

A Brief Review of Actions to Strengthen Gender Equality at the University of Costa Rica*

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Abstract

This article discusses efforts at the University of Costa Rica since the 1980s to incorporate a gender perspective and stimulate feminist studies at this institution of higher education. The dynamic of the national context together with the efforts of the feminist movement and of Costa Rican institutions have created an environment propitious to the establishment of various laws and the ratification of international agreements that defend the rights of Costa Rican citizens and particularly to fight discrimination against women. The article reflects on the advances achieved in the university and reports on other studies about the presence of men and women in the fields of science and technology. It concludes that, despite a stronger female presence among undergraduate and graduate students, there are still inequalities in participation and the access to careers. Some fields in the basic sciences and technology, such as the engineering fields, have a lower presence of women. The university situation certainly provides material for reflection and analysis about how to create incentives and transform female and male participation in a more equitable manner.

Keywords: Gender, Higher Education, Science and Technology, Costa Rica.

* Received March 17 2016, accepted September 16 2016. Translated by Jeffrey Hoff.

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Introduction

This article is based on studies of institutional processes that have sought to incorporate and discuss gender equity at the University of Costa Rica, within the context of national processes. It discusses the inclusion in university policies of related issues such as the creation of specific forums, and indicates gaps between the genders as well as current tensions and debates.

The University of Costa Rica (UCR) is the oldest public institution of higher education in the country, and began operating in 1941. It was formed from a variety of separate schools, some of which had been part of the Universidad de Santo Tomás, which had closed in the late nineteenth century (1888).

The University of Costa Rica was inspired by the Cordoba Reforms (González, 2006), which promoted autonomy, academic freedom, self-government and direct student participation in university bodies. Thus, it can be said that it is a humanist university open to critical and diverse thinking. In this regard, Solís Avendaño (2008) affirms the importance that it was created without influence from the Catholic Church.

Studies that focus on women's issues indicate that it was certainly the feminist movement of the 1970s that created the opportunity for a group of women scholars to raise the theme of women at the university. Guzmán (2008) discussed how the first protagonists of the process were responding to the impact of global conferences and declarations about the condition of women – marked by the International Year of Women in 1975. This inspired activities at the University of Costa Rica and at the National University, two institutions of public higher education in the country.

Sagot (2015), meanwhile, explained how feminist studies responded to questionings about the absence of a female presence in scientific theory and research, as actors and as objects of study. Sagot affirmed that the armed conflicts in Central America in the 1980s were obstacles to the development of studies about women

in the region, although Costa Rica did not have armed conflicts within its territory.

For this reason, the University of Costa Rica was able to realize particular actions in the 1980s. For example, it conducted the first research seminar about women; participated in university congresses (which are held at the university approximately every ten years and whose main focus is reconsidering itself as a public institution of higher education). At the School of the Social Sciences, the Eugenio Fonseca Tortós chair was created with the theme “Woman and Society”. This was expressed in the candidacy of a woman to be dean of the school of the social sciences, which had regularly been under the direction of men. Many of these women also participated in political movements and women’s movements.

At the National University, in the late 1980s and early 1990s, a series of courses were organized in conjunction with other national and international institutions to address violence against women, care for the victims and the abuse of children and adolescents. These courses were given by scholars recognized for their role in the feminist movement and for feminist thinking, such as Dr. Sara Sharrat.

In 1993 a program was implemented that was new and unique in the country, a joint master’s program in women studies at the two public universities. This pioneering political and educational action was made possible by the collaboration of scholars at the Interdisciplinary Center for the Study of Women at the National University and at the University of Costa Rica’s Research Program in Gender Studies. The students in this graduate program contributed with current studies about Costa Rican institutions and the university itself, as well as those about the women’s movement, the defense of human rights. Many studies had a clear influence on public policy.

Women’s Studies became an academic discipline that followed a historic process. González y Guzmán (1994) affirmed that a group of women scholars reflected on sexist forms and

gender discrimination in research, teaching and daily practices at both the university and in society in general.

The growing demand for a rigorous investigation about women and gender relations, together with a clear advance of these activities in the university environment, provided the environment needed to take the first steps towards the consolidation of Women's Studies in the country, despite the problems faced (González & Guzmán, 1994:12).

It should be emphasized that despite the achievements, in her analysis about the development of the construction of feminist thinking in Central America, Sagot (2015) indicated the existence of various criticisms. She found that at universities, the work conducted by women is often questioned by affirming that it is not scientific. Sagot therefore concludes that feminist studies is a field in dispute.

It is clear that the university processes were related to the national context. In the 1990s, the nation strengthened itself through public discussions to substantiate and achieve laws guided by gender equity and equality. This allowed taking important steps in both the central government and at the local level.

