IS THERE GENDER EQUITY IN PRODUCTION ENGINEERING? REPORT OF WOMEN ENGINEERS TRAINED IN THE PERIOD FROM 2011 TO 2018

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Abstract

This article aims to identify the challenges that women engineers face in their field of work. The main theoretical references are: Silva (1992), Hirata; Kergoat (2007), Carvalho; Casagrande (2011); Carvalho (2008); Casagrande et al. (2004); Lombardi (2006a, 2006b); Cabral; Bazzo (2005); Lime; Souza (2011); among others. It is a qualitative-quantitative research and data were collected through questionnaires. The 69 women who graduated from 2011 to 2018 were invited to participate in the survey. Of these 33 answered the instrument. The data show that women engineers experience gender discrimination, sexism, racism and sexual and moral harassment in their work field. Finally, these women, in 2019, reported cases of gender inequality experienced in the labor market. In this perspective, the study points out the following strategies to fight gender discrimination in the production engineering course: - include publications by renowned engineers in the teaching plans; - discuss with students and professors of the course about gender equity in the labor market.

Keywords: women; production engineering; gender equity; labor market.

1. INTRODUCTION

The objective of the work is to know the experiences lived in the labor market by engineers trained in the Production Engineering course at UNIPLAC in the period 2011 to 2018. The choice for the Production Engineering course was especially, because it is still a field, which in the last decade has received a significant number of female students. Also, this work seeks to contextualize the historical and cultural aspects of gender inequality in Brazil, pointing out the tensions, possibilities and perspectives experienced by women in the labor market, which is still predominantly male.

Prejudice and the establishment of a hierarchy advocate that men's work is more valuable than women. This hierarchy influences the positions and salaries offered to women engineers, resulting in vertical segregation, where women do not reach the same prestige and power positions that men generally do in companies. These unequal gender roles feedback a vicious process, as, even over-qualified, women are paid less.

Studies on gender equity have gained strength in the last two decades and the aim of this article is to know the situation of women in the labor market in the area of Production Engineering, and how women are

entering this market. Data collected by the IBGE from 2004-2014, from DIEESE, and the qualitative-quantitative research carried out with 33 women will be used.

The article is organized into four sections. In the first section, some concepts about feminism and gender equity are discussed. The second section contains some data on engineering and the job market for female engineers in Brazil. Section three presents the methodological procedures and the last section discusses the data.

2. GENDER INEQUALITY

The issue of gender inequality and wage differences between men and women is an old discussion and dates back to the beginnings of the industrial revolution in which there were reports of exploitation of female labor.

According to Silva (1992) it is important to understand the historical context of the masculinization of engineering in Brazil. Many engineering schools had their origins in the context of military schools and access by civilians took place from the mid-nineteenth century onwards. In this period, access to Military Engineering schools meant preparing men to assume officer positions.

Reflecting on gender inequality in the labor market is a challenge. One must take into account the relative understanding of what inequality actually is, since its recognition depends on historical and cultural issues that imply the naturalization of behaviors and ideas contrary to what is understood by equality and the struggle for gender equality.

When addressing gender inequality, the need to take a step beyond discussion based on common sense is evidenced. Therefore, to understand the concept of gender inequality, we first need to understand what gender means. We will use concepts from Louro (2014), Vianna (2011) and Finco (2003). The analysis of women's concealment and resistance struggles against the condition of submission throughout the 20th century in Brazil, according to Louro (2014), provide a reflection of gender inequalities that were gradually naturalized through Western culture.

“At the end of the 19th century and beginning of the 20th century, feminist struggles, according to the author, were more focused on women's right to vote, equal access to professional choice, job opportunities, and also questioned the form of family organization. It will be in the unfolding of the so-called 'Second wave' – the one that began in the late 1960s – that feminism, in addition to social and political concerns, will turn to properly theoretical constructions.” (LOURO, 2014, p. 19).

These theoretical concerns cited by Louro (2014) go beyond the expansion of the female professional space restricted to the domestic environment. The formation of magazines and organized groups based on different interests play an important role in these studies, questioning the male frame of reference and recognizing women as the author of their own history.

“France, the United States, England, Germany are especially notable places to observe intellectuals, students, blacks, women, young people, in short, different groups that, in many ways, express their non-conformity and disenchantment with traditional social and political arrangements, at great universal theories, empty academic formalism, discrimination, segregation and silencing”. (LOURO, 2014, p. 20).

It is assumed that the roles played by men and women are defined by biological characteristics that kept the woman in the condition of submission. Thus, society would walk against feminist ideals, based on the perspective of equal rights. According to Louro (2014), there emerges the need to break power relations that lead to silencing and oppression, through distrust of the discourses present in different institutions.

According to Vianna (2011), the concept of gender was gradually integrated by Sociology, considering the social organization between men and women.

