

ANALYSIS OF U.S. AND CANADIAN INTERNATIONAL STUDENT DATA

EXECUTIVE SUMMARY

Between 2016 and 2019, international student enrollment dropped 7% at U.S. universities but increased 52% at Canadian colleges and universities, according to a new analysis of government data by the National Foundation for American Policy. At U.S. universities, Indian graduate students in science and engineering, a key source of U.S. talent, fell dramatically, by nearly 40%, between 2016 and 2019 (before the pandemic). During the same period (2016 to 2019), Indian students attending Canadian colleges and universities increased 182%. The difference in enrollment trends is largely a result of it being much easier for Indian students to work after graduation and become permanent residents in Canada compared to the United States. The data show U.S. international student enrollment declined prior to the pandemic and fell even more during the 2020-21 academic year, particularly in master’s level computer sciences and engineering.

INDIAN GRADUATE STUDENTS DECLINE AT U.S. UNIVERSITIES

The number of international students from India enrolled in master’s level science and engineering programs at U.S. universities declined 38% (or 31,800) between the 2016-17 and 2019-20 academic years, according to an analysis of government data by the National Foundation for American Policy.¹ These numbers are pre-pandemic. Between the 2016-17 and 2020-21 academic years, Indian students enrolled in master’s level science and engineering programs at U.S. universities declined by nearly 56% or 47,230. (The 2020-21 academic year was in the middle of the Covid-19 pandemic.) The latest U.S. data are derived from a National Science Foundation tabulation of Department of Homeland Security student data.

**Table 1
Indian Students Enrolled in U.S. Master’s-Level Science and Engineering Programs**

Country	2016-17 Academic Year	2019-20 Academic Year	Decline 2016-17 to 2019-20
India – Master’s Degree Students in Science and Engineering	83,610	51,810	-31,800 (-38%)

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

Indian graduate students are a significant source of talent for U.S. technology companies and a key source of entrepreneurs, physicians and researchers in America. However, the difficulties in gaining H-1B status (over 70%

¹ National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

Analysis of U.S. and Canadian International Student Data

of [H-1B registrations](#) were rejected for FY 2022 due to the low annual ceiling) and ultimately permanent residence in the United States, along with policies implemented against high-skilled immigration during the Trump administration, lessened the attractiveness of a U.S. education, particularly when compared to Canada. Canada has made it much easier than the United States for international students to become permanent residents.

INDIAN STUDENTS SURGE AT CANADIAN COLLEGES AND UNIVERSITIES

The number of international students from India studying at Canadian colleges and universities increased 182% between 2016 and 2019 while at the same time, the enrollment of Indian students in master’s level science and engineering programs at U.S. universities fell almost 40%. Indian student enrollment at Canadian colleges and universities increased nearly 300% between the 2015-16 and 2019-20 academic years. (Indian student enrollment at Canadian colleges and universities rose from 29,487 in the 2015-16 academic year and 41,724 in 2016-17 to 117,477 in 2019-20.)²

**Table 2
Indian International Students Enrolled at Canadian Colleges and Universities: 2015-16 to 2019-20**

Country	2015-16	2016-17	2017-18	2018-19	2019-20	Increase 2015-16 to 2019-20
Indian International Students Postsecondary Enrollment in Canada	29,487	41,724	66,159	96,363	117,477	+298%

Source: National Foundation for American Policy, Immigration, Refugees and Citizenship Canada, Statistics Canada. Table 37-10-0086-01 Postsecondary enrollments, by status of student in Canada, country of citizenship and gender.

The number of Indians who became permanent residents in Canada increased 115% between 2016 and 2020 and 2021. The increase is much higher if one counts only 2021, but due to processing issues, it is reasonable to take the average of 2020 and 2021 (85,330), representing a rise of 115%, according to a National Foundation for American Policy analysis of data from Immigration, Refugees and Citizenship Canada. (See Table 3.)

² These numbers include only international students at Canadian colleges and universities.

Table 3
Increase in Indian Immigration to Canada: 2016 to 2021

Country	2016	2017	2018	2019	2020	2021	Increase 2016 to 2020/2021
Indians Admitted as Permanent Residents to Canada	39,710	51,590	69,985	85,590	42,865	127,795	+115%

Source: Immigration, Refugees and Citizenship Canada, National Foundation for American Policy.

