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How USMA's West Point Elementary School is helping prepare students for 21st Century

Ribbon Cutting Ceremony for the new West Point Elementary School. Credit: West Point Elementary School.

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By JoAnne Castagna, Ed.D.

Recently, Colonel Matthew Posner, MD, spoke at the ribbon cutting ceremony for a new state of the art elementary school at the U.S. Military Academy at West Point, New York, a school he attended as a child. Posner told attendees about a former teacher, Mr. Tom Robinson, or Mr. R, as he was known. "He without a doubt, taught me all that I really needed to know for a future in my current profession," Posner, a USMA graduate and an Orthopedic Surgeon at Keller Hospital, recalls. "He taught, he disciplined, he coached, he nurtured, he cared. He set high standards for us, academically and spiritually."

Posner went on to discuss the time his class spent a week at Lake Frederick under Mr. R's care. The experience included outdoor classes, field events and survival training courses. The reason behind mentioning Mr. Robinson was to remind the attendees about the most important link in the education chain: teachers, particularly elementary school, whom he said help students take relatively blank canvases and create masterpieces."

Mr. R was in the audience.

Posner's fourth grade daughter, Sarah-Jane, attends the same elementary school. Posner says he hopes she will be able to reflect on her elementary school days with the same fondness of her teachers and experiences as he does. "The new school gives our teachers a whole new set of tools to educate our kids with."

This is likely to happen, thanks to the U.S. Army Corps of Engineers, New York District's recently completed school, which will provide teachers the tools they need to teach students about STEAM or science, technology, engineering, art, and mathematics to prepare them for the 21st Century. The Army Corps has constructed many of the structures on the historic 200-year-old military academy. Now it has created a school for the children of Army Soldiers and Department of Defense civilians who live at the academy.





Teachers at the school are providing students a STEAM education. To do this, they are using a myriad of technological tools and the school is designed to be flexible and adaptable to provide different kinds of learners the environments they need to succeed.

"STEAM gets a bad rap, as many adults and kids are easily intimidated by math, science and engineering," Posner says. "Many folks believe that rocket science is capable of being understood by just a few super intellectual kids. Making STEAM education available at young ages enables our children to see just how fascinating these disciplines really are and knocks down any perceived barriers that STEAM is too complex for the average child."

Posner says the world has transformed into a technology-based economy—one in which today's children must be comfortable on computers, and well-versed in science and engineering. "In a way, the recent pandemic has turned many folks into pseudo scientists, epidemiologists, geneticists and pharmacists. STEAM is important in our everyday lives and it's incredibly important to have the background in the basics of these disciplines."

The new West Point Elementary School is helping to provide this. It replaced an outdated structure that was built in the 1960s. The school, which serves 509 students from pre-kindergarten to fifth grade, is located near the campus's middle school and gym. The multi-story, 95,552 square foot school was built into the side of a mountain and has beautiful views of the Hudson River, the river valley and the surrounding forests. Its design embraces this beauty to educate students about their region and the local culture.

To bring the vibrancy of the region into the building, large windows were installed throughout the school, and the floors and ceilings are painted with a wide variety of colored paints.

What also does this are the interior structures. Timothy Pillsworth, Project Engineer, New York District, U.S. Army Corps of



Engineers says instead of having utilitarian staircases, the stairwells are painted with pleasing colors for a pastoral feel.

Speaking of utilitarianism, instead of having corridors with classrooms to the left and right, students are learning in flexible learning spaces called Learning Neighborhoods. The school has five Learning Neighborhoods. Inside each neighborhood there are six learning studios, a teacher collaboration room, and a kitchenette that surround a central learning Hub.

The studios can be used for large or small groups and one-on-one instruction. They are flexible spaces that provide teachers an opportunity to be more collaborative in their teaching and they will be able to group students with interests, needs, and learning goals. Another benefit of these spaces is that it makes the best use of time during the day. Instead of students leaving their neighborhoods to see different instructors, the instructors come to them in the neighborhoods. The center Hub area serves as a seating and learning area and has a variety of different chairs and tables for students including couches, beanbags, and pillows. Posner says the center Hubs are his favorite aspect of the new school because he feels students should learn about collaboration. "It's not an innate behavior to work effectively with others in small or large groups. The school is designed to promote this collaboration at the lower grades and really builds on this concept as they advance in grades."

When training to become a doctor, Posner realized the importance of collaboration. "Medicine is all about collaboration and life-long learning. I remember the first thing that my anatomy professor told us on our first day of medical school, 'Everything you get taught over the next four years is already outdated.' This really hit home for me. Learning never ends, no matter the profession you choose. And didactic-style learning is not an efficient or even a realistic way to

learn as an adult. Exposing our children to collaborative learning and learning through multiple platforms is, in effect, getting them ready to be adult learners."

