

REPORT

MINISTRIES OF FOREIGN AFFAIRS AND SCIENCE DIPLOMACY TRAINING

From Awareness to Stepwise Efforts

Authors: Pierre-Bruno Ruffini^a and Maria Bonnafous-Boucher^b



ABSTRACT

Science diplomacy emerged in the early 2000s as a new concept and vocabulary to describe a large array of professional practices that bridge science, technology (S&T), and diplomacy. 2025 proved to be a particularly productive year for advancing the discourse and practice of science diplomacy. Fifteen years after the foundational 2010 report co-authored by the Royal Society and the American Association for the Advancement of Science (AAAS), the same institutions released an updated report titled Science diplomacy in an era of disruption. In 2025, the European Commission also published its comprehensive framework for science diplomacy, a report developed with input from over a hundred experts over several months. Each of these reports, in its own way, addressed alongside other topics the critical stakes of providing appropriate training for the diverse categories of actor who play a role in science diplomacy. The present report explores this highly relevant and timely issue from the perspective of Ministries of Foreign Affairs (MFAs), with a central question: what are MFAs doing to train their staff on S&T issues and science diplomacy? It presents and comments on the results of a survey conducted over the period from December 2024 to March 2025 among MFAs from twelve countries as well as the European Commission.

^{a, b} Association for the Promotion of International Scientific and Technical Relations (AVRIST) and European Union Science Diplomacy Alliance.

AVRIST is a French association that brings together individuals who serve or have served as counsellor or attaché for science and technology at French embassies, as well as other professionals of international relations in the fields of research, science and technology.

The authors express their sincere gratitude to Jean-Claude Arditti (AVRIST), Catherine Hodeir (AVRIST), Claire Mays (Institut Symlog de France) and Charlotte Rungius (ZSI and European Union Science Diplomacy Alliance) for their careful review of an earlier draft of this report. Their comments and suggestions significantly improved the final version. However, the authors alone are responsible for any remaining errors or omissions.

1 SCIENCE DIPLOMACY TRAINING: A GROWING RECOGNITION

Ongoing and diverse actions are exploring science diplomacy training. AAAS as well as the World Academy of Sciences (TWAS) have long been interested in these issues. Since its founding in 2019, the Geneva Science and Diplomacy Anticipator (GESDA) has developed a substantial training offer. Training courses have been organized as part of European projects funded by the European Commission between 2016 and 2022.¹ Some universities have created courses or curricula dedicated to science diplomacy. Myriad summer schools and training sessions are conducted, most of the time in an academic setting, whether in Montreal, São Paulo, Milan, Padua, Paris or elsewhere.² A quick review of existing training offers, however, shows that they are not intended for diplomats or other personnel employed by the MFAs. There is little information available on what MFAs are doing in this area, and the topic is not addressed as such in the literature. However, two recent sources based on surveys should be mentioned. A report was published in 2025 on the institutionalization of science diplomacy in Central, Eastern and Southeastern European countries, which gave insight, among others, on “the skills and knowledge required by diplomats and civil servants engaged in science diplomacy” and on “training programs to equip these professionals with essential competencies”.³ Another source is the report published in 2025 by the Asia-Europe Foundation (ASEF), which stated that there exist training mechanisms for diplomats responsible for science diplomacy in 26 of the 41 countries surveyed.⁴ Nevertheless, training in science diplomacy as it is conceived and practiced by MFAs remains a little-known subject. Based on a qualitative survey, the findings presented in this report provide specific insights which fill at least part of the gap in the knowledge of such practices.

¹ EL-CSID (European Leadership in Cultural, Science and Innovation Diplomacy, 2016-2019), S4D4C (Using science for/in diplomacy for addressing global challenges, 2018-2021) and InsSciDE (Inventing a Shared Science Diplomacy for Europe, 2018-2022).

² For an overview of existing offers, see Mauduit J.-C. and Gual Soler M., “Building a Science Diplomacy Curriculum”, *Front. Educ.* 5:138 (2020). doi: 10.3389/feduc.2020.00138; Swiss Young Academy (2025), *On Science for Policy and Diplomacy Education in Switzerland and Beyond: A Brief Overview* (Bern: Swiss Young Academy).

³ Simone Arnaldi and Dejana Petranovic (2025), *Connecting Science and Diplomacy in Central, Eastern and Southeastern European Countries: Institutions, Knowledge and Professional Training*, p. 3. Based on a survey of MFAs in 12 CEI Member States, this research was conducted by the University of Trieste, Italy, in collaboration with the Executive Secretariat of the CEI and financially supported by the Autonomous Region of Friuli Venezia Giulia.

⁴ Linnéa Regnell (2025), *Asia-Europe Science & Technology Diplomacy Report – Mapping Science & Technology Diplomacy Strategies and Actions in the Two Regions* (Asia-Europe Foundation).

For MFAs, building capacity in science diplomacy and training science diplomats are critical human resources stakes. Beyond the role that S&T have long played in the foreign policy of states, whether in terms of cooperation or influence, basic observation suggests that S&T are growing in significance as drivers of international relations. Many of the issues confronting MFAs need scientific input for optimal solutions. AI and quantum technologies unlock new opportunities while also introducing fresh challenges. This shift has led to a growing emphasis on S&T in diplomatic conversations. At some stage in their careers, diplomats will inevitably encounter S&T issues. How well equipped are they to handle such topics? Do they receive specific training in science diplomacy? Does that focus on obtaining scientific skills, on knowledge of current and emergent S&T affairs, on strategy or more? And how are the dedicated staff – such as science attachés – prepared and trained to address these complex issues on behalf of their government? What about the training of science diplomats? These are the core questions explored in the survey presented here.

