AUDIOVISUAL PRESENCE OF WOMEN RESEARCHERS
Gender Approach in Higher Education

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ABSTRACT
This paper describes the participation of women researchers in higher education in Ecuador at the Catholic University of Cuenca. A three-step process was applied; the first a desk research of research processes and products; the second, design, validation and application of a qualitative instrument; and the third, design and application of a contrasting interview with senior management..

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1. Introduction

The essence of higher education is defined by its substantive functions: research, teaching and outreach (Fabre, 2005). In turn, from the logical articulation between the processes and impact of research on teaching and outreach, the first is positioned as the central function of university work. However, and despite the different initiatives, efforts and impulses it receives annually, women continue to have a low numerical and symbolic representation (Directoraat-generaal Onderzoek en Innovatie, 2012; UNESCO, 2019). On this, the UNESCO (2019) points out that, "worldwide, only 29.3% of researchers in universities are women", even in prominent contexts such as Europe there is evidence of lower salaries, less funding award and lower citation (Vargas et al, 2020), so evidently, the gender issue is far from being systematically addressed in research projects (Directoraat-generaal Onderzoek en Innovatie, 2012), and many times, even in institutional policies.

According to Vargas et al. (2020), for historical, cultural, political, economic, and social reasons, women have been underrepresented in scientific research as creators of knowledge, but also as subjects of analysis. In other words, the exercise of power over women, and their mostly subordinate position, is not alien to science and has a long history. In several transcendental fields for human life, it has been confirmed that the lack of scientific knowledge derived from biased research can lead to erroneous diagnoses in women (Eguiluz, et al, 2011: 532); in addition, it has been exposed the persistence of the ownership of the dominance of the scientific paradigm in male hands.

Nowadays, differentiation between sex and gender is less necessary, and higher education and its research processes (formative, academic and scientific) tend to pluralize, in search of a significant improvement, although there is a diversity of limitations, and it even represents a major challenge and, in turn, a timely turning point, in view of the global health emergency associated with covid-19. In this regard, UNESCO and Instituto Internacional para la Educación Superior en América Latina y el Caribe [IESALC] (2021: 54) indicate that, "women still face a fundamental professional problem in the academic world: they still do not have full participation in the higher education system, whether in the role of managers, professors or high-level researchers".

With this starting point, this research work seeks to describe the participation of women researchers in higher education in Ecuador, based on the case of the Catholic University of Cuenca, as part of the reality of Ecuadorian higher education. Relating the institutional conditions and the research products associated with the national and international environment are fundamental, as well as the representation of women in these components. Therefore, the research presented here is detailed about them and their implication in the institutionalization of gender as an indicator of excellence.

Women researchers in Ecuador, as in Latin America, dedicate a large part of their time to unpaid domestic and care work. According to the latest survey of the Instituto Nacional de Estadísticas y Censos (2012) the total work time of women per week, is 17:42 hours more than men, with the burden of unpaid domestic and care tasks being 3.5 times greater than in men (Consejo Nacional para la Igualdad de Género del Ecuador, 2020). This allocation has increased due to teleworking, school closures, care for the sick, children and the elderly, which multiplies women's workload in times of pandemic (Organización para la Cooperación y el Desarrollo Económico [OCDE], 2020). In fact, if it is considered that professional productivity is influenced by the decisions that each individual makes throughout their lives (Zuckerman, 2001), in most cases, women themselves are the ones who postpone or abandon their working, academic or scientific life, prioritizing the development of their family, which identifies sexism and heteronormativity as a social, cultural and political problem that hinders parity and the perception of capabilities (Mantilla-Falcón et al., 2017). This social conception is consequently an example of symbolic discrimination that remains in society.

In this regard, Ecuadorian legislation expresses the desire for equality between women and men, as well as recognizing that non-discrimination on the basis of gender is an explicit right (Art. 331, Asamblea Nacional Constituyente de la República del Ecuador, 2008), which ratifies the responsibility of the State to guarantee equality in women’s access to employment, training and job and professional promotion, equitable remuneration and the initiative of autonomous work, through the necessary measures to eliminate inequalities, discrimination in all its forms and violence against women in the workplace (Asamblea Nacional Constituyente de la República del Ecuador., 2008). Consequently, the institutionalization of the gender perspective is concrete. Additionally, the same legal body refers to an education centered on the human being, which guarantees its holistic development, under the
framework of respect for human rights, with a participatory, mandatory, intercultural, democratic, inclusive, and diverse activities, which seeks quality and warmth; with emphasis on the promotion of gender equity, justice, solidarity, and peace (Art. 27, Asamblea Nacional Constituyente de la República del Ecuador, 2008). These guidelines make room to rethink education as an inclusive process whose vision for the formation of people is projected to equality and social justice.

