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Artículos Científicos

Disimetrías de las investigadoras en los centros de investigación del Instituto Politécnico Nacional. Un estudio cuantitativo

Researchers' Asymmetries in the Research Centers of the Instituto Politécnico Nacional. A Quantitative Study

Dissimetrias dos pesquisadores nos centros de pesquisa do Instituto Politécnico Nacional. Um estudo quantitativo

José de Jesús Peinado Camacho

Instituto Politécnico Nacional, México

jpeinadoc@ipn.mx

<https://orcid.org/0000-0002-2262-4565>

Resumen

El objetivo de la presente investigación fue encontrar y analizar datos cuantitativos que muestren las disimetrías de las investigadoras en los centros de investigación del Instituto Politécnico Nacional (IPN). El diseño de la investigación fue no experimental y transeccional. La metodología fue cuantitativa con enfoque exploratorio y descriptivo. Los resultados del estudio permitieron conocer que en los centros de investigación del IPN el número de investigadoras es menor al de investigadores. Asimismo, distribuidos según su nivel de preparación, hay más hombres que mujeres en todos los grados educativos. En cuanto al tipo de contratación, el personal masculino predominó en todos los apartados, a excepción de lo registrado en la casilla de 30 horas, donde las cantidades fueron semejantes. Con respecto a las becas y estímulos que otorgó el IPN, Licencias con Goce de Sueldo es el rubro con mayor número de investigadoras; en todos los demás el personal masculino registra arriba de 50 %. En relación con los miembros del Sistema Nacional de Investigadores (SNI),

hay menos investigadoras que investigadores y se registra un desequilibrio aún mayor conforme el nivel es más alto. En los proyectos de investigación, hay una menor participación de mujeres. La recopilación de datos de los colegios de profesores permitió evidenciar que solamente cuatro centros de investigación tuvieron 50 % o más de investigadoras. La participación de las investigadoras en las redes de investigación del instituto fue igualmente baja. En cuanto a las redes de género, por el contrario, fue escasa la colaboración del personal masculino. Los datos reafirman el reflejo de las disimetrías que enfrentan las investigadoras. Los datos numéricos exhibieron pocos avances desde la perspectiva de género.

Palabras clave: centro de investigación, disimetrías, investigadoras, perspectiva de género.

Abstract

The objective of the research was to find and analyze quantitative data that shows the asymmetries of the female researchers in the research centers of the Instituto Politécnico Nacional (IPN). The research design was non-experimental and transectional. The methodology was quantitative with an exploratory and descriptive approach. The results of the study revealed that in the research centers of the IPN the number of female researchers is less than the number of male researchers. Regarding the type of hiring, male staff predominated in all sections, except for what was registered in the 30-hour category, where the amounts were similar. With regard to the scholarships and incentives granted by the IPN, paid leave was the only section in which a greater number of female researchers was perceived; in all the rest, the male staff rose above 50 %. In relation to the members of the National System of Researchers (SNI, by its acronym in Spanish), there are fewer female researchers than male researchers and an even greater imbalance is recorded as the level is higher. Less research participation prevailed in research projects. The collection of data from teacher colleges revealed that only four research centers had 50 % or more female researchers. The participation of the researchers in the institute's research networks was low. Regarding gender networks, there was little collaboration from male staff in this activity. It was concluded that the data reaffirms the reflection of the asymmetries that the female researchers face. Numerical data showed little progress from a gender perspective.

Keywords: research center, asymmetries, researchers, gender perspective.

Resumo

O objetivo desta pesquisa foi encontrar e analisar dados quantitativos que evidenciam as assimetrias dos pesquisadores nos centros de pesquisa do Instituto Politécnico Nacional (IPN). O desenho da pesquisa foi não experimental e transversal. A metodologia foi quantitativa com abordagem exploratória e descritiva. Os resultados do estudo revelaram que o número de pesquisadores nos centros de pesquisa do IPN é menor que o número de pesquisadores. Além disso, distribuído de acordo com o nível de preparação, há mais homens do que mulheres em todos os níveis de escolaridade. Quanto ao tipo de contratação, predominou o pessoal do sexo masculino em todos os setores, exceto no que constava do quadro 30 horas, onde os valores foram semelhantes. Em relação às bolsas e incentivos concedidos pelo IPN, Licenças com Remuneração é a categoria com maior número de pesquisadores; nas demais, o efetivo masculino é superior a 50%. Em relação aos membros do Sistema Nacional de Pesquisadores (SNI), há menos pesquisadoras do que pesquisadores do sexo masculino e um desequilíbrio ainda maior se registra à medida que o nível é maior. Em projetos de pesquisa, há menos participação de mulheres. A coleta de dados nas escolas de professores mostrou que apenas quatro centros de pesquisa tinham 50% ou mais pesquisadoras. A participação de pesquisadoras nas redes de pesquisa do instituto foi igualmente baixa. Em relação às redes de gênero, ao contrário, houve pouca colaboração do pessoal masculino. Os dados reafirmam o reflexo das assimetrias enfrentadas pelos pesquisadores. Os dados numéricos mostraram pouco progresso do ponto de vista de gênero.

Palavras-chave: centro de pesquisa, assimetrias, pesquisadores, perspectiva de gênero.

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Introduction

Izquierdo and Atristan (2019) They point out that "the researchers face various tensions in their work, the rhythm of academic life displaces the care of themselves, their health and their spaces for recreation and enjoyment" (p. 138). Added to this are motherhood, children, parental care, partner, age, sexual division of work and others (Blazquez and Bustos, 2013, p. 147; Buquet, 2011, p. 222 ; Gómez and Tena, 2018, p. 1). These are very difficult difficulties to overcome.

