Harbor School student Gina Brown works on the NY sloop replica being built by the school's students. Photo by Sofie Malinowski.

High Performance in Education

How the maritime setting enables higher levels of training and learning

BY GAYLE HORVATH

Education in the maritime sector has always had a unique character compared to other educational settings. Historically, the middle class, education, and maritime trade have been very tightly interlinked. Countries with emerging maritime trade tend to require high levels of education, which in turn drives the development of the middle class and progressively higher standards of living.

The uniqueness of the link between maritime and high levels of education was strongly evident during the late 18th and early 19th centuries through the naval midshipmen system. This arrangement resulted in the development of highly-trained officers in an organic (and low-cost) educational program aboard ships, where the senior officers functioned as the teachers. The shipboard midshipmen training system has gradually shifted ashore but still provides an effective training program in maritime academies around the world, enabling students to move rapidly to a high level of operational functionality in the workplace. Where else can one obtain a bachelor of science degree and a ship's officer's license in four years, including a significant amount of on-the-job training, with excellent job prospects at comparatively low cost?

SNAME membership consists of maritime academy graduates and a large population of engineers trained in universities and technical schools. However, the education of naval architects and marine engineers

Educators and business owners are rediscovering maritime educational effectiveness and efficiency.

tends to differentiate itself from other engineering specialties due to its focus on ships. This focus creates full-function micro-communities and requires the student to balance a wider assortment of constraints than other engineering specialties. A concurrent benefit enables lowerclassmen to study and visualize tactile concepts, rather than esoteric abstractions.

Meanwhile, a large part of the world is struggling to develop higher performance methods for the education of the younger generation. Various arguments hold that today's educational systems are broken. This may or may not be true given the difficulty in measuring today's educational needs and achievements against those of the past. However, science, technology, engineering, and mathematics (STEM) do require additional attention in today's society. Unfortunately, in most efforts to improve STEM education, other important educational components—such as art, history, philosophy, or language—are being sacrificed.

Rediscovering effectiveness

The maritime setting is starting to prove that much higher educational performance can be achieved. More accurately, educators and business owners are rediscovering maritime educational effectiveness and efficiency. We should note that while no one using the maritime setting would discourage their students from entering the maritime field as their chosen profession, the most significant goal is in the use of the maritime setting as a highly effective training and learning environment.

What makes maritime environments so effective? Many synergetic factors can be identified, but consider the following.

- Marine settings continue to provide levels of unknowns that can be studied by students with even rudimentary levels of scientific training.
- Problem solving skills are often effectively developed with minimized educator interference in unfamiliar surroundings, particularly in maritime environments.
- Even in a very informal approach, an organic command structure provides students with the ability to learn to take charge and follow directions.
- Maritime enables students to teach other students, which is one of the most important components of organic education.
- Maritime enables students to clearly fail, but with the ability to re-evaluate and try again. This is parallel to the way that school sports develop this ability, but with maritime the failures are in the STEM realm.
- The cultural completeness of the maritime setting allows students to address STEM subjects and philosophical, historical, language, and arts subjects simultaneously. This approach is becoming known as STEMPHLA.

Maritime provides students with a setting in which they can use STEMPHLA and problem solving skills while constructing and operating actual tools, rather than learning through imaginary concepts. These may appear to be strong and unsupported claims, but typical maritime academy training incorporates all of these educational aspects. But should these educational concepts be applied only at the college level, or could education in general benefit from earlier use of this approach?

In 1982, the Monmouth County, New Jersey vocational school district started experimenting with this concept at the high school level and created the Maritime Academy of Science and Technology (MAST) at Sandy Hook, New Jersey. Initially, this school was created as a trade school for marine mechanics. But after a few years, the school leaders realized that this educational setting, which incorporates a navy junior ROTC program in a natural maritime environment, provided students with such a rich learning experience

Vessel operations student drives *INDY 7*, the Harbor School's donated navy launch. Photo by Aaron Singh.

