August 2022

Graduate Management Admission Council™

Research Brief

The Rise of STEM-Certified Graduate Business Programs in the United States

Supply and demand for STEM-certified graduate business programs are expanding rapidly in the United States. Data from the US Department of Education shows that the number of programs registered as STEM-certified in graduate management education (GME) increased 65 percent from 2017 to 2020, growing from 222 to 367.[1] Among international candidates responding to the GMAC Prospective Students Survey who want to study in the United States, nearly half now express a preference for STEM-certified programs (49%), up from 39 percent in 2019.[2]

In today's competitive international talent landscape, it's critical that US business school leaders understand these trends as a part of their efforts to maintain the relevance and attractiveness of their programs—not only to international candidates themselves, but also to the employers that may want to hire these candidates.

[1]IPEDS (2021). IPEDS Access Database 2020-21 Access. https://nces.ed.gov/ipeds/use-the-data/download-access-database

[2]GMAC (2022). GMAC Prospective Students Survey. Data collected in 2021. www.gmac.com/prospectivestudents

What is a STEM-certified graduate business program?

STEM-certified programs are those that meet the requirements of the United States Department of Homeland Security in recognized categories of science, technology, engineering, or mathematics. Certifications also require a program be both recognized as STEM by US Immigration and Customs Enforcement (ICE) as well as be accredited by the Student and Exchange Visitor Program (SEVP).

The Department of Homeland Security reviews and updates its list of STEM-classified programs that are a part of the classification of instructional programs (CIP) every 10 years.[3] The CIP code list of programs outlines the eligible fields in which a student on an F-1 visa can obtain a STEM OPT extension. For management programs, this includes programs under codes for management science, business statistics, actuarial science, and management sciences and quantitative methods. Though defined differently across different government agencies, DHS interprets these programs as fields that "[involve] research, innovation, or development of new technologies using engineering, mathematics, computer science, or natural sciences."[4]

For students to attend school with F or M nonimmigrant status and be eligible to receive an OPT visa extension, those schools must have undergone accreditation through the Student and Exchange Visitor Program-certified institution process to make sure their institution meets the necessary standards of the US Department of Homeland Security.[5] Though the SEVP certification can be received in special cases without going through the official accreditation process, often accreditation is a vital step of the international student visa process.[6]

To nominate a CIP code to be included in the DHS STEM Designated Degree Program list, a nomination can be submitted to the SEVP Response Center following a series of steps outlined by the Department of Homeland Security.[7] Nominators must provide details on how the nominated CIP code program "engages students in research, innovation or development or new technologies using engineering, mathematics, computer science or natural sciences."[8] SEVP evaluates these nominated programs to determine if the degree is STEM and engages with input from educational institutions, governmental entities and non-governmental entities. Programs are assessed by SEVP by their required curriculum and concurrent STEM features to determine whether the code meets their definition of a STEM degree.

[3]Department of Homeland Security (2022). CIP Conversion 2020. https://studyinthestates.dhs.gov/sevis-help-hub/student-records/classification-of-instructional-programs/cip-conversion-2020

[4]US Immigration and Customs Enforcement (2022). DHS STEM Designated Degree Program List. www.ice.gov/doclib/sevis/pdf/stemList2022.pdf

[5]DHS (2022). The Basics of School Accreditation. https://studyinthestates.dhs.gov/the-basics-of-school-accreditation

[6]DHS (2022). Basics of School Accreditation. https://studyinthestates.dhs.gov/the-basics-of-school-accreditation