"In the 1990s, the studies of American historian Joan Scott significantly influenced Brazilian gender studies, critical reflections on education, as well as the knowledge produced about sexual differences and the various meanings that this knowledge acquires in different spaces of socialization, among which institutions responsible for education". (VIANNA, 2011, p. 19).

The adoption of this concept in the labor market requires an understanding of the social construction of gender, and that in relationships there is no single normative model. This equality is present in the perspective of equal rights and opportunities.

Finco (2003), when conceptualizing gender, uses Scott's words (1995), pointing out that the term was socially constructed on the differences between men and women, perceived in different cultures. "The concept of gender implies knowing, knowing more about sexual differences and their meanings. To understand how the differences in the relationships between men and women are produced by cultures and societies." (FINCO, 2003, p. 91).

The author emphasizes the growth of gender studies in theses, journals and other academic studies in different areas, as a fundamental element for dialogue and the perception of the plurality in the use of the concept. "The number of theses defended, as well as courses, seminars, meetings and colloquiums, shows the maturity of this field of studies; the expressive growth of academic production points to the legitimacy of the field." (FINCO, 2003, p. 92).

It is pertinent to emphasize the relevance of discussions about gender in the labor market, especially in the field of engineering, as this has historically been considered a male space.

In the field of engineering, it is essential to reflect on gender inequality, as well as the concept of gender itself, as this reflection represents the concrete possibility of minimizing behaviors impregnated with prejudice and disrespect for women engineers. In addition, such dialogues promote the development of skills and abilities that are fundamental to the process of inserting women into the labor market.

Gender equity and women's empowerment is a commitment signed by the United Nations (UN), with the participation of 189 nations, which understand equality as a fundamental element for both women's empowerment and economic development, cultural and social aspects of nations.

According to Sardenberg (2009) I International Seminar on Paths of Women's Empowerment – Project Time, "Of course, this distrust is well founded. In recent years, the term empowerment has been used indiscriminately, acquiring new meanings in the process."

Sardenberg (2015), still on the divergence of meaning. "In fact, there is no consensus as to what empowerment will be, nor with regard to the processes and actions that, in fact, contribute in this regard."

The lack of focus and the indiscriminate use of the term women's empowerment has led to conflicts in achieving goals.

The UN 2030 Agenda has 7 goals to transform the world, which are called Sustainable Development Goals

(SDGs), and of these the fifth goal addresses gender - "5. Objective: Gender Equality" which aims to propose gender equality and empower all women and girls.

With regard to gender equity, we can cite article 5 of the Brazilian Federal Constitution, which in its item "I - men and women are equal in rights and obligations, under the terms of this Constitution;" (BRASIL, 1988). However, we know that in some areas of knowledge women still suffer wage discrimination and gender inequalities.

But what does feminism and gender equity mean? Feminism according to Pinto (2010, p. 16):

"Appears as a libertarian movement, which not only wants space for women – at work, in public life, in education –, but which fights for a new form of relationship between men and women, in which the latter has freedom and autonomy to decide about your life and your body."

The relevance of the feminist movement for Brazilian women is approached by Pinto (2010), as a lever that mobilized reflections on the ways in which these women lived and conceptualized their lives, and especially, changes they aimed at in the way of living and on their insertion in the business market.

In this article, we chose to use the concept of equity instead of gender equality because when we refer to equity, we are including the notion of social justice, of equal opportunities for women and men who have different histories. People are not equal, as there is a selection of the categories of difference: race/ethnicity, gender, social class, generation, level of education, among others.

3. ENGINEERING COURSE AND THE ENGINEERING LABOR MARKET IN BRAZIL

Traditionally, Engineering courses are expensive and difficult to learn, both because of the content of calculations and technical subjects, as well as the requirement for studying and fulfilling curricular hours with classes, laboratories and internships.

In this context, according to Silva Filho (2017), the titration rates of Engineering courses in the private sector are still below 40%, that is, for every one hundred students who enroll in the first year, only less than 40 graduate at the end. this is a problem that, despite being old, will have to be faced with planned actions and in an institutionalized way, now more than ever.

When evaluating the graduates, most of them are men. In the presentation of table 1, there is a growth of 114% in the number of engineers trained in Brazil between 2004 and 2014, which could represent a significant growth of graduates. But if we are to assess the percentage of female engineers graduated, they represent not even 1/5 of the universe formed, that is, 17% of the total category, we have the vast majority of the market dominated by men.

Table 1. Number of graduated engineers.

Year	Engineers\Male	Engineers\Female	Total
2004	202.964	40.362	243.326
2014	463.613	87.026	521.639

Source: PNAD-IBGE (apud CORRALES, 2016).

