

Importance of Collegiate Work among Academic Women and Men of Public State Universities in México

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Abstract

The gender dimension in science and technology has gained increasing importance and has become a hot topic worldwide. Although indicators show an increase in the last decade in the number of women in science and research, analyzing significant gaps persist. This paper aims to analyze the productivity of academic women and men in research groups. This investigation is descriptive with a total sample of 628 Mexican Public State University Professors surveyed. Overall, percentages indicate that women are more satisfied with the decision, the results of the research group and the policy Teacher Improvement Federal Program. Men reported being more satisfied in the role they play in the research group. These groups as a collaborative space are an opportunity for relations between men and women more equal, in that gender bias break and where the work of both genders is equally potentialized. Are the research groups democratic spaces with equal opportunities for women and men?

Keywords: Gender, academics, knowledge production

Introduction

The dimension of gender in science and technology has come to acquire growing importance and has become a current theme worldwide. Women represent a significant portion of the composite of resources of a nation, and they comprise a potential source of talents for science, technology, and innovation. However, frequently their representation in the policies of Science and Technology is null or insufficient. One of the greater transformations of the Mexican Academic System in the last 30 years has taken place at the higher educative level. The feminine presence in upper, middle and higher education has followed an unquestionable ascending progression. Few social changes explain the rhythm of growth of the feminine population in universities. The ambit of scientific investigation continues to be a space masculine in its majority. Worldwide tendencies indicate that female investigators and scientific women remain absent in positions of hierarchy worldwide (UNESCO, 2007). Although the indications present an increase in the last decade in the number of women in science and investigation, important gaps persist in analysis of, for example with reference to scientific categories or scoring levels, the highest hierarchies occupied by men, and with the highest percentages of those observed in their global presence in the system (OEI, UNESCO, 2004).

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The scientific disciplines in which men and women participate present biases. Women are found with low presence in the exact sciences, particularly in physical and mathematical sciences, less participation in engineering and in other technological sciences, with high participation in the social sciences, humanities, and natural sciences, these indicating high fields of masculinized and feminized knowledge fields (OEI, UNESCO, 2004). Similarly, the possibility of access to spaces of power and decision-making continues being restricted to women. Positions such as Director of Postgraduate Studies, Director of Research Centers or Institutes, and University Rector continue to be occupied by men, and the participation of women is found at the lowest management levels of the institutional hierarchical scale, thus levels with less responsibility and visibility (OEI, UNESCO, 2004). Bias and participation of women in science and technology in Mexico respond to the world panorama, formerly presented, taking as an example the National System of Researchers (SNI), which agglutinates scientific and technological investigation of this country. At its creation in 1984, women represented 19% of the system, and their incorporation has advanced slowly to reach 33% in 2010. However, although the advance is indubitable, in the detailed analysis, it is cited that the higher the SNI level, the lower the percentage of women and, at the same time, the insertion pattern of women by knowledge areas. In 2010, women were mostly in the lower level of the system, this is the category of candidate research by 40%; 35% of female researchers were in Level I, 28% in Level II, and Level III only 20%. As regards fields of knowledge, 50% of women were in the Humanities and the Behavioral Sciences, 45% in Medicine and Health Sciences, 37% in Social Sciences, 36% Biology and Chemistry, 31% in Biotechnology and Agriculture, and 20% in Engineering, and 19% in Physics and Mathematics and Earth Sciences. Women can be seen as representing only the fifth in the Level III of the SNI and are fifth in the areas of Engineering and Physics and Mathematics and Earth Sciences knowledge. (Bustos, 2012)

The evaluators SNI commissions remain a space of male decision, although the increased presence of women is in the Humanities and Behavioral Sciences, the Judging Commission in 2010 was comprised of 4 women and 10 men. In the Engineering area was only one woman on the committee, 3 in Medicine and Health Sciences, and 4 women in Biotechnology and Agriculture. (Bustos, 2012) While women have made advances in investigation and science, the reality is that gaps and inequities persist. According to the UNESCO, the following of the latter can be distinguished: absence of facilitator conditions; discriminatory salary scales; academic productions (publications); personnel-selection policies; segregation; cultural and structural barriers, and a "cold climate" for women in universities (UNESCO, 2002). Therefore, women find difficulties in developing within the scientific and academic ambit and the conciliation of traditional roles assigned to women. As stated by Escalante (2004), for academic women have not always been easy to resolve or accept the transition in roles; sometimes have experienced feeling of sadness, weariness and/or unrest in their desire to combine being mothers and the desire to evolve professionally. Others in their case decided to postpone marriage and maternity; however, for the society, the self-realization of the women is synonymous with marrying and having children; thus, so it helps in persuading female academics decisions. The national policy of the Professional Improvement Program (PROMEP) defining unified features a new university professor; it has not been measured in terms of gender. Thus, with regard to the definition of a new profile of professor, it is unclear how it affects men and women. Moreover, especially the latter whose professional trajectory must also be reconciled with the female academic's personal and family life.