This report follows a workshop held on 27 March 2025 at UNESCO on the theme “Science Diplomacy Training: Objectives, Practices and Recommendations”, during which the first results of the survey were presented. The event was organized by the European Union Science Diplomacy Alliance, chaired at the time by AVRIST, in collaboration with UNESCO and received support from both the European Commission and UNESCO.⁵ This report of the survey findings and analysis is structured as follows: the second section outlines the objectives and methodology. The third section presents and discusses the results. The fourth section contextualizes the survey by comparing with recent studies and reports, highlighting actionable insights. The final section offers concluding remarks.

⁵ European Union Science Diplomacy Alliance (2025), Workshop Report – Science Diplomacy Training: Objectives, Practices and Recommendations (Paris/Vienna). <https://www.science-diplomacy.eu/media/Workshop-Report-Science-Diplomacy-Training-27-March-2025.pdf>

2 AIMS OF THE SURVEY AND METHODOLOGY

The survey used a questionnaire to assess the scope and significance of training programs offered (or not) by MFAs. The ambition was to acquire empirical data, in order to identify the existing initiatives and experiences, to grasp their scope and limits, and to enable comparisons to be made between countries. The investigation focused on two key groups of actors and corresponding questions:

- career diplomats, with a central question: how are MFAs raising awareness and providing training on S&T issues and science diplomacy?
- staff, whether career diplomats or not, who are directly involved in what may be viewed as science diplomacy activities (collectively referred to as "science diplomats"). The core question addressed was: how do MFAs train their staff, including science counsellors and science attachés, directly involved in science diplomacy activities?

The training of other staff managing science diplomacy from MFA headquarters was excluded from this study.

To answer our questions, we turned to officials from MFA headquarters,⁶ science counsellors and science attachés in post, and representatives of diplomatic academies. In total, data was gathered from 22 people (their respective position is listed in the appendix).

The survey was carried out between December 2024 and March 2025, using two methods: semi-structured interviews⁷ for which the questionnaire served as a guide, and where no interview was possible self-administered questionnaires completed by the respondents. In some cases, two or more individuals from the same country collaborated to provide answers. The choice of countries included in the survey was guided by intentions of principle (bring together countries differing in size, scientific and diplomatic development) and by our practical capacity to establish appropriate contacts.⁸ The survey was conducted among MFAs of the following 12 countries: Austria, Brazil, Canada (including a special focus on Quebec), France, Germany, India, Italy, Netherlands, Romania, Switzerland, United Kingdom and United States of America. The European Union (European Commission) was also part of the survey.

Below is an overview of the themes of our questionnaire and the respective questions asked:

⁶ Directorate General for Research and Innovation in the case of the European Commission.

⁷ Interviews were conducted individually by Jean-Claude Arditti (AVRIST), Maria Bonnaïfous-Boucher (AVRIST), Raluca Coșcodaru (UEFISCDI), Catherine Hodeir (AVRIST) and Pierre-Bruno Ruffini (AVRIST).

⁸ Despite repeated requests, it was not possible to get in contact with pertinent organisations in Australia, Bulgaria, the Republic of Korea, Spain and Sweden. In Australia, science diplomacy is managed by civil servants from the Ministry of Industry, Science and Resources. However, most of the time, their office abroad is located at the Embassy of Australia.

- Key figures regarding S&T-dedicated human resources at MFAs, at headquarters and in the field.

"How many people are assigned to science diplomacy activities in the MFA?"

"In your ministry's headquarters, which department (directorate, sub-directorate, etc.) is responsible for science diplomacy?"

"Are S&T attachés or other S&T-related positions (nuclear, environment, health...) appointed? If yes: how many of them?"

- Raising awareness and training on S&T issues and science diplomacy for career diplomats without a specific science remit.

"Does the training of career diplomats include awareness of S&T issues in general? If yes, since when? If not, are such actions planned?"

"Does the training of career diplomats include awareness of major global issues with a significant S&T dimension (climate, environment, security, etc.)? If yes, since when? If not, are such actions planned?"

"Do career diplomats receive specific training (initial, continuing) in science diplomacy? If yes, since when? If not, are such actions planned?"

- Availability of training for staff with a science diplomacy remit.

- At headquarters:

"What assistance do diplomats receive during the preparation and conduct of negotiations on subjects with a S&T dimension?"

- At embassies:

"Are science counsellors and science attachés career diplomats? Non-diplomatic expatriate staff? Local recruits?"

"What are the required science attaché profiles (experience, skills) during recruitment?"

"Do science attachés receive any special training before taking up their duties? During the exercise of their mission?"

- Content and scope of the training activities.

A fourth set of questions sought to identify the types of training offered, categorizing them by target audience (career diplomats, science counsellors and science attachés, locally recruited staff with a science diplomacy remit, etc.); objectives (awareness-raising vs. active engagement in science diplomacy) and timing (pre-assignment or during the mission).

"What is the content of the training and how is it tailored to the backgrounds of the actors?"

"Do you organize training courses yourself, or are they outsourced to external service providers?"

"What teaching methods do you favor? (lectures, role plays, internships, etc.)"

- Overall assessment

The final open questions gave participants an opportunity to share their observations and assess whether specific priorities could be identified regarding generalist training (training in science diplomacy) and specialist training (training of science diplomats) within their MFAs.