At the government level, in 1998, the National Institute of Women was created. It was an heir to the National Center for the Development of Women and the Family, which had been created in 1975. The institute presented action plans in the field of citizenship for women, against domestic violence and encouraged opportunities for women and men based on various affirmative actions. At a local level Women's Workshops were organized by municipalities – with internal guidelines – at first to serve women who were victims of violence. Moreover, a series of norms and laws were approved and entities created that were dedicated to gender equity and that had a strong impact on Costa Rican citizens. These included: the Women's Delegation, 1990; Promotion of Social Equality for Women, 1990; The Office of Women's Defense in the Resident's Defense Office, 1993; the Law Against Domestic Violence, 1996; the Law for the General

Protection of Adolescent Mothers, 1997; the Code for Children and Adolescents, 1997; the Law Against Sexual Harassment at Work and Education, 1995; the Regulation of Sexual and Reproductive Health, 1999; the Responsible Paternity law, 2001; the Criminalization of Violence against Women, 2007; as well as the signing of international agreements.

These legal and institutional advances established a strong opportunity to change conditions of discrimination and inequality, but unfortunately have not always been translated into concrete actions. For example, Araya Umaña (2003) indicates that education policies have included measures to encourage gender equity and promote various aspects, that from her perspective, have not been translated into changes in the cultural system, which is instilled by the subjectivity and patriarchal social relations found in education. Umaña lists a number of pending issues:

equal opportunities between the sexes through the analysis of sexual stereotypes in text books; the study and overcoming of differences found today; of the behavior and language of men and women teachers used with boys and girls in the classrooms and the promotion and empowerment of women to enter and remain in careers considered masculine (Araya Umaña, 2003:4).

Therefore, it should not be a surprise that although there are now more women graduates from higher education, there is still inequality in technical and scientific careers. This is a product of a patriarchal culture that favors the participation of men and women in careers according to gender stereotypes.

Amid this complex situation, the University of Costa Rica has conducted actions to achieve changes. Yet it faces various forms of resistance to measures that seek to create stronger networks working in the field.

I. Studies and research

This section presents studies and projects that have focused on problematics related to women and is presented in two general lines: research and or academic production concerning situations in the social reality; and studies about the university.

In the 1970s, only fifteen academic studies were produced in Costa Rica about women according to González (2007a, b), who studied research about women. By the 1980s there were 249 studies. In these decades the studies concerned women in the workforce, politics and organizations as well as the family and education.

Academic production continued to increase in the 1990s, when there were more than six hundred studies on women's issues, indicating the systematic effort that had been made. There were some works in the academic sector, however there were also important studies initiated by the women's movement. González (2007a, b) found studies conducted by women's organizations concerned labor, violence, power, economics, health, education, family and gender identity.

In the same decade, studies were found about gender and health (of men and women), productive work (among rural and urban, young and adult women), and about political organizations and participation. The author reports that most of the studies were conducted by women researchers, who accounted for 85%, while men conducted 15% of these studies. This indicates that woman have been and continue to be those who drive the issue, which may reflect a response to discriminations suffered by these researchers as women and their particular interests.

The joint graduate program in women's studies (UCR-UNA) produced other studies that are systematized in the work of Cordero (2008) about: sexualities, political participation, history, religion, art and women, health, violence, ethnicity, education and gender, identities, communication and women, rural women, couples' relationships, migrants and feminism.

González (2007a) categorized the studies based on the twelve areas of the Beijing action platform, showing the relationship with: education, health, children and adolescents, violence, women and the economy and the exercise of power. Nevertheless, she mentions that there are issues that are not addressed such as: economic policies and women, multiculturalism, the elderly, the environment; and women and science.

Meanwhile, other actions at the University of Costa Rica can be highlighted that are not only related to research, but to institutional bodies and projects that are the product of different initiatives over time and that have permeated university life. In terms of institutional policies and the influence of university authorities, in 2004, the Women's Study Center (CIEM-UCR) succeeded in having candidates for dean in that year sign an agenda of minimal commitments to promote gender equality and equity. When Dr. Yamileth González was elected for the years from (2004-2012), she agreed to support them:

The "Agenda de Compromisos Mínimos por la Igualdad y la Equidad de Género 2004-2008" [Agenda for Minimum Commitments to Gender Equality and Equity] identifies the minimum actions and policies that the University of Costa Rica should enact and strengthen to guarantee substantial changes that would lead to the construction of a more fair, democratic and solidary university where women and men have real conditions to exercise their rights and enjoy their benefits (CIEM, s.f.:2).

In recent years university policies enacted by the University Council (2008 and 2015) have included sensitive expressions related to gender equity; which are also encouraged according to the document from CIEM (2007). These expressions include changes in the university career plan, the use of inclusionary language, faculty hiring, student inclusion and the promotion of responsible childcare and paternity. Some of these measures require financial resources and important changes in social practices and thus systematic long-term efforts.

Although these policies and actions have been incorporated to the general policies of the University of Costa Rica, some continue to be issues in dispute. For example, although the use of inclusionary language has been achieved, some academic personnel are still opposed to this. University policies recognize: respect for the human condition and the need to improve the quality of the social and natural environment; an academic environment free of violence and discrimination (such as sexual and labor harassment); affirmative actions to confront inequality and social exclusion; and access by the entire university population to the services, protection and promotion of rights (which was approved by the University Councils of 2010-2014 and 2016-2020). Mata Segreda, Ureña Salazar and Washburn Madrigal (2013) explain that many of these agreements have been expressed in specialized entities within the university.