The Organic Law on Higher Education [OLHE] (Asamblea Nacional de la República del Ecuador, Ley Orgánica de Educación Superior [LOES], 2010) reiterates the constitutional mandates. Art. 2 punctually recognizes the right to an education without discrimination, in an effective exercise of equal opportunities, as also referred to in Art. 4. Furthermore, and from this perspective, according to Art. 6, female researchers shall enjoy the necessary conditions for the exercise of their activity, access to training, stability, promotion, mobility and retirement, based on academic merit, research production, among others, without admitting discrimination of gender, ethnicity, or any other type. In addition, there is the possibility of affirmative actions, and other complementary particulars are reported from Art. 12; the principle of equality is incorporated to the Higher Education System, understood as such, the conception of policies and mechanisms to promote and guarantee equitable participation of women and those groups historically excluded at all levels and instances (Art 75, Asamblea Nacional de la República del Ecuador, 2010).

The truth is that, despite the validity of this framework for action, the legal framework in most cases does not guarantee the mainstreaming of the gender perspective. According to some authors, gender as an analytical dimension of reality has made it possible to demystify the university as an egalitarian space in which the values of justice, equity, solidarity, and transparency are materialized, as well as a space of inspiration and production (Sylva, 2014). That is to say, within university spaces inequalities are produced and reproduced that highlight the dynamic social, but at the same time hegemonic concept of the university, when it comes to gender conceptions. In addition, it is important to mention the great influence of naturalized social constructs that weigh on academic activity.

On the other hand, the impact of social stereotypes is observed in university spaces in a process that begins with the inclination of women towards careers considered feminine and the prolongation of domestic and care tasks (De Oliveira, 1989). On the other hand, areas such as STEM [Science, Technology, Engineering, and Mathematics], which are attributed to the male gender, are relegated. In this regard, in Ecuador there is feminization of careers related to social sciences (60%), health, welfare and social service (65%), and education (67%), but not in those related to information and communication technologies (ICTs) (23%), engineering, industry and construction (27%) and natural sciences, mathematics and statistics (40%) (Secretaría de Educación Superior, Ciencia, Tecnología e Innovación [SENESCYT], 2020). In other words, we are talking about a university immersed in society and, therefore, subject to its influence. So much so that, data on the registration of degrees by areas of knowledge during 2019 show that, 64% of those obtained by women belong to health and wellness careers, while barely 23% to STEM areas (SENESCYT, 2020).

The situation described implies a negative impact on scientific research, maintaining the hegemony and continuity of the segregation of women in technical areas, and with it, the vision and projection of an androcentric science, surely with gender biases. According to UN Women (2020), in Ecuador 41.1% of researchers are women, however, according to Leone and Paz-Y-Miño (2021) the scientific production sent from Ecuador to scientific databases such as Scimago between 2018 and 2019 is apparently equitable; 48% of scientific articles belong to women, while 52% belong to men, and the areas of knowledge to which they correspond were health sciences, life sciences, exact sciences, and social sciences. Likewise, when reviewing the impact of these publications by means of the h index, the highest value also corresponds to men (h = 42), while women lag behind (h = 26). In addition, it is established that the first four positions of authorship are occupied by men, the fifth and sixth positions by women, and the seventh position is shared (Leone and Paz-Y-Miño, 2021). In most cases, this order is based on gender, but not on the research contribution, thus promoting the invisibility of women.

On the same subject, Segovia (2019) mentions that only 21% of the published articles have a woman as correspondence contact, but that, in addition, there is little representation in editorial committees and as peer reviewers in scientific journals. One of the reasons for this bias may be that editors tend to choose peer reviewers of the same sex; in fact, 50% of editors and 10% of female editors opt for this (Angulo, 2018). This disadvantageous situation means that fewer scientific proposals prepared by
women are accepted. There is also a tendency for less female participation in lectures, panels, workshops, and scientific congresses when there is no explicit policy of equal participation. This leads to a lack of visualization of research, achievements, and, therefore, women receive less recognition (Segovia, 2019).

In terms of access to educational credits, the inequity gaps are reiterated. Only 28% of women benefit, a situation that can be explained according to Herdoíza-Estévez (2015) by a relationship between gender and age, justified in a late insertion of women in their academic careers due to the weight of tasks associated with motherhood and family responsibilities, which is incompatible with the age limits established to apply for certain types of benefits. Even scholarship policies emphasize careers in the natural sciences and engineering, which traditionally have a greater representation of men. Another aspect to consider is the limited ownership of knowledge by women. As an example of this, Ecuador is one of the countries with the lowest rate in the region in terms of registration of international patent applications. Only 9% of these include women (ONU Mujeres, 2020).