The study by DIEESE (2014, p. 4) in the largest Brazilian economy, São Paulo, presents data that point to greater gender equality in the profession. "Women are still a minority, but in 2013 they reached 19% of formal employees, totaling 17,875. In 2003, there were 7,829 and they represented 15%". In the State of São Paulo, we have 92,478 engineering professionals.

According to Corrales (2016), in addition to having fewer female engineers than male engineers, this second group grows at a faster rate, as its absolute number is visibly higher. Table 2 shows the number and variation by age group of engineers.

Table 2. Number of graduated engineers.

Age group	Men		Women	
	2004	2014	2004	2014
23-27	18675	63893	5817	16783
28-32	41177	57532	13864	13031
33-37	24982	65941	6830	12107
38-42	28875	35078	5819	8236
43-47	27992	28393	2910	6040
48-52	31207	40881	1281	4841
53-57	17901	48721	206	6264
58-62	7422	28235	459	2157
63 or more	2647	38804	-	1404
Total	200878	407478	39046	70863

Source: adapted of PNAD-IBGE (apud CORRALES, 2016).

When evaluating table 2 by age group and gender, it can be seen that from 23 to 27 years old, that age at which young people are entering the labor market, we have the participation of 26.26% of women engineers at that age. In the more mature phase from 33 to 37 years old, this percentage drops to 18.36%. If considering the peak of the career, which would be from 53 to 57 years old, the female percentage would be 12.85%. In the final phase of their career, for engineers over 63 years of age, we have a whopping difference of 1404 female engineers to 38804 engineers, which in real terms would represent 11.84% of women working as engineers.

Data from DIEESE (2014, P.16) in 2013 highlight those men represented the majority, that is, "81% of the total in the State – women engineers have been increasing their participation over the last two decades. In 1995, they represented 11% of the total number of professionals in the State of São Paulo; in 2005, it was already 15%; in 2008, 17%; and, in 2013, they reached the level of 19%".

Another important point highlighted by the DIEESE study (2014, p.23) in São Paulo is the salary issue, the female engineers, in addition to having presented a significant increase in the level of employment in the study period, 2003 to 2014, also achieved salary gains, "above those observed among engineers, which reduced the gender wage differential. Even so, they received, at the end of the period, 81% of the average income of a male engineering professional". If the main occupational groups are evaluated, "the greatest wage inequality between men and women is observed among chemists; geologists and geophysicists; and

mining engineers, areas in which women receive, on average, approximately 70% of men's wages"

The awareness that there was an invisible “oppression” specific to women started the movement for the defense of women's rights, when it becomes evident that a large amount of work is carried out for free by them, being carried out within the family and that it should be called and considered “work and recognized as such, but unfortunately this validation does not happen in our mercantile society.

The authors Hirata and Kergoat (2007, p. 599) when researching this movement state that:

“The sexual division of labor is the form of division of social work arising from social relations between the sexes; more than that, it is a priority factor for the survival of the social relationship between the sexes. This form is historically and socially modulated. Its characteristics are the priority assignment of men to the productive sphere and women to the reproductive sphere and, simultaneously, the appropriation by men of functions with greater added social value (political, religious, military, etc.).”

The social division of labor mentioned above has two guiding principles according to the aforementioned authors: the principle of separation (there are men's work and women's work) and the hierarchical principle (a man's work “is worth” more than a woman's work). These principles are accepted and validated by society over time. They can be applied through legitimation and naturalistic ideology (which reduces gender to biological sex, reduces social practices to sexual “social roles” that refer to the natural destiny of the species) (HIRATA; KERGOAT, 2007).

Next, the authors emphasize that two existing paradigms can be analyzed: the traditional and the conciliation one: "In the "traditional model": role in the family and domestic role assumed entirely by women, and the role of "provider" being assigned to men. In the “conciliation model”: it is almost exclusively up to women to reconcile family and professional life” (HIRATA; KERGOAT, 2007, p. 599).

In practice, it is up to the women to operate this reconciliation, in this situation another model emerges, which could be classified as the delegation model, that is, the outsourcing of domestic work and the care of the offspring for domestic workers and in the absence of these, the role would be entirely the responsibility of women, which characterizes the work overload imposed on women in the home and in the family and in paid work, known as double, triple shifts. It should be noted that domestic work is not being underestimated, it is only characterizing what happens worldwide in all modern societies, regardless of ideology.

Barros (2008, p. 75) analyzes that “parallel to this education in the strict sense, transmitted by the family and by the school, there is the one in the broad sense, seen as the one that society transmits to individuals, regardless of age, through religion, customs and relationships between men”. And unfortunately, this education still strengthens the sexist stereotypes that exist in our society in the world of work.

If salaried work is, without a doubt, a way to obtain freedom, economic independence, which will enable freedom for individual choices, it is in this occupational sphere that the greatest oppression occurs, being one of the fields where discrimination against women is most evident in sexist issues.