A calming effect

Throughout the entire school, there are interior soundproof windows, water bottle filling stations and partition walls that open and close like accordions, allowing the teachers to expand or limit the areas where they give their lessons. The school not only teaches STEAM but applies it to save the school energy.

For example, there are LED light fixtures (Light-emitting diodes). These lights have sensors that turn off or dim the lights depending on the amount of natural light entering the large windows and if there are people occupying the room. But natural light from the large windows is being used to the fullest. Light wells are also throughout the school to let in natural light.

Besides sufficient light, adequate heat is also important, especially in this region. To efficiently regulate the room temperature, a special pump system is being used. Instead of having one big boiler for the entire school, the building will have three smaller ones. If heat is needed, one of the boilers will run up to 30-40 percent of its capacity. If additional heat is needed, the second one turns on and so on. They will ramp up or down depending on the need. "Smaller boilers work more efficiently when they don't run at their full capacity and they last longer," Pillsworth says.

The boilers are part of a radiant heating system. Radiant heating systems supply heat directly to the floor or to panels in the wall or ceiling of a structure. In the school, heated water circulates through plastic tubing within the floors. Pillsworth says that when students sit on the floors in the wintertime, the floor is warm.

During the warmer months, the students have air conditioning—something they never had before—provided by an efficient central chiller plant. Some of the building's energy is generated from solar panels and a wind turbine on the roof of the building. Outside there are playgrounds for





the different age groups, an outdoor patio for art classes and an amphitheater for instruction, gatherings, and performances.

In addition, the Army Corp is constructing an enclosure that connects the new school to an existing gymnasium, so the students won't have to walk outside to get to their physical education classes. Most recently, the old elementary school was demolished, and the space used to create space for a main access drive, bus drop-off, parent drop-off, and 123 parking spaces.

While all these school features were being constructed, the Army Corps had the students get involved, as a way for them to learn about STEAM careers. Since before the Army Corps even broke ground on the project, the students have been highly anticipating their new school and playing an active role in its creation.

Throughout the construction, students looked out their windows at the construction and made daily entries in journals about the changes they observed week to week. One thing they observed in the beginning, were trees being removed to make space for the new school. The students were concerned that this would harm wildlife. The teachers saw this as a real-life learning opportunity and arranged for a wildlife expert to speak

with them. Together they came up with solutions to safeguard wildlife.

Not only did the students interact with wildlife specialists, but also with Army Corps engineers and architects who performed studies with them and showed them maps and print outs of the project. This experience has made many students extremely interested in architecture and planning.

The Army Corps also arranged to have speakers for the students. Civil engineers, architects and environmental specialists spoke with the students and explained what's involved with planning and constructing a new school. One of the speakers explained how soil is removed to prepare for the building. From this the students learned about slopes and the differences between different soils and terrains.

As construction progressed on the project and the school's interior was being worked on, the students wanted to play a role in the designing of their Learning Neighborhoods. They selected the color schemes, the furniture for the center Hub area, and they voted on an animal mascot to represent each Learning Neighborhood. They also chose animals indigenous to this region, including the Snow Owl, turtle, Black Bear, and raccoon. When students enter their Learning Neighborhood, they see a mural of their mascot displayed at the entrance.

Enter with class

Now that the school is completed, it continues to educate the students about STEAM careers. When students enter the building, the floor in the main foyer displays the granite that was removed to make way for their new school and to show them what was there before.

Eight thousand cubic yards of granite was blasted, excavated and recycled. Some of the rock was used as fill in the



construction and some was used by the academy. As they continue to walk throughout the building, students see colored concrete on the floor with contoured lines, showing them the original foundations or grades. "Students will be able to use these grades to create topographical maps," Pillsworth says.

In the hallways, the students will be able to see and learn about the building's internal operating systems. There are glass windows on the hallway walls, displaying the guts of the building, such as the heating pipes inside the walls.

On the hallway ceiling, students can look inside a 20-foot-long window, exposing the school's internal mechanical piping, wiring, and cabling systems at work. "There are signs stating, 'This is your chill water pipe where your air conditioning comes from' and 'This is a fire sprinkler pipe for fire protection," Pillsworth says. On the roof, where additional energy is being generated from solar panels and a wind turbine, the students can monitor the weather and learn about renewable energy. The students have an energy dashboard that tells them, "Hey today is a sunny day or a windy day."

Outside, there is a walking path around a storm-water detention pond. Classes can walk around this system and see the vegetation and animals, and how the system works to protect the environment. It also is a way for students to see how local plants and grasses can be integrated into construction projects."

Just as the students were involved during the construction of their new school, they were just as involved in the ribbon cutting. Students attended the ceremony from their Learning Neighborhoods using their new video conferencing system as a COVID-19 safety precaution. FC

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