

Evaluation of the Alexander von Humboldt Foundation's Feodor Lynen-Research Fellowship Programme

Summary

Description of programme, evaluation brief and method

Feodor Lynen Research Fellowships allow highly-qualified scientists and scholars from Germany to spend extended periods of research abroad up to twelve years after completing their doctorates¹. Since the programme was launched in 1979, well over 3,000 Lynen Fellows have been sponsored and integrated in the Humboldt Network. Mentoring is the principle on which the Lynen Fellowship is based: the fellows are supervised by hosts abroad, who are themselves Humboldtians, that is, alumni of Humboldt Foundation fellowship or award programmes. Networking is the focus of this programme; its aims are described as follows:

“The Humboldt Foundation’s network is consolidated by intensifying and extending existing collaborations as well as by maintaining and extending the host’s contact to the Foundation and to Germany. The network is used to ‘open doors’ to research stays for junior researchers abroad. This facilitates the process of internationalising and promoting the careers of highly-qualified postdoctoral and experienced researchers up to 12 years after completing their doctorates. International collaborations ensuing from this should have long-term prospects.”

Thus the programme serves to consolidate the Humboldt Network and to internationalise and promote the careers of researchers from Germany who are admitted to this network.

The current programme evaluation was conducted between January 2011 and June 2012 and covers the reporting period 1979-2010. In addition to the Alexander von Humboldt Foundation's Feodor Lynen Programme it also refers to the fellowship programmes offered by the Japan Society for the Promotion of Science (JSPS) and, from 1998 to 2000, the Science and Technology Agency (STA) of Japan and the National Science Council (NSC) of Taiwan. The Alexander von Humboldt Foundation was entrusted with the pre-selection of German applicants by these agencies; all the programmes mentioned are covered by a joint selection procedure within the Feodor Lynen Programme. Unlike the Feodor Lynen Programme, the other programmes do not stipulate that fellows should be mentored by a Humboldtian at the respective institution. The Humboldt Network is however open to JSPS and STA Fellows. One significant difference between these programmes and the Feodor Lynen Programme is the method of financing: JSPS/STA/NSC Fellowships are not based on co-financing by the host, whereas this is usually the case with regard to Lynen Fellowships.

Applicants are selected solely on the basis of their academic qualifications. There are no quotas, neither for countries nor for academic disciplines. The final decision is taken by an interdisciplinary committee based on independent peer reviews against the backdrop of available funding.

The objectives of the evaluation are to assess the programme both with regard to consolidating and extending the Humboldt Network and to the quality of the selection procedure; they also seek to trace the careers of Lynen alumni with regard to academic, economic and cultural development as well as internationalisation. Conclusions and recommendations for continuing or developing the programme constitute the central results of the study which is based on an analysis of the strengths and weaknesses of the programme and its constituent parts, taking account of its special features.

In order to fulfil these diverse requirements qualitative and quantitative methods were combined: the former comprised interviews with stakeholders and fellows, focus groups, examination of the literature and documents as well as participation as an observer in the Humboldt Foundation's Annual Meeting. The quantitative methods differentiate between collecting primary data, that is, a survey of Lynen, JSPS, STA and NSC Fellows going back to the beginning of the programme as well as unsuccessful applicants of the last ten years, and secondary data analysis. First of all, we evaluated the Humboldt Foundation's database and also analysed electronically-stored final reports submitted by Lynen Fellows' hosts. Two surveys of this target group undertaken in the context of previous evaluations of the Humboldt Research Fellowship Programme (2010) and the Humboldt Research Award Programme (2008) were re-evaluated. Bibliometric analyses of the publication activities of fellows and

¹ Until the introduction of the career stage model in 2007, eligibility was linked to biological age with an upper age limit of 38. Since then, a differentiation has been made between post-doctoral and experienced researchers.

unsuccessful candidates in selected fields of physics and chemistry, who chose the USA as their research destination, provide deeper insights into issues of scientific career promotion. Finally, we were gratefully able to access German Research Foundation (DFG) and German Academic Exchange Service (DAAD) funding data on their promotion of postdoctoral researchers abroad and compare it with Humboldt Foundation data in order to gain insights into the positioning of the respective programmes.