Several observations can be made regarding the survey implementation and findings. Notably, participants did not raise any concerns about the terminology or concept of science diplomacy, suggesting that these are widely understood and accepted within diplomatic institutions without requiring additional explanation. Second, for certain countries in our survey, questions assuming the existence of established generalist and specialist science diplomacy training proved premature, as these initiatives are not yet in place. More broadly, our aim to quantify the extent of training initiatives frequently fell short. Many questions – such as "how long have these training programs existed?" – yielded only vague or unclear responses. Questions regarding the time allocated to training often elicited incomplete, superficial, or impractical responses. For example, S&T-related courses – such as lectures on AI or emerging technologies – are frequently embedded within broader training programs, making it challenging to assess their specific weight or significance. Overall, the responses gathered are primarily qualitative in nature. Furthermore, variations in diplomatic resources – especially those allocated in the field by MFAs – resulted in responses that were uneven in both depth and detail. Lastly, while the sample of participating MFAs was selected to access a range of contexts, it cannot be regarded as fully representative of the global scene.

3 KEY FINDINGS

This section outlines the key findings and general trends, distinguishing between training initiatives targeted at career diplomats and those designed for science counsellors and science attachés.

3.1 What do MFAs do to raise awareness and train career diplomats on S&T issues and science diplomacy?

The survey's insights on career diplomats touch on two phases: initial training at the start of their careers and ongoing professional development. The responses reveal that no MFA among those consulted currently offers training explicitly labeled as "science diplomacy". While specialized training on S&T-intensive topics does exist for career diplomats, its scope varies markedly between countries and remains generally limited. Career diplomats, by nature "generalists", tend to draw on specific expertise as needed.

3.1.1 Initial training for diplomatic career entry

Nearly all surveyed countries – except one – incorporate S&T considerations into the standard training program for new diplomats. Few countries provide dedicated modules on S&T-intensive global challenges. Instead, S&T are typically addressed within broader economic training for new diplomats.

There is noticeable variation, in both scope and scale, among countries in how they address S&T for diplomats. When formal training exists, its duration typically ranges from a few days (two or three) to as long as two weeks (Brazil, India, USA). Approaches differ widely: some countries incorporate S&T-focused lectures into their diplomats' onboarding programs (European Union, the Netherlands, France), while others dedicate roughly one day to raising scientific awareness (UK, USA). Such training can account for 10 to 20% of the total curriculum during the initial year of diplomatic training (Switzerland).

"Most onboarding tasks are completed within two weeks, by which time the diplomat will have gained an overview of MFA's work in Science, Technology and Innovation." (Brazil).

"At point zero of the career, it will be ten days or so out of six months long training; this means at least two weeks of full science, and more in a wider understanding of science (ex: how to use digital tools; environmental issues...)." (India)

"At the start of the career, a year of training in which S&T represents approximately 10 to 20% of the content." (Switzerland)

"There is an induction programme for all new diplomats joining the UK's Science and Technology Network. The programme is usually over the span of a few days to a week. It is completed in the UK before they are sent overseas and is a mixture of learning in the classroom (typically on important Government priorities they might need to respond to in the job) and site visits to UK S&T". (United Kingdom)

"During general training (3-4 months) before taking the first position, about one day is specifically devoted to scientific issues." (USA)

In terms of content and approach, training combines courses, thematic lectures, and discussions with influential stakeholders – each in varying degrees.

"Employees assigned to the MFA's Division for Science, Technology and Innovation (STI) undergo an onboarding process (...) which includes introductory lectures, videoconferences with key players from the Brazilian STI system, mappings of innovation ecosystems, as well as feedback sessions." (Brazil)

"The basic training of our young diplomats includes a compulsory course at the Vienna School of International Studies – Diplomatische Akademie Wien (DA) – that also focuses on Science & Tech Diplomacy." (Austria)

"The European External Action Service (EEAS) organises, on a regular basis, digital diplomacy trainings and delivers presentations during pre-posting to all staff on the topic." (European Union)

"During their training at the beginning of their career diplomats will have some lectures on scientific issues and meetings with experts." (Netherlands)

"If diplomats will have a specific S&T role, the international academy offers specific online training on emerging technologies and other issues around S&T." (United Kingdom)

However, several surveyed countries indicated that they do not specifically incorporate S&T awareness in the early career training of diplomats:

"The pre-assignment courses organized by the Canadian Foreign Service Institute do not include specific efforts to raise awareness of S&T issues (...) We do not have specific training that would allow us to stay up to date with the latest scientific advances and research (...) That said, several of the courses on global issues do include an S&T dimension, such as for the environment, but also critical materials." (Canada)

"There is no tailored training offer to staff in the EEAS headquarters on the topic of S&T-intensive files." (European Union)

"Currently, there is no formal, structured training in science diplomacy for career diplomats. However, the MFA recognizes the importance of such training. While specific training is not yet institutionalized, these topics are occasionally covered within broader diplomatic training programs." (Romania)

3.1.2 Ongoing training throughout a diplomatic career

Professional training is offered at various stages of a diplomat's career, including when preparing for a new assignment. Within these programs, S&T topics may be addressed, though they are usually integrated alongside other key themes.

"The Austrian Foreign Ministry organised a training course on "Tech Diplomacy" for mid-career diplomats whose work focuses on S&T issues" "All diplomats have the opportunity to take courses at the Austrian Federal Academy of Public Administration – the training institute for all civil servants. They offer several trainings with emphasis on digital transformation (e.g. AI, cyber-security, digital leadership, open data)" (Austria)

"Diplomats may continue to improve their skills by participating in training courses throughout their careers" (Brazil)

"As part of continuing education, science diplomacy is seen succinctly in the context of influence diplomacy." (Canada-Quebec)

"The EEAS organizes thematic trainings on global geopolitical topics, such as green transition and climate diplomacy, digital diplomacy, AI and diplomacy, etc. and these topics are also part of our flagship diplomatic training programs." (European Union)

"Online-meetings with career diplomats, Foreign Office, Federal Ministry of Education and/or experts - Biannual S&T-seminar in Germany for career diplomats in the field in charge of S&T." (Germany)

"At the 8, 15 and 25 years of service: a 3-weeks long training; it will include inputs from scientific institutions: nuclear power, space, AI..." (India)

"Diplomats are also encouraged to use the training programs offered by the Academy along their career. It is very difficult to assess to which extent S&T issues are covered in these programs." (Netherlands)

According to the responses collected, the annual gatherings of all diplomats are regarded as opportunities for professional training.