For Cárdenas (2015), “women researchers have lacked equal opportunities in the labor market” (p. 9). McDonald (2016) refers that “even occupational segregation due to socially significant forms of difference such as sex and race are present” (p. 19). In this sense, social categories are related to inequalities in a complex way (Heiskanen, Otonkorpi, Leinonen and Ylöstalo, 2018, p. 459). The belief of a natural division of labor between women and men due to sexual difference still remains (Bustos, 2017, p. 288; Gamboa and Pérez, 2017, p. 256). Even images of value are still assigned to collaborative practices in gender stereotyped ways (Castellano, July 2, 2019, p. 35; Zippel, 2019, p. 1794), which predisposes the exclusion of researchers (Nielsen, 2017, p. 151).

Along the same lines, Sinha (2015) states that “the participation of women in paid employment in Japan, China and India have lacked equal opportunities despite being the three largest economies in Asia and the great expansion of access to education in the last fifty years ”(p. 846). For its part, Nielsen (2017) reports that “in Denmark academic gender stratifications persist, a country recognized for its international position on issues of social gender equality” (p. 134). Gupta (2016) explains that “in India patriarchy and hierarchy contribute to creating a masculine environment in the workplace of women scientists” (p. 437). Estrada, Mendieta and González (2016) describe that “in Mexico, stereotypes, roles and prejudices that promote discrimination and unequal treatment, product of culture and idiosyncrasy, are maintained and reproduced” (p. 12).

Working life generates inequalities in society, such as economic opportunities (Jabbaz, Samper & Díaz, 2019, p. 6) and career expectations (García, 2014, p. 22; Heiskanen et al., 2018, p. 459) . Mattsson (2015) emphasizes that “gender inequality in the academic world is an effect of the belief of contradiction between women and science” (p. 685). This is influenced, to a large extent, by the idealization of women's family roles (Nikunen and Lempiäinen, 2018, p. 554), which affects their position as scientists (Gupta, 2016, p. 437), in such a way that the variables associated with the family can be part of structural and systemic discriminatory practices (Aiston and Jung, 2015, p. 205); there, in the family nucleus, the centrality of marriage and child rearing persists, but not paid work (Moreno, 2018, p. 140; Sinha, 2015, p. 846).

Blazquez and Bustos (2013) warn that “together with the development conditions of academics, there are decision-making positions that become an obstacle” (p. 147), occupied mainly by male personnel (Nielsen, 2017 , p. 149), and sometimes used as a tool for

inequality and segregation (Blanco, 2018, p. 11). In this regard, it is necessary to say that power dynamics are present in the research, as well as in the roles of representation, the positioning of the researchers and gender identity (Hoskins, 2015, p. 393; Kannen, 2013, p. 178). Additionally, Nielsen (2017) establishes that “knowledge about the structural and cultural conditions that circumscribe the professional ambitions and expectations of female researchers, come together in a transition point summarized by the high demands of academic productivity” (p. 149). Institutional reward structures unite symbolic and material values of gender (García, 2014, p. 22; Moreno, 2018, p. 164; Zippel, 2019, p. 1794).

On the other hand, Macías and Islas (2018) establish that “information and communication technologies [ICT] represent advantages for the research work carried out by women, but they are not yet perceived as an instrument of empowerment” (p. 208). According to Gamboa and Pérez (2017), with the development of ICT “the mobility problem is solved but not the difficulty of time for work, for the family or personal time” (p. 265). Bustos (2017) adds that “the use of time is decisive in the construction of work trajectories; the academic ones find limitations to develop their work trajectory, due to the divergence of distributing their time between unpaid work and paid work ”(p. 269). Meza, Galbán and Ortega (2019) conclude that “the challenge is the balance of family life and work” (p. 29).

The National Polytechnic Institute

The National Polytechnic Institute (IPN) has 100 units. More than 420,000 people participate in the three educational levels taught in the formal, non-school and mixed modalities. It has a presence in 32 towns in 21 states of Mexico, through 19 academic units of the upper secondary level, 27 academic units of the upper level, 20 scientific and technological research centers, 17 continuing education centers, four educational support units, three units of support for educational innovation, eight units of support for research, development and technological and business promotion and two educational units linked to science, technology, research and business development. By combining the three educational levels, it offers an educational offer of 262 academic programs. Likewise, it has an enrollment of 178,492 students, a figure to which, if the continuing education and language services are still added, gives a total of 390,000 people attended annually. Regarding research, the IPN has quality academic staff that is reflected in the 1,216 professors who are registered in the National System of Researchers (SNI), which places it in second place at the national level,

without count what corresponds to the Center for Research and Advanced Studies (IPN, 2018, pp. 19-31)

According to the Organic Regulation of the IPN (2020):

The scientific and technological research centers are academic units that are in charge of carrying out basic and applied research and technological development, directing their results to solving problems in strategic areas of national development, to generate knowledge that contributes to the advancement of science and technology. technology, to the training of high-level human resources, to improve the quality of life of the population, to satisfy specific needs of the public, social or private sectors and to the conservation and sustainable use of the country's natural resources (p. 58).

The topic of gender perspective has been little studied directly in the IPN research centers. For this reason, it is welcomed here precisely as an object of study. The goal was to find and analyze quantitative data that show the asymmetries of the researchers in these scientific and technological research centers.

