

MENTORING AS A TRANSFORMATIVE EDUCATIONAL PRACTICE: GENDER PROCESSES, INCLUSIVE LEADERSHIP AND INSTITUTIONAL CHANGE AT INFN

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Abstract

Gender inequalities in research organizations cannot be explained solely by individual factors, but are produced and reproduced through organizational processes, informal practices, and implicit models of power and leadership. Within this framework, mentoring can serve as a strategic educational practice, fostering critical awareness, transformative learning, and institutional change. This contribution introduces the Gender Mentoring Programme (GMP) developed at the Istituto Nazionale di Fisica Nucleare (INFN), Italy, as a structured and permanent educational practice established in 2018, aimed at simultaneously fostering individual development and shaping organizational culture within the institute. The programme is grounded in a bifocal approach that combines mentoring as support for professional careers with explicit actions addressing gender-related processes that affect evaluation, access to networks, power relations, and leadership across the institution. Through peer and intergenerational mentoring, mentee and mentor training, collective reflective spaces, and self-observation tools, the GMP promotes forms of informal and continuous learning oriented toward the deconstruction of dominant models of excellence and leadership, often associated with competitiveness, apparent neutrality, and gendered norms. Particular attention is devoted to the relationship between mentoring and sponsorship, reframed in an inclusive perspective as a practice aimed at redistributing opportunities, visibility, and recognition, while challenging exclusive networks and gender homophily. Mentoring is thus interpreted as an educational and organizational practice oriented toward the construction of more equitable and inclusive research and working environments, where relational quality, shared responsibility, and the valuing of differences become central elements of learning processes, leadership development, and institutional growth. In addition to the points discussed above, mentoring is a developmental and identity-forming academic practice. As such, it plays a crucial role in preparing a new generation of researchers, who will in turn support and educate future generations through university teaching and outreach activities.

Keywords: *Gender equality in higher education, mentoring programmes, organizational change, inclusive leadership, professional identity development.*

1. Introduction

Over the past decade, most policies promoting gender equality in academia and research institutions have become increasingly widespread; however, they often remain quite limited, since they tend to individualize the problem and its solutions. Instead, gender inequalities are shaped by organizational practices, relational dynamics, and implicit leadership models, deeply rooted in institutional environments. The concept of gendered organizations (Acker, 1990) highlights how institutional processes, practices and expectations influence participation, recognition, and career development. Traditional gender equality interventions, focused on increasing the numbers of women and underrepresented groups (“fixing the women” approach), fail to change these gendered norms and work practices. In contrast, the “fixing the institution” approach promotes equality in careers by means of structural change in organizations through a gender analysis on institutional structures and cultural norms that perpetuate gender inequality. Within this perspective, mentoring programmes, which can address both individual development and transformative organizational practices, have the potential to change the dominant logic and gendered processes that contribute to the reproduction of systemic inequalities in organizations (Leenders et al., 2020). Based on the personal growth for both actors involved - mentors and mentees - through dialogue, shared experiences, and collective reflection, these programmes can support the emergence of new

collaborative and supportive networks, as well as inclusive and dialogic leadership practices within professional environments. The National Institute for Nuclear Physics (INFN), one of the leading Italian public research institutions, launched the Gender Mentoring Programme (GMP) in 2018, becoming the first research body in Italy to implement a mentoring programme dedicated to gender issues. The GMP is based on a transformative model developed by the Gender Observatory on University and Research at the University of Naples Federico II, coordinated by Ilenia Picardi and it was recognized by the European Institute for Gender Equality (GEAR tool) as one of the most significant actions implemented in Italy to promote gender equality in research and innovation. This paper examines mentoring as a mechanism for fostering professional development, raising institutional gender awareness, and identifying gendered organizational norms and their influence on work practices. It focuses on the experience of the INFN GMP and its role in supporting institutional transformation and more inclusive professional cultures.

2. Institutional context and gender awareness within INFN

The INFN is a national public research institute that carries out both theoretical and experimental research in the fields of nuclear, elementary particle, and astroparticle physics, as well as technological and interdisciplinary research. It has scientific and administrative facilities distributed throughout Italy and works in close cooperation with the main Italian universities, within a highly competitive international context.