Finally, as a whole, it can be said that the presence of women in universities and in scientific work does not always mean the existence of gender equality; rather, there are still several types of manifestations of symbolic violence and social control that limit parity of opportunities. Therefore, it is important not to confuse the processes of feminization with gender equity, but, above all, the existence of policies and planning with their effective implementation and visibility.

2. Materials and Methods

In this paper, descriptive empirical research on women researchers in higher education in Ecuador was developed, based on the case study of the Catholic University of Cuenca (Ecuador), from the substantive function of research, under the institutional perspective of the management, teaching, administrative and student staff. Thus, the integral study corresponds to a case study, which according to Chetty (1996) as a method of analysis, has been an essential form of research in the social sciences and its contribution lies in the inclusion of the perception and behavior of the population involved (Martínez, 2006).

Within this context, the information input comes from three sources: a) institutional historical data on the processes dealt with in the research, b) interviews with managers, and c) a psychometric instrument that measures the perception of the impact of gender on the different activities linked to the reporting subjects. Likewise, the research process employs three techniques for the analysis of results; the first, of a bibliographic and documentary nature to define the subject matter and the case; the second, of a qualitative nature, based on the design, application, and validation through expert judgment of a measurement instrument (questionnaire) based on previous studies (Bas-Peña et al., 2017; García-Carpintero et al., 2018; Arenas-Tarazana et al., 2019; Castillo et al., 2020). For its part, the third phase includes the design and application of a general contrast interview with management personnel.

The techniques used for the analysis of the results of the three inputs were: a) descriptive exploratory analysis of historical data, b) analysis of the interview, and c) confirmatory factor analysis (CFA) applied to the informants, which finally allows discrimination tests of the substantive research function according to the perception of gender. For this purpose, the fit of the types of participants in the established theoretical model, convergent validity, discriminant validity, and total and composite reliability is verified to verify the invariance of the factorial structure and to compare the traits of the groups of participants.

This process is based on the collection of information from internal (case study) and external (previous research of different types) secondary sources. In the first case, the repositories of the Head of Human Resources on the distribution of the teaching, administrative, and student population were consulted (UCACUE, 2021a), as well as the Head of Research and Innovation on calls for projects, scientific production and participation of members of the educational community (UCACUE, 2021b; UCACUE, 2021c) in research processes (UCACUE, 2021b). With this, the authenticity of the data collected can be corroborated because they come from official institutional records. This allows us to define the time frame of the study starting in 2017 and to perform an exploratory data analysis (EDA) of quantification and inference.

As for external sources, a bibliographic search was carried out in books, scientific articles, conference proceedings, and others, with the purpose of specifying the predominant qualitative elements of the gender approach, in accordance with Ecuador’s governmental guidelines and the case study. With the information collected, a theoretical construct was generated, contextualizing the research and
establishing criteria for the design of the data collection instruments, in accordance with the stated objective (Chetty, 1996).

The construction of the measurement scale is based on the substantive functions and organizational principles of the case study, which as a theoretical construct formed 8 dimensions that define the initial scale proposed with a total of 58 items for evaluation of closed Likert-type responses in 5 categories. The creation of the items was based on the operationalization matrix and 17 items correspond specifically to research. Likewise, the writing of the instrument sought to adapt to the role of the potential participants, and once the instrument had been created, it was submitted to the judgment of 8 local, national and international experts. For the application of the instrument, the finite population of 15,975 members (students, directors, teachers, and administrative personnel), who were considered informant agents (UCACUE, 2021a), was approached. A proportional stratified sampling of 913 people was applied to this population (Table 1), which after the application of the instrument was reduced to 904 due to the existence of missing data. Of this group, 37.39% were students, 39.27% were teachers from the five institutional sites, 20.69% were administrative personnel, and 2.65% were managers.

<table>
<thead>
<tr>
<th>Position</th>
<th>Number of members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directors</td>
<td>24</td>
</tr>
<tr>
<td>Active teachers</td>
<td>355</td>
</tr>
<tr>
<td>Administrative Personnel</td>
<td>187</td>
</tr>
<tr>
<td>Active students</td>
<td>347</td>
</tr>
<tr>
<td>Total</td>
<td>913</td>
</tr>
</tbody>
</table>

Source: Author, 2023

For data processing, a qualitative-quantitative rubric was designed, which establishes evaluations of the responses (Table 2) and makes it possible to describe the perspective of the informant agents regarding the gender approach by means of cross-referencing the variables observed.

<table>
<thead>
<tr>
<th>Quantitative Valuation</th>
<th>Qualitative Valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Always</td>
</tr>
<tr>
<td>4</td>
<td>Often</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes</td>
</tr>
<tr>
<td>2</td>
<td>Rarely</td>
</tr>
<tr>
<td>1</td>
<td>Never</td>
</tr>
</tbody>
</table>

Source: Author, 2023

This primary information collection instrument included an individual application guide (Olaz and Brändle, 2013) with 9 open questions that sought to contrast the results of the processes of obtaining bibliographic and documentary reviews, in order to promote the joint construction of meanings (Janesick, 2015). The universe of participants is framed by the members of the University Council and its different population representations, which coincide with the general types (Table 1), performing a convenience sampling.