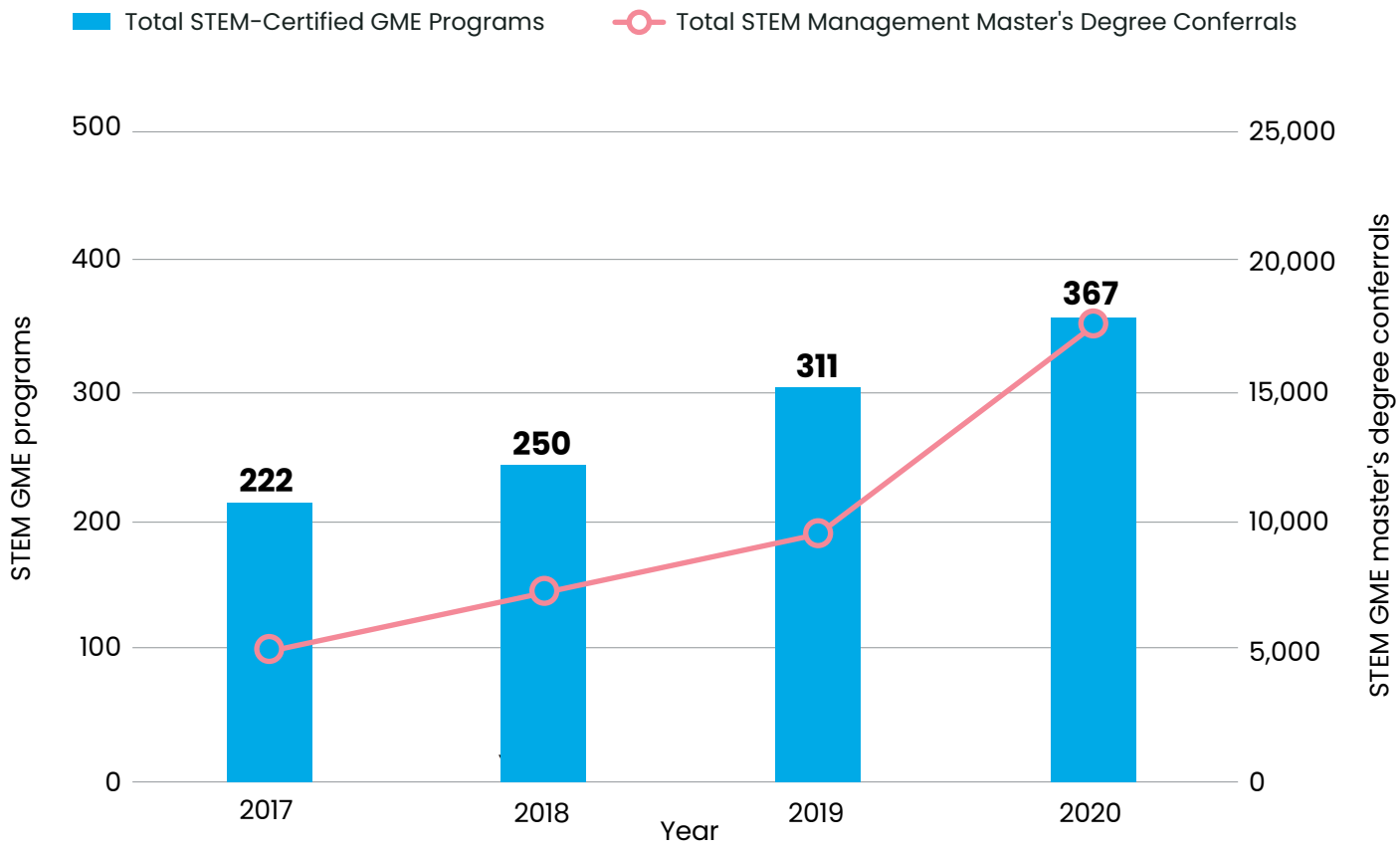
[7]US ICE (2022). School and Programs: DHS STEM Designated Degree Program List and CIP Code Nomination Process. https://www.ice.gov/sevis/schools

[8]ICE (2022). School and Programs. https://www.ice.gov/sevis/schools

Rapid expansion of certified programs

The number of STEM-certified graduate programs in management has seen considerable growth over the past several years. From 2017 to 2020, the number of programs registered as STEM-certified in GME - including management science, business statistics, actuarial science, and management sciences and quantitative methods - has increased every year (**Figure 1**). In 2017, data from the Department of Education shows only 222 graduate management programs in the United States were in these four STEM-certified categories, but by 2020 the number of GME STEM programs had risen to 367. As the supply of programs has increased, so have degree conferrals. Between 2017 and 2020, STEM-certified GME conferrals increased 257 percent, from 6,466 to 23,091 (**Figure 1**).