The research question that guided the present study was: how is the inclusion of female researchers in the IPN research centers? To answer this question, it was necessary to know what is the level of studies of academic staff in IPN research centers; what is your distribution by hiring hours; How many male and female researchers obtain scholarships, incentives or licenses and who access the most; how many are members of the SNI; how is the distribution of research projects by area and type of research and what is the proportion of participation of women and men; what is the participation in the IPN research and postgraduate networks; what is the participation of the polytechnic community in gender matters, and how are the faculty colleges of the IPN research centers formed.

Method

The general objective of the research was to find and analyze quantitative data that show the asymmetries of the researchers in the IPN research centers. The importance of the study lies in showing evidence that shows inequalities in the gender perspective in the research centers of the institute in question. The research design is non-experimental and transectional. The methodology was quantitative with an exploratory and descriptive approach.

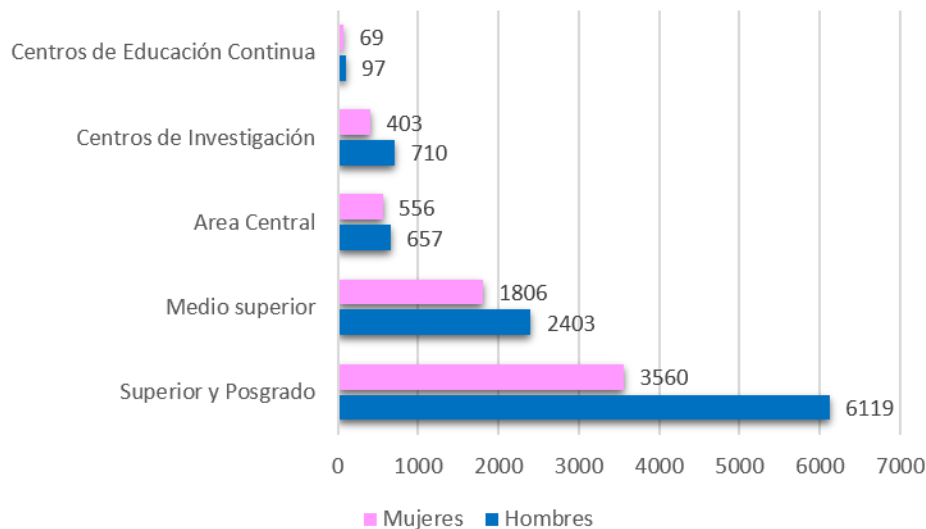
The first step was to select the sample. Of the population of 20 scientific and technological research centers of the IPN, only 18 were selected. The centers that were not considered for the study were: the Center for Nanosciences and Micro and Nanotechnologies, because it does not have a research and postgraduate section, and the Center for Research and Advanced Studies, because it is a decentralized public body with its own legal personality and assets, in addition to having 28 research departments that are distributed in nine campuses throughout the Mexican Republic, for these characteristics, therefore, this center would require a different study.

The second step was to divide the investigation into two parts. The first part consisted of collecting secondary data, which had to be investigated and gathered for statistical analysis, then it was necessary to categorize them and finally position them as indicators to support the research question. The second part of the investigation consisted of obtaining the primary data. This information was collected especially for your examination. The figures were obtained from the teachers' colleges of the IPN research centers. To collect the data, their integration was meticulously examined, emphasizing the number of researchers that comprise them. The information was documented from each of the electronic pages of the 18 scientific and technological research centers.

Results

The academic staff of the IPN is made up of 16,380 teachers, of whom 9,986 are men and 6,394 are women. The largest number of staff is at the upper and postgraduate level, followed by the upper secondary level, then there is the central area, then there are the research centers and, finally, the continuing education centers (IPN, 2018, p. 28). In figure 1 you can see the distribution of academic staff by areas in the IPN, as well as the number of men and women.

Figura 1. Distribución de personal académico por áreas en el IPN

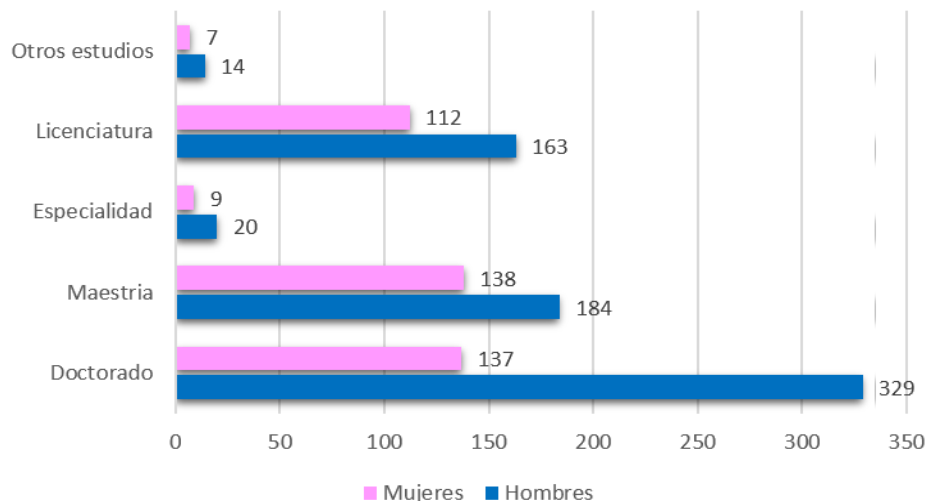


Fuente: Elaboración propia

Figure 1 shows that 1,113 teachers are assigned to the IPN research centers, of which 710 are men and 403 are women. The above data allows us to support the claim that the number of researchers is less than the number of researchers.

