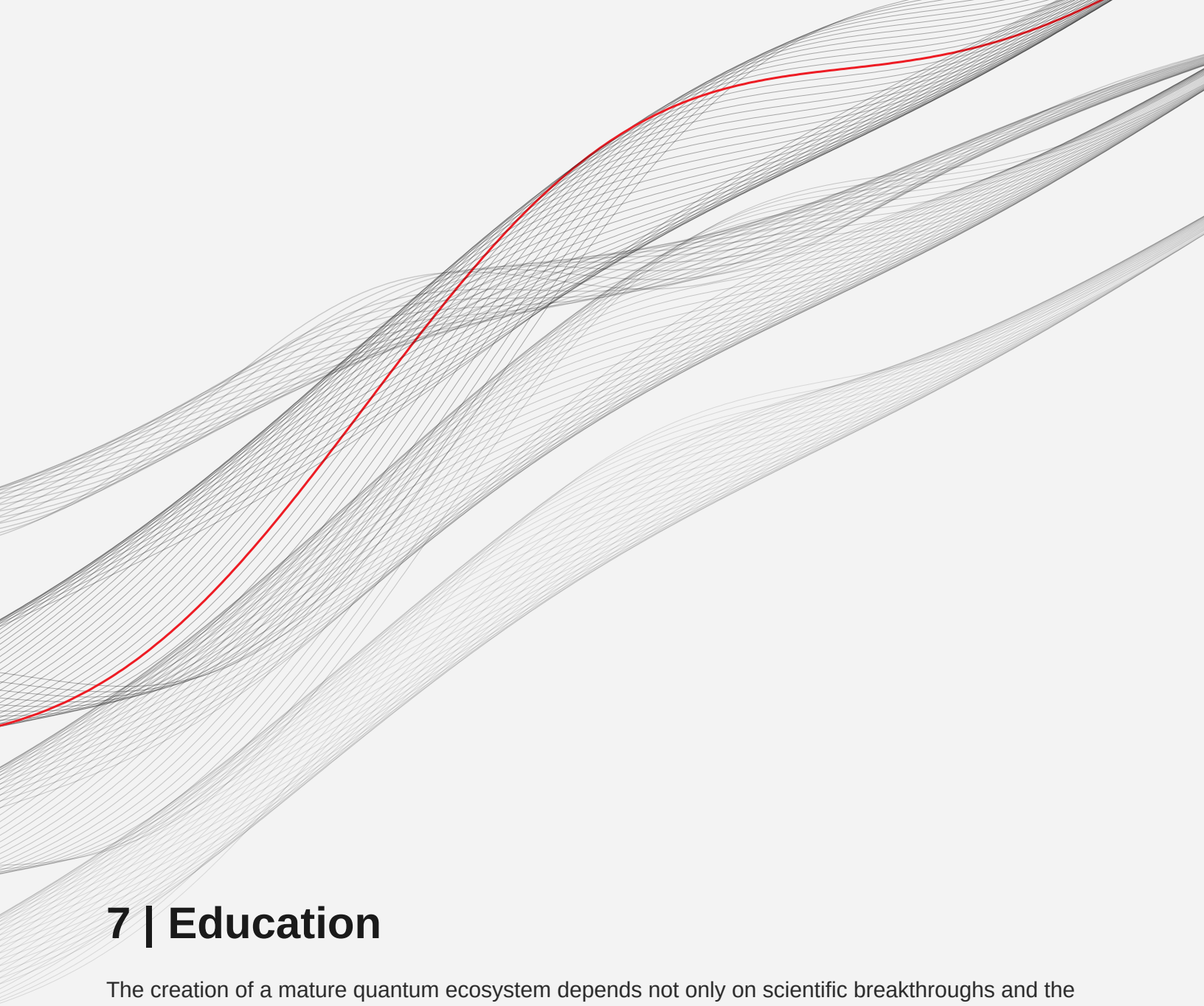


7 | Education

The creation of a mature quantum ecosystem depends not only on scientific breakthroughs and the identification of commercially valuable use cases, but also on the development of a multidisciplinary workforce capable of building, operating and governing quantum technologies. This remains a particular challenge because quantum education has traditionally been concentrated at the postgraduate level and associated with advanced mathematics, engineering and physics. Between 2024 and 2026, education policies widened globally with a focus on distinct areas such as training teachers, introducing quantum concepts earlier, creating undergraduate pathways, expanding practical access to hardware and laboratories, and supporting professionals who may need quantum literacy without becoming quantum physicists. This shift is taking place against a continuing shortage of qualified quantum talent, particularly people able to bridge quantum science with engineering and software skills.