While it is true, that academic work has been characterized by requiring a significant investment of time and effort, so it is that from the operation of the quality policies associated with the assessment and obtaining academic degrees of teachers, mainly the PROMEP-, diversification of activities and the institutional expectation of a large number of teachers with desirable profile, placed intension by significant others as noted below. Based on the above, this study aims to analyze the productivity of academic women and men in the research groups (CA), considering that the national policy driven mainly by PROMEP are based on the idea that academic institutions work must be done by groups or teams, especially when it came to issues requiring multidisciplinary or interdisciplinary care. In addition, the same organization of universities and promoting collegial care of virtually all the work that concerned the academy (SEP, 2006).

The Collective Production of Knowledge

The scientific production as a result of the activities carried out by researchers in all countries, measured in terms of indicators such as: the count of articles published in journals and the number of citations of these in other investigations. Also on the issue of how to measure the importance of the contributions associated with the researchers, it should be noted that these indicators serve to measure the impact of their publications in the international scientific community and give an approximation of their quality.

Therefore, these bibliometric indicators have become the most common way to measure productivity, not only of individuals, but also of institutions that compete for project funding, or to recruit and promote other investigators (Brambila y Veloso, 2005). Scientific production or productivity of scientific research is an academic activity carried out and the production of tangible results that are generated there from. It is therefore the performance and results obtained by an individual to conduct, without making judgments about the quality of it (Jimenez, 1982). Given its characteristics, scientific productivity, should not be understood as a mere abstract concept, but as a fact that is realized in an evident way when it distinguish economic productivity, another technique and a third of social nature (Valle, 2009). Collective production derives from the English translation of the concept *Collaborative Research*, or *Collaborative Action Research*, or *Interactive Research and Development*, and manifests itself as an alternative to research design (Research and Development) (R&D) (Bartolomé, 1986). In Mexico, collaborative work is driven by the National System of Researchers (SNI) and the Professional Improvement Program (PROMEP) as a way to involve more researchers on a project, which could result in quality innovations that come to detonate in society contributions to improve aspects or covering areas such studies. Undoubtedly, the fact that team work provides a number of benefits or advantages over individual work. Such as greater speed and flexibility to detect errors or mistakes and solve problems, increased satisfaction among individuals and even the quality of life, easier to learn and acquire skills and abilities to perform more tasks, enhancing the commitment and involvement in the work and the group, significant increase in the quality of work performed and results or products.

Gender and Academia

Over the past several years, various studies and research have indicated the conditions under which academic women perform within higher education institutions (Chávez, 2009; Osorio, 2005; Padilla, 2013; Guzman, 2013). The minority presence of women in academia should be according to Padilla (2013), to three factors: family issues; the organization where they work and discipline. In this regard, Eguinoa (2006) states that the university is a mixed space, but not joint nor equitable in relation to gender, despite the massive entry of women in recent decades. The feminization of higher education has been managed by tracks and areas of study valued for men –the hard sciences– devalued against soft disciplines, occupied by women. However, these changes also affect men to the extent that they have been upsetting the role played by t both genders. Graña (2004) notes that “discrimination in academia often takes the form of multiple “micro-inequalities” which taken at a time seem insignificant, but which contribute globally to generate a “hostile climate” that deters or demoralizes women who have chosen scientific-technological area”. Given these scenarios, it is important to distinguish the way women and men face academic work into consideration that are subject interacting socially and culturally constructed from two distinct ways of seeing the world. This is why, remain rooted cultural stereotypes on the roles of research, leadership, decision-making, and the masculine share characteristics such as hardness, rigor, and rationality. Whereupon the academic woman, involve in these tasks is seen as a contradiction (Cetto, 1990:5, quoted by Preciado, 2008) because, generally, she is related with subjectivity, with emotion; characteristics that tend to discard scientific activity (Maturana, 1994, quoted by Preciado, 2008).

