Mercersburg students tackle high-level challenges through new capstone experiences

BY LEE OWEN

This year, groups of students have visited a computer animation studio in Connecticut that makes some of Hollywood’s most-popular animated films. They’ve sampled the cuisine of a James Beard Foundation Award-winning chef at one of his bustling restaurants in downtown Washington, D.C., and talked with him about creating their own businesses. They’ve examined issues of hunger and poverty, debated ethics and Freudian theory, traveled internationally to conduct independent research and immerse themselves in cultures very different from their own, and have begun work on what will become a 40-to-50-page research paper on a topic of their choosing.

None of these students are in college. Some have yet to even begin their senior years at Mercersburg.

They are the first group of Mercersburg students to enroll in one of two capstone academic programs that were offered for the first time during the 2013–2014 academic year. Fifteen members of the upper-middler (11th-grade) class were chosen by application as the first students in Mercersburg’s Advanced Program for Global Studies (or MAPS), and approximately 45 seniors elected to sign up for one of three interdisciplinary SpringBoard courses—Entrepreneurship, The Global Food Chain, and 3D Design.

Beginning in the 2015–2016 academic year, all students will be required to enroll in SpringBoard or MAPS in order to graduate—but for members of the Classes of 2014 and 2015, the courses are completely optional. Still, nearly 35 percent of this year’s senior class opted to sign up for a SpringBoard course, including a full 50 percent of postgraduate students in the student body.

“I think it really speaks to our students’ desire to do something novel and challenge themselves,” says faculty member Pete Gunkelman, who is team-teaching the 3D Design course. “When we presented the idea of our course to the students last spring, we described it as ‘a synthesis of math and art.’ We knew there were kids who were really interested in the math side, and we knew there were some interested in the art side. And we have some kids doing undergraduate-thesis-level work.”

“I’m thrilled with how the students have responded, when you consider this is a course the students aren’t getting Advanced Placement credit for, or even departmental credit,” says Emily Howley, a history faculty member who teaches The Global Food Chain and also serves as director of the SpringBoard program. “I’ve already had kids come up to me and say they wish they could have taken this class even earlier.”
At the request of Head of School Douglas Hale, Mercersburg’s faculty began an intensive review of the school’s curriculum in 2008. The resulting recommendations were wide-ranging and included the official affirmation of six 21st-century skills (critical thinking and problem solving; effective communication; collaboration; information literacy; creativity, curiosity, and imagination; and personal responsibility and accountability) as those most important for Mercersburg students to master; the adoption of a slightly later start to the academic day (in accordance with research by cognitive scientists on creating an optimum environment for adolescent learners); the requirement that all students take courses in each of the core disciplines (classical & modern languages, English, history, mathematics, religion, science, and fine arts) in their ninth- and 10th-grade years; and the creation of two capstone experiences for the senior class, which became MAPS and SpringBoard.

For the previous decade, seniors could choose immediately before graduation—in lieu of taking final exams during the spring term—to produce an independent research project on a topic of their choosing. While a fair number of the projects were successful, many of the projects were completed at the last minute due to the often-frenetic nature of the end of the senior year, and the results sometimes reflected that approach.

“We found through research and frank discussion that 96 percent of the faculty were not happy with the execution of the senior-project idea,” says Academic Dean Julia Stojak Maurer ’90, who is Mercersburg’s academic dean and served as co-chair of the school’s Program Review Committee. “It was clear that for our seniors, taking on a yearlong project would be more meaningful.”

The school created two options for students to satisfy the capstone requirement: MAPS, which begins in the 11th-grade year and is a two-year program available by application only; and SpringBoard, which is a one-year, interdisciplinary, project-based course for seniors. Both utilize the principles of Apple’s Challenge Based Learning model—which promotes learning that “encourages students to leverage the technology they use in their daily lives to solve real-world problems through efforts in their homes, schools and communities.”

The two programs allow all members of the senior class to participate regardless of when they first enroll at Mercersburg; post-graduates and other students entering the school as seniors will sign up for a SpringBoard course along with the majority of the rising senior class, while students entering prior to their 11th-grade year are eligible to apply for MAPS.
LOOKING AT MAPS

As 11th graders, MAPS students take Thought, Knowledge, and Belief, a seminar-style course taught by MAPS director and history department head Phil Kantaros. There is no formal textbook for the course—instead, Kantaros and the students digest, discuss, and debate content from media outlets as varied as *The Economist*, *Psychology Today*, National Public Radio’s *Radiolab*, and TED Talks, as well as more traditional assigned readings dealing with ethical questions and issues.

“The course is based upon the Theory of Knowledge course offered as part of the International Baccalaureate program, but since we’re not an IB school, we have much more freedom to investigate and follow intellectual trajectories that I think are worthwhile,” Kantaros says. “We can always stop and cover something current right away if the situation lends itself to our discussion. Our curriculum is what we decide it is at any given moment, with the necessary precondition that it challenges the students and pushes them to think in new and different ways.”