In the United States, the National Q-12 Education Partnership[1] remains one of the clearest examples of an attempt to build a pre-university quantum pipeline. Launched in 2020 by the National Science Foundation (NSF) and the White House Office of Science and Technology Policy, the partnership provides K-12 educators and students with learning materials, career resources and links to internships and mentorship opportunities. In 2025, NSF presented Q-12 as part of a broader workforce portfolio that also included teacher-development initiatives such as Quantum for All and Quantum Education for Students and Teachers, alongside the ExLENT program[2], which supports experiential learning from high-school level through professional upskilling.

Europe has moved even further toward system-level coordination. Earlier Quantum Flagship projects[3], such as QTIndu (Quantum Technology Courses for Industry) and DigiQ (Digitally Enhanced Quantum Technology Master), developed educational modules, degree pathways, industry training and the European Competence Framework for Quantum Technologies.[4] The framework was updated to version 3.0 in April 2025, providing a common reference for describing quantum competences, proficiency levels and qualifications. A larger step followed in May 2026 with the launch of the European Quantum Academy (EQA).[5] Backed by €19.8 million and involving more than 70 partner institutions and over 100 affiliated organizations, the EQA is intended to coordinate education from school outreach and harmonized bachelor's and master's programs through doctoral training and professional upskilling. Its stated targets include training at least 600 advanced quantum professionals and reaching 5,000 learners, with six Regional Quantum Academies intended to reduce uneven access across Europe.

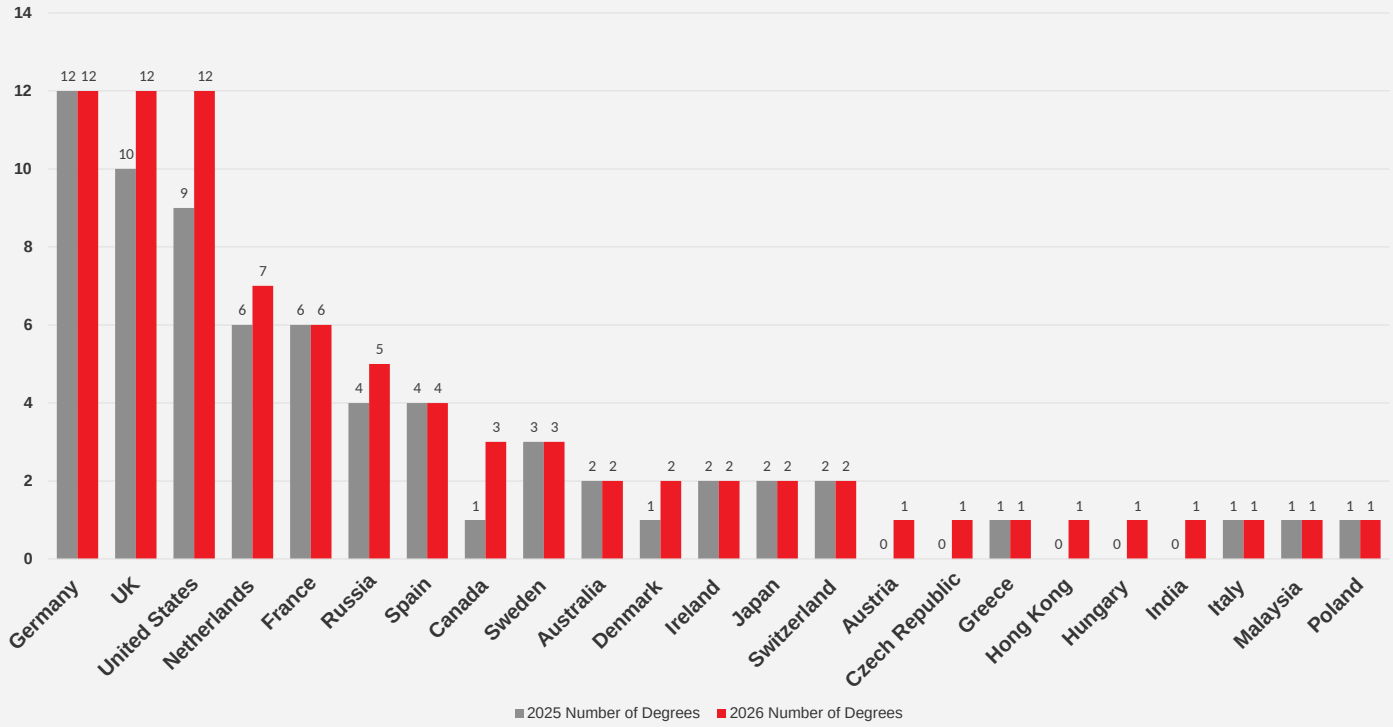
The United Kingdom has similarly placed skills at the center of national quantum policy. Its Quantum Skills Taskforce report, published in June 2025, argues that the sector will need engineers, technicians and professionals in adjacent disciplines who possess sufficient quantum knowledge to work with emerging systems. The Taskforce recommends greater use of apprenticeships, continuing professional development, industry placements and quantum modules embedded in engineering degrees, as well as continued school outreach and teacher training. It also links these pathways to the UK National Quantum Strategy commitment to support more than 1,000 PhD studentships between now and 2034.[6]