The Study

The results presented in this paper emerge from the research project *Collective Modes of the Knowledge Production of Academics of Public State Universities*. Research by the members of Network of Educational Institutions Studies (RESIEDU), whose objective is to analyze the changes in collective modes of knowledge production in male and female academics in Public State Universities, such that were allowed to make interpretations on the changes that are taking new forms within public state universities. The research is descriptive; in the interest of a description of the collective modes of knowledge, production of the research groups (CA) and identifies common features. For the study, the database PROMEP2012CA, which contains names and e-mails from male and female academic and researchers of the country, was selected. The total population consisted of all members of public universities research groups, Consolidated, on Consolidation and Training, which is 16,080 male and female academics.

Based on these three strata, it was carried out a three-calculation sample sizes(Tm) one for each group. Tmtwo calculations with an error of3% and 4%, selected only one, highlighting a reliability of 95% and 4%errorgettinga total sample of628subjectssurveyed. The instrument was built based on the empirical experience of the Network participants, selecting the variables, categories, and indicators.

Pilot tests were performed by making suitable modifications to achieve the definitive instrument, consisting of seven sections, which are general data; academic degree; employment status; production; research group (CA); management, and entailment. The questionnaire was sent via electronic mail, with an a link to an online system that yielded the results raised.

Results

Of the 628 researchers surveyed, 366 were men and 262 women. That is 58.3% of the respondents were male and 41.7%, female. 52% of the respondents do not belong to the National System of Researchers (SNI), and 48% are members of the system. Who are members, 63% are men and 37%, women, in line with national indicators of women’s participation in the SNI.

Table 1: SNI Gender

	SNI		Total
	No	Yes	
Gender	176	190	366
Female	151	111	262
Total	327	301	628

Source: RESIEDU Database, 2013.

With regard to the SNI level in which research participants are, women academics are distributed as follows: 16% in candidate level, 70% at Level 1, 12% in Level II; 1% in Level III, and 1%, emeritus. As can see in Table 2, women are mostly in the lower levels of the system, and men at the highest SNI levels.

Table 2: Gender by SNI Level

	SNI level										Total	
	Candidate		Level 1		Level 2		Level 3		Emeritus			
Gender	Masculine	26	14%	112	59%	36	19%	16	8%	0	0	190
	Feminine	18	16%	78	70%	13	12%	1	1%	1	1%	111
Total		44		190		49		17		1		301

Source: RESIEDU Database, 2013.

Regarding the degree of participation within the research group, the results indicated that men and women academics surveyed are involved in 25% of man as research group leaders, and 23% of the women are research group leaders, as shown in Table 3.

Table 3. Gender and Participation of the CA

	CA status				Total	
	Leader		Member			
Gender	Masculine	91	25%	275	75%	366
	Feminine	61	23%	201	77%	262
Total		152		476		628

Source: RESIEDU Database, 2013.

Regarding the type of research that the participants of this research pointed out perform, the results indicate a similarity in the type of research they perform: basic, applied or mixed, although men reported slightly higher proportion make joint research, as it can be seen in Table 4.

Table 4: Gender and Research type

		Research type						Total
		Basic		Applied		Mixed		
Gender	Masculine	99	27%	112	31%	155	42%	366
	Feminine	82	31%	83	32%	97	37%	
Total		181		195		252		628

Source: RESIEDU Database, 2013.

The participation of men and women in collegiate groups (see Table 5) according to results of this research shows that the participation of men is overwhelming, as 82% of men surveyed reported participating, compared with 18% who responded negatively to the survey item. Women reported participating in a 75%, and more pointed than men do so by 25%. With regard to governance (see Table 6), male and female participants academics note to have little presence, with 26% of men and 17% of women participate in the governing groups.

Table 5: Participation in Collegiate Groups by Gender

		Participation in collegiate groups				Total
		Yes		No		
Gen-der	Masculine	299	82%	67	18%	366
	Feminine	197	75%	65	25%	
Total		496		132		628

Source: RESIEDU Database, 2013.

Table 6: Participation in Governance Groups by Gender

		Participation in governance groups				Total
		Yes		No		
Gender	Masculine	97	26%	269	74%	366
	Feminine	46	17%	216	83%	
Total		143		485		628

Source: RESIEDU Database, 2013.

In response to the question on how the academics prefer to work, the data indicate are shown in Table 7.

Table 7: Individual/Collective Work by Gender

	None		Little		Much	
	M	F	M	F	M	F
Individually	4%	7%	39%	39%	56%	55%
Work in pairs	1%	2%	28%	23.5%	71%	74.5%
Groups (CA)	5%	6.5%	36%	34.5%	59%	59%
Networks	5%	7%	48%	44%	46%	49%

Source: RESIEDU Database, 2013.