Figure 1: Total Number of STEM-Certified Graduate Management Programs and STEM Management Master's Degree Conferrals



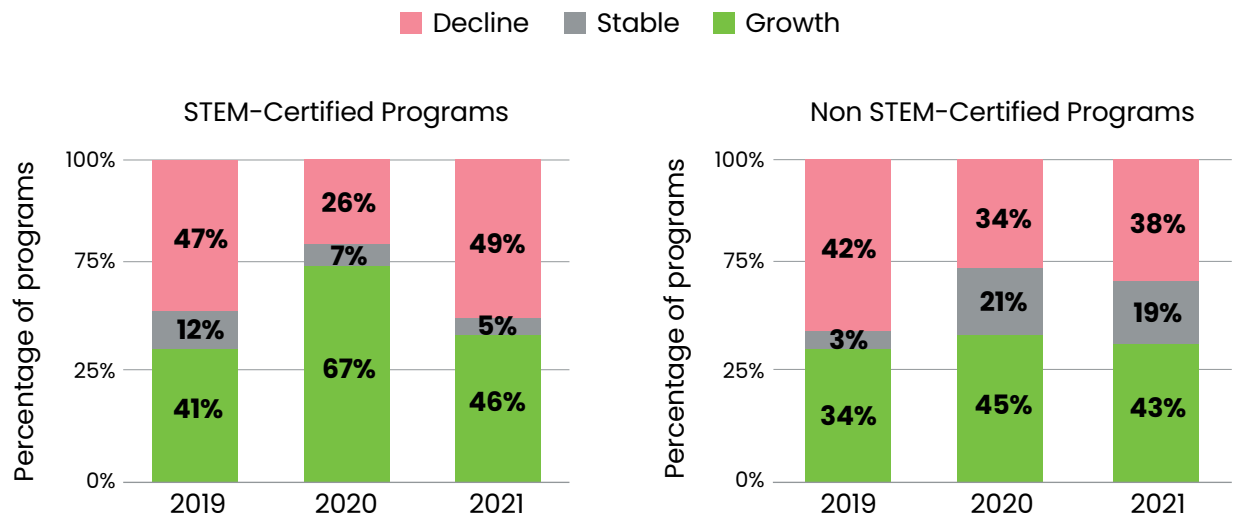
Data from National Center for Education Statistics (2021) https://nces.ed.gov/ipeds/use-the-data/download-access-database

The STEM-certified student profile

The increased popularity in STEM-certified management programs can be credited, in part, to the added value these programs offer to international students. International students in programs that have met STEM-certified requirements are eligible for a longer student visa in the form of an additional 24 months of Optional Practical Training (OPT) in addition to the standard 12 months.[9] Interest in STEM-certified programs is driven primarily by international students.

According to data from GMAC's Application Trends Survey, the percentage of US STEM-certified programs reporting year-on-year growth in international applications has exceeded that of non-STEM-certified programs for the past three years. For example, in 2020, 67 percent of STEM-certified programs received more international applications than they did the year prior. Compare that to only 45 percent of non-STEM certified programs (**Figure 2**).[10]

Figure 2: Relative Year-on-Year Change in International Applications, by STEM-Certification