Recent approaches suggest that a scalable quantum economy will not rely exclusively on PhD-level physicists, and that quantum education is becoming broader, more structured and more coordinated, offering differentiated pathways for school students, teachers, technicians, engineers and industry users.

7.1 | Postgraduate education

Fig. 7.a | Master's degrees with a specific reference to "quantum" in the degree name, 2025 vs. 2026

MIT Quantum Index Report



In 2026, the master's degree landscape[7] specifically referencing "quantum" in the postgraduate degree title is led by three countries in a tie at the top: Germany, the UK, and the United States each offer 12 programs. This marks a shift from a single clear leader in 2025 to a three-way tie at the top. The Netherlands sits just behind in fourth place with 7 programs, while France holds fifth with 6.

Together, these top five countries account for 49 of the 83 total quantum-titled degrees on offer globally, roughly 59% of all programs tracked. Russia follows with 5 programs, and Spain, Canada, and Sweden form a next tier with 3-4 programs each. A broader cluster of countries, Australia, Denmark, Ireland, Japan, and Switzerland, each offer 2 programs, while a long tail of Austria, Czech Republic, Greece, Hong Kong, Hungary, India, Italy, Malaysia and Poland each offer a single program.

> Austria, the Czech Republic, Hong Kong, Hungary and India each launched their first master's degree referencing "quantum" in the degree title in 2026, extending country-level representation in the dataset to 23 countries.

Comparing the 2025 vs 2026 data reveals a market that has grown substantially rather than simply reshuffled. Total quantum-titled master's degrees worldwide climbed from 68 to 83, a 22% increase, suggesting the field is scaling up broadly rather than merely consolidating around early leaders.

12

In 2025, Germany offered the most degrees (12); in 2026, the UK and the United States caught up to match it exactly at 12 programs each in 2026, creating a three-way tie at the top.