Autonomous sessions were arranged for the application, which allowed audio and video recording with the prior consent of each informant. In addition, the process was supported by direct annotation based on a simple template designed according to the recommendations for survey
content analysis (Steinar, 2011). These two processes made it possible to avoid possible errors arising from the limits of the interviewer's memory, or distortion of the content for subjective reasons.

This analysis in its entirety included several particulars; 1) use of cross-frequency tables for the exploration of the documentary information and demographic results from the application of the psychometric instrument using categorical variables of gender, age, marital status, highest academic degree achieved, origin and length of service, 2) use of a table of descriptive statistics of the items of the psychometric instrument responses of the participants according to the role of the reporting agents and, 3) simple contrast for the responses of the general interview.

The factorial model is defined by 4 dimensions based on the model of organizational principles and the substantive research function. The wording of the instrument was standardized so that it can be applied with few changes to the reporting agents (Table 1). For the theoretical model, the fit of the data obtained, convergent validity, total and composite reliability, and finally structural invariance were also verified when applying the same model to the groups of informant agents. This verification was performed by contrasting the fit of the data obtained in the theoretical model and the fit of the data on an independence model where it is assumed that there are no common factors.

To verify the comparison, the indicators were used; 1) the Root Mean Square Error of Approximation (RMSEA) where a good fit is defined for values less than 0.6 or acceptable values between [0.06,0.08], 2) the Standardized Root of Mean Squared Residual (SRMR) with good fit values less than 0.08, 3) the Non-Normed Fit Index (NNFI) or Tucker and Lewis Index (TLI) with acceptable goodness-of-fit values greater than 0.96 for categorical scales, and, 4) the Comparative Fix Index (CFI) with acceptable goodness-of-fit values greater than 0.95 (Aldás and Uriel, 2017).

With respect to the SRMR index, they recommend its use combined with other indicators as follows (TLI>0.95 and SRMR<0.09, or in turn, RMSEA<0.06 and SRMR<0.09) (Hu and Bentler, 1999). In turn, RMSEA, TLI, and CFI are suitable indicators to consider the parsimony of the model and penalize to some degree its complexity. Individually, RMSEA is considered a descriptive measure of a model misfit. The TLI index takes into account an acceptable and parsimonious model fit, finally, the CFI index is based on the comparison of the approximation error of the proposed model and the independence model (Abad et al 2011).

The content validity of a measurement instrument represents the degree to which the indicators are relevant and representative of the latent variable to be measured; representativeness refers to the extent to which all the dimensions of the concept collected by the scale items are consistent with the theoretical domain of the concept to be measured, the response formats and the instructions for answering them. After the peer evaluation by expert judgment, the aim is to validate the scale based on the literature by analyzing the validity of items without eliminating an excessive number of them and compromising the validity of the initial contents to be reflected in the final scale (Aldás and Uriel, 2017).

The theoretical argument that validates the model that conforms the gender scale in the context of the case study was based on the substantive research function and organizational principles, forming a scale of 58 items in the instrument.

3. Results

The sample distribution based on the profiles of the IES (Table 3) made it possible to develop approximations to the recognition of the institutionalization of the gender approach according to the type of reporting agent. Thus, Table 3 details by type of reporting s, and shows that the percentages of women are higher in the groups of administrative personnel with 113 out of 187 (60.428%), teachers with 180 out of 355 (50.70%), and students with 223 out of 338 (65.97%), and the only group with a female minority is that of managers with a frequency of 8 out of 24 (33.33%).
Regarding the distribution of the reporting agents, in terms of age and gender, the findings show a general female concentration between 26 and 55 years of age. In the administrative staff, there is a predominance of females between 26 and 35 years of age (58 of 187 respondents), in the management staff, males between 46 and 55 years of age (6 of 24 respondents), in teachers, two female groups stand out, those between 26 and 35 years of age (56 of 335 respondents) and those between 36 and 45 years of age (65 of 355 respondents). Among students, there is a predominance of female participants between 18 and 25 years of age (189 of 904 respondents) and between 26 and 35 years of age (155 of 904 respondents), which shows a significantly greater interest of female students in the gender approach in the HEI. A similar pattern is observed in the characterization of reporting agents according to marital status.

