodians work for administrative wimps.
- If you can't keep the school clean, chances are you are not able to improve learning in it either; so who needs you?

(What They Don't Tell You in the School of Education About School Administration, p. 229)



**Safety Feature**

**Major School Design Feature**





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### 💡 Essential Question:

💡 Does the **overall Impression** of a school make a difference in students' accomplishments?



💡 <http://www.issa.com>

💡 International Sanitary Supply Association

💡 <http://www.appa.org>

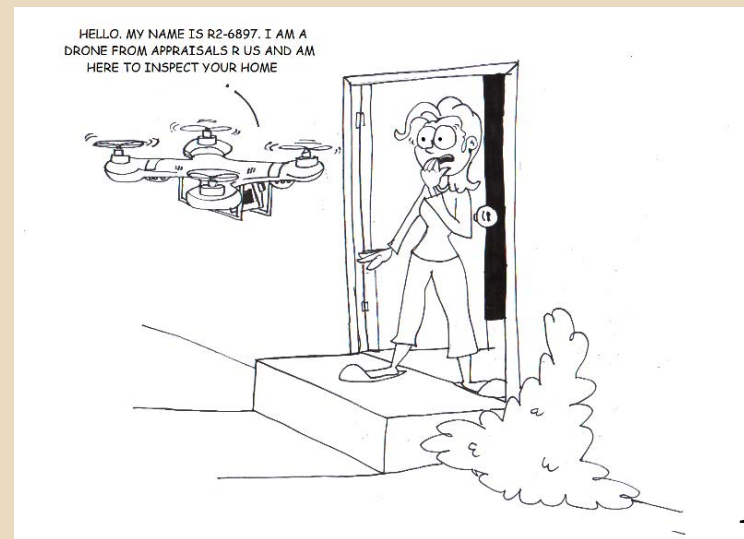
💡 Association of Physical Plant Directors

- Standards for Cleanliness
- (Level 1 ..... Level 5)



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		<u>Tools &amp;</u>	<u>Technology</u>
<b>School Design Grouping</b>	<b>Examples</b>	Drones with regular cameras and thermography cameras	Roof Layout Drawings
<b>Roof System</b>	<b>Roof Inspections, Appraisal</b>	Materials in roof system	Other Imaging Instrumentation





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## Review Questions:

-  How do the feeling of safety and security and the presence of esthetics impact student learning?
-  Do views of green spaces influence achievement?
-  What Influence does color have on students?
-  How does the overall impression and cleanliness of a facility fit into the student achievement equation?
-  What major, but often unnoticed, school design feature influences student learning?

Drone checking for air leaks in a structure!



**Thermal Camera**

<http://www.thenational.ae/uac/technology/drones-armed-with-thermal-cameras-inspect-etihad-towers>

<http://www.equipmentworld.com/drones/>



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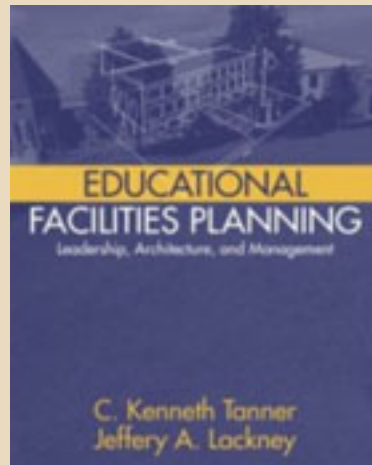
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We must look at the physical environment through **Design Groupings**

- Design **Principles**
- Design **Components**
- Design **Elements**

Main Sources for this presentation:

<http://www.amazon.com>

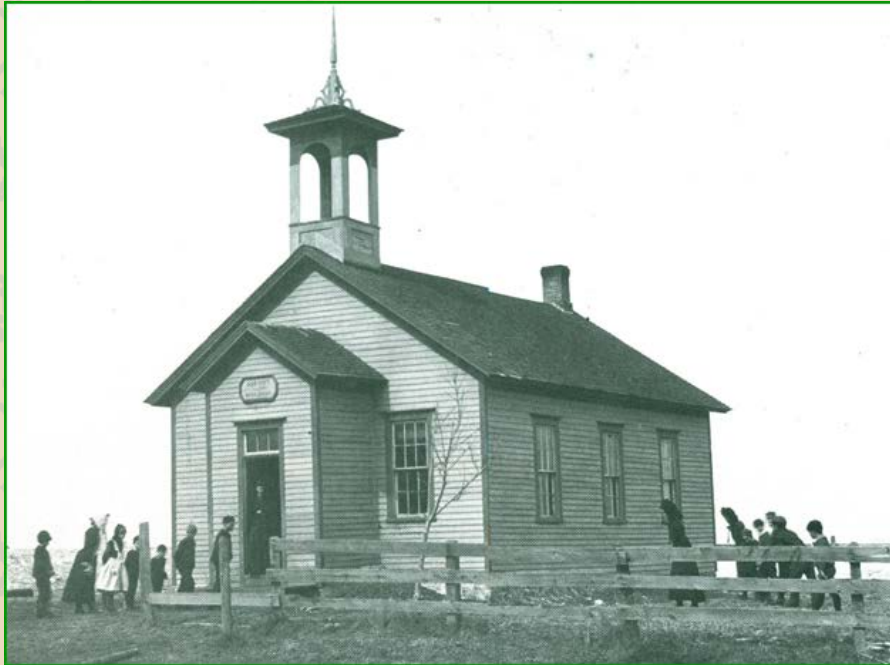
**The Language of School Design**

<http://www.amazon.com>

<http://www.efc.gwu.edu/?s=Tanner>



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💡 Sources of various images appear on each page. Educational images were provided by:

- 💡 [www.tfp.org](http://www.tfp.org)
- 💡 [www.designshare.com](http://www.designshare.com)
- 💡 [www.ablongman.com](http://www.ablongman.com)