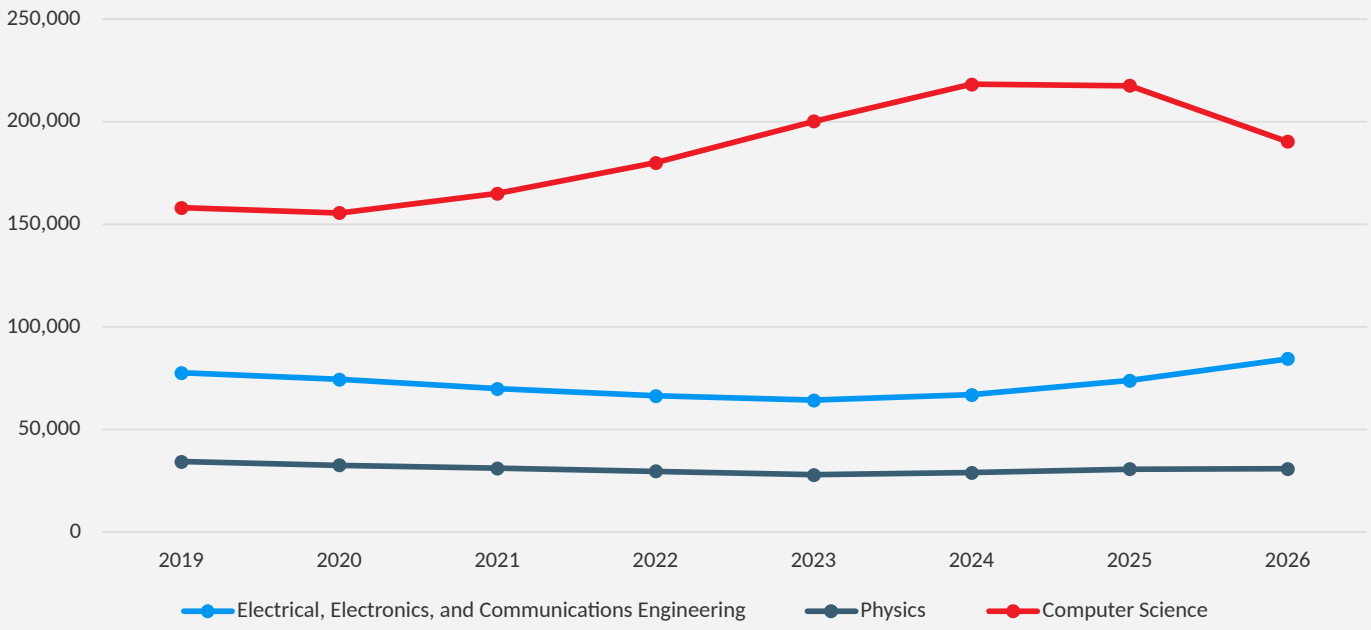
7.2 | Enrollment numbers

Historically, the United States has successfully retained global talent, with roughly 70% of international STEM PhD graduates electing to stay in the country as of 2017.[8] However, cultivating new quantum talent is a long-term endeavor, typically demanding around ten years of higher education and specialized training. To meet expanding labor demands, the U.S. must adopt a two-pronged approach: strengthening domestic educational pathways while continuing to attract and retain top international talent. According to the 2021 U.S. Report “The Role of International Talent in Quantum Information Science”, physics, electrical engineering, and computer science represent the primary degree fields for quantum information science and technology (QIST). These disciplines were identified using a dual methodology: filtering online job listings for key industry terms and evaluating doctoral dissertation titles, abstracts and keywords.

To better understand emerging enrollment trends for physics, electrical engineering, and computer science courses (broad proxies for quantum) we analyzed data from the National Student Clearinghouse (NSC) Research Center (June 2026 update).

Fig. 7.b | Undergraduate degree enrollments in the U.S., 2019–2026

MIT Quantum Index Report



Based on the enrollment data from 2019 to 2026, computer science exhibits by far the highest and most dynamic enrollment trajectory among the three fields. Numbers climbed steadily from 158,122 in 2019 to a peak of 218,190 in 2024, a gain of roughly 60,000 students, or 38%, before pulling back over the following two years to 190,285 in 2026.

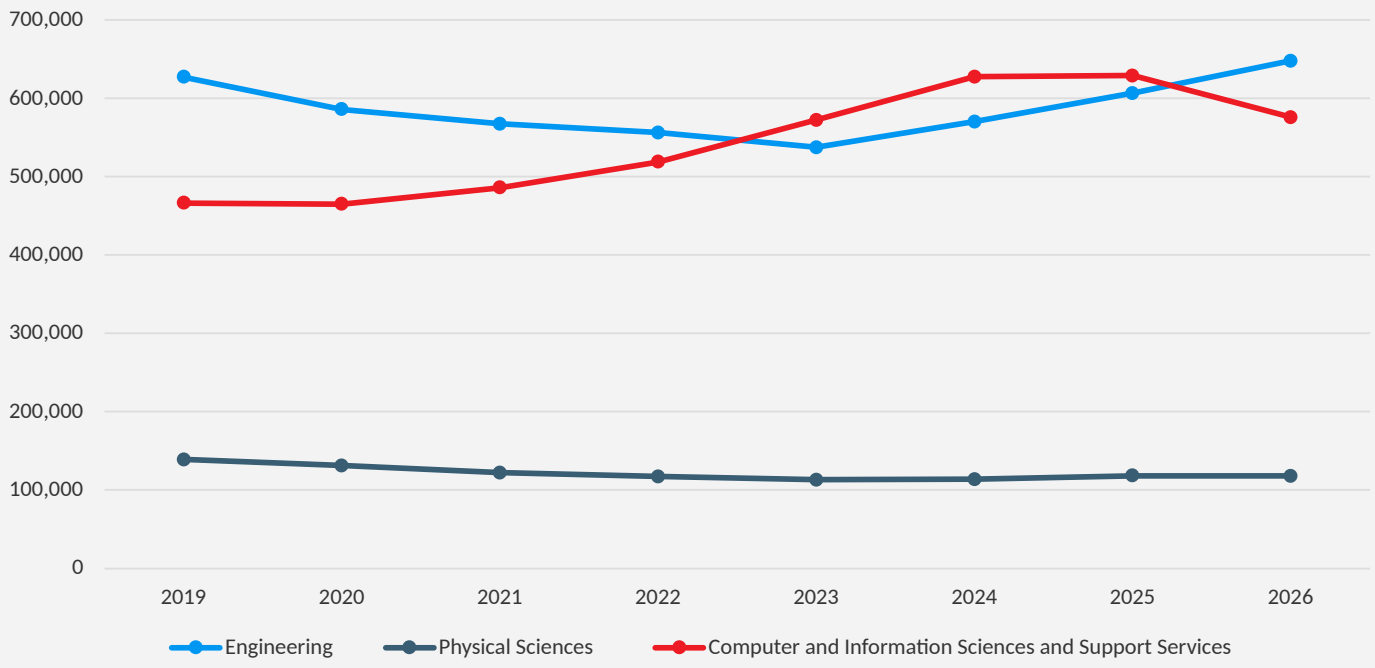
Electrical, Electronics, and Communications Engineering follows a different pattern: enrollment contracts from 77,527 in 2019 down to a low of 64,234 in 2023, before rebounding to 84,415 by 2026, its highest point in the entire period, and a swing of over 20,000 students between trough and peak.