When speaking of the marital status of the participants, the married group stands out among the female administrative personnel (52 of 187 respondents), as well as among the male managers (16 of 24 respondents) and male teachers (134 of 355 respondents), while among the students, the group of single women (174 of 338 respondents) is a priority. In turn, if the sample is considered from its geographic origin, it can be observed that female administrative personnel predominate (94 out of 187 respondents), male management personnel (13 out of 24 respondents), and male teaching personnel (123 out of 355 respondents); only in the student component, female participants from Cañar predominate (101 out of 338 respondents).

On the other hand, the characterization of the sample in terms of academic degree shows that the master’s degree stands out among administrative, managerial and teaching staff, while the bachelor’s degree stands out among students. In the first case, female administrative staff (44 out of 187 respondents), male managerial staff (12 out of 24 respondents), and female teaching staff (134 out of 355 respondents) are predominant. Finally, when considering years of service, the surveyed population shows general superiority between 3 and 20 years. The female administrative staff, the male managerial staff, and the female teaching staff working between 3 and 10 years stand out. As for the students, this relationship is not feasible to

<table>
<thead>
<tr>
<th>Agent</th>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Valid percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adm</td>
<td>F</td>
<td>113</td>
<td>60.428</td>
<td>60.428</td>
<td>60.428</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>74</td>
<td>39.572</td>
<td>39.572</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>0</td>
<td>0.000</td>
<td>0.000</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>187</td>
<td>100.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dir</td>
<td>F</td>
<td>8</td>
<td>33.333</td>
<td>33.333</td>
<td>33.333</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>16</td>
<td>66.667</td>
<td>66.667</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>0</td>
<td>0.000</td>
<td>0.000</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>24</td>
<td>100.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teach</td>
<td>F</td>
<td>180</td>
<td>50.704</td>
<td>50.704</td>
<td>50.704</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>175</td>
<td>49.296</td>
<td>49.296</td>
<td>100.000</td>
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<tr>
<td></td>
<td>O</td>
<td>0</td>
<td>0.000</td>
<td>0.000</td>
<td>100.000</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>355</td>
<td>100.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stud</td>
<td>F</td>
<td>223</td>
<td>65.976</td>
<td>65.976</td>
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</tr>
<tr>
<td></td>
<td>M</td>
<td>113</td>
<td>33.432</td>
<td>33.432</td>
<td>99.408</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>2</td>
<td>0.592</td>
<td>0.592</td>
<td>100.000</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>338</td>
<td>100.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author, 2023
determine, since their relationship with the IES is not of an employment nature, but they do report academic affiliation.

The existing information in the institution has been analyzed, filtered, qualified, and quantified to form articulated data on the situation of women in university scientific activities. It should be noted that both the analysis and the production on gender issues are unprecedented and recent, so there is particular attention on institutional terms.

From the documentary review in UCACUE (2021b) it is established that, since 2017, at least seven internal calls have been developed for the presentation of research projects, with the consequent allocation of funds and discharge of linkage, teaching, or administrative activities (Figure 1), whose scope includes the different geographic spaces of development of the IES, that is, the headquarters (Cuenca), the headquarters (Azogues and Macas) and the extensions (Cañar and La Troncal). In addition, there is evidence of growing female participation, although it does not reach a majority in terms of collaboration or leadership (Figures 2 and 3). This implies that access to economic and technical resources, as well as to the downloading of other assignments is not significant for women researchers, those who seek to start their research career, or failing that, have postponed it. In terms of geographical representativeness, the situation shows the dominance of the matrix (166 projects), followed by the headquarters (48 projects), and finally, the extensions (46 projects). This is associated with the historical distance marked by the physical conditions of the territory, which deepen the limitations of space equipment and the inclusion of effective resources for the development of research (Figure 3). In other words, not only is a gender gap evident, but also a geographical gap that positions intersectionality as a necessity that cannot be postponed in the university environment. In addition, in terms of gender, it provides an opportunity for interest in scientific research.

Regarding the representation of women in research projects by areas of knowledge, it is determined that 40% are involved in STEM areas, i.e., the status quo of horizontal segregation visible in Ecuador and in the region is preserved, despite the efforts of recent times (Braña et al., 2016), which necessarily implies a development perspective with emphasis on strengthening areas that have historically excluded women. Unfortunately, from this perspective, HEIs prioritize technical and technological projects from which women are often disengaged (Logroño, 2017). Therefore, it is important that gender as a variable of study in research projects should meet the basic expectations of contemporary feminism, that is, to rethink social processes, with a democratic vision for social justice, which contains and includes the human experience (Belucci, 1993). It also highlights that the percentage of projects related to gender issues (10%) is of minuscule representation when considering that, today, such studies and their application in universities have become spaces for theoretical strengthening and social transformation (Buquet, 2011). This condition ratifies that the hegemony of the male gender remains in areas historically subject to this condition. Furthermore, when the percentage ratio is the opposite, it is necessary that not only is there quantitative representation of women in research projects and products, but also that the variables of analysis have gender explanatory potential, i.e., a true institutionalization of the approach.