Key figures from sponsorship statistics

During the reporting period (approvals 1979-2010), a total of 3,099 fellows were sponsored, 2,712 of them in the Feodor Lynen Fellowship Programme, and 387 in the JSPS, STA and NSC programmes. Historically, an initial expansion phase can be traced up to 1989, during which the number of fellows increased, with slight fluctuations, from 14 in 1979 to 80 in 1989. A second expansion phase followed between 1989 and 1994, with a peak of 180 fellows in 1994. The third phase (1995-2001) began with strong fluctuations following a rapid reduction of 37 percentage points in the number of fellows in just two years. The figures then levelled off to approximately 130 people per year. Since 2002, with slight fluctuations, a reduction in the average number of fellows can be observed.

The most popular destination amongst fellows is the USA: 59% choose the USA for their research stay. Japan comes in second place, although during the last decade the number of research stays in Japan has dropped by about half in comparison with the 1990s. The United Kingdom, Canada, France and Australia are the countries chosen by 3% to 4% of fellows respectively, whereby in some years the proportion rose to 9% to 12% whilst in others no-one applied successfully for these countries at all.

The profile of Lynen Fellows reveals a clear emphasis on natural science: in the 1980s and 2000s, 52% of fellows were natural scientists; in the 1990s, the figure even reached 60%. In the 1980s, every fourth fellow was a life scientist. In the following two decades, this figure dropped to 19% and 18% respectively while humanities scholars and social scientists only achieved 25% of fellowships in the last decade. Engineering scientists play a comparatively minor role overall (previously 8%, in the 2000s 6% of fellowships).

The role of Lynen Fellows in the Humboldt Network

The entire network of researchers sponsored by the Humboldt Foundation² currently comprises 22,388 research fellows from abroad, 3,963 award winners from abroad, 3,215 Feodor Lynen Fellows from Germany and 730 Humboldtians sponsored in other programmes. Lynen Fellows thus account for roughly ten percent of Humboldtians as a whole. What role do they play in the network and to what extent do they contribute to consolidating and extending the Humboldt Network yet further?

For Lynen Fellows the Humboldt Network essentially functions as a door-opener thanks to its excellent reputation in general and its access to eminent academics abroad in particular³. This works in both directions: applicants find their hosts through the Humboldt Foundation, and the hosts appreciate the fact that they can rely on the high quality of applicants they do not know personally.

On the other hand, the mandatory linkage with a Humboldt host is also seen as a restriction which can have various consequences. Since the 1980s, it has been possible to engage an additional academic mentor if a Feodor Lynen Fellow wishes to pursue a research project abroad which cannot be directly mentored by a Humboldtian, provided that a Humboldtian in the immediate field supports the application. The evaluation of the database reveals that this option has been used increasingly frequently. Of the fellows selected in 2010, 38% had an additional academic host; the overall figure (since 1979) is 28%. The survey results show that in the first year after the research stay has come to an end more than 25% of fellows cooperate intensively with their Humboldt hosts whereas only some ten percent cease cooperation. However, it does emerge that neither during the stay nor in the course of long-term cooperation is the contact with Humboldt hosts any more intensive than that with classic, freely-chosen academic hosts. The ties even tend to be somewhat weaker. The ambivalence created by a network that opens up perspectives and a stipulation that limits opportunities is reflected in the fellows' evaluation of the rule requiring them to choose a Humboldtian as host: 30% consider it a very good idea, 20% judge it negatively. The option of naming an additional academic host, on the other hand, is highly welcomed by 52% of respondents and only seen as negative by four percent. In the long

² Evaluation of Humboldt Foundation Annual Reports, as of December 2011

³ The results of the focus groups consistently emphasize this quality of making contact with particularly eminent academics; 60% of Lynen Fellows are indeed mentored by Humboldt Award Winners.

term, Lynen alumni cooperate above all with other academics from the host country – networking thus extends well beyond the Humboldt Network.