Physics, by contrast, remains the smallest field throughout and shows the most contained movement, narrowing from 34,256 in 2019 to a low of 27,952 in 2023 before a modest recovery to 30,832 in 2026, a range of roughly 6,300 students between its lowest and highest years, reinforcing physics as the most stable, if slowly contracting, of the three fields.

As in our 2025 report, categorization presents some challenges: related degrees such as “Computer and Information Science, General” and “Astronomy and Astrophysics” fall outside these subject-level figures, meaning the field-level counts likely understate the true scale of activity in each area. To provide a fuller picture, the corresponding field-family totals—Engineering, Physical Sciences, and Computer and Information Sciences and Support Services, tell a broadly consistent story.

Fig. 7.c | Undergraduate major field family enrollments in the U.S., 2019–2026

MIT Quantum Index Report



Computer and Information Sciences and Support Services shows the most substantial growth, rising from 466,306 in 2019 to a peak of 628,770 in 2025, an increase of nearly 35%, before easing back to 575,747 in 2026, mirroring the pullback seen at the subject level, though the decline arrives one year later at the family level.

Engineering follows a dip-then-recover pattern similar to its subject-level counterpart: enrollment falls from 627,221 in 2019 to a low of 537,294 in 2023, then climbs steadily to a period-high 647,877 in 2026, surpassing its 2019 starting point.

Physical Sciences again proves the most stable of the three, moving within a comparatively narrow band from a 2019 high of 138,947 down to a 2023 low of 113,075, before completing a mild recovery to 118,027 in 2026, a pattern that closely tracks physics at the subject level, though at roughly four times the enrollment scale. Taken together, the family-level data confirms the subject-level trends while smoothing out some of their sharper year-to-year swings, and helps contextualize the subject-specific figures within their broader disciplinary categories.

7.3 | Future research

Although the quantum education space is expanding quickly, it remains fragmented and inconsistently tracked. While informal feedback suggests growing interest and rising enrollments in quantum programs, solid data on student demographics, institutional funding, and career trajectories is urgently needed. Gathering these metrics is vital for pinpointing best practices, addressing equity and access gaps, and guiding data-driven policymaking.

To deepen and broaden these insights in future editions of this report, we welcome contributions from the quantum education community. We encourage researchers and educators to reach out if they can share enrollment figures, curriculum models, or updates on emerging programs. Through this community-driven approach, we hope to build a fuller global picture of quantum education efforts and support better learning strategies across the field.

You can reach us at contact@qir.mit.edu

Footnotes

[1] 'National Q-12 Education Partnership' <https://q12education.org/> accessed 16 August 2026.

[2] 'Experiential Learning for Emerging and Novel Technologies (ExLENT) | NSF - U.S. National Science Foundation' <https://www.nsf.gov/funding/opportunities/exlent-experiential-learning-emerging-novel-technologies> accessed 16 August 2026.

[3] 'Quantum Flagship' <https://qt.eu/ecosystem/education-and-training> accessed 16 August 2026.

[4] European Commission: Directorate-General for Communications Networks, Content and Technology, Quantum Flagship, Greinert, F. and Müller, R., 'European Competence Framework for Quantum Technologies (CFQT)' (Publications Office of the European Union 2025).

[5] 'The Quantum Academy Launches to Train Europe's Next Generation of Talent' (*Quantum Flagship*) <https://qt.eu/news/2026/2026-05-06_The_Quantum_Academy_launches_to_train_Europes_next-generation_of_talent> accessed 16 July 2026.

[6] 'UK Quantum Skills Taskforce Report' (*GOV.UK*) <https://www.gov.uk/government/publications/uk-quantum-skills-taskforce-report/uk-quantum-skills-taskforce-report> accessed 16 July 2026.

[7] As sourced from StudyPortals database, following the country coverage therein.

[8] Subcommittee on Economic and Security Implications of Quantum Science, Committee on Homeland and National Security of the National Science & Technology Council, 'The Role of International Talent in Quantum Information Science'.