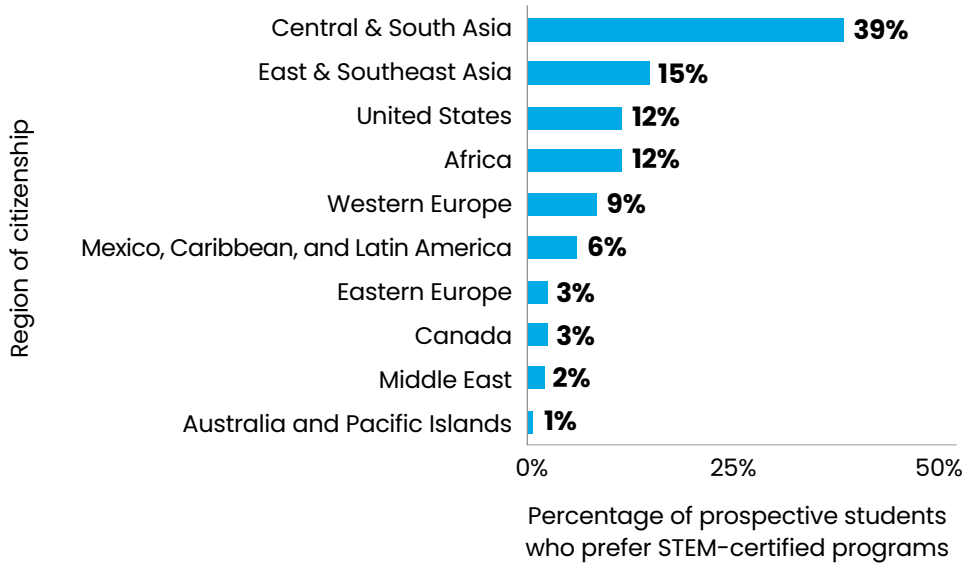
Data from GMAC's 2021 Application Trends Survey.

The 2022 Prospective Students Survey data show that the largest share of STEM-certified students are citizens from Central and South Asia (39%), followed by students whose citizenship is in East and Southeast Asia (15%), Africa (12%), and the United States (12%) (**Figure 3**).

[9]US Citizenship and Immigration Services (2022). Optional Practical Training Extension for STEM Students (OPT). https://www.uscis.gov/working-in-the-united-states/students-and-exchange-visitors/optional-practical-training-extension-for-stem-students-stem-opt

[10]GMAC (2021.). Application Trends Survey Report 2021. https://www.gmac.com/market-intelligence-and-research/market-research/application-trends-survey

Figure 3: Citizenship of Students Preferring STEM-Certified Programs



Data from GMAC's 2022 Prospective Students Survey

A large percentage of students interested in STEM-certified programs are male (62% vs 38% female), and they tend to be relatively young, as less than a fifth of students who are interested in STEM-certified programs are 31 and older (18%). Most have no work experience or less than one year of work experience (66%). Most plan to pursue an MBA (60%).

For students who prefer to obtain a STEM-certified degree, when asked what their post-GME interests are, 35 percent of students say they want to work outside their country of citizenship, and 38 percent say they want to work for a company where they can travel internationally (compared to 28% of those who do not want a STEM-certified program and 31%, respectively).

As US management programs work to attract more international students, it is vital to recognize the competitive landscape of the international GME student market. GMAC's 2022 Prospective Students Survey shows that the United States is the preferred region of study for nearly half of those who wish to obtain a STEM-certified degree, followed by Western Europe (23%) and Canada (11%). Similar to the US OPT extension, Canada has a Post-Graduation Work Permit (PWGP) that allows international students to work in Canada for three years post-graduation and has likewise experienced increases in international students over recent years. By securing STEM management program offerings, OPT extension becomes a likelier possibility for international talent and can further engage that student demographic.