Among the important actions are the requirement that non-sexist language be used in all official university documents; and the work of the Commission Against Sexual Harassment, which highlights an issue that is usually invisible and denied in interpersonal relations. This Commission is affiliated to the university's highest executive body, the dean's office, and can be used by any person at the university to file complaints and identify someone responsible through a specific procedure, which has led to direct consequences for perpetrators. This practice has also been favored by the support provided to victims by the Women's Research Center (CIEM-UCR), which has a staff of professionals to support the process. Another achievement that stands out is training in parenting, a program aimed at students and known as the Casa Infantil [Children's Home]. Moreover, the legitimacy of studies of women and masculinity has been emphasized.

Given that the University of Costa Rica is a complex and diverse institution there have been responses to the institutional policies that have led to particular projects. Without presenting all of them, we can mention: the consolidation of the Women's Study Center (CIEM) a specialized center for research and social action. There is also the Education and Gender Program of the Institute of

Investigation in Education (INIE 2000-2010), which had worked for a decade and continues to be an issue of interest. The law school offers specialized services for victims of domestic violence for the general population. The school of engineering has a Women in Engineering project to encourage female participation in the field. Meanwhile, perhaps the least successful effort, but which must be mentioned because of its potential impact, are courses in the university curriculum that focus on feminist and gender studies.

Three reviews have been conducted in the past ten years about the situation of gender equity at the university. In 2001, Dean Dr. Gabriel Macaya (2000-2004) presented the *Primer Balance de Equidad de Género de la UCR* [First Gender Equity Review at UCR] (Cárcedo, 2001). A quantitative methodology was developed to prepare the report by using indicators about the presence of men and women at the university. The study was directed by Ana Cárcedo, who is a feminist and professor in the graduate program in women's studies. She also organized the two following reports about the situation of women at the University of Costa Rica (Cárcedo, 2006 and Cárcedo & Amador, 2012).

Dr. González was the first woman to become dean of the University of Costa Rica. She presented the *Segundo Informe de Equidad de Género* [Second Gender Equity Report] (2006) in her first administration. At the end of her second administration (2012), she called for the *Tercer Balance de Equidad de Género* [The Third Review of Gender Equity] which was presented in 2013 by Dean Dr. Henning Jensen (2012- 2016).

The main conclusion of all these studies is that cultural and historic factors still associate women to the domestic world and men to spaces of professional work and those outside the home. Women are still not recognized as protagonists in all spheres of life and gender stereotypes are still reinforced that directly influence career choices and continue to be found at UCR.

The gender division of the student population at the University of Cost Rica manifests standards similar to those found in the national labor market, according to the report (Cárcedo & Amador, 2012). Women are concentrated in fields related to

children and care, such as education and healthcare, and men in those closer to technology. This analysis reminds us that we must recognize the context in which people live and the logics of a society that instill a patriarchy.

It is obvious that the differentiation of research subjects by sex that is commonly used in some fields is very important, but not sufficient. Various authors have indicated the need to identify intragender and intergender differences, as well as those of class and ethnicity (Menjívar Ochoa, 2006). This makes the analysis of the participation of men and women in the world of labor, the scientific fields and in education even more complex.

González (2005) found that sexism continues to be found in education. Data from the reports mentioned speak to this: although there is evidence of greater participation by women than men at the university, the form of this participation is sexist.

For the years 2000 and 2006, Cárcedo and Amador (2012)¹ reported that the percentage of women students registered at the university was 51.4 and 51.6 respectively. In 2011 the number of male and female students at UCR totaled 35,738 of which 18,130 were women and 17,608 men or 50.7 and 49.3 percent respectively. Nevertheless, these authors found that women and men continue to take courses according to traditional gender roles.

Concerning the fields, three of the six existing fields have a presence of either of the sexes between 40% and 60%: arts and language and literature, social sciences and agro and food sciences, while in the healthcare field there are fewer

¹ In an informal conversation with Ana Cárcedo (2016), she affirmed that in the three studies conducted about the University of Costa Rica, in those in which she was the main researcher (2001, 2006 and 2012), it is clear that parity means 50%. Nevertheless, her reasoning was as follows: “when we measure an indicator it is known that the goal is never attained. At times it is good to go deeper to meet your goal, and this is what these reports sought to do...by not reaching this goal (50%), one could speak of an acceptable proximity, and of unacceptable gaps, which must be addressed. This frontier is located at 40/60 because at this level none of the groups reach 50%, and because the quota policy for women often uses the at least 40%” standard.

than 40% men and in the basic sciences and engineering there are less than 40% women. This represents a notable improvement over the year 2000 when only two fields achieved these minimums, but it is also a setback since 2006, when in the basic sciences, women had reached 42.2%... (Cárcedo and Amador, 2012:15).

