

# Students Drive, Teachers Guide:

Winter Projects Provide Transformational Teaching  
by Maria Buteux Reade



## Headmaster Bill Taylor initiates innovative coursework

Boys learn best by doing. Faculty and students reconfirmed that notion as they engaged in a variety of projects during the winter term, an initiative proposed by Headmaster Bill Taylor. Some projects were hands-on, collaborative, independent, or all three.



Here's a glimpse into three projects.

## BRIDGE PROJECT

Jay Kellogg and Ryan Henry (*physics and math*)

Ever wonder how a bridge is built? 11 students enrolled in this course explored civil engineering and bridge construction from the physics and math perspective. Each student selected a specific bridge from anywhere in the world; most chose some structure they're familiar with. They researched topics such as the bridge's design, costs, EPA regulations, and traffic load. One boy discovered that the Golden Gate Bridge was designed to move laterally up to 27 ½ feet to withstand an earthquake. Another learned that the Chesapeake Bay Bridge tunnels under the bay because the water depth varies from 20 to 100 feet. The engineers couldn't sink pillars deep enough so the bridge descends into a tunnel which allows ships to pass through the channel above.

The project culminated with each boy writing an article that could potentially be submitted to a professional engineering journal. Students also built balsa models of various truss designs to enhance their knowledge of how geometry

responds to force distribution. A bucket filled with sand tested the model's structural integrity.

Over the course of the project, the boys studied the concepts of load limit and force calculations as well as how environmental factors impact design and construction materials. Northern bridges need to withstand ice load while warmer coastal spans must bear up to hurricanes.

Although students worked independently to research "their" bridge, they teamed up on the balsa models. They also shared pertinent articles and resources they discovered, posting them on the portal for their peers to access. According to Jay Kellogg, one of the instructors, "Kids really liked the hands-on nature, and they enjoyed contributing shared resources." One student reflected that he grew more comfortable with independent research and actually enjoyed losing himself in the project. "I gained a new respect for bridges and those responsible for designing them."

Teachers from different academic departments worked in pairs to create an interdisciplinary topic, a step which inspired collegiality. Students could choose from an array of fifty projects. According to Taylor, "Giving the students the opportunity to select their project allowed them to have greater autonomy in the process."

"Absorbing, analyzing, synthesizing and applying content with the goal of creating something new enhances the dynamism of the experience," Taylor continued. "By creating a project that incorporates two academic disciplines, students gain a deeper appreciation for the interrelation between subjects. The skills engaged in project-based learning, including time management, prepare students for the types of collaborative learning that occurs in college and in the workforce."

This transformational teaching places students at the center of the learning process, actively engaged in pursuing information and developing skills. Faculty no longer serve as 'sage on the stage' providing the lesson for students to dutifully absorb. Roles are reversed: students drive while teachers guide. With these projects, faculty offered the initial materials to introduce the topic while students sought additional resources and analyzed the information as they worked through their projects. The end result could be practical (a product is developed) or theoretical (a new understanding of a concept).

## ECONOMICS OF THE COCAINE TRADE

Scott Harff and Christina Kratzman (*Economics and Spanish*)

Should international cocaine trafficking be legalized, and if so, what regulations should be placed on the trade? Eight students researched legislation, human and health impacts, indigenous rights, and international trade of this illegal narcotic. Weekly assignments include readings, documentaries, and videos.

The students were also enrolled in Scott Harff's economics classes and had gained working knowledge of concepts such as externalities (unintended consequences), globalization, supply and demand, black markets, and corruption. For this project, however, the students needed to apply those terms to the cocaine trade. They also examined the problem from sociological and

humanitarian angles such as who drugs impact beyond the dealers and users.

Harff reflected, "It's been interesting to watch the students make their own connections as we veer away from linear thinking and dive into the "what if" and "how" questions. For example, one boy observed that an addict will pay anywhere from \$10 to \$100, so dealers can charge whatever price they want because the demand is there. That's supply and demand in action."

Christina Kratzman added, "In the second half of the project, the students worked independently to seek their own resources and build an annotated bibliography. The bibliography needed to explain the purpose and value of each resource and show



## THE LANGUAGE OF BASKETBALL

Mark Corliss and Ralph Fedele (*Mandarin and English*)

Imagine you're a teenager living in China and want to learn how to play basketball. You search the Internet and bam, a video pops up with American kids demonstrating the fundamentals while instruction is offered in ... Mandarin.

Dream met reality as 17 students collaborated to produce a series of instructional videos that teach the rudiments of basketball. "The enrollment cut across all spectrums," said Mark Corliss, Mandarin teacher - we had varsity basketball players, techies, and Mandarin students. What united these kids is their love of tech and basketball which shrinks any global or language boundaries."

These professional-quality videos were loaded onto a student-designed website, with accompanying social media platforms, branding, and advertising. Aspiring basketball players of any age or gender in China can now watch these presentations and learn the game.

"I needed self-starters who could collaborate with their peers," said Corliss. "I was in the wings

as a resource but it was up to them to run with this. I turned them loose and let them create. This project capitalized on the kids' current interest while also pushing them to develop or strengthen another skill set."

The project had eight distinct components tied to creating the videos, and each boy participated in two realms. Each group had a team leader who ensured the tasks were completed. Components included demonstrating the basketball skills (shoot, dribble, rebound, guard, etc.); filming and editing; language translation; website design; social media/branding; research of non-BMI or ASCAP music for the video; advertising; and code writing for future apps.

"The kids had to keep everything on track to meet the overall production timetable we arranged. This project married process with product," Corliss concluded. "Kids learned how to use social media in positive ways, to connect outside themselves with other cultures."

And true to form, Bill Taylor offered an independent study near to his heart. "An English teacher (Will Dore) and I combined on a project that looked at how the arts were involved in counter-culture movements in the 20th century. Students chose their era and the type of art they wanted to explore. One focused on the Harlem Renaissance and its influence on the civil rights movements, another focused on the Vietnam era. A third explored the arts through the theme of American Exceptionalism."

The Project-Based Learning committee that helped launch this inaugural session is exploring the next

steps. This project will appear as a two-credit class on a student's transcript, providing the college counselors with rich fodder for a student's written profile.

"Critical thinking, communication, collaboration, and creativity are highly valued skills in the 21st century and equip students to become more adept problem solvers," Taylor concluded. "Projects like these provide ways to place students at the center of their educational process and ensures that our graduates are life-long learners and contributing members of society amidst the challenges of an ever-changing world."

why it works. This step prepares students for college-level research: how to weed through information and assess its value."

Students developed a final presentation and shared their findings with the class. They staged a mock congressional hearing to decide whose "bill" would pass.

The teachers opted for a paperless format, posting and exchanging information via the portal and responded to students' questions electronically. Harff noted that "This faceless approach prepares the students for independent college learning with online work and hybrid classes. They're given guidelines, receive

support electronically, and collaborate with peers online. This taught them self-advocacy as they contacted us with questions, and they had to manage their time to adhere to deadlines." Kratzman said, "We were accessible but the project rested on their shoulders. Kids learned to adapt to the independent style of self-education."

Chris Connolly '17 reported that "I learned to effectively synthesize articles and take the most important information to build my argument. I have a much better understanding of the war on drugs and its impact on society."