**Facilities for 21st Century Learning**

**Ideas for 21st Century Facilities**

**Facility as a Teaching Tool**

Every square foot of a school building and its grounds can be seen as an educational opportunity. Giving students an understanding of how the school building works and how it fits into their broader community can foster their sense of ownership and engagement with their learning environment. The teaching tools listed here are suggested ideas. The intent is for the Project Design Team to develop a theme/brand that can tie the school, the community, and the educational mission together. Within that context the teaching tools suggested below should be selected with consideration to supporting the school’s theme and educational mission. LEED and Federal or site specific sustainability requirements that are potentially teaching tools should be addressed through exhibitry and the overall school theme. The cost for teaching tools provided in a school should not exceed $250K without prior coordination with HQ DoDEA.

**Exhibitry (Indoor & Outdoor Signage)**

- Define the theme/brand or culture for the school through super graphics displayed at strategic locations such as the entrance, the commons, and access to individual neighborhoods.
- Exhibitry should be thematic for a particular school and its neighborhoods (i.e. the Phantom neighborhood in an aviation themed school).
- The theme/brand should be built into all signage inside and outside the school.
- Use exhibitry to highlight sustainability features, technology and utility systems (i.e. exposed structure/systems, occupancy lighting, manual shading controls, LID Bio Swales, etc.).
- Promote physical activity and health in schools and the use of the building as a public health instrument (how many calories do you burn when you climb the stairs, etc.) through exhibitry.
- Curriculum may be concurrently developed with DoDEA Education support so the teaching elements will be designed to support the overall branding and theme for the school.

**Exposed Structure/Systems:**

- Include exposed structure or building systems, especially in gathering/assembly areas (i.e. interactive dynamic window opening or building demonstration wall cut-out).
- Use appropriate exhibitry to relate systems to learning concepts (i.e. label the piping and equipment and provide information on how these systems work with age-appropriate concepts).
- When possible provide dynamic components like digital flow meters or temperature sensors on chilled water piping to engage the students and provide information that can aid in learning.
- Engineering systems must be encouraged as a fun learning tool and promote students into STEM fields.
- The school can be presented as a “body”: consider an “Operation Game” in which the data/electrical wiring represents veins, HVAC represents lungs, and the building structure represents bones.

**Dashboard**

- Think beyond just a central prominent dashboard that displays information on the energy usage of the school (energy use/production, weather data).
- Consider an expanded system (i.e. touch screen interactive dashboards at each neighborhood), having the dashboard available as an “app” on student smart phones or web browsers, or consider different formats, such as an Interactive, hands-on exhibitry.

**Example of building demonstration wall cut-out, courtesy of Zyscovich Architects**

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**Fort Rucker Elementary School aviation theming, courtesy of Schenkel Shultz**
“energy table” versus a screen on a wall.

- Sub-meter the different wings or areas of the building separately.
- Increase student awareness of the school’s energy and environmental impacts as an interactive educational experience tied to school curriculum.
- Making a competition out of striving for energy savings engages students at a new level. System must go from a screen on a wall to information that can be adapted in an actual learning environment.
- The dashboard should be connected to demonstration solar panels, wind turbines and weather stations designed for age appropriate educational use.
- All demonstration teaching tools should have a defined purpose (i.e. Install solar charging stations for laptops and handheld devices, and shall include appropriate, child-scale exhibitry.

DoDEA Dislikes:

- Cast in concrete details requiring maintenance (maze/maps)
- Water features that do not provide a function (i.e. fountains).
- Upper story rooftop gardens (cost/maintenance).
- Speakers along a walkway (maintenance costs).
- Living wall “living air bio-filters” (high cost/maintenance).
- Solar tubes (roof penetrations).
- Excessive floor graphics (high cost/maintenance and custom finished floor issues).
- Light fixtures that make shapes (if excessive cost).
- Electric vehicle charging station.

Water Harvesting

- Use rainwater harvesting (inexpensive rain barrels) to demonstrate the water cycle for a defined purpose (i.e. to water a student garden).

- Spillways or troughs may be used as water features when utilizing the harvested rainwater for irrigation in an outdoor classroom.
- Use exhibitry to highlight Low Impact Development (LID) features used at the school and their connection to the water cycle and responsible storm water management.

Outdoor Learning Environments

- The PDT should be challenged to integrate the great things on each school site into learning opportunities (i.e. butterfly gardens that will attract local specimens, nature trail highlighting local endangered species, site history, etc.)
- Identify indigenous plants used in the landscape and make connections to natural resources.
- Highlight local culture or the legacy of who the school is named for.
- Outdoor learning environments should be designed to be easily maintainable.

PDT to Consider only low cost/cost effective features:

- Outdoor Amphitheaters sized for small gatherings (40-50 students) are permitted only if able to use natural grade, with minimal material cost.
- Outdoor mazes are permitted only if they are low-maintenance designs.

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