In regard to the 50 academic divisions or schools that offer courses leading to a university degree, 42% or 21 schools have a parity of 40/60; with a higher registration of men in 28% (14 schools) and with more women at 30% (15 schools).

The data for 2012 indicated that more women were entering the engineering courses than in the basic sciences, and that there was a slight increase in the presence of men in fields such as social work and nutrition. The participation of women in the engineering fields is a positive fact; nevertheless, in a recent informal conversation with a professor from the School of Computer Science she reported a possible decrease in the female presence in recent years.

On the other hand there are schools that have a clear trend towards a more balanced participation of students; this is the case in engineering, fine arts, education and language and literature. The latter two schools are close to attaining a minimum of 40% male registration (37.45 and 39.4% respectively). In contrast, microbiology and odontology have had a period of sustained growth in the female presence, considerably increasing the gaps (Cárcedo and Amador, 2012:17).

The Third Report also conducted interviews and organized focus groups at four academic units, two of which had a majority of women students and the other a male majority. The report concluded that the main opposition mentioned to women engineering students is their intellectual capacities. Meanwhile, men who study in courses with a majority of women have their masculinity questioned. We thus find subtle forms of discrimination and violence based on stereotypes of being a woman and being a

man.² Of course we do not want to affirm that gender is essentialized, but future studies should consider what authors such as Lugones (2005) have discussed about different fusions and forms of intersectionality.

That is to say, they did not understand themselves in intersectional terms, at an intersection of race, gender and other strong signs of subjection or domination (Lugones, 2005:63).

The challenge that is emphasized as being optimal in these studies is the quest for parity (40/60 percent of men and women or vice-versa); however, it is clear that practical differences, opportunities and experiences related to gender remain and that it would be ideal to attain 50%.

In other spaces such as the labor market, salaries for women are still lower than those of men who perform equal work and other forms of discrimination and violence persist that reflect gender relations and the type of society in which we live. In relation to gender differences of professors by field it was found that in the arts and language and literature, healthcare, social sciences, and gender studies, parity is in the acceptable range. Nevertheless, in the cases of the agro and food sciences, and the basic sciences there is a predominance of male professors at 61.9%, 73.2 % and 78.7%, respectively.

The Third Report found an increase in the hiring of male professors over women, although within the margins of 40% women and 60% men. This is a troubling trend in university teaching, and would indicate that this proportion will be maintained.

In terms of the rise of women through the categories of the academic career regime, a system established by the university that relates benefits to service, women are in a parity in the 2nd and 3rd

² This is in relation with the gender focusing on a difference between men and women, but how would it be when young people affirm other forms of gender expression that break with the traditional definitions?

category, which have 40% women and 60% men. But in the fourth and highest category there are more than twice as many men as women. This leads us to think of the domestic tasks and care that women still assume in daily life and the opportunities that men have to continue their education.

The university authorities of the University Council, the dean and the assistant deans are responsible for being aware of and sensitive to these issues. However, this is a dynamic process that requires the university community and entities to continue to encourage specific actions. Perhaps the point is that the changes needed for women to attain parity depend considerably on the interests of these authorities and pressure from other levels to push for changes. The report by Cárcedo and Amador (2012) concludes that there is a need to conduct in-depth studies that reveal the relations of power and break with the practices of social discrimination by gender.

II. Science, Technology and Gender

Science and technology are essential activities in society today and means to stimulate and resolve human needs. Scientific and technological processes directly influence social organization, which obviously raises challenges for higher education.

It is in this context that the XI Ibero-American Congress of Science, Technology and Gender was held in Costa Rica in July 2016, and was an opportunity to recognize the efforts made in the country regarding the issue and the need to reflect on the conditions of the lives of women and men. The Congress defined lines of analysis that sought to address the issue of education and the impact of science and technology on contemporary life, with a special emphasis on women and on digital gaps; the world of labor and gender inequalities; bioethics in the field of healthcare; technological innovations with a gender perspective; the environment and public policies related to these issues. The congress also reflected on feminist epistemology and the history of science.

The previous congresses were organized by scholars concerned with the low presence of women in the sciences and technology. They created the Ibero-American Network for Science, Technology and Gender created, which has held regular conferences and established ties with other movements and entities. This has clearly strengthened initiatives at academic institutions throughout Ibero-America.

In general terms, the congresses have presented a diversity of themes and demonstrated an interest in discussing problems and questions that have brought together specialists from all fields of knowledge, with no distinction between people who promote the basic sciences and the social sciences. Thus, the opportunity to conduct the XI Congress in Costa Rica allowed us to share reviews, establish synergies and above all raise the theme with greater strength as a public policy on a national, regional and international level.

Blázquez (2010) affirmed in a review of previous Congresses, that fields that clearly express the situation of women in science and technology include:

the history of women in science, feminist epistemology, the non-sexist didactics of science and the relevance of medicine as “truth” about our bodies, technology as biopolitics and scientific-technological literacy as a right. And as always, there has been a continuing evolution in the situation of women in science and technology in Ibero-America, the obstacles to our careers, strategies to promote equal opportunities, the creation of specific indicators for this monitoring, affirmative action policies to promote women and to increase the interest of girls and young women in scientific careers (Blázquez, 2010:3).