In turn, with respect to the participation of students in research projects, the available information does not specify data, except in the last call for proposals, despite the fact that, for the HEI, training researchers is crucial for the development of science and competencies in future professionals (Christensen and Eyring, 2011). In this context, the information mentioned formally records the limited participation of both men and women, however, the former predominates. It is also clear that this lack of representation of women constitutes an obstacle for the approach to areas of knowledge such as STEM, the initiation and promotion of their research activity, the visibility and permanence in research processes and scientific production, but also for the projection of referents in these areas and the promotion of potential talents. In fact, this same particularity within HEIs implies limitations for the institutionalization and mainstreaming of the gender approach in their scientific processes.

Regarding the visibility of women in scientific production, although their participation in science has been algid since its origins, and has had to face numerous barriers (Gervasoni, 2018), within the framework of the evaluation parameters in Higher Education, three forms of scientific production are recognized: articles, book chapters, and books. For the case study, a marked superiority of scientific production is observed in the matrix and its headquarters Azogues, a trend also dominated by the male gender, while, in the Macas Headquarters and Cañar Extension there is female leadership. In general terms, 57% of the scientific articles (2072) were published by men, while 43% were published by women.

In relation to the production of book chapters, there is evidence of a predominance of male participation with respect to gender, i.e., 67%. In addition, geographically, the matrix stands out with 57%, compared to a
representation of women equivalent to 43% (Figure 5). Along the same lines, 55% of book production is by men and 45% by women. Analyzing the data by territoriality, it is evident that in the matrix the production of books reaches 29% compared to 19% for men, while in the headquarters and extensions the trend is reversed, with men reaching a production level of 35% and women 16%.

In most cases, male participation and production are in the majority; however, women, in an attempt to overcome and demystify the spaces of power attributed to the male gender and in the face of the demands of the new public policies regarding recategorization, have tried to increase scientific production, but despite this, their participation, regardless of the reasons, is still limited. That is to say, although she seeks greater adherence to the standards of scientific production evaluation determined by the SENESCYT (2020) for the promotion of category in universities, as well as the provisions issued in the regulations of the Council for Quality Assurance in Higher Education (CQAHE) and the Council of Higher Education (CHE), respectively, women remain lagging behind their male peers.

From another perspective, which can also show merit and opportunity, since the lack of knowledge and cultural recognition of the female gender in scientific research has gone throughout history (Vargas, et al., 2020), it is established that there is slow growth in the role of women as researchers (Figure 6a). Between 2017 and the present, there are two men for every woman researcher, which, according to the implementation of the current research policy guidelines, maintains the same dynamics for the categorization of researcher profiles, and is accentuated the higher the category or the higher the access to such career is sought (Figure 6b). Namely, women experience horizontal (sticky floors) and vertical (glass ceilings) segregation (ONU Mujeres, 2017), in the different sectors of their specialty (Basco and Lavena, 2019), one of them, scientific activity.

In spite of the previous situation, the designation of research center coordination positions has progressively become more balanced and, in general, has maintained minimal variations in terms of gender. This represents progress in the participation of women in positions of power and a conscious recognition by the HEI of the female figure in leadership scenarios. As for the situation of women researchers, it is associated with multiple factors, among them, the type of contracting that limits access to the research scenario, their own interest and desire to be involved, as well as the availability of time. Not surprisingly, it was determined that 54.1% of respondents recognize a balance of time between research activities and care tasks at home, and in turn, 50.8% indicate that there is also a balance between the number of research activities and the number of care tasks. In other words, dedication to tasks other than professional and scientific careers continues to be a limitation for women, which, moreover, is not fully recognized. It is also important to note that, in the prevalence of this scenario, female education has historically played a fundamental role in the naturalization of stereotypes and expressions of hegemonic masculinity, which lead to subtle teaching of submissive behaviors of women in order to maintain or ascend in their professional career (Smith and Huntoon, 2013), and even not perceive the existing limitations in their environment.

As for the specific results, the assessments reported by the population indicate low values in terms of the arithmetic mean for 5 of the 11 questions, with a tendency value in the interval 3 - 4, while the remaining questions have a value of 5. This also indicates that the distributions present a negative skewness coefficient, i.e., a negative bias, which confirms the accumulation of responses in the relatively high values on the Likert scale.

In this regard, issues of particular interest in the case study indicate that; 1) according to 80.4% of the teachers, students and directors of the HEI, research work is encouraged regardless of gender; 2) for 79.9% of those surveyed, the research work developed by teachers/students is recognized regardless of gender; 3) 60% recognize that policies guarantee equal opportunities regardless of gender in research work; 4) 81.8% of the reporting agents promote the participation indistinctly of gender in research programs/projects; 5) for 67% the lines of research of the university have included the gender perspective; 6) while 71% of respondents perceive that there is gender independence in the research process; and, 7) likewise, 60.6% state that there is training in research with a gender perspective.