Over the years, in compliance with Italian national legislation, INFN has established the Single Guarantee Committee (Comitato Unico di Garanzia, CUG) and adopted a specific Code of Conduct to prevent workplace harassment. This includes the appointment of an external figure—the Confidential Counselor (Consigliera di Fiducia)—who ensures the implementation of this code. More recently, the institution approved its first Gender Equality Plan, which is required for public bodies to access Horizon Europe funding. Institutional attention to gender dynamics has progressively led to some improvements in recent years. An example is the INFN mentoring programme: originally launched as a “pilot” initiative and implemented by a small group of researchers and technologists inside the institute’s national training plan. Now it has an expanded coordination and working group formally appointed by the institute, with its own dedicated budget. GMP is currently planning its fourth edition. However, as indicated in the 2026 Annual CUG report (INFN CUG, 2026), substantial efforts are still needed to address the underrepresentation of women in both scientific and technological staff, as well as in decision-making positions. In fact, women still account for only 23% of the scientific and technological staff, a figure in line with or slightly larger than the proportion of researchers operating in disciplines as engineering, and Information and Communication Technology (ICT), but more than 10 percentage points lower than the overall proportion of researchers in Science, Technology, Engineering and Mathematics (STEM) fields.

In the same CUG report, the analysis of the gender composition within the National Scientific Commissions of INFN, which cover different fields of physics, highlights significant disparities, with a particularly critical situation in the theoretical physics area. A positive sign is that the distribution of male and female researchers across career levels is very similar. However, among technologists, a significant difference emerges at the top level: the proportion of women in top level is 5.6%, compared to 16.2% for men. At the governance level, women now account for 20.6% of members in decision-making bodies, marking a significant improvement compared to some years ago, when female representation in such roles was absent. Another positive development is the increase in female representation in scientific bodies with managerial appointments, which in 2025 reached 39% of the total. This figure is close to the 40% threshold indicated in European recommendations for decision-making bodies in the research sector.

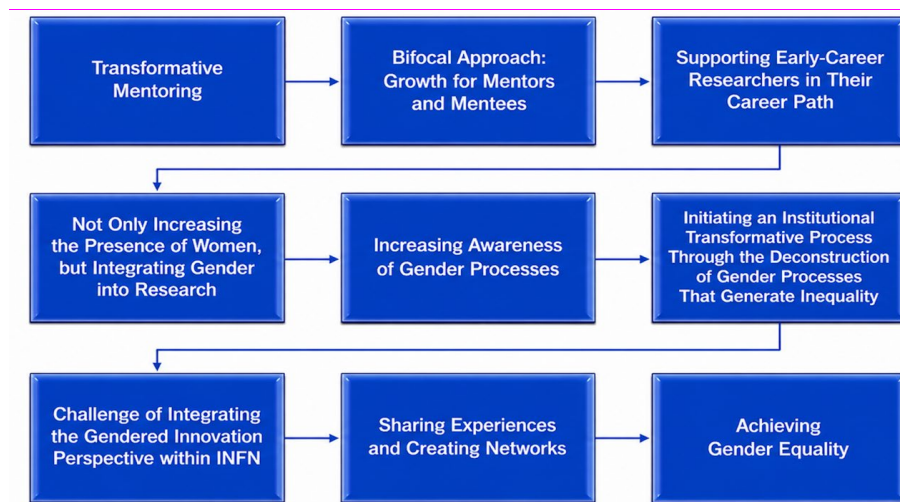
Within this context of progressive institutional change, mentoring emerges as a valuable strategy for supporting professional development and fostering reflection on organizational practices.

3. The gender mentoring programme at INFN: Structure, evolution and transformative capacity

Mentoring programmes are widely recognized as a key strategy for supporting professional development in academic and research environments. However, growing evidence shows that career trajectories are shaped not only by individual competencies, but also by relational dynamics, access to networks, and institutional expectations. The connection between individual development and organizational change underpins the bifocal approach by J. de Vries (De Vries et al., 2016) which provides the foundation of the GMP model. In particular, the GMP methodological framework is built on work coordinated by Ilenia Picardi, where mentoring is conceived as a transformative practice. In this perspective, mentoring not only supports individual careers but also helps to strength alternative professional networks, and to recognize and address the gender dynamics embedded within research

institutions influencing career (Picardi, 2017). The overall structure of the programme is summarized in Figure 1, which provides a schematic representation of the GMP pathway and its main dimensions. In practice, mentoring is implemented through structured relationships between mentors and mentees, complemented by collective activities such as plenary meetings, thematic seminars, and reflective workshops conducted in peer and collective settings. These activities make it possible to work simultaneously on both individual and collective dimensions. On the one hand, they encourage participants—primarily mentees, but also mentors—to reflect on their own career paths and working practices, considering their specific competencies, goals, and expectations. On the other hand, they foster dialogue, support the exchange of experiences, and promote reflection on common professional practices and institutional dynamics. Furthermore, shared tools - such as interviews, reflective logs, and periodic reports - support continuous monitoring of the mentoring process and make it possible to partially adapt the programme to participants' needs, thereby ensuring a flexible structure.

Figure 1. GMP INFN Pathway.