The question thus arises about what has been done in Costa Rica about this issue and above all, about how a feminist perspective or at least a gender perspective has influenced studies about the participation of men and women in science and technology. Evidently, the experience has been positive and

interesting, based on the encounter of government and non-governmental institutions that have been working on and conducting actions to make the issue visible and legitimate.

Since this report there have been more recent initiatives and work. In 2002 there was an effort to bring together women scientists by the National Council of Science and Technology (CONICIT, 2002) of Costa Rica in collaboration with the Organization of Ibero-American States (OEI) and the Inter-Science Association (AAAS), with the goal of influencing public policy to work for gender equity in the fields of science and technology.

Garita and Herrero (2008) have demonstrated the lack of equity in women in science. They reviewed data from the University of Costa Rica and the national census, highlighting advances in female participation, but indicating the difficulties and the gender differences in education in the fields of science and technology. They also highlight differences in employment and practices that express traditional gender roles:

There is still a need for public policies that support the development of talents of both men and women in scientific and technological advances. The reinsertion of women who left their work to dedicate themselves to caring for children should be supported. Years of seclusion signify a waste of talent and a return with outdated information in a field in which it is essential to “be up to date” (Garita y Herrera, 2008:10).

On the other hand, it should be highlighted that in recent years in the field of education in engineering at the University of Cost Rica one initiative of professors interested in the theme has gained strength. In 2015, after seven years of actions, a social action project was enacted for female high school students to encourage them to study for a career in this field. Under the program, they accompany a university student from the school of engineering. Evelyn Salas Valerio (comunicación personal, 11 de junio del 2015) indicated what they have been doing: “for the university students we had technical visits to companies, talks,

discussions, workshops, promoted information, and other activities. With the high school students we conducted workshops in the schools, promoted materials, lectures, encounters and other things”.

On the TV program *Palabra de Mujer* [The Word of Women] on the university's channel 15, in 2013 Ana Lucía Faerron presented a series of reports about women scientists at the university. In a personal communication with Faerron (4 November, 2015), she said that she did not find much resonance in the women's movement, because they understand that there are other more pressing concerns. Nevertheless, the issue is significant in terms of gender inequalities in science and technology.

Another important contribution is work being done at the Ministry of Science and Technology and Telecommunications (MICITT) which produced reports from a gender perspective, under the responsibility of Ruth Zuñiga (2015). The reports presented actions that gave visibility to the work of women scientists, and to motivate youth to study non-traditional fields. The reports cited the recognition of responsible entities about gender gaps in these fields. The first *Informe de la Ciencia, la Tecnología y la Innovación* [Report on Science, Technology and Innovation] (Programa de Estado de la Nación, 2013), which is known as the *Informe* (2013) highlights information about male and female researchers in the country, differentiated by sex. In this report “science” refers to the “hard” or basic sciences, and not the social sciences.

The people who conduct research, according to the report of the Programa de Estado de la Nación [State of the Nation Program] (2013) about science, technology and innovation, indicate that the country has attained a significant group of men and women researchers. Nevertheless, it makes various warnings. One of them is the age of the researchers, given that a majority are 46 or older (71.9%), which is related to a generational change and to the so-called “brain drain”. This situation is a product of a highly competitive, globalized and unequal society. The report identified a significant group of Costa Ricans dedicated to science

and technology who are living abroad, of whom 75% are men. Their ages range from 20 to 35. It indicates that 42% of this group studies and half of them work. They are engineers, technicians and doctors, as well as people in the agricultural, exact and natural sciences. They are scattered in 30 countries, but 45% are concentrated in the United States. Most report no interest in returning to Costa Rica and that they do not have ties with colleagues in Costa Rica. According to the data: 4 of every 10, have decided not to return, and one in ten is undecided. Only five in ten consider returning. The Informe (2013) indicated the potential that this group has, given that they could form part of the generational change. I understand that the public universities fulfill an important role in this field. This issue is being studied by Muñoz (2014), given the importance it could have and the complex reality of globalization.

Meanwhile, the Informe (2013) indicates the fragile conditions found in the country because of the lack of strong research groups. It depicts a situation where one or a few people work in isolation, without an ability to have an impact or transfer practical experience. In this sense, it indicates that sustainable communities would be those that are able to establish a greater interconnectivity (collaboration and interdisciplinarity) and greater productivity, which would tend to assure the continuity of research production. The report indicates that the few areas that have stable research groups are the fields of: biomedicine, human molecular genetics, earth sciences and veterinary sciences. The Informe (2013) mentions that in the agricultural sciences only a limited number of isolated research groups are found.