Regarding the level of studies of academic staff in IPN research centers, it was found that the schooling of male staff is higher than that of female staff in all grades (IPN, 2018, p. 28). In figure 2 this trend can be observed.

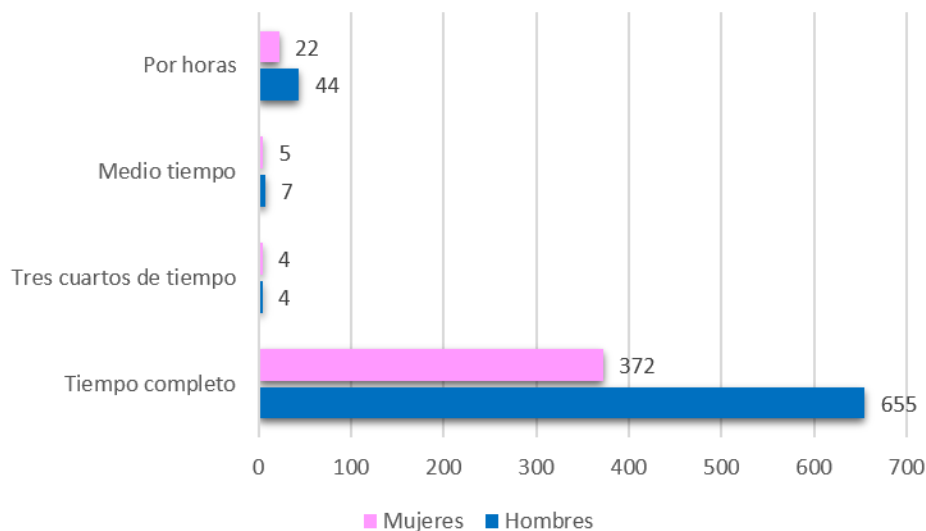
Figura 2. Personal académico por nivel de estudios en centros de investigación del IPN



Fuente: Elaboración propia

On the other hand, the academic staff of the IPN is hired full time (40 hours), three-quarters of the time (30 hours), part-time (20 hours) and hourly (from one to 19 hours) (IPN, 2018 , p. 29). Its distribution in the research centers can be seen in figure 3.

Figura 3. Personal académico de centros de investigación por horas contractuales

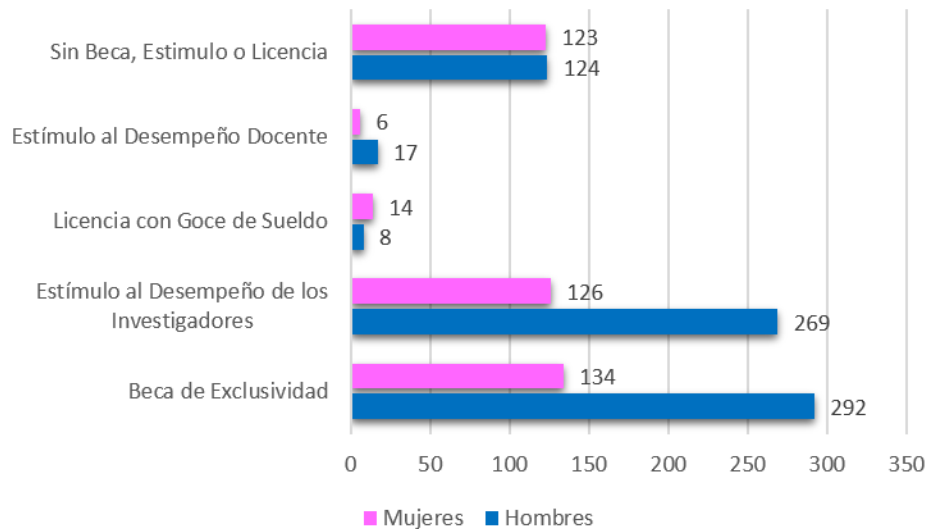


Fuente: Elaboración propia

The amounts shown in Figure 3 make it clear once again that male personnel predominate in all sections, with the exception of the Three-quarters of the time item, where the amounts are similar.

Regarding the scholarships and incentives granted by the IPN, there are the exclusive scholarships of the Commission for the Operation and Promotion of Academic Activities, the Stimulus for Researchers' Performance, the Stimulus for Teaching Performance and the Licenses with Pay (IPN, 2018, p. 30). In figure 4 the amounts corresponding to these items can be analyzed.

Figura 4. Becas, estímulos y licencias al personal académico de centros de investigación