"We have two days that involve all Italian embassies, consulates, and cultural institutes abroad, and which are dedicated to the scientific world. ... Every year we have days for each continent or subcontinent, we talk about all topics: promotion of the country, trade... science is one topic among others." (Italy)

"At the time of the annual ambassadors' conference, there are interventions on S&T." (Switzerland)

"A head of missions conference is held each year. It is usually hosted by our foreign secretary and/or permanent undersecretary who will cover key Government issues." (United Kingdom)

3.1.3 The career diplomat is a generalist, and this guides the training he/she receives

All countries surveyed indicated that career diplomats either receive no specialized training on S&T- intensive topics, or are exposed to them only in a cursory manner. A recurring theme, in our interviews, was the emphasis on the diplomat's role as a generalist. The objective, therefore, is not to provide diplomats with in-depth specialization in any particular S&T field but rather to equip them with broad adaptable knowledge as opposed to subject-matter expertise.

When questioned about the support available to diplomats during the preparation and execution of negotiations involving S&T issues, the interviewees emphasized the critical role of teamwork and expert guidance from technical ministries.

"They benefit of the support from the relevant sectoral ministries, and possibly also of the support from the team of the Chief Scientist Adviser of Quebec." (Canada-Quebec)

"(Diplomats) receive technical support from relevant policy DGs of the Commission (Environment, Climate Action, etc.) as well as the science advisory structures of the Commission, especially the Joint Research Centre (JRC). In addition, the EEAS is supported by scientific-technical agencies like the EU Satellite Centre (SATCEN) or the EU Institute for Security Studies (EU ISS)." (European Union)

"In the negotiations, we send a team consisting of technical experts, diplomatic negotiators, bureaucrats... The technical person is there to give advice when needed. We do not give training allowing people to become self-sufficient on all S&T aspects." (India)

"It happens very smoothly. Diplomats are generalist, who deal with scientific issues at the institutional level by having points of contact or interactions with scientists." (Switzerland)

"They will receive a briefing, and that briefing will cover S&T elements, political elements, decision making. We give them knowledge on the UK system relating to the topic to be discussed, we give background on the UK historical position. We might also deploy the Chief Scientist Adviser or the science attaché to support in the negotiation." (United Kingdom)

"A career diplomat generally won't specialize in one topic (for example, climate). Therefore, you need to have colleagues from other ministries (energy, etc.), but also from the State Department, which has many civil servants who are experts (of conflicts, technical subjects, etc.). Career diplomats don't represent our deepest subject-matter expertise; we're versatile and we know how to negotiate." (USA)

"There are technical experts from other departments, from agencies, in order to assist and make sure that we have consistency on our points. There is a lot of coordination at the negotiation and before it." (USA)

Highlighting the diplomats as generalists helps define the scope of their required training. Their expertise need not extend beyond a foundational awareness of key scientific, economic, and diplomatic challenges they encounter. As facilitators, career diplomats leverage both internal resources – such as various ministries – and external S&T contacts. Their grasp of S&T issues is simply one component of the broad skills set they have to master.

3.1.4 Other results

In addition, the survey revealed that:

- In all cases, training is primarily organized in-house. Courses are delivered either by entities within the MFA or by those under its direct oversight, such as the Vienna School of International Studies (Austria), the Rio Branco Institute (Brazil), the Canadian Foreign Service Institute, the International Academy (United Kingdom) or the Diplomatic and Consular Academy (France). Established in May 2024, the Diplomatic and Consular Academy intends to integrate science diplomacy explicitly into its training programs. Occasionally, external private organizations also contribute, such as the Balsillie Executive Institute, which offers a cutting-edge program bridging S&T with policy and governance (Canada).
- To the question "Is science diplomacy included in the ambassador's letter of mission", only three positive answers were given: Brazil

(about “innovation diplomacy”), Germany and Switzerland. While other responses highlighted the mention of scientific and academic cooperation in the ambassador’s mission letter (Canada-Quebec, France, Italy, Switzerland), they never mentioned the concept of science diplomacy as such. The following statement captures the essence of the most common replies: *“Science diplomacy is not explicitly included in ambassadors’ mission letters, but it is part of broader cultural and educational diplomatic efforts”* (Romania).

3.2 How do MFAs train their science counsellors and science attachés?

The survey asked how MFAs train staff with a specific science remit. Responses varied widely, reflecting the diverse backgrounds of science counsellors and science attachés. In most cases, specialist training before taking up office is either minimal or nonexistent. The annual meetings of all the science counsellors and science attachés organized by their MFA are seen as an opportune moment to provide them some training. Although these gatherings are highly valuable for networking, they only partially cover updates on key scientific and technological issues and ongoing negotiations.