When the group studying the state of the nation studied academic networks and the situation of the research groups, it found the gender factor to be important, because it highlighted that women compose 43% of the relevant actors in the work teams. These groups are found in the following fields: physics and earth sciences have a majority of men. There is a majority of women human geneticists and biomedical scientists. Meanwhile, a trend was reported towards increased female participation, even in

administrative posts. Nevertheless, it found that only 35% of administrators in the various fields are women. This issue must be studied with greater depth.

Another satisfactory result in the evolution of this group is the increase in female participation. The presence of women in these fields registered a 116% growth rate, compared to 86% among men. Moreover, they were able to position themselves in administrative levels at a higher proportion than their male colleagues; for example at the level of public administration, and at private companies, 61.2% of professionals in science and technology are women, contrary to that found in the general employment market, where female participation is an average of 35.2%. Therefore, despite the advances, the participation of women in science and technology continues to be low (Programa Estado de Nación, 2013:17).

In terms of education it was found that the greatest needs in the country are in the fields of digital technologies, clinical medicine, earth and space sciences, the engineering fields and the chemical industry. It was also found that the field of technical education is a challenge and that it is necessary to create more options for mid-level technicians, although it is clear that the complexity of capitalist organization presents social contradictions such as the lack of employment.

In relation to labor options, it is confirmed that having a higher level of education comparatively improves income by at least 2.4 times, compared to occupations and jobs that do not require greater schooling. Unemployment among those with higher education is at 1.9%, which is much lower than the national rate at the time of the study in 2013, which was 7.3%. A territorial gap was found between the central urban region and the rest of the nation that is related to the formal education system and its influence in the construction of opportunities for youth.

Improving this situation requires public policies on two fronts: supporting activities in science and technology that increase sources of employment and adapting the educational system to increase and improve the education of professionals in these fields. The advantages held by workers related to these fields help to raise the profile of the labor market; this is a good starting point for developing new actions that attract more people to science and technology (Programa Estado de Nación, 2013:18).

The Informe (2013) identifies the three strongest fields in scientific production: biochemistry; immunology and microbiology; and pharmacology and toxicology. It found deficits in: material sciences, engineering fields, computer sciences, molecular biology and mathematics. It also affirmed that in many fields equipment is out of date and that suitable equipment is not available. The field of the medical sciences is that which has the best equipment, at least in two-thirds of the labs studied. The natural and hard sciences and engineering fields do not have state of the art equipment. There is little investment in research and development; the state uses government funds to contribute to 70.3% of this spending compared to 21.4% from the private sector and bureaucratic impediments are found such as the lack of financing for scientific personnel.

Conclusion

It is understandable that the development of science and technology is a field that responds not only to the education of male and female scientists, but is also at the heart of national policies and common actions that affect employability, the economy, university agendas and society as a whole. Thus the low participation of women and of underprivileged groups is manifest in social deficiencies and needs.

One important task is certainly the strengthening of working groups through mutual collaboration. Institutional actions and

policies should be supported that are more interdisciplinary and equitable in terms of participation of men and women.

The country has human talent and educational infrastructure that provides continuing support to the participation of women and men in scientific fields. The presence of female youth in the educational system is undeniable, but gender segregation is still found.

This situation is made difficult by the existence of a sexual division of labor, where reproductive work, and that involving care for others, continues to be the responsibility of women. These circumstances impede professional development for many women scientists who must put off studies and even conduct double and triple work shifts. This places them at greater disadvantage in relation to their male colleagues who are able to rise in the categories of the academic regime, as is found at the University of Costa Rica, where the number of male professors in the most senior category is twice as high as the number of women.

As indicated here, higher education has contributed through feminist and gender studies; which has problematized and made visible inequalities. Of course, this process has been in line with critical trends and feminist movements that have also influenced institutional relations at the university. Studies and research have made possible not only the analysis of situations that were previously not visible, but the identification of issues and problematics that affect women and men in the patriarchal society.

There is no doubt that the country has established an agenda in which the priority has been given to gender violence. It is clear that expressions of violence in all its dimensions: the various forms of discrimination, labor and sexual harassment, misogyny and more radical forms such as femicide, have been addressed before the issue of women and science. But this issue is also important for the lives of women and potential scientists.

Advances and actions have clearly been produced, strengthened and realized at the university level. These circumstances have led to transformations and support for fair conditions and equity in Costa Rica. Nevertheless, resistance is

recognized, as affirmed by Sagot (2015), who identified setbacks that reaffirm patriarchal systems and adjust to maintain social mandates and privileges of some groups over others.

In this sense, and as a conclusion, one of the most difficult issues found has been in the field of teaching and the incorporation in the university curriculum of perspectives critical of gender inequalities. It is clear that not only the curriculum is a factor. There are also practices that are realized in a hidden curriculum, which sustain subtle and not so-subtle actions that maintain traditional gender roles. While it is true that there have been initiatives and efforts by male and female professors to strengthen gender and feminist studies, there are still no specific official university guidelines about these fields.