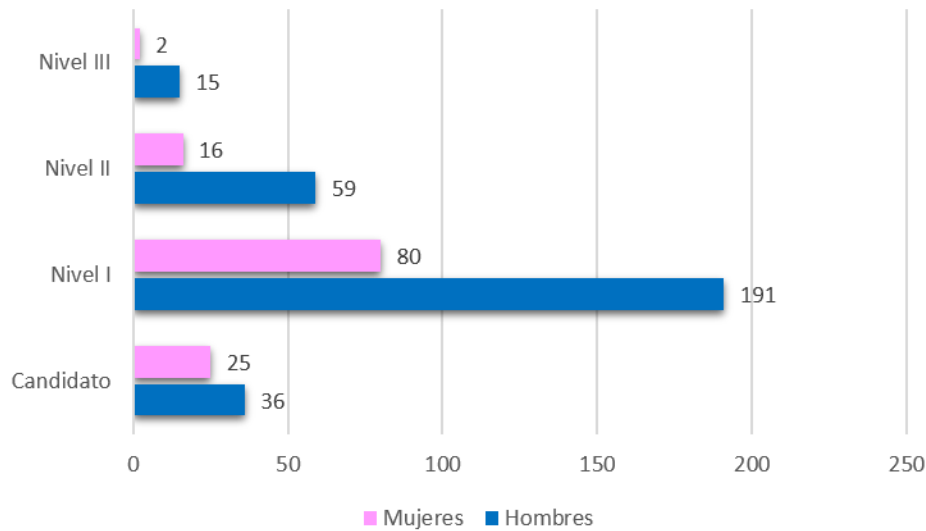


Fuente: Elaboración propia

The data in figure 4 determine that the section on Licenses with Pay is the only one that registers more women than men; in all the others the male staff excels above 50%. For a better appreciation of the data, researchers without grants, incentives or licenses were included.

In relation to the academic staff who are members of the SNI, the proportion of men and women indicates that the presence of female researchers is lower and decreases gradually as the level is higher (IPN, 2018, p. 55). This trend can be verified in figure 5.

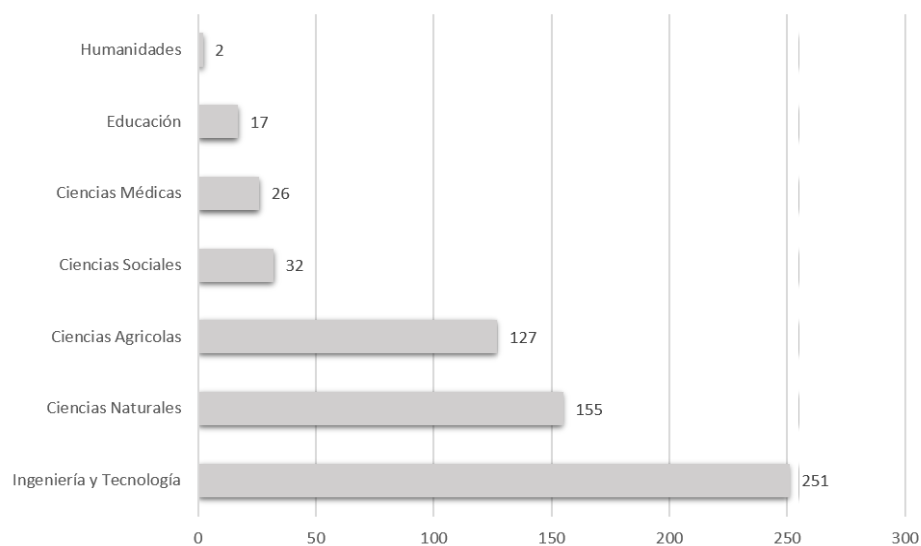
Figura 5. Académicos de centros de investigación miembros del SNI en el año 2018



Fuente: Elaboración propia

Concerning the distribution of research projects by area in research centers, the IPN financed 1,779 research projects in 2018, of which 610 were assigned to research centers. Its distribution by research area was as follows: in engineering and technology 251, in natural sciences 155, in agricultural sciences 127, in social sciences 32, in medical sciences 26, in education 17 and in humanities two; These data can be seen in Figure 6.

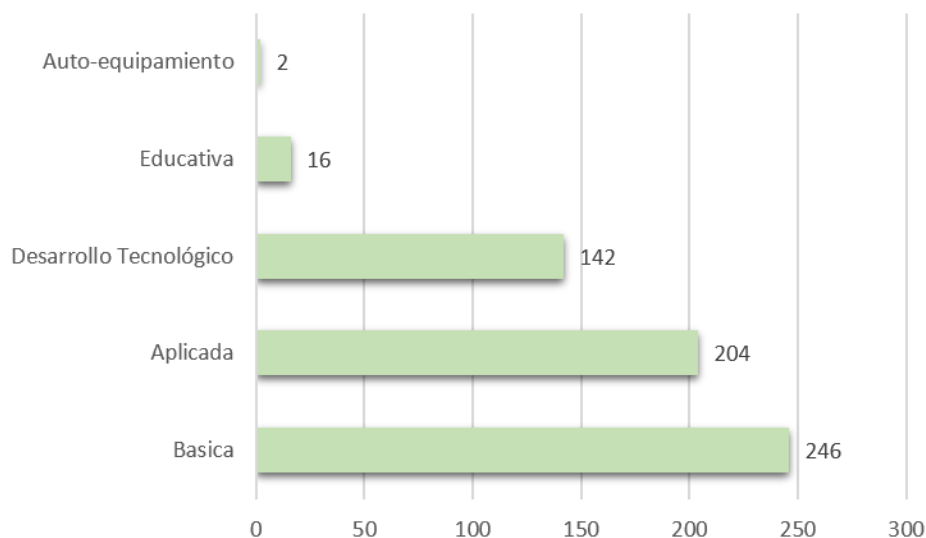
Figura 6. Proyectos de investigación IPN por área en centros de investigación



Fuente: Elaboración propia

Regarding their ordering by type of research, in figure 7 you can see the quantities that stand out in this trend. Most of the projects are carried out in basic research (40.3%), applied (33.4%) and technological development (23.2 %) (IPN, 2018, p. 53).