Also, according to Barros (2008) highlights that we have two types of segregation in the professional world: horizontal and vertical. In horizontal segregation we have:

“The tendency to separate men and women in certain professions, called horizontal segregation, is one of the factors responsible for the wage and occupational disparity. In the US, for example, where women, on average, receive more schooling than men and where discrimination based on sex is prohibited by law, women continue to be excessively concentrated in occupations

considered to be feminine, of the care type, such as teacher, nurse and secretary, functions that reproduce the traditional division of labor in the home. Occupational segregation generates 40% of the wage gap between men and women in the US". (BARROS, 2008, p. 75)

In vertical segregation we have the removal of women from management posts. The main reasons presented by the author to justify the exclusion of women from these positions refer to: "the difficulty of submitting men to her orders, their lack of qualification, the discontinuity of female careers, especially in the face of pregnancy, childbirth and taking care of the children". And finally, "the way of driving adopted by women is different, because they work more as a team" (BARROS, 2008) p. 76).

In this perspective, Lombardi (2005) points out in his studies that the entry of women into the engineering field is considered a rupture in gender paradigms, as the profession was considered to be masculine. For these women to gain space and recognition in this professional field, they had to go through numerous confrontations, in the face of sexist and sexist patterns established in the most varied workplaces.

4. METHODOLOGICAL PROCEDURES

The method used is descriptive-comparative, using qualitative and quantitative research. As for the objectives, the research is descriptive and comparative. Descriptive research is one that analyzes, observes, registers and relates variables that involve facts without altering them. In comparative research, information, contexts, historical series are compared. The main data collection techniques generally used in descriptive research are: forms, interviews, questionnaires, registration forms for observation and data collection in documents. (GIL, 2008).

According to Gil (2008), the questionnaire is a data collection instrument consisting of an ordered series of questions and we have three types: -descriptive: where the objective is to describe the profile of the research participants, such as income, age , education and profession; -behavioral: whose purpose is to know the behavior of these people as a pattern of consumption, social, economic and personal behavior, among others; -preferential: that seek to understand the opinion of some condition or circumstance that is related to the research issue.

For data collection, the "Google forms" instrument was used. The invitation for graduates of the Production Engineering course from 2011 to 2018 was made through telephone contact, social networks, and sending emails.

The questionnaire was divided into three parts: identification, data about the undergraduate course, professional experiences, including more specific questions about gender prejudices and discrimination experienced during the course and in professional practice.

The target audience of the research was the production engineers trained by UNIPLAC in the period from 2011 to 2018, totaling 69 female engineers. In 2011 three female engineers were graduated; in 2012 there were two trained female engineers; in 2013, eight female engineers completed the course; in 2014 they completed nine female engineers; in 2015 the number of women graduates increased to 16 engineers; in 2016, seven female engineers graduated; in 2017 it presents the highest percentage of female engineers graduated with 18 graduates and, finally, in 2018 only six female engineers completed the Production

Engineering course.

As for the inclusion and exclusion criteria for the research, we can mention that the inclusion criteria listed were: all women who completed the Production Engineering course during the research period; and accept the invitation to answer the questionnaire.

With regard to the exclusion criteria, it is considered that: women who did not complete the course in the period from 2011 to 2018 were excluded; and not being female.

As it is research involving human beings, the project was submitted to the Ethics Committee for Research with Human Beings at UNIPLAC and approved under the number 12007419.1.0000.5368.

Regarding the risks and benefits, it is considered that this research offers minimal risks to the participants, as it guarantees voluntary participation, anonymity, withdrawal at any time and confidentiality of information provided by the participants, respecting Resolution CNS 510/2016. As for the benefits of research, there is an improvement in policies for the inclusion of women engineers in the academic world and in the professional field.

5. METHODOLOGICAL PROCEDURES

The survey was conducted from June 5th to August 15th, 2019. Our research universe involved 69 production engineers trained by UNIPLAC from 2011 to 2018.

The difficulties encountered during the survey were lack of data updating, change of telephone numbers, outdated addresses, and the dissemination method that resulted in a greater number of respondents was through social networks. Even so, the results are relevant, as from the total of 69, 33 women graduated from the Production Engineering course answered the instrument, which is equivalent to 48% of the target audience. As it is a survey with confidential data, the identities of our interviewees were preserved, and the names used were fictitious.

The average age of female engineers is 26 years old, the youngest being 23 years old and the oldest being 31 years old. Most live in the city of Lages-SC with 10 respondents, and the others are distributed in cities such as Correia Pinto/SC, Blumenau/SC, Palhoça/SC, Itapema/SC, Vacaria/RS and Mogi das Cruzes/SP.