Quality of selection procedure

Does the Humboldt Foundation's selection procedure ensure that academically highly-qualified German researchers are selected from the pool of applicants?

If the answer to this question is based on the appraisal of Lynen Fellows by their hosts, then it has to be yes: in the reports that the hosts send to the Humboldt Foundation at the end of the research stay the fellows receive particularly high ratings. If the mid- to long-term success of Lynen Fellows is a criterion, this picture is confirmed: although the majority of fellows apply immediately after their doctorates (42%) or as postdoctoral researchers (44%), the proportion of full professors (C4/W3 professorships) amongst alumni working at a university or non-university research institution was 59% in the year groups from 1980-1989, 44% from 1990-1999 and 14% from 2000-2009. The progress of fellows' careers and bibliometric data indicate that indeed, academically highly-qualified German researchers are selected from the pool of applicants. At the same time, amongst the candidates rejected there are also qualified researchers.

Apart from selecting fellows (review, processing by the Humboldt Foundation, selection committee), the selection procedure can also be seen as including the initiation of an application (Who knows about it, who applies?). What appear at first sight to be high approval rates (71% in the 1980s, 57% since the 1990s) are explained by the ratio between applicants and successful fellows.

The high approval rates averaging 57% since the 1990s indicate that autoselection is very common amongst candidates. We know from the focus groups that candidates thought the programme was more inflexible in some respects (e.g. the stipulation about mentoring by a Humboldtian and access to the Humboldt Network) than it actually turned out to be in practice. Thus the fellowship has the reputation of being less accessible than experience proves. This probably discouraged applications, for example from women, who would have been qualified for a Lynen Fellowship, or from researchers working in areas in which they assumed they would not find a Humboldtian able to host them.

Lynen Fellows' career development

Considering the very early career stage during which Lynen sponsorship is usually granted (the only exception being humanities scholars), the impact of the sponsorship programme should be emphasised: Lynen Fellows are remarkably successful in career terms. The following outlines the most important key data on Lynen Fellows' career development:

- Today, a total of 85% of alumni work in research and teaching or research and development: 60% of fellows are full-time employees at universities. A further 12% work at non-university research institutions, 22% for companies and 3% in administration or for non-profit organisations. And amongst the fellows employed by companies, every second person works in research and development.
- The proportion of full professors (C4/W3 professorship) working at a university or non-university research institution was 59% amongst the groups selected from 1980-1989, 44% from 1990-1999 and 14% from 2000-2009.
- Of the alumni now working for a company, 33% of the first cohort and 16% of the second cohort hold (or held) executive leadership positions.

By far the majority of alumni who returned to Germany with the intention of continuing their academic careers claim the fellowship had a positive, and in 61% of cases, a very positive impact on the continued development of their careers. In general, experience abroad is seen as the greatest impact factor; belonging to the worldwide Humboldt Network is only of minor importance. For every third fellow the host – Humboldt host for those who had no additional host and academic host for those who had two or more hosts – had a very positive impact. But this contact could be even more significant: 55% of rejected candidates, who nonetheless realised a research stay abroad with alternative financing, claimed the contact to their host had had a very positive impact on their subsequent academic careers⁴.

⁴ In this context the funding design and concomitant anchorage at the host institute probably play a role. After all, 25% of rejected applicants who still went abroad did not return to Germany when the research stay came to an end. This was only true of 14% of Lynen Fellows.

In addition to their current professional positions, bibliometric studies and other funding demonstrate the quality of Lynen alumni's academic careers:

- The publication data that were evaluated in the fields of chemistry and physics show a significant difference between Lynen Fellows and rejected applicants. Apart from the fact that Lynen Fellows publish more, and in more prestigious journals, their publications also receive more citations. Furthermore, 15 of the 20 fellows who had ceased academic publishing three years after the beginning of the fellowship, called attention to themselves as patent authors; this was only true of two of eleven rejected candidates.
- Finally, other funding successes should also be considered as a quality indicator: of the 1,724 FLF, JSPS and NCC alumni who completed the survey 24 have so far received an ERC Grant (approvals range from 3% to 15%) and nine have been awarded one of the 28 Lichtenberg Professorships granted up to 2010 by the Volkswagen Foundation. Furthermore, 82 people received DFG funding under the Heisenberg Programme, which sponsors between 30 and 70 individuals per year with an approval quota ranging from 33% to 48%⁵. 61 alumni were granted DFG funding under the Emmy Noether Programme, that is, approximately every 6th award of Emmy Noether Programme funding for young researchers.