3.2.1 Science counsellors and science attachés vary in role and responsibilities from one country to another

In embassies, the staff in charge of S&T files are science counsellors and science attachés. Local recruits are also employed as science attachés, with or without that job title. The interviews showed that there is a great diversity of situations depending on the country:

- Terminology varies. In American embassies, the title “counsellor”, which refers to a diplomatic status, is held only by career diplomats assigned as head of the scientific service, and the term “science attaché” is used for staff from a technical agency (energy attaché, space attaché). The situation is similar in Brazilian embassies, which do not employ “science attachés” as such. In European Union delegations, the title of science counsellor is reserved for expatriates from the Commission, and the term “science attaché” is not used. In other countries (France, India, Switzerland), there are science counsellors and science attachés, the former occupying a higher hierarchical position. Only the term “science attaché” is used in Italy’s embassies.
- The number of science counsellors and science attachés posted at embassies varies widely: from none in one surveyed country to over a hundred distributed across more than fifty countries.
- The diversity of professional backgrounds is extensive. In the embassies, S&T issues are managed by career diplomats (Brazil, USA), by expatriate nationals from academic and research fields (France, India, Italy) or from research administration (European Union, Germany), or by a mixture of career diplomats and local recruits with science backgrounds (United Kingdom). In some cases, local recruits serve as the primary resource (Canada – Quebec, Switzerland), while in others, they play a

complementary role (Brazil, European Union, Germany, United Kingdom, USA).

- The network of science counsellors and science attachés may operate under different governance structures: it may be fully and exclusively managed by the MFA (France, Italy, USA), overseen by the Ministry of Research only (India), or subject to joint supervision by both the MFA and the Ministry of Research (United Kingdom). Within the European Union, this network is coordinated by the European Commission's Directorate-General of Research and Innovation.
- The professionals responsible for S&T affairs are integrated into various embassy services – such as economic and commercial section (Canada, India, Italy, USA), cultural service (France), or political or cultural department (Austria, Quebec). For some countries, the governance of S&T is dependent on local circumstances (European Union, Germany, United Kingdom). Posted in larger countries, scientific counsellors and attachés may be part of a specialized embassy unit or office dedicated to S&T matters (Brazil, European Union, France, India, Switzerland).

3.2.2 Training before taking up office

The pre-deployment training for science counsellors and science attachés primarily involves networking sessions, which help new appointees establish essential contacts both at ministry headquarters and in their host country. Additionally, this training may include targeted lectures on priority topics relevant to their ministry's objectives.

While pre-posting training often covers the diplomatic aspects of the role, specialized training on S&T topics before taking up office remains limited or absent in most of the countries surveyed. However, a few countries do invest more significantly in this area.

"Upon arrival at the mission, the diplomats who will head the Science, Technology and Innovation Sections receive an onboarding guide, which includes video lectures with stakeholders from the Brazilian science, technology and innovation system, a report detailing activities conducted in the Innovation Diplomacy Program and film about Brazilian innovation ecosystems." (Brazil)

"There is no pre-departure training. But this was unanimously requested by the science attachés at the major annual conference." (Italy)

"During the one-week induction programme, we will arrange for our country-based staff a series of presentations from different government department that will explain them what are their specific priorities, they will meet with academics, industry, and they will also get local training on navigating in their country of assignment." (United Kingdom)

"Our Environment, Science, Technology and Health (ESTH) officers (at headquarters and abroad) take a 2-week long course about all aspects of ESTH. This course is taught twice a year in person, for 20 or so officers. There are also shorter courses on cybersecurity and digital policies, on critical and emerging technologies, etc. These shorter courses are optional." (USA)

Others emphasize the targeted preparatory meetings that the science attaché must carry out:

"There is a common component for all science attachés with meetings with the various departments of the Ministry of International Relations and Francophonie, then each attaché is invited to organize specific meetings with the interlocutors of their choice according to their needs." (Canada-Québec)

"No specific preparation before taking up office, but a series of meetings are organized." (Switzerland)

3.2.3 Training during the assignment period

For many of the countries included in our survey, a key training opportunity is the regular gathering (most often annual) of the network of science counsellors and science attachés (European Union, France, Italy, Switzerland):

"Once a year, all EU Science Counsellors (including local agents) meet for an in-person meeting for a whole week in Brussels, which aims at updating them on relevant developments and providing them with specific training for their work – e.g., on how to use information systems relevant for Horizon Europe." (European Union)

"During the Journées du réseau – once a year – there are sessions and presentations related to science. There are also presentations from key scientific figures and institutions." (France)

"Once a year, the Farnesina (Italy's MFA) holds a one-day online meeting between science attachés with the Ministry of research, with research centers and major universities." (Italy)

"It is mainly about feedback and sharing information. There are no formalized courses, but rather occasional meetings during major events or visits to major research and academic institutions. There is no regularity or frequency; the contacts are continuous." (Switzerland)

During the mission, asynchronous and on-demand training were sometimes mentioned as important resources (Brazil, India, USA), alongside field visits, exchanges and working meetings:

"During their mission: everybody has the possibility to get additional training depending on what is useful; it is driven by the initiative of individuals, but the institution supports; it is on-job training." (India)

"The training materials are available to the employees of Embassies' Science, Technology and Innovation Sections for asynchronous and progressive use, enabling them to develop their skills as they perform their duties. The materials consist of written resources and approximately 25 video lectures and videoconferences, each lasting approximately 1½ hour. New training sessions are organized regularly." (USA)

"Additional training modules are available online." (Switzerland)

3.3 Examples of innovative practices

The survey identified several notable best practices in training, particularly those that align closely with the evolving techno-scientific landscape. Interviews also revealed programs that actively involve researchers in diplomatic work and foster connections between diplomats and academic activities.

3.3.1 Training in alignment with overall policy priorities

Two countries have a particular topical orientation of their science diplomacy. From the given examples, Austria's approach seems to focus on critical technologies and the implementation of a "tech diplomacy", while Brazil chooses to pursue "science and innovation diplomacy" rather than simply "science diplomacy" – which is a way of recognizing the importance of its business dimension. In both countries, the training offer is built on these priorities.