The previous reports are particularly representative when we learn that, in terms of reporting agents, there is a slight predominance of women (57.9%) over men (41.8%). Likewise, 38% of the informants are teachers, which is the universe potentially linked to the research, and, in addition, 53.9% have been working in the institution for between 3 and 30 years, i.e., objectivity and solvency can be recognized when answering the questions. Thus, the trend towards mainstreaming is increasingly evident as a necessity.
The report also does not indicate that there is a perception of gender discrimination in the HEI, despite being contradictory to the records of production and participation in scientific activities. This position could become a source of sustained competitive advantage (Barney, 1991 cited in Tura et al, 2012), because scenarios of gender equality project quality of the work environment and, consequently, productivity, welfare, peace and development (UNESCO, 2014). On the other hand, this structural perception, which also implies the naturalization of social constructions that perpetuate roles and hierarchies, not necessarily positive, since they are not only associated with cultural practices, but also with prescriptive stereotypes or gender mandates (Macías-Valadez-Márquez and Luna-Lara, 2018) that strongly and frequently permeate gender gaps (Castillo, et al., 2020). It could also be fictitious equality that is strongly embodied in the patriarchal structures of society (Segato, 2016).

With regard to the overall results (Figure 7), there are two attitudes on the gender approach at the level of acceptance scale (García-Pérez et al., 2010); the first, which is framed within the adaptive attitude or in accordance with the political conventions of the formal and public, that is, that framework that allows identifying the indicators of inequality in the social discourse. The second, or egalitarian attitude, implies the recognition of inequality and the positive valuation of those models of behavior and thought that implies an equitable and concerted vision of the male-female relationship and their roles (García-Pérez et al., 2010; Castillo, et al., 2020). That is ratings between 1 and 2. Nor is it ruled out that the behavioral designations sexist (hostile and benevolent) (Glick and Fiske, 1996), neosexism, or ambivalent sexism (Rebollo, et al., 2011; Moya, 2004), could be recognized by broadening the parameters of observation.

Finally, it should be noted that from the application of the questionnaire, highly significant, valid, and reliable data have been obtained to scientifically support the actions of institutionalization and mainstreaming of the gender approach.

Based on the structured interview with management personnel, and considering that, among the 9 questions, it can be determined that teaching activities and links with society are given priority over research in general. In this way, the scenario of the research and scientific career itself is shown to be lagging behind. These findings can be extrapolated to the relevance of research as a substantive function. It is also necessary to rethink the slow process of incursion and consolidation of research as a need of the Ecuadorian society. Thus, the institution is a reflection of society (I_02_2021_V, personal communication), which implies that the limitations in both contexts may be the same, but that they are difficult to objectify since they are associated with the beliefs and convictions of its members and the predominance of the patriarchal system (I_02_2021_V, personal communication).

Faced with this reality, the creation and regulation of research policies are one of the short-term contributions (I_02_2021_V, personal communication) with an interesting vision to incorporate the gender perspective. In fact, from the Head of Research, for the period between July and September 2021, a Call for Research Projects is presented, specifically in the areas of Gender, Interculturality, Diversity, and Environment, with the purpose of strengthening the research capacities of the research groups; as well as, of the teaching and student community (Centro de Investigación y Transferencia Tecnológica, 2021). It is also committed to the protagonism of women in research groups, enhancing their inclusion in university processes. In the same way, strategic links with organizations such as the Ecuadorian Network of Women Scientists (ENWS) are supported (I_02_2021_V, personal communication; I_06_2021_R, personal communication), which have generated institutionalized and channeled spaces from observatories and research projects for the visibility of gender issues (I_05_2021_V, personal communication).

From this perspective, the training of women for research has preponderant importance, since only 1.7% of female teachers have completed doctoral training, and only 14.7% have doctoral training in progress, i.e., only 8.9% of the teaching population will be highly qualified in a short time and can report their full potential to ideally increase the participation of other women (teachers and students). In fact, it is well known that the existence of female models and the gender perspective in research allows, from academic training, greater interest, participation, and validity of the results obtained (Vargas et al., 2020; Segovia, 2021).

It is essential to point out that actions and projections such as those described are not only milestones but also good and meritorious practices. Among them, the modification of the statute with the incorporation of organizational principles (acceptability, affordability, accessibility, and adaptability) has contributed to the institutionalization of the gender approach. Thus, there have been no obstacles in general, an inclusive environment is generated, discrimination is eliminated and there is no salary gap as in other institutions (Segovia, 2021); however, there are notorious weaknesses in the STEM areas that have not allowed compliance with the principle of accessibility due to the lack of female staff (I_04_2021_D, personal communication).
Likewise, the Head of Research indicates that, in order to determine participation in projects, gender equality and equity policies are applied that consider the preparation of people regardless of their gender. In recent years, female teachers have significantly increased their scientific production and participation in research projects. Also, expanding the institutionalization and mainstreaming of the gender approach will improve the conditions of women researchers in the institution, facilitating access to historically masculinized spaces (I_07_2021_D, personal communication).