As can be seen in Table 7, the men and women academics no significant differences in preferences for individual and collective work, in pairs or networks. This can be explained because national policies have impacted the forms of work of researchers equally to men and women. Men and women academics mostly state their preference for individual work, in pairs, and in research groups, and at lesser proportion enjoy it a lot and at the same percentage note have little preference for work in networks. Table 8 shows the satisfaction of male and female academic who participated in the study toward the PROMEP policy, role in the research group (CA), in the way that decisions are taken in the CA and the results achieved as a CA

Table 8: Degree of Satisfaction by Gender

	Not at all satisfied%		Little satisfied %		Very satisfied %	
	M	F	M	F	M	F
PROMEPE policies	10	5	42	41	48	54
Role assigned to perform in CA	7	7	24	22	69	71
The way decisions are made in CA	8	12	21	21	71	67
Results achieved as CA	12	9	33	34	55	57

Source: RESIEDU Database, 2013.

The degree of satisfaction of men and women reflect similar results with few significant differences. The female academics are very satisfied with the PROMEP policy in 54%, while 48% of men state being so, and 10% say they are not at all satisfied. Additionally, 71% of women affirm being very satisfied with the role that they perform within the CA, as do 69% of males. In terms of the decision making type in the CA, 71% of the men indicated being very satisfied, as did 67% of women, but the latter also reported being not at all satisfied at a greater proportion than men by an additional 4 percentage points. The degree of satisfaction with the results achieved as CA, and respondents said the women being very satisfied by 57% and men 55%, men showed greater percentage of not being at all satisfied by 12%. In general, percentages indicate that women are more satisfied with decisions, with the results of the CA, and PROMEP policy. Men reported being more satisfied in the role they play in the CA.

Conclusions

The results presented in this study show that men and women within the research groups (CA) have a vision of collective work. An analysis with a gender perspective has enabled display that men and women are satisfied with the job within the CA, with results and generally PROMEP policy. Doing the same kind of research and much like individual work, work in pairs and work in the CA. It also makes clear that gender segregation in the National System of Researchers, in which the presence of female academic minority still persists. At the same time, women are found mostly in the lower two levels of the system's ranking. Similarly, women participate to a lesser extent in collegiate and government groups. The National Council of Science and Technology (CONACYT) made changes in 2011 to the Law on Science and Technology in order to encourage the equal participation of women and men in all areas of the National System of Science, Technology and Innovation and promote cross the inclusion of a gender perspective in these areas. Among the modifications made to Article 12 it says that policies to support scientific research should "encourage balanced and without discrimination between men and women participation" and Article 14 suggests gender difference database with information on research, in order to measure the impact of policies and programs. (Law of Science and Technology) Article 42 promotes the development of a system of education, training and human resources consolidation "equal opportunity and access for women and men".

However, actions that CONACYT has done, they focused support undergraduate scholarships and technicians. Regarding the SNI, the regulation sets a one-year extension granted to researchers who become pregnant during the term of their distinction. But there is no clear policy that encourages the participation of women in science. Undoubtedly policies towards professors have impacted significantly to higher education, in the search for balance between the four main functions: teaching, research, mentoring and management; male and female academics have modified their activities and transformed their visions of what it means to be an academic (male or female). In this transition process, new forms of interaction-oriented collaborative work, according to the results of this investigation, have maintained female and male academics equally satisfied. The CA as collaborative space is an opportunity for relations between men and women more equal, in that gender prejudices are broken and where the work of both genders equally potencialized. As a first approach to work that men and women within the CA, the results have indicated that regardless of gender, policies have impacted equally. Which leads to new implications for future work. Do research groups are a strategy to increase the levels of participation of women in institutions of higher education? Are research groups(CA) democratic spaces with equal opportunities for women and men?

These and many questions remain to be resolved, the proposal is that since the national policy and be consistent with mainstreaming of the National Development Programme 2013-2018, could integrate a gender perspective to politics in general PROMEP and foster links academics between men and women. The results also would impact research, teaching and management that made men and women.

The urgent need to promote scientific and technological activities that incorporate the gender perspective is highlighted by: 1) increasing the participation of women in science and technology and research and development around the world, 2) more awareness of the public on issues of science, technology and gender; and 3) increase the collection of more data on science, technology and gender and promoting rigorous research related to science, technology and gender.

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