In Austria, training strongly focuses on technological issues:

"The basic training of our young diplomats includes a compulsory course at the Vienna School of International Studies – Diplomatische Akademie Wien that also focuses on Science & Tech Diplomacy. » (...) The Austrian Foreign Ministry organised a training course on « Tech Diplomacy » for mid-career diplomats whose work focuses on S&T issues."

In these trainings, themes such as "Diplomacy in the Digital Age" or "AI and Diplomacy" are developed and the missions of the special envoy for cyber-foreign policy and cyber-security are highlighted. In addition, "Tech Diplomacy Talks" were organized in more than thirty Austrian embassies in 2023 and 2024, "in order to boost the capacity of the Austrian diplomatic service in Tech Diplomacy".

Brazil stands out from other countries by emphasizing innovation in its approach to science diplomacy. Science, technology and innovation issues were initially addressed within training on economic issues usually taught to new diplomats. In 2016, the MFA began appointing diplomats with a dedicated focus on STI issues for overseas postings. Since then, the Rio Branco Institute has included, in varying proportions, science and innovation diplomacy in its curricula.

"The diplomats in training are introduced to the Innovation Diplomacy Program conducted by Ministry of External Relations, the national research infrastructure, the main scientific and technological cooperation projects developed by Brazil, as well as other relevant information to support their future diplomatic activities."

3.3.2 Programs that engage researchers in the work of a diplomatic service

"Does your ministry develop initiatives to make researchers more aware of the world of diplomacy?": in three countries, this question received an affirmative answer.

USA fellowship programs to bring scientists to the Department of State

The United States organize six fellowship programs, thanks to which scientists are chosen for one or two years in order to provide expertise and support negotiations, and elevate the level of knowledge deployed in science diplomacy. These scientist fellows are based at headquarters and focus on strategic policy making. Their work may include temporary missions abroad. The AAAS program is the largest one, gathering usually 40 fellows for up to two years. Programs for one year are the Jefferson Science Fellows (with the National Academies of Sciences, Engineering and Medicine, gathering five fellows), and the Fellowships with respectively the American Society of Mechanical Engineering, the American Institute of Physics, the Institute of Electrical and Electronics Engineering, and the Georgetown Center for Security in Emerging Technology (each of them hosting one fellow per year). Some of these programs have existed for 40 years in the Department of State, and the most recent one was launched in 2021-22. Together, these programs have generated more than 1,000 alumni. Many of them return to academia after completing their fellowship, while others transition to roles within the federal government or the private sector. An alumni network helps to share information about science diplomacy, making the academic community aware of what the Department of State does for S&T.

"Scientists in residence" at Quebec's representations abroad

Another initiative can be seen in Quebec, where the Ministry of International Relations and La Francophonie is partnering with the Fonds de recherche du Québec to integrate scientists in residence into Quebec's representations abroad that do not have a science attaché. This one or two-year experience allows young scientists to better understand how to communicate and interact with the political and diplomatic environment.

Netherlands's Embassy Science Fellowship programme

The programme is coordinated by the Ministry of Foreign Affairs in collaboration with the Netherlands Organization for Scientific Research (NWO). Fellows work on various themes from embassies and permanent representations. They are deployed on site for three months to strengthen bilateral and multilateral relations and make foreign policy more forward-looking and knowledge-based.

3.3.3 Practices that connect diplomats with academic activities

"Do you have any arrangements for raising awareness of S&T issues among career diplomats in the field (for example, stays in research institutes, working in pairs with a scientist, etc.)?". This survey question received a substantial and model answer in the case of the USA.

On the one hand, diplomats (about fifteen per year) are stationed at one American university, according to the "directed tour" program. From there, over the course of 2-3 years they oversee work and engagement at a number of universities around the USA, focusing on recruitment, hiring, and developing better connections between universities and the Department of State. There are also direct programs with certain universities, called "tech tours". Such a program has existed with Stanford University since the 1960s: each year, it allows a diplomat to spend a year there to carry out a research project. In the past two years, the Department of State has launched a program by which diplomats (12 to 15 annually) can complete a one-year residence at one of the fifteen participating universities. They work in technical fields such as S&T diplomacy and cyber diplomacy, and do a research project before coming back to the Department.

"We expect them to better understand how Academia works, and then bring back this knowledge into the State Department." (USA)

Another example of the inclusion of diplomats in academic and research activities can be found in France. In institutions partially or entirely dedicated to research and in which the Ministry of Foreign Affairs is one of the stakeholders, such as the French Alternative Energies and Atomic Energy Commission (CEA), the French Agricultural Research Centre for International Development (CIRAD), or the Institut de recherche pour le développement (IRD), it is standard practice for one of the Director-General positions to be held by a career diplomat.

Finally, the Ministry of Foreign Affairs of Netherlands actively encourages and supports employees pursuing doctoral research. Under this initiative, staff members may take leave during their final year to focus exclusively on their thesis. Additionally, the ministry operates a "special professor" program, which involves assigning a diplomat to a Dutch university for roughly five years in part-time capacity. This role enhances the university's training offerings in a social

field.⁹ Currently, a diplomat serving as a special professor dedicates one day a week to teaching and research activities.

⁹ <https://www.government.nl/ministries/ministry-of-foreign-affairs/organisational-structure/research-and-expertise>

4 OVERALL ASSESSMENT AND DISCUSSION

Given the heterogeneity of responses, what are the key insights and lessons to be derived from this survey?

4.1 The scope and scale of training initiatives differ significantly by country, though yet they are widely regarded as insufficient

Whether it is a matter of raising awareness among career diplomats about S&T issues or of providing specific training to science counsellors and science attachés, the overall impression that emerges from responses is that actions exist in practically every context, but they are often rather embryonic. According to interviewees, all MFAs implement job preparation but few provide dedicated structured training on S&T and science diplomacy. In a small number of countries, however, these actions are more substantial.