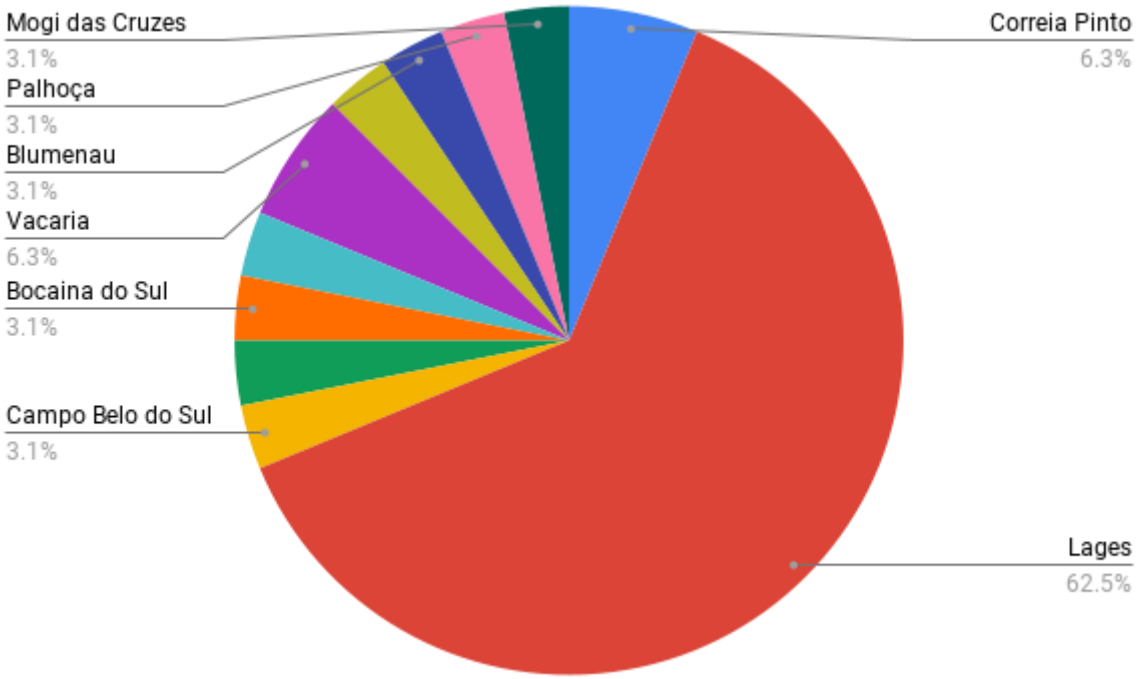

Figure 1. Participant count by city.
Source: The authors, 2020

As for ethnicity, we have 31 white and two brown engineers. We have five mothers among those surveyed, most of whom have one child and one of them has two children.

With regard to the average completion of the course, it was found that the majority managed to complete the course within a period of five years and only one graduate engineer took 8 years to complete it. The difficulties presented for completing the course were: financial course monthly fee, displacement (for living in other cities), the difficulty of reconciling work with studies, for traveling a lot for work, for math and calculations charged in the course, for having attended another college, etc.

In subchapter 5.1, the main difficulties faced by women engineers in entering and consolidating in the labor market will be presented.

5.1 INSERTION OF ENGINEERS IN THE LABOR MARKET

In this subsection, we will present the testimonies of only six women, out of the 30 who are working in the field of Production Engineering; to exemplify the experiences lived by women engineers in the labor market. Participants were identified as: Maria, Joana, Lolita, Rosa, Ana and Mariana.

As for employability, at the time of the research, out of the 33 women, 30 were working and three were unemployed. In the analysis criterion on the area of expertise, it is observed that of these 30 women, 22.2% do not work as engineers and most work in specific areas of the course. A significant fact is that 77.8% of these women are working in the specifics of their training, as we can see in Figure 2 below:

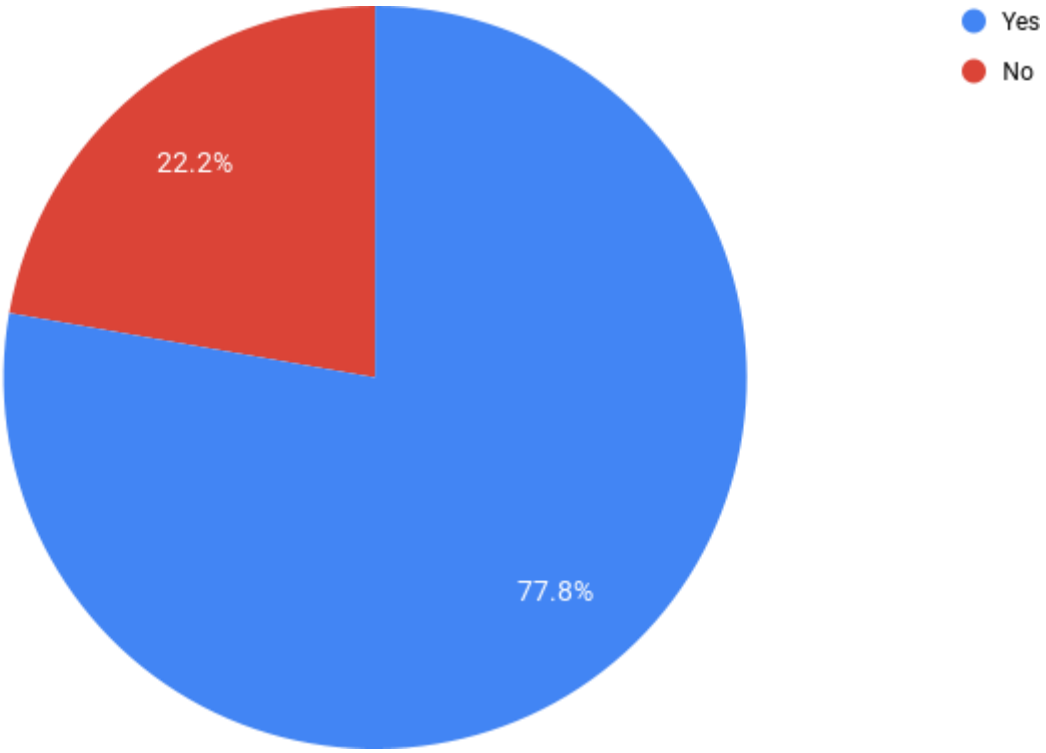

Figure 2. Participant count by city.
Source: The authors, 2020

The areas of activity are the most diverse, such as consulting, logistics, sales, planning and control, maintenance, quality, purchasing supplies, processes, information technology, teaching, etc. They work in the following companies in Lages and the region, (SC), Vacaria (RS), Mogi das Cruzes (SP): CELESC, KIMBERLY, AMBEV, NDD DIGITAL, SEARA, VOSKO, ENGIE, UNIPLAC.

Another interesting data in this analysis refers to the salary range, in which it was found that of the 30 employed participants, of these 24.24% earn up to two minimum wages, 51.51% of them receive two to four minimum wages, 9% earn above four minimum wages, and one of these 30 participants did not answer this question.

This data indicates that most women engineers receive remuneration below the minimum wage provided for production engineers, as provided for in Law No. 4,950-A, of April 22, 1966 and Resolution No. 397, of August 11, 1995.

• 6:00 am daily - 6 minimum wages
• 7:00 am daily - 7.25 minimum wages
• 8:00 am daily - 8.5 minimum wages

One of the questions on the form was about the difficulties encountered in their professional performance. They indicated as difficulties: demand for experience, coping with sexism, racism, prejudice for already having children. As can be seen in the following reports: Participant Maria replied that she experienced the following difficulties “first point for being a woman, already having a daughter and for not being "white". Another difficulty was the issue of lack of experience. For some situations my education was "high" for the function and others lacked experience” (2019).

Participant Maria summarizes the main difficulties faced by women in the field of Production Engineering.

Cabral and Bazzo (2005) point out in their studies that women faced social barriers to enter the field of engineering, marked by gender discrimination, due to the mistaken ideas that the necessary reasoning to exact is linked to the male gender.

In addition to gender discrimination, in relation to women's competence in the specific area of production engineering, two other discriminations were also made explicit: discrimination in relation to motherhood, that is, already having "a daughter"; and racial discrimination, that is, for being a black woman.

Two other points highlighted by the participant Maria were that she had an academic background considered above average, but that in the selection interviews to compete for a place in the labor market as an engineer, she was asked about her lack of professional experience.

Participant Rosa reported that in a certain selection of a vacancy for a Production Engineer, the following criteria were included: "The vacancy was specific for men, due to the issue of leave due to maternity leave". This criterion implies gender discrimination with regard to maternity, and a factor used to justify inequalities in salaries and positions. According to Scavone (2001, p. 138) motherhood can "be understood as a social construction, which designated the place of women in the family and in society, that is, the main cause of male domination over females". Currently, there are several methods of preventing pregnancy and women can choose to opt for maternity or not. Therefore, the criterion of motherhood can no longer be accepted as a justification for gender inequality and, furthermore, men have the same co-responsibility for the care and education of their children.

According to Cabral and Bazzo (2005, p. 5) "It does not mean that one career is more masculine or feminine than another, but that the values that built them have imbricated the history and culture of men and women". However, it is important to remember that women were excluded for centuries from the public sphere and, there are still spaces, professions, such as the engineering field, in which women still suffer discrimination and gender prejudice.

Participant Lolita responded in this same perspective:

"In the region of Lages there is a great difficulty, there is still a gigantic barrier in employing women in more 'nobler' positions, unfortunately our region is still behind. Since I graduated, I see that there is a movement, but with little perception for this to change".