3.1. From pilot experience to institutional practice: The three editions

The GMP has progressively developed across successive editions, reflecting an increasing awareness of the role mentoring can play within the institution. The first edition was conceived as a pilot experience specifically addressed to women researchers, involving mentor–mentee pairs composed exclusively of women, with the goal of supporting individual careers but also of exploiting the opportunity to foster reflection on gender processes within the institutional context (De Vries et al, 2016). The second edition marked an important stage in the programme development, introducing cross-gender mentoring relationships with the participation of male mentors and mentees. This transition reflected the recognition that a transformative process on gender equality within the institution cannot rely solely on initiatives targeting women but requires broader participation across the organization. During this phase, collective activities assumed a more prominent role. These included structured opportunities for exchange within peer communities—mentees alone and mentors alone—as well as between the two groups. Together with the inclusion of both women and men in the programme, this approach contributed to broadening perspectives and sharing reflection on professional experiences and institutional dynamics. The second edition also represented a key step in refining programme coordination and implementing new practices aimed at strengthening its overall effectiveness. The third edition marked a phase of consolidation and further development of the mentoring pathway. Participation increased, and mentoring duration was extended from 12 to 18 months, allowing for deeper engagement among participants. Specific attention was devoted to strengthening formal and informal networks, recognizing their role in supporting professional visibility and facilitating access to opportunities. Across successive editions, the GMP progressively matured both in its organizational coordination and in its focus. Table 1 illustrates participation, duration and gender composition of the GMP across the three completed editions. Since the second edition, each cycle ended with a bottom-up process, involving both mentees and mentors to analyze and reflect on gender processes inside INFN and to identify concrete, implementable solutions. Each cycle provided opportunities for reflection and adaptation, enabling the programme to respond to emerging institutional needs and to refine its practices over time (Pellizzoni et al., 2023).

Table 1. Overview of the three GMP editions.

Edition	Year	Duration	N. pairs	N. participants	Male mentees (%)	Male mentors (%)	Overall male participants (%)
1	2018	12 months	17	34	0	0	0
2	2021	12 months	12	24	33	25	29
3	2024	18 months	19	38	16	16	16

3.2. Mentors as partners for change and network development

A major outcome emerging from the evolution of the GMP concerns the progressive recognition of mentors as partners for change within their professional environments. Through participation in mentoring activities, mentors developed increasing awareness of how gender processes within institutional contexts impact on their everyday professional practices, influencing - through implicit bias communication - participation and organizational dynamics (De Vries et al, 2006). In addition to activating the mentor in their specific role within the individual relationship with the mentee, the GMP aims to develop awareness of the importance of mentors' behaviors and actions within their wider working environments. The objective is that this awareness can be translated into both the promotion of more inclusive organizational practices and policies and small, everyday actions—such as encouraging participation, supporting collaborative exchanges, and making professional contributions more visible—which can gradually influence relational practices. The shared spaces between mentees and mentors within the mentoring programme encouraged dialogue among them and supported the development of a common language around professional responsibility and inclusive actions. At the same time, collective activities promoted the development of connections among participants beyond individual mentoring relationships. In GMP, a specific attention was devoted to strengthening the importance of formal and informal connections (networks), recognizing their role in supporting professional visibility and facilitating access to opportunities. Over time, these interactions contributed to the construction of a broader mentoring community -formed by mentees and mentors- further reinforced by the growth of an Alumni network across different mentoring cycles. A greater awareness has developed how participation, visibility, and recognition are shaped by daily relational practices, culture, and values associated with the discipline. Real changes are certainly not measurable at the end of each cycle, as the program works on models and processes deeply rooted in individuals and the institution. In this transformative process, the value of the Alumni Network, triggered by mentoring through continuous dialogue between cycles, is to consolidate mentoring as an ongoing institutional practice and, at the same time, contribute to gradual institutional change.