This overall observation is confirmed by the interviewees' own judgment. To the question "is training in science diplomacy and training of science diplomats sufficient?", the answers were:

Sufficient	3
Not sufficient	9
No answer	10

Comments from interviewees generally acknowledged the growing importance of S&T and science diplomacy training. Projects and improvements are underway in several countries, such as the announced introduction of a "science diplomacy" module in training programs (France, India).

Regarding career diplomats: It was stated in the interviews that the S&T and science diplomacy dimensions of the training of career diplomats, as generalists, would not require any particular deepening. This type of training has only recently become a concern for most MFAs.

Regarding science counsellors and science attachés, the most detailed and compelling responses about the scope and content of pre-posting training came from countries that recruit their S&T personnel – either partially or entirely – among career diplomats (Brazil, United Kingdom, USA). In these cases, training tends to focus on equipping them with knowledge of the national research system, research institutions' priorities, and key current S&T topics, as this is deemed essential to their role. Conversely, when science counsellors and science attachés are drawn from academic or scientific backgrounds (Canada-Quebec, France, Italy, Switzerland), their pre-assignment preparation places greater emphasis on familiarizing them with the expectations of their diplomatic hierarchy and the workings of a new institutional environment, diplomacy itself. Here, the primary challenge is their acculturation, their integration into the diplomatic world. However, based on the survey responses, there is little evidence that this critical need is being effectively met.

4.2 Are we talking about training, or briefing?

This question arose indirectly during the interviews. When asked the question: “How do you train your staff in S&T and in science diplomacy?”, responses were often such as: “Here is what we do to prepare them for the tasks that await them abroad”. Through these answers, it became clear that interviewees generally interpreted “training” in two distinct ways: what we categorize as “formal structured training” and “informal training”.

1/ *Structured training* follows a defined *curriculum* with clear learning objectives, covering both general knowledge and practical tools essential to the role. This type of training typically involves group-based sessions (e.g., classroom-style instruction) and interactive, action-oriented methods such as role-playing or simulation games. Some components may also be self-directed, such as asynchronous online modules accessible to participants. For career diplomats, formal training can occur both at the start of their professional journey and throughout their career. For science counsellors and science attachés, it may be provided prior to taking up their post and during their assignment.

2/ *Informal training* is tailored to each individual assignment. It encompasses all the instances where the agent receives verbal guidance, instructions, or advice from headquarters to prepare for their specific role abroad. According to the survey, this approach is especially common for science counsellors and attachés. Preparation often includes meetings with key stakeholders in S&T, as well as visits to relevant field organizations and laboratories in the home country. Additionally, agents benefit before their departure from the knowledge and experience shared by their predecessors during preparatory discussions. Once on assignment, on-the-job learning continues, particularly through annual network meetings where all science counsellors and science attachés gather to exchange insights and best practices.

The survey revealed a mixed model. All countries use a both formal structured training and informal training, in what could be described as a blended training approach. The balance between these two methods varies depending on the targeted agents and country-specific practices.

The interviews consistently highlighted the significant role of informal training:

“The Austrian MFA does not offer training in the field of S&T before postings. The focus is on independent preparation for a posting abroad and on training on the job during the posting.” (Austria)

“Before departure, personal contact and individual discussions are very important. Most of the training is provided by predecessors; they give a lot of advice that would never be included in a filmed video, and it goes faster. ... The training consists more of telling them what they will have to do in their country of assignment.” (Italy)

“Before their departure, we explain to them one by one the opportunities, expectations, and missions in their assigned country. We introduce them to their contact persons. It is individual training, it is very concrete.” (Italy)

"There is a lot of on-the-job learning. Training is mostly done through briefings." (Switzerland)

This might imply that personalized guidance and tailored instructions before taking up a post are more valuable than broad training on S&T topics. However, if these preparations primarily consist of ad-hoc-briefings rather than structured learning, can we truly classify them as "training" or simply "pre-departure briefings"?

5 CONCLUSION AND PROSPECTS

Science Diplomacy today faces significant challenges due to the rapid evolution of the global landscape: "In just a few years, the dialectic between the interests of science and those of diplomacy has changed. For a long time, the idea prevailed that science sought to obtain and apply its knowledge at the international level without regard for borders, while diplomacy pursued national or, at best, multilateral interests. In this context, until recently, science and diplomacy managed to find a win-win balance. This not always the case. Rather, science diplomacy is a tool that is used to achieve a notion of diplomatic objectives."¹⁰ As S&T become increasingly central to international policy – and vice versa – especially in areas such as defense, health, trade and artificial intelligence, there is a pressing need to identify the human skills and specialized training required to effectively navigate the intersection of these fields.

Given the complex and often volatile international context, the survey presented here, sought to assess the initiatives undertaken by MFAs in the realm of science diplomacy training and the preparation of science diplomats. Conducted between December 2024 and March 2025, the survey gathered insights from twelve countries, as well as the European Union (European Commission).

The survey findings, presented under the label "From Awareness to Stepwise Efforts", reveal a clear recognition among all participating MFAs of the critical role S&T now play in diplomacy. However, this awareness is not consistently reflected in staff training practices. The scope and structure of formal training programs vary significantly across countries, with informal knowledge-sharing and on-the-job learning often taking precedence. In most cases, science counsellors and attachés assume their roles without receiving any specialized preparation. For career diplomats, updates on global S&T issues and advances remain sporadic rather than systematic. Overall, the training and capacity-building initiatives needed to equip diplomats and MFA science diplomats for their evolving responsibilities, remain limited. But how far should training be strengthened? A key finding of our research is the role played by the briefings that science counsellors and science attachés receive before their posting in the field. What we have called "informal training" was considered even more important than "structured training" by some of our interviewees. If we add — and this is another lesson of our survey — that training in S&T issues and science diplomacy is not a universal priority for career diplomats, as generalists, we conclude that providing more structured training is a matter of debate and can only be answered on a case-by-case basis across countries. It is up to each MFA to determine the right balance of regularly updated training and informal training through the practice of briefings.