In the region of Lages, the culture of patriarchy is still present. Patriarchy works as a social system, which is reproduced in social, cultural and historical relationships and becomes a phenomenon "unnoticed in society", as people get used to relationships marked by male superiority.

In the 1970s, and also at the end of the previous one, several feminists, especially those known as radicals, rendered a great service to the so-called women's studies, using a concept of patriarchy [...], their intention being quite political, or that is, denounce male domination and analyze the resulting male-female relationships (SAFFIOTI, 2015, p. 101).

In view of the existence of the culture of patriarchy in society, it is possible to identify legal, religious and medical discourses that infuse the position of inferiority of women linked to their biological nature, which, consequently, determine social behaviors based on gender roles defined by a created standard by society.

We understand that the history of women built over time did not give the female the role of social actress. On the contrary, male supremacy has been evidenced and consolidated for centuries in Western society,

with the support and officialization of the church, justice and medicine. Three spheres of society, which legitimized women as being inferior to men, in numerous aspects.

Here we can recall some issues to exemplify: spirituality, cognition and the differences existing in the woman's body in relation to the man's body. Finally, factors that supported the segregation of the female gender, which made the woman a being with the right to few decisions, and only internal to the home.

In this sense, the differentiation between genders (male and female) and the way roles are understood and assigned in the labor market, is what shape the rules and social norms when hiring a woman or man in the engineering field.

Joan Scott (1995) when referring to the historical construction of the world states that everything is built within power relations, but this power is not fixed and does not follow just one direction, just as there are no separate worlds for men and women, the relationships and experiences take place within the plurality, specificity and individuality of each one, but at the same time together.

It is important to think that gender relations are in all spheres and social classes and are permeated by issues related to race, ethnicity, religiosity, culture and everything that involves people, and the process of gender violence also occurs within this plurality and diversity. Under this Lombardi (2006, p. 199) points out that:

> In the professional environment, it can be said that if women have dared other specialties in addition to Chemistry, Civil and, more recently, Production, there are still very delimited places for their performance, either in terms of work areas or in terms of the work activities themselves, or even their position in the hierarchies of companies and institutions. The gender order, transversal to engineering, classifies/reclassifies and ranks areas of knowledge and areas of work, activities, attributions and hierarchical positions as more or less male or female and values them differently.

The engineer Joana expressed in relation to the difficulties faced in the labor market that: “The company is in the logging industry, women were not always well received... even more in management, so the judgment of incapacity is great, and fortunately or unfortunately I have been able to prove the opposite with time and dedication”.

Another issue addressed about the prejudices experienced in the labor market is the fact that out of 30 employed women, 21 of these women, is 63.63%, stated that they had already suffered some kind of prejudice throughout their professional career, with comments that questioned its capacity and efficiency, prejudices of the most varied types that are proven by the following reports:

According to Rosa, "people, even if not mean, believe that because they are a woman and work in the industry, it has to be in HR functions." Participant Ana reported that she was harassed in the workplace “It's not really prejudice, but harassment, teasing! General, both from colleagues and clients”. In this perspective, Maria also mentioned that she has heard “bad jokes, harassment, disregard for my efficiency. Sexual harassment can occur as a result of a series of behaviors, expressions, “sing-ups” that annoy, annoy, humiliate or harass a woman. Harassment can manifest itself in many ways, some more explicit and others more “veiled”.

Sexual harassment is not synonymous with praise, as sexual harassment can be understood as an onslaught of sexual connotation, unacceptable and unsolicited, offers of sexual favors. It is a form of violence against women, in the case of the quotes above, and considered as a treatment of gender inequality, anyway”.

With regard to gender and generational discrimination in relation to the competence of women engineers,

a research participant named Mariana reported that “I notice that some people feel insecure about closing a deal with me, because I am young and a woman”.

In the above statement, it is possible to observe, in addition to gender discrimination, generational discrimination, that is, because she is a young woman, her insertion and permanence in the labor market in the area of Production Engineering is not respected by some men.

Finally, according to data from this research, women engineers in the field of Production Engineering still have some challenges in the categories of gender, generation and race/ethnicity to face and, later, consolidate their spaces with the recognition of their potential.

6. FINAL CONSIDERATIONS

These reports indicate that women still face barriers due to gender, in professions historically considered more appropriate for men. In this context, it is important to question what schools and universities are working on in their education systems, with regard to creating gender equity, equal equality of opportunity for men and women, not only of access, but, of permanence and with the achievement of fairer results in the educational system and in the entry and permanence of women in the labor market in the engineering area.

We know that part of the explanation for this phenomenon lies in the education itself and in the expectations of the family, society in relation to the role of women. One of the impediments is the macho culture, with different gender roles for boys and girls that starts in their own family. The fact that girls receive dolls and boy’s games already creates expectations about future professions.