There is no curricular guideline that expressly refers to the issue of gender, nevertheless key informants from the Center of Academic Evaluation recognize that it is always present at workshops and meetings held with the academic units to develop and revise the curriculum (Mata Segreda, Ureña Salazar and Washburn Madrigal, 2013:88).

In our patriarchal and capitalist society, long-term practices, stereotypes, actions and conditions influence the decisions of women and men when they have the opportunity to opt for higher education. The data expressed in the documents analyzed show the disparities and difficulties that are generated in the academic and scientific world. Therefore, great challenges exist not only to strengthen research groups in the sciences (social sciences and basic sciences), but to contribute to the social transformations needed to attain greater equity.

In the vertiginous twenty-first century, science and technology bring rapid changes to contemporary societies. These contributions establish both positive and negative trends, changes and opportunities, and as we see there are still tasks to be performed. The realization of the XI Ibero-American Congress of Science, Technology and Gender was an opportunity to address this issue more deeply.

The current context has also seen public debates over worldviews between alternative and conservative positions that influence policy at various levels in Costa Rica. Sexual and reproductive rights have become hot topics. There is strong opposition to same sex marriage and to the interruption of pregnancy in situations of rape, or when there is a risk to the life of the mother. There is also strong conflict over in vitro fertilization: the country has no laws or regulations over this or other medical procedures for fertilization for couples that require assistance. In 2012, the Inter-American Human Rights Court condemned the Costa Rican state for violating reproductive rights and the integrity of its male and female citizens, by not permitting in vitro fertilization for couples with fertility problems. The international court's decision called on the state to meet its obligation to re-establish the legislation and regulations needed to offer the service. Although there have been various attempts in the national legislative assembly to enact laws about the issue, it has not been possible to approve them, leaving the country without a response to the court's request. In the political campaign of 2013-2014, there was opposition to the measures from conservative and religious sectors, even though candidates from various political parties sought to raise the issue. This reveals the conflicts and disputes that society has faced (Muñoz, 2013).

Social organizations have been influenced by a series of ideological positions that are in dispute. In a highly interconnected world, these disputes take on other dimensions and society today has other ways to discover and develop issues that in the past were perhaps left unseen. In this sense, science and technology are not neutral issues or exempt from patriarchal and social contradictions and conflicts. Education, as a source of human development, and higher education as a path towards professionalization, are fields that provide opportunities to discuss and generate transformations.

References

- ARAYA UMAÑA, Sandra. Caminos recorridos por las Políticas Educativas de Género. *Actualidades Investigativas en Educación*, 3(2). San José, Costa Rica, 2003
[\[http://revista.inie.ucr.ac.cr/index.php/aie/article/view/32\]](http://revista.inie.ucr.ac.cr/index.php/aie/article/view/32).
- BLÁZQUEZ. Norma. *Breve Historia de los Congresos de la Red Iberoamericana de Ciencia, Tecnología y Género*. México, CEIICH-UNAM, 2010. Material inédito
- CÁRCEDO, Ana. *Balance sobre el Estado de la Equidad de Género en la Universidad de Costa Rica. Informe de la Rectora*. San José, Costa Rica, UCR, 2001.
- CÁRCEDO, Ana. *II Balance de Equidad de Género en la Universidad de Costa Rica. Informe de la Rectora*. San José, Costa Rica, UCR, 2006.
- CÁRCEDO, Ana; AMADOR, Diana. *III Balance de Equidad de Género en la Universidad de Costa Rica. Informe de Rectoría*. San José, Costa Rica, UCR, 2012.
- CENTRO de Estudios de la Mujer, CIEM. *Agenda de Compromisos Mínimos por la Igualdad y la Equidad de Género 2004-2008*. San José, Costa Rica, Universidad de Costa Rica
[\[http://genero.bvsalud.org/cgi-bin/wxis.exe/iah/?IsisScript=iah/iah.xis&lang=E&base=CIEM\]](http://genero.bvsalud.org/cgi-bin/wxis.exe/iah/?IsisScript=iah/iah.xis&lang=E&base=CIEM) – acceso em: 14 jan. 2014].
- CENTRO de Estudios de la Mujer, CIEM. *Propuesta de políticas generales y específicas para el año 2007 en materia de equidad de género*. San José, Costa Rica, Universidad de Costa Rica, 2007.
- CONSEJO Nacional para Investigaciones Científica y Tecnológicas (CONICIT). *Primer Encuentro multidisciplinario Mujeres y Ciencia*. San José, Costa Rica, 2002
[\[http://campus-oei.org/ctsi/catcostarica2.htm\]](http://campus-oei.org/ctsi/catcostarica2.htm) – acceso em: 02 fev. 2016].
- CONSEJO Universitario. *Políticas de la Universidad de Costa Rica para los años 2010-2014*. UCR, 2008
[\[http://www.cu.ucr.ac.cr/normativ/politicas_institucionales_2010-2014.pdf\]](http://www.cu.ucr.ac.cr/normativ/politicas_institucionales_2010-2014.pdf).