Do alumni pursue international careers in the longer term?

86% of fellows return to Germany immediately after the fellowship period; at this stage, 17% of fellows have been granted a Return Fellowship or bridging allowance. However, a significant proportion of alumni go abroad again for an extended period: almost every second alumnus (48%) had worked abroad again at least once after the initial return, approximately three out of four of them at a university abroad. Today, 28% of alumni have a correspondence address outside Germany; amongst the group that received Return Fellowships this figure is only 20%. Of the alumni surveyed, 30% state that they work abroad, 13% in their host country and 17% in other countries.

39% of fellows surveyed stated that the original research stay had facilitated subsequent research stays abroad. This was particularly true amongst humanities scholars and social scientists (49%).

Collaborations that are initiated during the research stay at the institute or with the Humboldt host do continue but are less sustainable than collaborations with other researchers in the host country. Thus, for Lynen Fellows, internationalisation plays a greater role than integration in the Humboldt Network.

Conclusions

1. Feodor Lynen Fellowships have proved successful with regard to academic careers and internationalisation: Lynen Fellows consistently demonstrate a high degree of expertise in their subjects. Following the fellowship, the overwhelming majority makes a career for themselves, mostly in academia or in corporate/industrial R&D, the vast majority of them in Germany. Problems only occurred in a few cases, which is not wholly avoidable when promoting individuals.
2. The linkage to a Humboldt host is both a door-opener and a restriction. The Lynen Programme was originally conceived as an alumni programme for Humboldtians abroad, but de facto it is largely perceived and used as a classic outgoing programme. The linkage to the network provides access to prestigious research institutions, but in the long term Lynen Fellows cooperate with other researchers from the host country rather than with their Humboldt hosts, although the latter are their point of reference in the Humboldt Network: networking reaches well beyond the Humboldt Network.
3. Lynen Fellows profit more from the fellowship than they do from the Humboldt Network, and the network could profit more from them. Lynen Fellows are eligible for the Humboldt Foundation's characteristic, lifelong alumni sponsorship which includes sponsorship for further research stays. Lynen alumni, especially humanities scholars and social scientists, usually take advantage of this for further research stays in the host country; the option of a research stay with a Humboldtian in another country is hardly used.
4. The complexity of the situation ensuing from the Humboldt Foundation's statutes, which assume that sponsorship essentially targets Humboldtians abroad and not – as is de facto the case – the Lynen Fellows, makes it difficult to assign them the place in the Humboldt family they really deserve. Their intrinsic motivation is the driver and guarantor of the quality of their later careers.

⁵ C.f. DFG: Statistical Information on the Development of the Heisenberg Fellowship. Report on the 2nd Heisenberg Networking Meeting on 4 April 2011.

The contacts they themselves make with researchers in the host country lead to long-term collaboration whilst the connection with the host becomes less pivotal in the long term – quite unlike the situation in the Humboldt Foundation’s incoming programmes. However, as the programme addresses Humboldtians the dynamics of open networking – with additional academic hosts or, in the case of JSPS/STA/NSC Fellows, their hosts – can only partially be integrated in the Humboldt Network.