The career of engineers currently provides good economic working conditions, and this becomes an element that facilitates social mobility with a broad professional insertion of men and women, however, they are still a minority in this area. Thus, universities face the challenge of promoting new institutional practices that meet the current needs of promoting gender equality in the field of engineering, in this case, Production Engineering.

We know that there is no biological factor limiting the insertion of women in this vast job market in the field of engineering. On the contrary, increasing the presence of women in professional engineering environments is a desirable factor for the profession's new challenges, making it more diverse in its views and more human in its objectives.

Finally, the data show that women engineers experience gender discrimination, sexism, racism and sexual and moral harassment in their work field. These women still, in 2019, reported cases of gender inequality experienced in the labor market. In this perspective, the study points out the following strategies to fight gender discrimination in the production engineering course: - include publications by renowned engineers in the teaching plans; - discuss with students and professors of the course about gender equity in the labor market.

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Appendix

Appendix 1. Survey Questionnaire On the situation of women graduated in the production engineering course at UNIPLAC - Period 2011 to 2018.

The data informed are for the exclusive use of the research and the identities of the interviewees will not be revealed.

1)Identification

Name:

Age:

Resident city:

Contact phone:

Ethnicity: ( ) White ( ) Brown ( ) Black

Have children: ( )Yes ( )No. If so. How many children?

2) Production engineering course data

2.1) How long did it take to complete the course?

2.2) What are the difficulties found to attend the production engineering college?

2.3) Are you currently working?

( ) Yes ( ) No Note: If yes, answer the other questions.

2.4) Are you working in specific areas of training?

2.5) In which area?

2.6) What company do you work for?

2.7) Report what were the difficulties you encountered to work in the profession?

2.8) What is your average income?

( ) up to 2 minimum wages

( ) From two to four minimum wages

( ) From four to 6 minimum wages

( ) Above 6 minimum wages

2.9) Did the conclusion of the production engineering course help you to increase your income?

( ) Yes ( ) No

2.10) If you were already working, were you able to change roles within the company?

( ) Yes ( ) No

2.11) If so, which area is currently working?

2.12) Have you suffered any kind of prejudice in the profession for being a woman?

( ) Yes ( ) No

2.13) If so, what kind of prejudice?

Appendix 2. INFORMED FREE CONSENT FORM

FREE AND INFORMED CONSENT FORM – TCLE

You are being invited to participate in a survey. The document below contains all the necessary information about the research being carried out. Your collaboration in this study is very important, but the decision to participate must be yours. To do so, carefully read the information below and don't rush to decide. If you do not agree to participate or wish to withdraw at any time, it will not do you any harm. If you agree to participate, just fill in your details and sign the declaration agreeing to the survey. If you have any questions, you can clarify them with the person responsible for the research. Thank you for your attention, understanding and support.

1. I, _____ , resident and domiciled _____ _____ bearer of Identity Card, RG _____, born on ____/____/_____, I agree of free will to participate as a volunteer in the survey WOMEN IN ENGINEERING: SITUATION OF ENGINEERING ENGINEERS PRODUCTION FORMED BY UNIPLAC-2011 TO 2018. I declare that I have obtained all the necessary information, as well as any clarifications regarding the doubts presented by me. I am aware that: The study seeks to analyze the situation of WOMEN IN ENGINEERING: SITUATION OF PRODUCTION ENGINEERS TRAINED

BY UNIPLAC-2011 TO 2018

2. This study aims to collaborate with the investigation of aspects of difficulties in accessing the labor market, current situation, as well as the characterization of tensions, possibilities and perspectives experienced by the subjects involved, in this case the production engineers.

3. Women who agree to participate in the research will be interviewed.

4. The interviews will be guided by a pre-established script and will be carried out by google documents for greater data reliability.

5. The risk presented to the researched subjects refers only to emotional contents that may emerge during data collection. If there is any psychological or emotional problem or need, I can seek assistance at the UN

6. If, during the course of the research, I have any questions or for any reason I need it, I can look for Graciela Alessandra Dela Rocca, phone 991470266 or at Av. Castelo Branco, 170 – Bairro Universitário Caixa Postal 525 - Lages- SC. IPLAC School of Psychology Service, with free assistance.

7. I am free not to participate or stop collaborating in this study at any time I wish, without the need for any explanation. The withdrawal will not cause any harm to my health or physical well-being.

8. The information obtained in this study will be kept confidential, and in case of disclosure in scientific publications, my personal data will not be mentioned.

9. If I wish, I can personally learn about the results at the end of this research by contacting those responsible for it and coordinating the engineering course

I DECLARE, also, that after being conveniently clarified by the researcher and having understood what was explained to me, I voluntarily consent to participate in this research and I sign this document in two copies of equal content and form, one of which remains in my possession.

Lages, _____ of _____ Universitario _____

_____

(Name and signature of the research subject and/or legal guardian

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