- CONSEJO Universitario. *Políticas de la Universidad de Costa Rica 2016-2020. "Excelencia e Innovación con Transparencia y Equidad"*. UCR, 2015. Recuperado de <http://www.cu.ucr.ac.cr/uploads/media/politicas2016-2020.pdf>
- CORDERO, Teresita. Aportes investigativos de la Maestría Regional en los Estudios de la Mujer en Costa Rica. *Revista Casa de la Mujer* (14), 2008 [<http://www.revistas.una.ac.cr/index.php/mujer/article/viewFile/6777/6935>].
- GARITA, Nora; HERRERO, Libia. *Mujer y ciencia en la Universidad de Costa Rica*. Costa Rica, San José, Noticias UCR, 2008 [http://vinv.ucr.ac.cr/index.php?option=com_content&view=article&id=123:mujer-y-ciencia-en-la-universidad-de-costa-rica&catid=20:opinion&Itemid=112].
- GONZÁLEZ GARCÍA, Yamileth. *Educación y Universidad*. San José, Costa Rica, Editorial de la UCR, 2006.
- GONZÁLEZ SUÁREZ, Mirta; GUZMÁN STEIN, Laura. Los estudios de la Mujer en Costa Rica: desafiando el pasado, construyendo el futuro. *Revista Ciencias Sociales* 65, setembre 1994, pp.7-16 [<http://www.revistacienciasociales.ucr.ac.cr/los-estudios-de-la-mujer-en-costa-rica-desafiando-el-pasado-construyendo-el-futuro/>].
- GONZÁLEZ SUÁREZ, Mirta. *El sexismo en la educación*. San José, Costa Rica, Editorial Universidad de Costa Rica, 2005.
- GONZÁLEZ SUÁREZ, Mirta. Producción Académica en Estudios de la Mujer (1996–2000). *Revista de Ciencias Sociales* (116), 2007a [<http://revistas.ucr.ac.cr/index.php/sociales/article/view/11202>].
- GONZÁLEZ SUÁREZ, Mirta. Agenda política del movimiento de mujeres: demandas de fin de siglo. *Revista Reflexiones*, 85(1), 2007b [<http://revistas.ucr.ac.cr/index.php/reflexiones/article/view/11438>].
- GUZMÁN STEIN, Laura. *Conversación con un grupo de estudiantes de la maestría en el curso Taller de Investigación*. Costa Rica, San José, Maestría Regional en Estudios de la Mujer, Universidad de Costa Rica, Universidad Nacional, 2008.

- LUGONES, María. Multiculturalismo radical y feminismos. *Revista internacional de filosofía política*, n.25, 2005, pp.61-76 [<http://dialnet.unirioja.es/servlet/ejemplar?codigo=1167621>].
- MATA SEGREDA, Alejandrina; UREÑA SALAZAR, Viria; WASHBURN MADRIGAL, Stephanie. *Informe Institucional. Programa Marco Interinstitucional para la Política de Equidad y Cohesión Social en la Educación Superior*. San José, Costa Rica, Universidad de Costa Rica, RIAPE 3, 2013.
- MENJÍVAR OCHOA, Mauricio. Género y esclavitud en el Caribe durante la época colonial. *Revista InterCambio*, 3(4), 2006, pp. 125-143.
- MUÑOZ, Nefer. Costa Rica el país que niega la fertilización in vitro. *BBC Mundo*, 12 de agosto, 2013 [http://www.bbc.com/mundo/noticias/2013/08/130812_fertilizacion_in_vitro_costarica_nm – acceso em: 02 fev. 2016].
- MUÑOZ, Luis. Comunidad Investigadora de la Universidad de Costa Rica. Una aproximación exploratoria y descriptiva. *Revista Electrónica Actualidades Investigativas en Educación*, 14(2), 2014 [<http://revista.inie.ucr.ac.cr/index.php/aie/article/view/639>].
- PROGRAMA Estado de la Nación. *Primer Informe del Estado de la Ciencia, la Tecnología y la Innovación*. San José, Costa Rica, Programa Estado de la Nación, 2013 [<http://www.estadonacion.or.cr/ecti/> – acceso em: 11 jul. 2015].
- SOLÍS AVENDAÑO, Manuel. *La institucionalidad ajena. Los años cuarenta y el fin de siglo*. San José, Costa Rica, Editorial UCR, 2008.
- SAGOT, Montserrat. Construcción del conocimiento feminista en Centroamérica: rupturas, semi-rupturas y continuidades. In: *VII Conferencia Latinoamericana y Caribeña de Ciencias Sociales, CLACSO*. Medellín, Colombia, noviembre 2015.
- ZUÑIGA, Rutth. Situación de Género en Ciencia Tecnología y Género. In: Ministerio de Ciencia, Tecnología y Telecomunicaciones (ed.). *Plan Nacional Ciencia, Tecnología e Innovación 2015- 2021*. San José, Costa Rica, MICITT, 2015 [<http://pdf.crealink.ca/doc/intergraphicdesigns-micitt/plan-nacional-2015-2021/2015022301/#68> – acceso em: 02 jun. 2015].