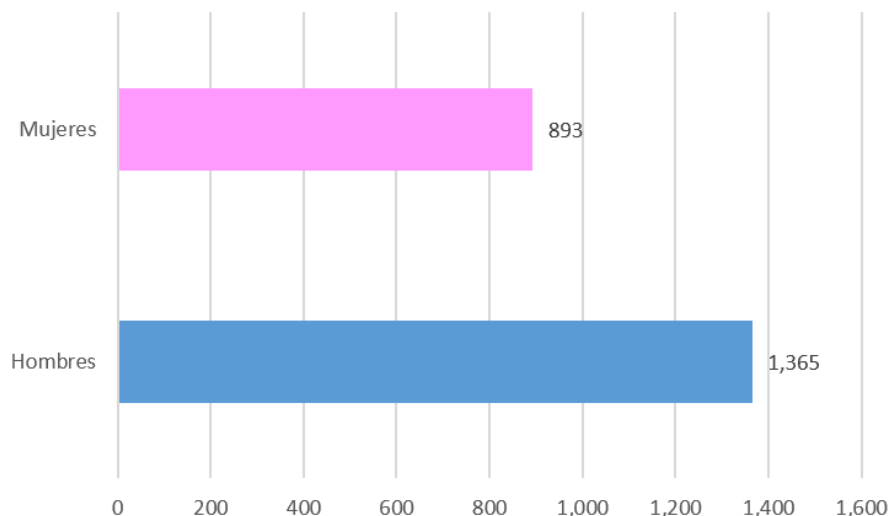
Figura 7. Proyectos por tipo de investigación en centros de investigación



Fuente: Elaboración propia

For Peinado, Cerecedo and Jaramillo (2015), “the management of scientific production in the IPN is an integration of various elements that intervene in this process” (p. 148). About the participants in IPN research projects, that is, about the researchers who contribute their knowledge and experience to research projects, specifically those assigned to research centers, without referring only to directors of the project, but of all those who collaborate in it; In these research projects, we said, a total of 2,258 researchers participated: 1,365 men and 893 women (60.4% and 39.5%, respectively) (IPN, 2018, p. 54). These data are shown in figure 8. As can be seen, there is less participation of female researchers in research projects.

Figura 8. Participantes en proyectos de los centros de investigación

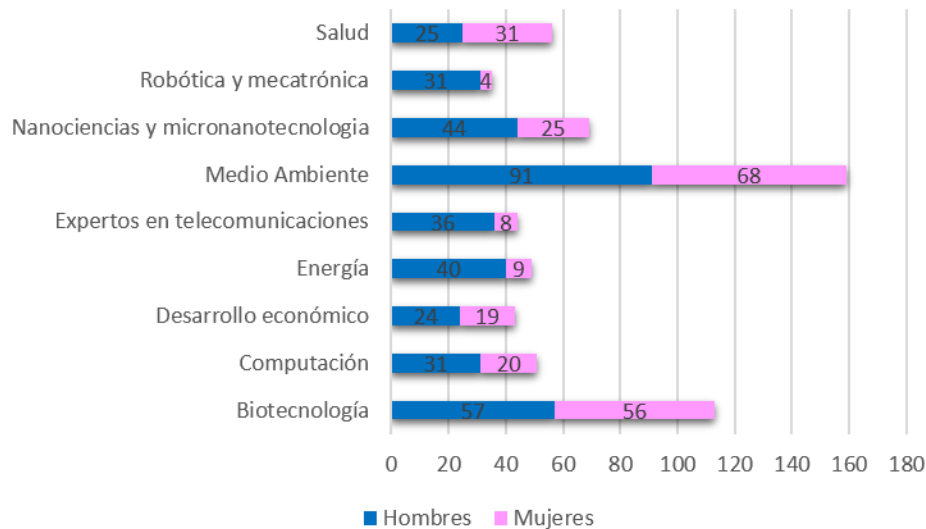


Fuente: Elaboración propia

Research and postgraduate networks at the IPN

Another point worth mentioning are the IPN research and postgraduate networks, which were created as of November 30, 2006 as advisory, consultation, support and coordination bodies of this house of studies, in order to promote the training of human resources of academic and professional excellence, as well as the generation of cutting-edge scientific knowledge and its transformation into useful applications to society in this matter. In other words, it is the association of researchers or people who collaborate and contribute their knowledge and skills in the synergistic promotion of postgraduate programs and network research projects (IPN, 2011, p. 2). In the nine networks constituted in the IPN, 619 researchers participate, 379 men and 240 women (IPN, 2018, p. 57). Figure 9 describes the number of participants in each network.

Figura 9. Participantes en redes de investigación y posgrado en el IPN



Fuente: Elaboración propia

Figure 9 shows that the highest participation of researchers is made in the Biotechnology and Environment networks, with 56 and 68 respectively. The networks with the least participation of researchers are Energy with nine, Robotics and mechatronics with four and Experts in telecommunications with eight. This figure, in addition to indicating the low participation of researchers in research networks, also allows us to see in which areas their participation can be strengthened.

Participation of the IPN community in matters of gender

Since 2012, the IPN has established gender networks in all its schools, centers, units and central area, with the aim of contributing to the integration of the gender approach in the daily work of the IPN, as well as the monitoring strategies and impact on the polytechnic community. Gender networks are made up of a group of interrelated people who carry out various actions in order to contribute to the integration of the gender approach in institutional work. They require a fundamental role to promote a culture of equality and good treatment in educational and work spaces through awareness-raising, training, dissemination and promotion activities (IPN, 2012, p. 17). In 2018, the gender networks were made up of 466 participants, 310 women and 156 men; It is not difficult to point out the scarce collaboration of male personnel in this activity, it is the only area where the participation of women stands out (IPN, 2018, p. 125). This information is specified in Table 1.