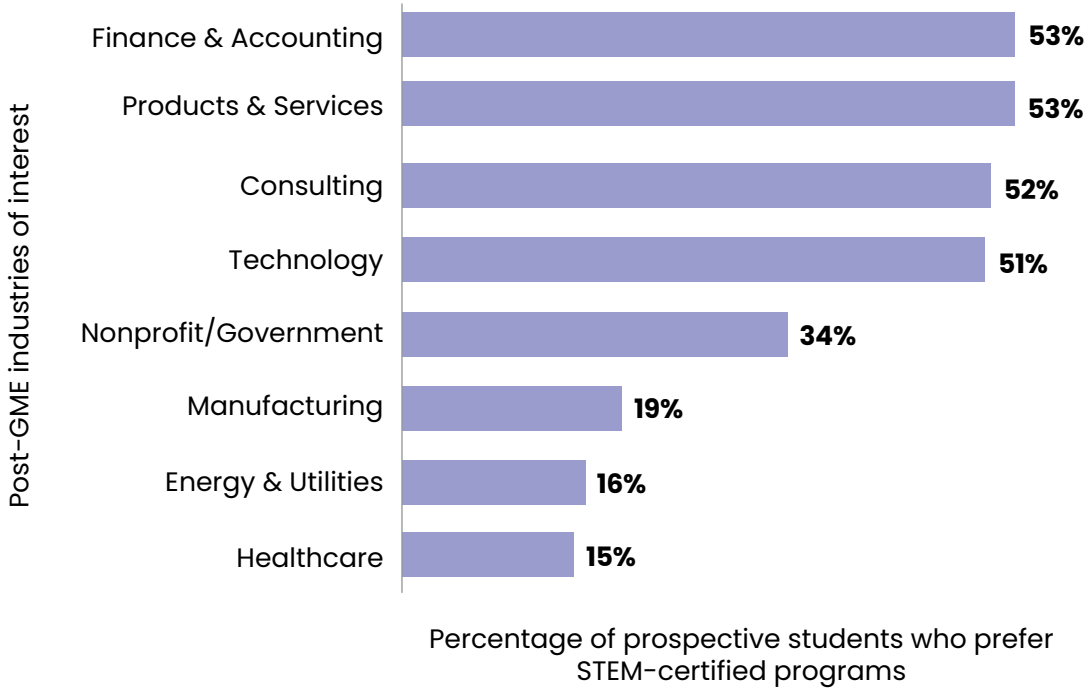
When asked what reasons were most important when selecting a study destination, 74 percent of students pursuing STEM degrees said they selected their study destination based on the reputation of the educational system. Over half of prospective STEM students said they were selecting their study destination so they could be better prepared for their careers. International students that select to study STEM in the US, due to possible OPT visa extension, could be choosing these programs due to the opportunities the degree provides for them to find employment in the US.

Post-GME STEM careers

A rising interest in STEM-certified programs (accompanied by a simultaneous expansion in the offerings of STEM-certified management programs) is clear. This bears the question as to what might be driving perceived utility for these specific program offerings, which in turn could show the ways in which a graduate management school could benefit from providing STEM programs.

