How STEM Courses Can Enhance Your MBA

Many business schools are expanding their offerings in cutting-edge areas of science and technology.

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Graduate students attend a business modeling class at the University of Rochester.**(TRACI WESTCOTT FOR USN&WR)**

RALPH CAPRIO, 30, WAS going into the second year of his MBA program at Duke University's Fuqua School of Business when administrators there offered him the chance to get a technical twist on his traditional business degree: By taking eight data-focused courses, he could earn a specialized certificate that would give his MBA a designation in science, technology, engineering and math.

Caprio jumped at the opportunity, signing up for classes that trained him in a variety of in-demand technical skills, such as using systems-modeling software and data visualization tools. All told, the coursework put "a quantitative spin on marketing and other core subject areas in business," he says.

After graduating in May 2018, Caprio landed a job as a senior program manager at Amazon in Seattle, where he was soon deploying his abilities in data analytics. For example, he helped the company figure out how it could cut back on its use of corrugated shipping boxes without damaging the customer experience.

"I was able to focus on the analytical side of business," Caprio says. "I learned valuable skills, like how to design marketing campaigns in the tech space, and how to use quantitative analysis to plan the life cycle of a business."

Duke is among a rapidly growing number of schools adding science- and tech-focused courses and programs for MBA and other graduate business students.

In 2018, the University of Rochester's Simon Business School began offering a STEM option to all full-time MBA students, regardless of whether they're specializing in marketing, finance or any of the other eight areas the school makes available. Other graduate business schools with STEM programs include those at the University of Wisconsin—Madison and Worcester Polytechnic Institute in Massachusetts.

A formal STEM designation for college degree programs was launched during the Obama administration as a way to enhance America's leadership in fields like computer programming, the biological sciences and engineering. The designation was initially designed to attract international students by allowing those who qualify to live and work in the U.S. for additional time after graduation. But MBA programs that carry the STEM designation are finding that it has attracted applicants from within the U.S., too.

"There are absolutely benefits to students, whether domestic or international, to have the courses organized in a way that allows them to get the connection between business and technology, and to learn the tools that are relevant for doing more analytic and management-science type of work," says Russ Morgan, senior associate dean for full-time programs at Fuqua.

STEM degrees also provide "a good signal to employers that they have pursued this depth of technology competence," he says. In the fall of 2017, Fuqua also launched a stand-alone master's degree program in quantitative management for those who choose not to pursue a full MBA.

B-schools are responding to two different but complementary demands: Employers are looking for graduates who are comfortable using sophisticated software to parse data and then deploy the results toward improving business practices. And many students are looking for training that will help them balance soft skills like marketing, management and communications with technical know-how.

The intersection of business and technology might even help attract students who already have backgrounds in science or engineering. At Stanford University's Graduate School of Business, the University of Pennsylvania's Wharton School and the University of Michigan's Ross School of Business, for instance, nearly a third of the MBA classes of 2020 had undergraduate degrees in a STEM field before enrolling.

STEM-focused MBA grads are highly valued for a wide variety of jobs, such as helping to automate the trading desks of investment banks, managing the implementation of electronic health records at hospitals and working at technology consulting firms.

"Companies are dealing with an explosion of data that they need to analyze, understand and collate," says Scott Rostan, an adjunct finance professor at the University of North Carolina—Chapel Hill Kenan-Flagler Business School, which offers a concentration in data and technology. "Then, they need to figure out how to use that data to improve the services they provide to customers. That creates a lot of job opportunities for well-rounded business school graduates."

Take Mastercard, for example. About 70 percent of the company's 2,400 new hires in 2018 came in with strong training in what the company calls "hot skills," which include blockchain, cybersecurity and artificial intelligence.

"Our entire workforce is focused on figuring out how to embed technology in everything we do, and how to make sense of the tsunami of data we have," says Sarah Gretczko, senior vice president for organizational development and people insights at Mastercard. Prospective new hires at the company don't necessarily have to be computer science whizzes, Gretczko adds, "but

they do have to embrace technology as a mindset in how they approach their work."