“Canada is benefiting from a diversion of young Indian tech workers from U.S. destinations, largely because of the challenges of obtaining and renewing H-1B visas and finding a reliable route to U.S. permanent residence,” according to Peter Rekai, founder of the Toronto-based immigration law firm Rekai LLP.³

In the United States, in the employment-based second preference (EB-2): “Under current law, and owing to a limited number of green card issuances, the current backlog of 568,414 Indian nationals would require an estimated 195 years to disappear,” according to the [Congressional Research Service \(CRS\)](#).⁴ CRS estimates that within a decade, more than 2 million people from India will be waiting years or potentially decades for employment-based green cards.⁵

“Under Canada’s [Global Skills Strategy](#), many temporary visa applications for high-skilled foreign professionals are approved within two weeks,” testified NFAP Executive Director Stuart Anderson at a House Immigration and Subcommittee hearing in 2021. “And there is *no numerical limit* on high-skilled temporary visas in Canada. The Canadian government has made it increasingly easy for employers to attract and retain talent. In the United States, H-1B visas are essential because they typically represent the only practical way for high-skilled foreign nationals, including international students, to work long-term in America. However, numerical restrictions on high-skilled temporary visas block the vast majority of foreign-born applicants from working in America in a given year.”⁶

³ Stuart Anderson, “Indians Immigrating to Canada at an Astonishing Rate,” *Forbes*, February 3, 2020.

⁴ *The Employment-Based Immigration Backlog*, Congressional Research Service, March 26, 2020.

⁵ *Ibid.*

⁶ Testimony of Stuart Anderson, “Oh, Canada! How Outdated U.S. Immigration Policies Push Top Talent to Other Countries,” House Subcommittee on Immigration and Citizenship, July 13, 2021.

CHINESE GRADUATE STUDENTS AT U.S. UNIVERSITIES

The number of international students from China enrolled in master's level science and engineering programs at U.S. universities increased 18% between 2016 and 2019. However, that increase was temporary, and there was a sharp drop in Indian and Chinese master's level students after the Covid-19 pandemic began. International students from China enrolled in master's level science and engineering programs at U.S. universities decreased 20% (or 8,210) between the 2016-17 and 2020-21 academic years. (Data on Ph.D.s by field and country were not available for 2019 and 2020.)

Table 4
Chinese Students Enrolled in U.S. Master's-Level Science and Engineering Programs

Country	2016-17 Academic Year	2019-20 Academic Year	Change 2016-17 to 2019-20
China – Master's Degree Students in Science and Engineering	41,230	48,670	+7,440 (+18%)

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

A significant impediment to Chinese graduate students attending U.S. universities likely will continue to be a May 2020 [presidential proclamation 10043](#) (PP10043) on the "Suspension of Entry as Nonimmigrants of Certain Students and Researchers from the People's Republic of China." The proclamation, issued by the Trump administration but continued during the Biden administration, has resulted in the State Department revoking many existing visas and denying other visas. The State Department has not published figures, but the policy is likely to block [at least 3,000 to 5,000 Chinese graduate students a year](#), according to the Center for Security and Emerging Technology at Georgetown University. The estimate may be low since it does not include individuals who decide to study in other countries in response to the proclamation without even applying for a U.S. visa.

After the resumption of consular activities in China, U.S. universities reported denials of J-1 visas for Chinese scholars and new and F-1 visas for graduate students in science and engineering. The implications of the denials have alarmed analysts and universities given the significant role Chinese graduate students and scholars play in key technical fields in the United States.⁷

⁷ See Stuart Anderson, "Biden Keeps Costly Trump Visa Policy Denying Chinese Grad Students," *Forbes*, August 10, 2021.

Analysis of U.S. and Canadian International Student Data

**Table 5
Indian and Chinese Students Enrolled in U.S. Master’s-Level Science and Engineering Programs**

Country	2016-17 Academic Year	2020-21 Academic Year	Decline 2016-17 to 2020-21
India – Master’s Degree Students in Science and Engineering	83,610	36,380	-47,230 (-56%)
China – Master’s Degree Students in Science and Engineering	41,230	33,110	-8,210 (-20%)

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

The policy could produce an economic loss to the United States of more than \$210 billion for every 1,000 Ph.D. students blocked annually over a ten-year period, according to a National Foundation for American Policy analysis of patents and tuition.⁸ These numbers do not include the value of nearly 7,000 fewer Ph.D. scientist and engineers working in the U.S. labor force and innovations and patents created outside the university setting.