Tabla 1. Redes de género del IPN en el año 2018

Nivel	Núm. de redes	Mujeres	Hombres	Total
Medio superior	19	81	48	129
Superior y posgrado	25	106	54	160
Centros de investigación	7	20	14	34
Área central	33	103	40	143
Total	84	310	156	466

Fuente: IPN (2018)

Formation of the teachers' colleges in the IPN research centers

In the words of Peinado and Jaramillo (2018), “a very specific characteristic of postgraduate courses at the IPN is the collegiate work carried out in them” (p. 132). The colleges of professors of the IPN are academic advisory bodies made up of postgraduate professors with appointment as a collegiate of an academic unit; They are intended to assist the academic units of the IPN in the fulfillment of their postgraduate functions (IPN, 2017, p. 34). In the teachers' colleges, work is carried out for the better development of the academic programs regarding the lines of research, the admission processes, planning and evaluation of courses, designation or changes of director or thesis directors, conformation and evaluation of committees tutorials, thesis review committees, pre-doctoral and undergraduate exams (Peinado, 2020, p. 5), as well as the activities necessary for the dissemination of the offer of academic programs, the application for scholarships or support for graduate students and professors, the organization of files for the accreditation of the quality of academic programs, among others. Peinado, Mayagoitia and Cruz (2019) comment that “the work carried out in teacher colleges is a fundamental advantage in the development and consolidation of postgraduate courses, it is a practice that should not be left behind and in which efforts should be redoubled to generate consensus and agreements that benefit (p. 21) ”. Hence the importance of its formation and analysis for this study.

The collection of data from the teachers' colleges of the IPN research centers focused on examining their integration in a general way, emphasizing the number of researchers that comprise them. The corresponding description can be found in Table 2.

Tabla 2. Conformación de los colegios de profesores por centro de investigación

Centro de investigación	Mujeres	Hombres	Total	% de mujeres
1) Centro de Biotecnología Genómica	7	15	22	31.8 %
2) Centro de Innovación y Desarrollo Tecnológico en Cómputo	5	21	26	19.2 %
3) Centro de Investigación en Biotecnología Aplicada	25	21	46	54.3 %
4) Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada Unidad Legaria	17	36	53	32.0 %
5) Centro de Investigación en Computación	4	40	44	9.0 %
6) Centro de Investigaciones Económicas, Administrativas y Sociales	13	16	29	44.8 %
7) Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional Unidad Durango	27	27	54	50 %
8) Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional Unidad Oaxaca	30	49	79	37.9 %
9) Centro Interdisciplinario de Investigación y Estudios sobre Medio Ambiente y Desarrollo	10	20	30	33.3 %
10) Centro de Desarrollo de Productos Bióticos	19	15	34	55.8 %
11) Centro de Investigación e Innovación Tecnológica	6	14	20	30 %

12) Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada Unidad Altamira	1	10	11	9.0 %
13) Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada Unidad Querétaro	8	24	32	25 %
14) Centro de Investigación y Desarrollo de Tecnología Digital	4	22	26	15.3 %
15) Centro Interdisciplinario de Ciencias Marinas	14	48	62	22.5 %
16) Centro Mexicano para la Producción más Limpia	7	6	13	53.8 %
17) Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional Unidad Michoacán	7	15	22	31.8 %
18) Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional Unidad Sinaloa	13	29	42	30.9 %
Totales	217	428	645	33.6 %

Fuente: Elaboración propia

In relation to the percentages, the Center for Research in Applied Biotechnology, the Interdisciplinary Research Center for Integral Regional Development Durango Unit, the Center for the Development of Biotic Products and the Mexican Center for Cleaner Production have 50% or more researchers ; the others are below this proportion. The research centers with fewer female researchers are: the Computer Research Center, 4 of 44, the Altamira Unit Research Center for Applied Science and Advanced Technology, 1 of 11, the Digital Technology Research and Development Center, 4 of 26 , and the Center for Research in Applied Science and Advanced Technology Querétaro Unit, 8 of 32.

It is important to mention that the data collected in table 2 include collegiate and subject teachers; Guest or visiting professors were not considered. It should be specified that the website of the Mexican Center for Cleaner Production does not refer to this section, the amounts were obtained from its directory. Likewise, due to the fact that some pages do not

show the teachers' curricula in detail, it was not possible to carry out a more detailed analysis and consider other parameters that would allow highlighting the differences between women and men in the research, in addition to a more exhaustive differentiation between each center, depending, of course, on the area to which they belong (engineering and physical-mathematical sciences, medical biological sciences, social and administrative sciences, and interdisciplinary). This information can be the preamble for other more detailed investigations that allow visualizing the work of women researchers in the IPN research centers. The amounts do not coincide with the data initially presented because information was only collected from the teachers' colleges, and not from the total academic staff assigned to each research center.

Discussion

The results obtained allowed corroborating asymmetries of the researchers in the IPN research centers. The first point to observe is that this problem could originate in previous training stages, which has a direct impact at the moment of joining a job. As Nielsen (2017) mentions in her case study on the phenomenon of opt-out among young researchers, “early career researchers face a series of drawbacks that produce limited career options and prevent some of them from translating with success their abilities in sufficient scientific rewards and professional advancement ”(p. 149).