High Performance in Education *continued*

Students in the marine systems technology class. Photo by Harbor School staff.

that mechanics training was almost too easy to achieve for the student body, and the entire program was elevated to a very rigorous college preparatory program. The program includes high levels of original research and applied technology development, using the maritime environment as the research and testing ground. Programs range from on-water research projects to freshman year full-size cardboard boat design, construction, and operational evaluation.

Today, MAST is one of the top high schools in the nation with very high graduation rates and impressive university education success rates. While MAST attracts high-achieving county students, who are recruited by military and marine academies, only a small percentage of the students actually enter the maritime industry. The majority attend (often with scholarships) non-maritime universities. However, most students acknowledge that the maritime setting enabled them to learn more, learn it faster, and learn it with more fun than any other educational setting they can imagine. They also recognize that their already-developed skills in research and problem solving resulted in a seamless transition to the university environment.

Recognizing this level of success at the high school level, a small educational organization in Monmouth County, New Jersey, started experimenting with these concepts at the fifth to eighth grade level. This organization, Navesink Maritime Heritage Association (NMHA), originally focused on maritime historical and cultural preservation. To support this mission, the decision makers at NMHA decided to organize a boat-building festival, where families could build a simple canoe in a weekend. This program quickly started to focus on boat construction with fifth to eighth graders and then assisted area children in building their own canoes. The children then used these canoes on the water during a week-long summer "River Rangers" river exploration program. This program has been refined over the last 10 years and has provided hundreds of middle-school students with the opportunity to build their own tools; to learn from their mistakes; to experiment; to learn about STEM issues without realizing it; and to learn that the world is not prepackaged but is filled with surprises that most adults never have experienced. While NMHA runs River Rangers for area children, the same program has been adopted by the Red Bank Charter School for its students.

While simple in concept, the educational factors previously noted apply to this program as they do in a maritime academy. The real question is: How young should children be to take advantage of marine high-performance education?

Meanwhile, some 10 years ago, Murray Fisher, a former member of the Waterkeeper Alliance, started to wonder about these maritime high-performance issues, and received permission to experiment with them in a failing high school in Brooklyn, New York. His efforts resulted in the formation of the Urban Assembly New York Harbor School. Initially, the program consisted of a separate school within a failing high school in Bushwick, Brooklyn. After a few years, the maritime approach started to significantly improve educational effectiveness and graduation rates rose rapidly—from 23% in 2003 to 86% by 2012. Undoubtedly, this level of success is related to talented teachers and administrators, but these results could have never been achieved if the students were not moved to new and much more effective educational settings, approaches, and opportunities.

The rapid educational improvements have resulted in an even more significant change for the Harbor School, in the form of a campus in the heart of New York Harbor on Governor's Island. This move coincided with ever-increasing graduation rates, test scores, and university and maritime employment successes. To some extent, the school has become a victim of its own success, where higher-achieving New York City students are starting to clamor for admission to this effective high school. The mission to elevate lower-performing students can become suppressed. Murray Fisher and his legion of maritime education supporters are well aware of this, and he admits to pondering the question: How can we apply the high-performance benefits of maritime education to grade schoolers? **MT**

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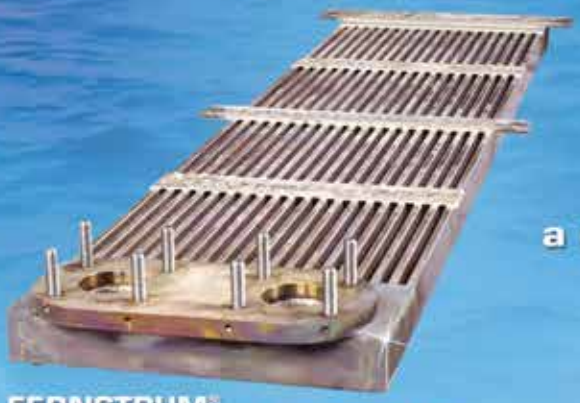

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