The high degree of flexibility in the design of the stay abroad is one of the programme’s strengths, but it also leads to a lack of transparency. The support provided by the Humboldt Foundation during the stay abroad achieves top marks in all aspects of mentoring and fellowship requirements. The results of the survey also show that 88% of alumni rate the Humboldt Foundation’s information about the programme as good or very good. However, in the focus groups it emerged that in some respects the Humboldt Foundation commands a degree of flexibility that is not generally known about without specific enquiries being made. If you have a problem and ask, you usually get an answer, and a solution will be sought. People who have not contacted the Foundation directly may, however, think the programme is more inflexible and inaccessible than it really is. In all the focus groups certain “regulations” were discussed. The various participants interpreted them differently, whether they were discussing the need to seek approval for trips to Germany to hold a lecture in the context of appointment procedures or the issue of proximity between a fellow with an additional academic mentor and his or her Humboldt host. In the commentaries included in the survey fellows often mention that they find the programme requirements as well as the application and award procedures lacking in transparency. The clearer the formulation of the sponsorship criteria and the rights pertaining to an approval the easier it will be to interest new target groups in the programme. In this context it should be emphasised that the Foundation’s flexibility was highlighted as a quality characteristic; problems will only arise if some people are unaware of this flexibility.

5. The sophisticated selection procedure for Lynen Fellows leads to self-selection by excellent applicants and guarantees the quality of the programme: the selection of Lynen Fellows conforms with the procedure and criteria for the selection of fellows in the classic Humboldt Research Fellowship Programme. It is not the Humboldt hosting but the approval of the application by the interdisciplinary selection committee that makes Lynen Fellows as well as JSPS/STA/NSC Fellows into Humboldtians.
6. The fellowship is more open than its reputation suggests. Potential applicants misunderstand the Lynen Programme in two ways: firstly, the Humboldt Foundation is essentially known as a funding organisation for foreign researchers; secondly, those who have no direct contact with Humboldtians interpret the regulation requiring an applicant to name a Humboldtian as host more exclusively than it is applied in practice.
7. Different generations of Lynen alumni profit from sharing their experiences, with the support of the Humboldt Foundation. The Foundation’s networking events are also one of their hallmarks. This networking is very advantageous for Lynen Fellows: shortly before they depart, they can be brought together with alumni who have just returned or been back for a few years.
8. Fellows’ social security is dependent on the host country and the host institution and is therefore uncertain. Both in the focus groups and in the commentaries frequent reference is made to inadequate family allowances and non-existent pension schemes. Whereas family allowances were increased significantly in 2010, fellows are still not automatically included in social security although nowadays, stays abroad are generally considered to be an integral part of an academic career.
9. The support in processing applications to the JSPS and NSC programmes means that the target countries, Japan and Taiwan, have a special place on the map of the Feodor Lynen Programme: the number of candidates interested in spending time on research in these countries is high as a result of these special programmes, but JSPS and NSC Fellows do not identify as closely with the Foundation as Lynen Fellows.

Recommendations

1. The impressive career development of Lynen alumni in fundamental and applied research, their obvious successes in international publications and their sustained collaborative relations with academics from the host country speak in favour of continuing the programme.
2. The current level of sponsorship should at least be maintained and possibly extended.

3. Clarification of the mission of the Lynen Programme, focusing on the Lynen Fellows themselves, could make the programme more coherent. As a result, the sustainable international networking of Lynen alumni could become easier to trace and be used to benefit the Humboldt Network.
4. This would lead to a concomitant re-definition of the concept of the Humboldt Network, allowing the integration of individuals who were active on behalf of the Humboldt Network but not actually Humboldtians themselves. In the case of the Lynen Programme this would particularly refer to academic hosts and hosts of JSPS/STA/NSC Fellows whose position as an additional loop in the network would be enhanced by receiving “guest status” in the Humboldt Network.
5. Applicants interested in a stay in Japan or Taiwan should be directed both towards the sponsorship opportunities offered by the FLF programme as well as to the JSPS and NSC programmes. Apart from mentoring by the national funding agencies, the Humboldt Foundation could increase its local support for the linkage between the fellows and the local Humboldt Network. By providing a “Humboldt mentor” in Japan for fellows who do not chose a Humboldtian as host, identification with the Humboldt Network could be promoted.
6. Post-doctoral research stays are part of a phase of professional life and not of education. Thus every effort should be made to couple the fellowship with social security. Fellows should specifically have their attention drawn to this issue.
7. Finally, we recommend the Foundation to campaign for greater mobilisation of Lynen alumni in Germany, particularly as hosts or reviewers.