4. Future steps: Gender processes, mentoring and sponsorship

The power of the bifocal approach, exploited in GMP, lies in its capacity to address gender inequalities by changing gender regimes, with the involvement of both mentors and mentees as possible agents of change. The application of this approach combines two goals: the development/empowerment of the mentees and the education of mentors, more equipped to change gendered norms in the institution. In this context, the transformation process in the organization can be considered as a continuum with different steps of changes (Leenders et al., 2020). The work done during the mentoring period triggers an iterative process of change, which cannot be adequately measured only at the end of the programme. An Alumni Network, as mentioned before, is an important implementation to work in this direction. A further step involves the integration of sponsorship as a practice to broaden the focus, with greater emphasis on the mentor role. Sponsorship uses influence, networks, and institutional resources to facilitate access to opportunities and increase professional visibility within organizational contexts. The concept of sponsorship is particularly relevant in research institutions, where career advancement often depends on participation in networks, visibility, and access to collaborative opportunities. Many sponsorship dynamics (Ibarra et al, 2010) remain informal and not always explicitly recognized, making it difficult to understand how opportunities are distributed over time. When these processes remain implicit, they may unintentionally reinforce existing power structures and privilege individuals already connected to dominant networks. Within gendered organizations, these dynamics operate at multiple levels, shaping expectations, behaviors, and access to resources. Informal networks, leadership expectations, and organizational norms associated with excellence may reinforce competitive and individualistic models while undervaluing collaborative and relational competencies that are essential in research environments. For these reasons, it is valuable to adopt approaches that increasingly integrate mentoring and sponsorship within broader frameworks of inclusive leadership. Inclusive sponsorship practices challenge traditional hierarchical models (Bagilhole et al, 2001) by promoting more transparent and equitable redistribution of opportunities.

In this sense, sponsorship is not merely an individual act of support, but a collective responsibility embedded within leadership practices and organizational cultures.

5. Discussion and conclusion

The experience of the Gender Mentoring Programme at INFN, after three completed editions and one currently in progress, highlights how mentoring can function as a structured institutional practice capable of supporting both individual development and participants' reflection on gendered organizational practices and institutional dynamics. A central element emerging from this experience concerns the growing awareness among mentors of their potential role within the organization. As an important aspect, the programme supported critical analysis on how everyday professional interactions influence participation and visibility within research environments. In this sense, mentoring promoted forms of responsibility grounded in dialogue and shared evaluations rather than formal authority. Another relevant dimension concerns the consolidation of relational networks supported through collective activities and strengthened by the development of an Alumni Network. These connections sustained continuity among participants and reinforced mentoring as an ongoing institutional resource rather than a temporary initiative. Overall, the GMP experience suggests that mentoring can act as a catalyst for gradual institutional transformation when embedded within structured programmes that promote reflection, dialogue, and shared responsibility. Both mentees and mentors become change agents and experiment with new practices that transform individualistic academic culture into a collaborative and supportive one. Rather than relying on top-down interventions, sustained engagement and micro-level transformations can contribute to shaping more inclusive professional environments. Small, adjustments in the everyday attitudes may generate a multiplier effect, supporting the development of role models capable of influencing organizational cultures in a gradual and sustainable way.

References

- Acker, J. (1990). Hierarchies, jobs, bodies: A theory of gendered organizations. *Gender & Society*, 4(2), 139–158.
- Bagilhole, B., & Goode, J. (2001). The contradiction of the myth of individual merit, and the reality of a patriarchal support system in academic careers: A feminist investigation. *European Journal of Women's Studies*, 8(2), 161–180.
- de Vries, J., & van den Brink, M. C. L. (2016). Transformative gender interventions: Linking theory and practice using the bifocal approach. *Equality, Diversity and Inclusion: An International Journal*, 35(7/8), 429–448.
- de Vries, J., Webb, C., & Eveline, J. (2006). Mentoring for gender equality and organisational change. *Employee Relations: The International Journal*, 28(6), 573–587.
- European Institute for Gender Equality (EIGE). *Gender Equality in Academia and Research (GEAR) tool – Italy*. Retrieved from <https://eige.europa.eu/gender-mainstreaming/toolkits/gear/legislative-policy-backgrounds/italy>
- GMP – Gender Mentoring Programme INFN. Available at: <https://mentoring.infn.it/>
- Ibarra, H., Carter, N. M., & Silva, C. (2010). Why men still get more promotions than women. *Harvard Business Review*, 88(9), 80–85.
- INFN CUG – Comitato Unico di Garanzia. (2026). *Relazione del Comitato Unico di Garanzia sulla situazione del personale*. Rome, Italy. Retrieved from <https://web.infn.it/CUG/wp-content/uploads/2026/04/Relazione-CUG-2026.pdf>
- Leenders, J., Bleijenbergh, I. L., & van den Brink, M. C. L. (2020). Myriad potential for mentoring: Understanding the process of transformational change through a gender equality intervention. *Gender, Work & Organization*, 27(3), 379–394.
- Pellizzoni, S., Gargano, A., & Masullo, M. R. (2023). *Gender mentoring inside INFN: A transformative path towards inclusion and equity in research*. *Proceedings of Science (ICHEP2022)*, 409, 1–6. <https://pos.sissa.it/414/409/>
- Picardi, I. (2017). *La dimensione di genere nelle carriere accademiche: Riflessività e cambiamento nel progetto pilota GENOVATE@UNINA* (Vol. 2). Naples, Italy: FedOA – Federico II University Press.