One notable gap highlighted by the survey – and thus a key area for potential improvement – is the lack of definition of the skills required for careers in science diplomacy. The broader challenge in designing effective training programs stems from the absence of a formalized career path or professional identity specifically labeled as "science diplomacy". However, this issue appears less problematic within MFAs. In diplomatic institutions, there are established professional roles

¹⁰ Science diplomacy in an era of disruption, op. cit.

that bridge science and diplomacy, such as chief scientific advisor, science counsellor, or science attaché at embassies. These positions are formally outlined in mission letters or job descriptions. Yet, even in these cases, MFAs do not make reference to a structured and explicit framework of competencies.

Research and reflection on training suggests that for any position at the intersection of science and diplomacy, a mix of traditional diplomatic skills and scientific knowledge is required. These assets fall more precisely into three areas¹¹:

- Scientific literacy and general understanding of scientific culture and scientific issues in order to be able to engage with experts.
- Knowledge of research policy in an international context, in particular regarding regulatory aspects of intellectual property and research security.
- Horizontal or soft skills: communication and writing, strategic analysis, adaptability, networking, negotiation, leadership and management capabilities.

Following their survey of MFAs from Central and Eastern European countries, S. Arnaldi and D. Petranovic noted that “participants emphasized the importance of balancing these skills, noting a preference for generalist competencies while recognizing the value of specialized knowledge in certain contexts.” The same conclusion could be made following our survey.

A competency framework typically outlines the roles, tasks, and responsibilities within an organization, as well as the skills required to fulfill them effectively. Crucial for recruitment, such a framework helps identify gaps between existing and required skills, serving as a vital tool for assessing training needs and focusing educational efforts on areas where competencies are lacking. The necessity of establishing a competency framework for science diplomacy professions was strongly emphasized in the European Framework for Science Diplomacy, published in 2025 by European Commission.¹² In order to “train and empower Europe’s current and future science diplomacy professionals”, the report advocated for “building capacity for European science diplomacy through the training of scientists, diplomats, and professionals at the intersection of science and policy, including the development of career paths.”¹³ Regarding the professionalization of training in science diplomacy, the report also laid out potential steps to be implemented in the short, the medium and the long term.

These recommendations should serve as a source of inspiration for all MFAs. Our survey specifically examined the initiatives undertaken by MFAs to design and implement tailored training programs that address the distinct requirements of each category of personnel involved in S&T and science diplomacy. Developing competency frameworks for both groups – career diplomats, and science

¹¹ Adapted from S. Arnaldi and D. Petranovic, op. cit.

¹² Op. cit.

¹³ Cf. recommendation 8: Train and empower Europe’s current and future science diplomacy professionals.

counsellors and science attachés – would undoubtedly support them in achieving their objectives more effectively.

Appendix - Interviews conducted during the survey

Country	Position of interviewee	Date of interview
Austria	Counsellor, Scientific cooperation and science diplomacy, Federal Ministry, European and International Affairs	18 March 2025
Brazil	Rio Branco Institute, Coordinator for Education	17 February 2025
	Head of the Division for Science, Technology and Innovation, Ministry of Foreign Affairs	7 March 2025
Canada	Director General, Investment, Innovation and Security, International Trade Branch, Global Affairs Canada	3 February 2025
	Director General and Dean, Canadian Foreign Service Institute (CFSI) Global Affairs Canada	4 February 2025
	Scientific Attaché, General Delegation of Quebec in France	28 February 2025
	Deputy Director, STI Network Innovation, Science & Technology Division Global Affairs Canada	5 March 2025
European Union	Coordinator Science Diplomacy and Multilateral Relations, European Commission, DG Research and Innovation with supplements from EEAS	27 January 2025
France	Head of Academic and Scientific Partnerships, Ministry for Europe and Foreign Affairs	15 January 2025
	Director for research, Diplomatic and Consular Academy	15 January 2025
	Cultural counsellor, Embassy of France in New Zealand	14 March 2025
Germany	Head of Division for international science Policy, Ministry of Foreign Affairs	30 January 2025
India	Dean, Sushma Swaraj Institute of Foreign Service, Ministry of External Affairs	9 January 2025
Italy	Head of science diplomacy and bilateral scientific cooperation	16 December 2024
	Science attaché, Embassy of Italy in France	13 January 2025
Netherlands	Chief Scientific Officer at the Ministry of Foreign Affairs of Netherlands	19 March 2025

Romania	Director, Directorate of Cultural Diplomacy, Education, and Science, Ministry of Foreign Affairs	11 March 2025
Switzerland	Attaché for university and scientific cooperation, Embassy of Switzerland in France	24 March 2025
	Economic counsellor, Embassy of Switzerland in France	24 March 2025
United Kingdom	Global Science Lead, Global Science Department, Foreign, Commonwealth & Development Office	2 January 2025
U.S. of America	Counselor for Environment, Science, Technology and Health, Embassy of the USA in France	26 February 2025
	Deputy Science and Technology Adviser to the Secretary, Department of State	3 March 2025

AUTHORS:

Pierre-Bruno Ruffini

Maria Bonnafous-Boucher



www.science-diplomacy.eu
contact@science-diplomacy.eu



Co-Funded by the
European Union