Each MAPS student is required to complete 150 hours of community service, a four-week study-abroad experience with a homestay component, 15 credits in the highest-level courses from at least four different disciplines in the curriculum (including a foreign language to Level 4 or higher), and a yearlong research project that includes a substantial (40-to-50 page) paper and presentation during the senior year. The project, which is called SEARCH, stands for “study–engage–apply–research–create–help,” and students choose topics for their projects during the spring 2014 term. As seniors, they will not meet together every day as a class rotation, but instead will conduct independent research on their respective projects in consultation with Kantaros, MAPS assistant director Peter Kempe, and off-campus mentors from Mercersburg’s robust community of alumni.

“This is a significant undertaking for the students, but it will be very impressive to prospective colleges that our students will

MAPS student Annabel Taylor ’15 giving a presentation in Bordeaux, France
have essentially written and defended a thesis—and at the same time, a 15-page paper will not worry them when they get to college," Kantaros says. "The kids are working very hard, and it is a privilege for them to be part of this. Beyond all the requirements is the idea of being a positive contributor to our community. We all see the program as, organically, much more than the sum of its parts."

“It’s been a great first year,” says Kempe, who teaches German in addition to his work with MAPS. “The students deserve a lot of credit. They are a wonderful representation of our student body as a whole—they’re from different international backgrounds and have very different interests, sports, activities, and class schedules. It’s a great cross-section of who our students are, which is exactly what we wanted it to be.”

“TAKING CARE OF BUSINESS”

The resume of faculty member Todd McGuire includes a section not often found in the background of a typical English teacher: he built and operated a skate park for several years in the Seattle area. Even before Mercersburg introduced the SpringBoard program, McGuire and history faculty member Nate Jacklin ’96 had talked about proposing an interdisciplinary course that would examine elements of history, economics, business, and marketing. Combining McGuire’s experience as a small-business owner and Jacklin’s interests in business (and his time working on Wall Street), the duo settled on a proposal for the Entrepreneurship course, which is one of the inaugural three SpringBoard offerings running this year.

“When I was teaching AP Economics, I had a lot of students tell me the main reason they were taking the class was that they one day wanted to run their own businesses,” Jacklin says. “So I thought this class would attract a lot of interest. We have some students who are also taking AP Economics in the course, and we have others who might not necessarily take a course like that.”

In the Entrepreneurship course, students—working individually or in small groups—propose a plan for a hypothetical business. They begin the year by examining the components of successful
**Going Outside (Outside of Class)**

Students enrolled in SpringBoard courses visited businesses, farms, retail food establishments, and even movie studios as part of their study of issues raised in the courses, while a handful of their MAPS classmates have already taken international trips to further their global awareness and conduct research for their respective SEARCH projects:

**ENTREPRENEURSHIP**

**McLean, Virginia:** Visited with Marc Katz, co-founder and president of Custom Ink (an online apparel company named one of America’s fastest-growing companies by Inc. magazine) and toured corporate offices.

**Washington, D.C.:** Met with José Andrés, founder and CEO of ThinkFoodGroup (named one of Time magazine’s 100 Most Influential People in 2012); toured corporate headquarters and his mezze-inspired restaurant Zaytunya.

**Reston, Virginia:** Visited AOL Fishbowl Labs to meet with three executives at the startup business Mhelpdesk—Vincent Wong, founder and chief executive officer; Jacob Garlick, senior vice president; and Ryan Shank, chief operating officer. Fred Schaufeld, a successful Northern Virginia-based entrepreneur and investor, accompanied the group in the D.C. area; he is the father of Max Schaufeld ’13 and the uncle of Entrepreneurship class member Jordan Shihadeh ’14.

**THE GLOBAL FOOD CHAIN**

**Mercersburg, Pennsylvania:** Toured Bending Bridge Farm with owner/operator Cameron Pedersen ’92, who spoke about the challenges of producing organic vegetables, the community-supported agriculture (CSA) model, and his efforts to create new markets for his crops.

**Waterford, Pennsylvania:** Visited at Blue Rooster Farm with Julie Brubaker, who shared her experiences raising grass-fed livestock and the ethical reasons for doing so without genetically modified organisms.

**Chambersburg, Pennsylvania:** Toured Martin’s Potato Rolls corporate office and visitors’ center with Julie Martin ’90, whose grandparents started the company. Martin’s has plants in Pennsylvania and Georgia and distributes its products all along the East Coast.

**Miscellaneous:** Met with Neal Barnard, founder of the Physicians Committee for Responsible Medicine; visited local McDonald’s and Food Lion locations; attended Pennsylvania Farmland Preservation Board meeting.

**3D DESIGN**

**Greenwich, Connecticut:** Toured Blue Sky Studios, a computer-animation studio that has produced the popular animated films Ice Age, Rio, and Epic. Carl Ludwig, one of the company’s founders and its head of research & development, led the students through a sampling of various departments (including layout, modeling, and animation) and the Sculpture Room (where they saw how clay, 3D scanners, 3D printers, and software were leveraged to create computer models). Students also viewed presentations from departments that make up the company’s animated movie pipeline.