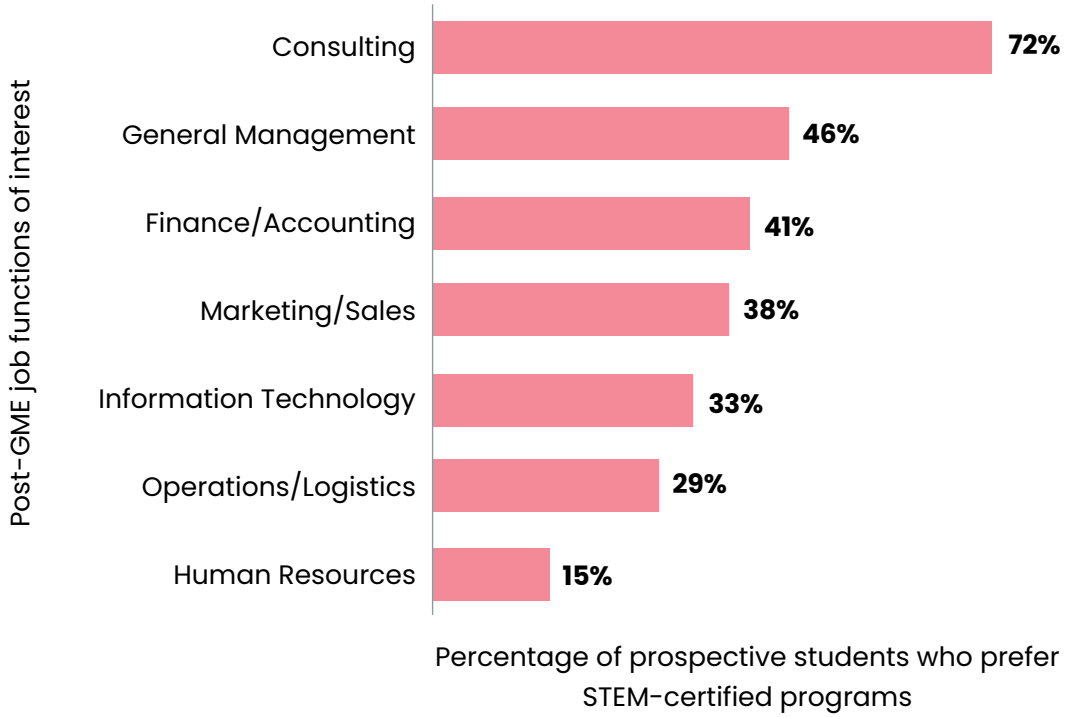
Study International says 3.5 million jobs in STEM will need to be filled by 2025;[11] because of this, a graduate of GME with skills in technology and management might be that much more likely to find gainful post-GME employment. International students focused on STEM-certified management programs are provided a more accessible path to obtaining full-time employment in the United States. Many of the surveyed prospective STEM GME students are seeking employment post-GME in four main industries: as found in the 2022 Prospective Students Survey, the career goals of prospective STEM students are primarily in industries such as finance and accounting (53%), products and services (53%), consulting (52%), and technology (51%). In regard to specific job functions, the majority of prospective STEM students seem to be interested in consulting (72%; **Figure 4**), but following consulting, the job function prospective STEM students prefer widely varies, with other popular functions including general management (46%), finance and accounting (41%), and marketing/sales (38%; **Figure 5**).

Figure 4: Post-GME Industries of Interest of Candidates Who Prefer STEM-Certified Programs



Data from GMAC's 2022 Prospective Students Survey

Figure 5: Post-GME Job Functions of Interest of Candidates Who Prefer STEM-Certified Programs



Data from GMAC's 2022 Prospective Students Survey

There is also a robust demand for international students in the US workforce in general. GMAC's 2022 Corporate Recruiters Survey found that US companies are increasing their international GME hiring plans in 2022. The industry with the highest rate of international student demand is the technology industry, as 62 percent of surveyed recruiters in the technology industry indicated that they actively have plans to hire international business school graduates in 2022, and 21 percent were willing to hire international graduates but did not yet have hiring plans.[12]

Therefore, employers in the United States appear to be keen to hire graduates with extensive technology expertise; specifically, 35 percent of surveyed recruiters said they wanted candidates to have skills in tools and technology. US employers are also specifically seeking candidates who exit graduate school with skills in management and technology. This makes candidates with honed STEM abilities even more competitive in the US job market.

[11]Study International (2021). STEM-designated MBAs: How you can stay longer in the US? https://www.studyinternational.com/news/stay-in-the-us-through-stem-programmes/

[12]GMAC (2022). Corporate Recruiters Survey- 2022 Summary Report. https://www.gmac.com/-/media/files/gmac/research/employment-outlook/2022_gmac_corporate_recruiters_survey_summary_report_final.pdf

Conclusion

International management students are drawn to STEM-certified programs, specifically in the United States, due to the practical professional opportunities that having a student visa with longer sponsorship provides. Over the past five years, program offerings in STEM as well as degree conferrals in STEM have risen significantly. International students continue to pursue education in countries, such as the United States, where they seek an institution that aligns not only with their academic goals, but also their long-term employment goals. A degree in graduate management education becomes that much more appealing when paired with strong labor opportunities and the rich potential for development in a growing field.

Thus, with the rise of the technology industry and subsequent popularity of STEM-certified programs, a management program that is STEM-certified is that much more appealing. By providing STEM-certified programs, a school can find ways to engage international students and appeal to those seeking employment in the United States.

Graduate Management Admission Council™