From the rector’s point of view, in the substantive function of research as in the others, it is recognized that the participation of women has had to overcome cultural obstacles and inequalities. Thus, efforts have been made to deal with androcentric masculinities, through firm policies that materialize true equality, leaving aside mere discourse, trying to cede spaces of power and prioritizing the provision of conditions so that they can access opportunities. Along these lines, the principles of parity and alternation are considered fundamental, merit and abilities regardless of gender, in an environment of human rights and equality of participation, generation of work and opportunities, as well as wage equality (I_06_2021_V, personal communication).

In view of the current situation, the challenges of research and the gender approach, drive a necessary construction of actions that improve the conditions and possibilities of women. Thus, the strategic actions proposed are based on the following:

Strengthen research training with a gender perspective. Thus, the challenge for the HEI is to generate knowledge without gender bias, oriented from social and cognitive justice, seeking to reverse beliefs and stereotypes, demystify masculinities, overcome the barriers that vertical and horizontal segregation produces. In other words, it is a moral duty and a historical debt to include women in science for democratic knowledge.

Motivate research with a gender perspective, considering it as the scientific basis for designing and promoting programs and policies in favor of gender equity (Buquet, 2011). Its approach implies the knowledge of inequalities, under a critical thinking that allows segmenting the problems and their treatment from a contextual and territorial intersectional approach in which the HEI are framed.

Promote the implementation of educational strategies that allow the insertion of female students in the field of science, but also encourage their talent with real incentives (academic, professional or other). This, in turn, aims to visualize the researchers as mentors. In both cases, this is a scenario for exploring merit relative to opportunity as an essential part of the principle of equality with equity (Herdoíza-Estévez, 2015).

Improve space, time, and assignment of tasks conditions that women can balance their dedication to scientific activity with their role as mothers. This, in turn, will allow for better conditions in terms of career ladders, remuneration, and stability.

Insert proactive approaches such as doing gender to identify levels or degrees of predisposition to adopt the necessary changes in terms of equality and participation in the construction of a gender culture (García-Pérez et al, 2010).

Support women, as the pandemic has disrupted social, cultural and family dynamics whose real impact will only become evident in the coming years.

This framework involves a continuous rethinking of the actions of institutionalization and mainstreaming of the gender approach in university coexistence. Considering the scenario of the General Standards of Equality in Higher Education (Herdoíza-Estévez 2015), it is possible to give continuity to the national and institutional policies forged in the last decade, adjust to the synchronous guidelines implemented by the accreditation and quality body, as well as an action framework conducive to the construction of particular and significant indicators. Ultimately, moving toward an effective instrument for verifying the implementation of these strategies.

4. Conclusions

The perception of students, professors, administrative personnel, and managers shows in general terms that the IES has made effective efforts to ensure equal opportunities regardless of gender. Likewise, gender has been included in the lines of research in accordance with global dynamics, and this has been accompanied by training with a gender perspective, stimulating scientific work in an equitable manner. It is also an achievement that the reporting agents can identify and recognize the progress of this HEI on the subject under study since it validates and questions the advances in university research.
In the case of existing rules and regulations, these tend to institutionalize the gender approach within the university, that is, at first glance, they are aligned to gender equality; however, from the review of documentary information, there is a contradiction. Therefore, the practices considered normal and common favor the prevalence of asymmetrical relationships and naturalize certain masculinities, making it necessary to rethink the regulations and research practices within the university community.

For its part, the potential of academic and research capital of HEIs represents their maximum development engine in the processes of training and democratization of science, therefore, including the gender approach not only contributes to improving the work environment but also diversifies the forms of production, innovation and the levels of satisfaction of human needs. It is necessary to implement real goals to mainstream gender in research, whether in processes or products. In fact, gender biases are recognized in scientific production, with male participation exceeding female participation by far, a situation that could respond to stereotypes rooted, which are transferred from society, reproducing asymmetries in university spaces.

In spite of the unfavorable conditions that exist, it is noteworthy that the institution has generated spaces for equality within the framework of public and institutional policies. Currently, the institutionalization of the gender approach guides its mainstreaming process, outlining a long road in the face of cultural obstacles that still affect university processes.

Finally, the invitation is opened to continue developing gender studies incorporating anthropological categories that help to deepen the evolution or involution of research from the feminist epistemology.
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Audiovisual Presence of Women Researchers


Interviews


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