⁸ For every 1,000 entering doctoral students blocked annually for 10 years, implies lost tuition for United States graduate programs of nearly \$1 billion using the National Center for Education Statistics average for 2018. NCES estimated an average graduate tuition of \$19,314 in 2018. <https://nces.ed.gov/programs/digest/d19/tables/xls/tabn330.50.xls>. When multiplied by the estimated lost enrollment of 49,840 this suggests \$962.6 million in lost tuition. This assumes average completion rate of doctoral students at Stanford (83%) and the average time to degree for doctoral students reported by the National Science Foundation (5.8 years), implying around 50,000 fewer years of attendance in U.S. graduate programs. (Even assuming all students not completing their doctorates dropped out of the program after their first year, these numbers imply a loss of 49,840 graduate student years. Stanford’s completion rate for doctorate students is reported at <https://irds.stanford.edu/data-findings/doctoral-degree-programs-completion-and-time-degree> and represents the completion rate of the 2012/2013 entering cohort. The National Science Foundation estimate of 5.8 years is the time since entering the doctoral program for recipients of new U.S. Ph.D.’s in 2019 reported in National Center for Science and Engineering Statistics (NCSES). 2020. Doctorate Recipients from U.S. Universities: 2019. NSF 21-308. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf21308/>.) Most foreign students are not eligible for financial aid program and pay full tuition rates. Rather than displace U.S. students, foreign students provide crucial support for the survival of many graduate program, actually increase the educational options for Americans seeking graduate training. When Ph.D. students earn tuition waivers in return for their labor as research assistants it is beneficial to both the student, who gains practical experience, and for universities and research funders. The cost to the United States of losing the contributions of these graduate students to research is likely to dwarf lost tuition. While the economic gains to research are widely spread through the whole economy, one concrete measure is patenting by universities. AUTM (formerly known as the Association of University Technology Managers) estimates that the more than 117,000 patents issued since 1996 are associated with an additional \$865 billion in GDP—an average of \$7.4 million per patent. (<https://autm.net/AUTM/media/Surveys-Tools/Documents/FY20-Infographic.pdf>.) A 2008 study (Gnanaraj Chellaraj, Keith E. Maskus and Aaditya Mattoo, *The Contribution of International Graduate Students to U.S. Innovation*, Review of International Economics, 16(3), 444-462, 2008) found that each additional foreign student increased patents by 0.57. Taken together, this suggests an economic loss of \$210 billion for every 1,000 Ph.D. students blocked annually over a ten-year period.

A DECLINE IN INTERNATIONAL STUDENTS AT U.S. MASTER’S DEGREE PROGRAMS IN SCIENCE AND ENGINEERING

The enrollment of international students in master’s level computer sciences at U.S. universities has declined sharply over the past four to five years, fueled largely by the decline in graduate students from India in technical fields. Between the fall 2016 and 2019, international students enrolled in master’s level programs in computer sciences at U.S. universities fell 20%, from 62,270 to 49,900. Between fall 2016 and 2020, the number of international students enrolled in master’s level programs in computer sciences at U.S. universities declined 39% or 24,040.

The story is similar in U.S. engineering programs. Between the fall 2016 and 2019, international students enrolled in master’s level programs in computer sciences at U.S. universities fell 29%, from 60,130 to 42,890. Between fall 2016 and 2020, the number of international students enrolled in master’s level programs in engineering at U.S. universities declined 52% or 31,070.

Table 6
International Students Enrolled in U.S. Master’s-Level Computer Sciences and Engineering Programs

Year	Computer Sciences	Engineering
2016	62,270	60,130
2017	52,560	51,690
2018	54,400	47,660
2019	49,900	42,890
2020	38,230	29,060

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

Between 2016-17 and 2019-20, the number of international students enrolled in all science and engineering programs declined 16% at the master’s degree level and increased 12% at the Ph.D. level. However, international student enrollment at both the master’s and Ph.D. level declined in science and engineering in 2020-21.

U.S. INTERNATIONAL STUDENT ENROLLMENT FELL BEFORE 2020

International student enrollment at U.S. universities declined 7.2% between the 2016-17 and 2019-20 academic years, before the start of the Covid-19 pandemic. At the same time, international student enrollment at Canadian colleges and universities increased 52% between the 2016-17 and 2019-20 academic years, illustrating the increasing attractiveness of Canadian schools due to more friendly immigration laws in Canada, particularly rules enabling international students in Canada to gain temporary work visas and permanent residence.

Table 7
International Student Enrollment at U.S. Universities (2016 to 2020)

All Countries	2016-17 Academic Year	2017-18 Academic Year	2018-19 Academic Year	2019-20 Academic Year	Decline 2016-17 to 2019-20
Undergraduate	452,180	442,210	435,270	418,660	-33,520 (-7.4%)
Graduate	390,300	368,890	369,150	363,290	-27,010 (-6.9%)
TOTAL	842,480	811,100	804,420*	781,950	-60,530 (-7.2%)

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

Table 8
International Students (All Countries) Enrolled at Canadian Colleges and Universities: 2016-17 to 2019-20

All Countries	2016-17	2017-18	2018-19	2019-20	Increase 2016-17 to 2019-20
International Students Postsecondary Enrollment in Canada	256,494	296,496	341,964	388,782	+52%

Source: National Foundation for American Policy, Immigration, Refugees and Citizenship Canada, Statistics Canada. Table 37-10-0086-01 Postsecondary enrollments, by status of student in Canada, country of citizenship and gender.