Financial services firms like Mastercard and all of the major banks are actively recruiting STEM-trained graduates, business school administrators report, as are major technology companies like Amazon, Microsoft, Google and Dell.

"There's definitely a skill gap right now in the economy," says Wendy Moe, associate dean of master's programs at the University of Maryland—College Park Smith School of Business. "You have people with good business and leadership skills, and then you have people with the technology skills. They speak different languages." STEM graduates are attractive to employers because they can "help to fill that gap," she says.

Students who want to pursue STEM-focused degrees can sometimes choose between tacking them onto existing MBA programs or pursuing a specialized master's degree. The latter tend to be more focused on technical coursework than the traditional management-related topics, and they can often be completed in as little as a year.

Maryland's business school, for example, offers a number of STEM specialty master's degrees in topics such as quantitative finance and marketing analytics. The University of Iowa's Tippie College of Business recently phased out its full-time MBA program altogether to focus on a range of alternative degree programs, such as two STEM-related master's degrees – one in business analytics and the other in finance.

David Deyak, assistant dean at Tippie, says the school made the change in response to interest from applicants, many of whom want to build their tech expertise without having to take too much time out of the workforce. They want their degrees to be "more condensed and specialized," Deyak says. The college's two full-time programs run for 15 months over three semesters, with a break before the third term so students can complete summer internships.

At Fuqua, "the goal of the MBA program is to offer students the bread-and-butter management training, and then give them a lot of latitude to choose electives that focus on specialty areas" such as health analytics, financial statement analysis and innovation, Morgan says. By comparison, the Master of Quantitative Management degree requires just 10 months and is more heavily focused on data-analysis training, with options to focus on the technical side of finance, fraud analytics, marketing or strategy, say.

There are often cost advantages to such master's programs, too. At Duke, for example, the quantitative management degree costs about $95,300, including living expenses, for students starting in 2018 – half the cost of the full-time MBA.

As with many more traditional B-school programs, STEM business options tend to have a heavy focus on experiential learning and helping students sharpen their tech skills by solving real-world problems with actual companies.

For example, one group of MBA students at Duke analyzed the social media platforms used by the NBA's Milwaukee Bucks basketball team. They used regressions and correlation analyses to determine the best content for the team to post on its feeds so it could better engage fans and leverage that into payments for tickets and merchandise.

Most such programs help students find internships. Caprio, who trained as a mechanical engineer and worked as a consultant before enrolling at Duke, was connected with an internship in one of Amazon's fulfillment centers in Charlotte, North Carolina, where he crunched data to try to figure out how to alleviate shipping bottlenecks that commonly occur at the busiest times, such as the winter holiday shopping season.

Andrew Ainslie, dean at Simon Business School, believes the combination of technical training and real-world experience provided to students in STEM-focused programs is helping to attract interest in the school's offerings. He expects more than 85 percent of Simon's 2019 graduates will opt into STEM-designated MBA degrees, up from just under 70 percent in 2018.

Ramya Mure, 25, who graduated from Maryland's Smith school with a master's in information systems in December, gained valuable experience in data analysis while completing a class project for Airbnb. She and a group of other students mined data to determine which of the vacation rental company's properties would be the most popular based on the amenities they offered. Among their discoveries: Apartments that let renters bring pets were among the most highly booked places.

In addition to gaining experience from such hands-on case studies during her classes, Mure nabbed a paid position in the B-school admissions office, where she analyzed data on applicants and made suggestions about how staff could improve their decisions about whom to admit. She was also hired as a research fellow for the Center for Health Information & Decision Systems on campus. She spent a year there using informatics to match patients with

telehealth services in a way that would benefit them while also reducing the cost of care for providers.

Mure, who had previously earned a bachelor’s degree in computer science in her home country of India, parlayed her work experiences at Maryland into a full-time sales job at Cisco in Raleigh, North Carolina. All in all, the blend of STEM and business in the master's program helped her balance out her expertise, she says.

"I love technology, but this degree taught me the organizational strategy and management side of business, too," she says. "That was what I needed to be relevant in an organization."

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