On the other hand, although the number of women entering universities has increased, few are still being trained in science, especially in exact sciences. This could be the cause of the lower number of researchers in the IPN research centers and, consequently, a lower number of researchers in the SNI. In addition to the above, female researchers who enter the SNI rise to a lesser extent than their male counterparts in levels II and III (Izquierdo and Atristan, 2019, p. 128). For example, in 2016 there were 25,072 members in the SNI, 15,991 men (64%) and 9081 women (36%). In 2017 there were 27,186 members of the system, 17,204 men (63%) and 9,982 women (37%), an increase of 901 women. Likewise, 96% had doctoral studies and 3% had a master's degree (National Council of Science and Technology [Conacyt], 2017, pp. 57-63). Women represent 36.6% of the national total of researchers in the SNI, and they are largely concentrated in levels I and Candidate (Izquierdo and Atristan, 2019, p. 128). In the specific case of the IPN, the statistics are not very different: the academic

members of the SNI in 2018 were 809 men and 407 women. Table 3 shows 56 men and 9 women at level III; 155 men and 55 women in level II; 486 men and 261 women in level I; 112 men and 82 women at the Candidate level (IPN, 2018, p. 55).

Tabla 3. Académicos del IPN miembros SNI

Adscripción	Candidato		Nivel I		Nivel II		Nivel III		Totales		
	H	M	H	M	H	M	H	M	H	M	Total
Medio superior	2	2	1	2	0	0	0	0	3	4	7
Superior y posgrado	69	51	27	17	96	3	41	7	48	27	757
			9	5		9			5	2	
Centros de investigación	36	25	19	80	59	1	15	2	30	12	424
			1			6			1	3	
Área central	5	4	15	4	0	0	0	0	20	8	28
Totales	112	82	48	26	15	5	56	9	80	40	1216
			6	1	5	5			9	7	

Fuente: IPN (2018)

Regarding the colleges of teachers of the research centers of the IPN, the number of women is less than that of men. Although the inclusion percentages have been increasing, they are not comparable to achieve the gender equality that is required. It is imperative to create strategies, programs, plans, policies or models that encourage the inclusion of more women in the field of research, since, according to Cárdenas (2015), “by increasing the number of women in professional categories and in the work teams of the scientific and technological sector can have different visions and enrich the solution of problems”(p. 8). Increasing the number of female researchers is a matter of inclusion, equity, gender perspective and social justice; It is part of the response to generate more knowledge and find solutions to national problems with social impact and that benefit the development of the country.

Although there are several gender perspective studies that have been carried out in schools and academia (Buquet, 2011, p. 220; McKnight, 2018, p. 220; Román, Domínguez, Saucedo and Tánori, 2016, p. 84), research centers are also a suitable space to carry them

out (Vayreda, Conesa, Revelles and González, 2019, p. 430; Peinado, Montoy and Torres, 2020, p. 13), since their awareness motivates equality policies in institutions (Litosseliti, Gill and García, 2019, p. 1; Tapia, 2017, p. 7). In this sense, normative practices have been promoted to have a certain percentage, for the inclusion of women in various fields of daily life. In the academic and research community, this practice could be implemented with the aim that researchers have sufficient spaces for their growth and development. This would benefit everyone, because what it is about is to offer equity to all and all members of society.

It is necessary to accept that multiple obstacles prevail in the lives of the researchers: the use of time, family responsibility, maternity, disparity in labor insertion, working conditions, gender stereotypes, organizational culture, among others. However, according to Mattsson (2015), “women collectively experience a certain uniformity that makes them strong as a group and they adapt better in the academic world” (p. 685). Macoun and Miller (2014), in turn, determine that “informal peer support networks can provide avenues for sustenance and sustenance in the academic world” (p. 287). The accumulation of these advantages allows them to reduce tensions with the standards of the academy (Jenkins, 2014, p. 262; Sang, 2018, p. 192; Peinado, 2020, p. 15); In this way, the challenges and adversities they face serve to envision success in their duties (Redmond, Gutke, Galligan, Howard & Newman, 2017, p. 332).

Finally, it should be noted that, although the present study found quantitative evidence of the asymmetries that impact the researchers, among its limitations it can be noted that it is not generalizable or conclusive (Hernández, Fernández & Baptista, 2010, p. 165). It is absolutely necessary to continue researching this topic, as well as to stimulate the growth and strengthening of this line of research. For future work, it is recommended to extend the analysis to other public and private research centers and institutes, either separately or jointly. It is also recommended to broaden the dimension of this topic, including the experiences of research teachers and research teachers, inquire about the practices of managers and the impact of this phenomenon on the regulatory framework and in the economic sphere.

Conclusions

The objective of the research was to find and analyze quantitative data that show the asymmetries of the researchers in the IPN research centers. The statistics presented here are more significant than they appear. The academic community is facing a great difficulty, the efforts required to resolve these asymmetries are very demanding, but there is the best availability to overcome them.

The data reaffirms the reflection of the asymmetries faced by the researchers. The intervention of other variables before and during their training is necessarily recognized. The former is manifested in their roles as a woman and the tradition of focusing only on certain fields of study that directly intervene with their training. The later, due to the decisions he has to make based on his complex situation of woman-mother-wife, which is largely opposed to the academic-researcher, especially if it is taken into account that in the research cloisters still archaic practices of control and submission prevail today.

Without pretending that this seems like a justification, it takes time to absorb all the proposals of the researchers, which are certainly understandable, necessary and urgent; time is required to conclude with a trend of wrong customs, bad habits and deviant thoughts that must be forgotten in order to train the new generations, because they are the ones in which we must work with the greatest effort from all possible spheres, contexts and perspectives.

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