Making the decline in international enrollment at U.S. universities between 2016 and 2019 even more concerning is that the number of international students between 2016 and 2019 increased 19% worldwide, according to UNESCO, a United Nations agency.⁹ That means U.S. universities enrolled fewer international students even though the number of international students around the world increased. After the pandemic hit, the enrollment of

⁹ NFAP analysis of UNESCO data.

Analysis of U.S. and Canadian International Student Data

international students declined an additional 22.7% at U.S. universities between the 2019-20 and 2020-21 academic years. (See Table 9.) Comparable 2020-21 figures for Canada have not been published, but other data indicated there was a decline in enrollment at Canadian colleges and universities in 2020-21 due to the Covid-19 pandemic.

Table 9
International Student Enrollment at U.S. Universities (2019 to 2020)

All Countries	2019-20 Academic Year	2020-21 Academic Year	Decline 2019-20 to 2020-21
Undergraduate	418,660	314,560	-104,100 (-24.9%)
Graduate	363,290	290,140	-73,150 (-20.1%)
TOTAL	781,950	604,700	-177,250 (-22.7%)

Source: National Foundation for American Policy, National Science Foundation, U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2021) of the Student and Exchange Visitor Information System (SEVIS) database. Data include active foreign national students on F-1 visas and exclude those on optional practical training. The data reflect fall enrollment in a given year and include students with active status as of November 15 of that year.

CONCLUSION

Even before the Covid-19 pandemic, U.S. universities saw a more than 7% drop in international students between 2016 and 2019, when enrollment of international students at Canadian colleges and universities increased 52%. The difficulty in international students gaining temporary work visas and permanent residence in the United States compared to Canada contributed to the enrollment of Indian students in master's level science and engineering programs at U.S. universities declining almost 40% between 2016 and 2019 while international students from India enrolled at Canadian colleges and universities increased 182% during those same years. That is a worrisome sign for America's technology future due to the vital role Indian immigrants play in science and engineering in the United States. U.S. restrictions on international graduate students from China are another problematic policy development likely to harm U.S. companies, universities and the American economy.

In February 2022, the House of Representatives passed the America COMPETES Act. A handful of provisions in the nearly 3,000-page bill contain what would be the most significant measures on legal immigration since the Immigration Act of 1990. The bill would exempt from the annual limits on employment-based green cards individuals with Ph.D.s in STEM (science, technology, engineering and math) fields and foreign nationals with master's degrees in critical industries. Those provisions would be a powerful tool for companies recruiting top talent from around the world. The bill would also make it easier for many international students to get a visa by adding dual intent for

Analysis of U.S. and Canadian International Student Data

students in STEM fields.¹⁰ The bill also contains a startup visa for immigrant entrepreneurs that would likely lead to the founding of many cutting-edge companies and potentially over one million of jobs during the course of a decade.¹¹ The bill's future and its immigration provisions remain uncertain.

International students help American students in many ways, including by making more classes available through increases in revenue at U.S. universities. International students are also a significant source of talent for American companies. Even before the pandemic, restrictive U.S. immigration policies discouraged many international students from attending U.S. universities. The enrollment figures at Canadian universities, particularly for students from India, show that absent changes in U.S. immigration laws and policies, it will be challenging for U.S. universities to attract international students at the level of even five or six years ago. That will harm the competitiveness of U.S. companies and lead to more work and innovation taking place in other countries.

¹⁰ Stuart Anderson, "House Passes Bill With More Measures For Immigrants In STEM Fields," *Forbes*, February 7, 2022.

¹¹ *Startup Visas and Job Creation*, NFAP Policy Brief, National Foundation for American Policy, March 2016.

ABOUT THE NATIONAL FOUNDATION FOR AMERICAN POLICY

Established in 2003, the National Foundation for American Policy (NFAP) is a 501(c)(3) non-profit, non-partisan public policy research organization based in Arlington, Virginia, focusing on trade, immigration and related issues. Advisory Board members include Columbia University economist Jagdish Bhagwati, Cornell Law School professor Stephen W. Yale-Loehr, Ohio University economist Richard Vedder and former INS Commissioner James Ziglar. Over the past 24 months, NFAP's research has been written about in the *Wall Street Journal*, the *New York Times*, the *Washington Post*, and other major media outlets. The organization's reports can be found at www.nfap.com.
Twitter: [@NFAPResearch](https://twitter.com/NFAPResearch)