**MAPS**

In the first year of a two-year program, class members have already visited China, France, and Spain for cultural immersion and field research; individual trips are planned this summer to all three of those countries, as well as Germany, Italy, Japan, and Taiwan.
pline and teach something you feel passionately about. And that’s really valuable.”

For the students, the value of being pushed somewhat outside their comfort zone and delving into unfamiliar issues can have lasting positive effects. “It can be hard for the students at first,” Maurer says. “But at the end, when you ask the students to challenge themselves, they discover things about themselves that they didn’t know before—their strengths, their weaknesses, how to solve problems, and how they work best, but in a safe way. They have the space here to wrestle with big questions. And they are truly helping to drive the class and where these classes go.”

There is a community-service component to Howley’s course as well; students in the class prepared, delivered, and served meals on multiple occasions for approximately 20 people at the Chambersburg Cold Weather Drop-In Shelter. Howley says that after the class watched the 2012 documentary film A Place at the Table (which examines hunger in the

“The Global Food Chain SpringBoard class in Waterford, Pennsylvania, with Julie Brubaker of Blue Rooster Farm (far right) and SpringBoard Director Emily Howley (far left)

Global Food Chain students Emily Mitchell ’14 and Elizabeth Stern-Green ’14 with a bottle-fed calf at Blue Rooster Farm

“...they discover things about themselves that they didn’t know before.”
United States), the students were inspired to delve into the problem of hunger in Franklin County. They connected with faculty member Jim Malone, a longtime supporter of the Chambersburg shelter, to coordinate and provide the meals.

Class members presented individual in-depth research projects on the link between hunger and childhood obesity, how iron deficiency affects health, and even perceived connections between meat and traditional masculinity.

“At the end of the day, our students are finding their voice,” Howley says. “When students are calling and visiting experts and personally interacting with them as part of their research, it shows them directly how these issues affect people, both in our local community and in the wider world.”

EXPLORING NEW WORLDS

When Mercersburg faculty first received an invitation to submit proposals for SpringBoard courses, the challenge read as follows: “Propose a course—potentially outside your job description—that you would be excited to teach to a group of seniors. Your proposal should consider the Challenge Based Learning model, be interdisciplinary and experiential in nature, and can be team-taught if necessary.”

The 3D Design course meets all these requirements. It’s a collaboration between Amy Kelley, a mathematics teacher with a Ph.D. and experience teaching upper-level courses to both high-school and college students, and Gunkelman, the school’s direc-
tor of outdoor education and a talented sculptor who majored in studio art with a 3D concentration at the University of Richmond. “With the rise of computer-graphic animation, video games, and digital art, the connections between the fields [of math and art] are increasing rapidly,” Gunkelman says. “We both have friends and contacts in the computer-graphics industry and were interested in the crossover. As we talked about topics like proportion, ratios, and scale, we found we were using different languages to talk about the same principles. The overlap is obvious.”

Students began the fall term by tackling three challenges designed to help them develop the tools for their success in the course. They were asked to replicate a clay model of a human skull that was placed before them; compose a perspective, two-dimensional graphite drawing of a three-dimensional campus scene; and create a three-dimensional copy of a rubber duck using the software program Autodesk Maya, which is a crucial part of the course and is fast becoming required knowledge for those working in the field of computer graphics.

“The earlier you gain experience working with a program that is an industry standard, [the more] it becomes a part of who you are instead of something you’re working with,” Kelley says. “And as a result, you then spend your time pushing boundaries instead of trying to learn the basics of a program like Maya. It will be a huge advantage for any student who decides to go into this field.”

For the course’s overarching challenge, students worked in groups or individually to create a 3D model of an object of their choosing in response to this question: “Can you synthesize math and art to communicate your perception of 3D space?”

Several students designed furniture or other objects using Maya or sculpture and drawing. One student, Dikachi Osaji ’14, even conducted a focus group with faculty children, who provided feedback for the makeup of a virtual playground that she modeled in Maya. Aspiring filmmaker Chantel Yague ’14 created a model of a cat in Maya and didn’t stop there; she rigged the cat for animation and in the process modeled and textured an entire virtual living room. Gunkelman describes Yague’s effort and results as “more typical of an undergraduate completing a thesis project in the animation discipline than a high-school student.”

“This is a really independent and collaborative class,” Yague says. “I’ve always been interested in art and technology, and I’ve taken as many courses as I can. And I love self-teaching; I love going to YouTube and watching tutorials. I definitely want to add computer graphics to my skillset as a filmmaker.”

“3D Design is behind everything our students—and all of us—consume on iPads, smartphones, and in so much of the media today,” Kelley says. “When we teach this course next year, we could get an entirely different set of projects. The possibilities are truly endless.”

THE FINISH LINE

Before they walk across the Commencement stage at the end of their high-school careers, the more than 60 students currently taking MAPS or SpringBoard courses will have immersed themselves in independent, college-level, publishable work.

And not one of those students will have been required to do so.

“There is a huge amount of dedication on the part of the students and the faculty involved with these new capstone experiences,” Maurer says. “It’s not just about the content covered but the experiences they have and the connections they make. This is high-level work and it will be really important to our students going forward.”