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Investigating Unconscious Gender Bias among female engineers

Group SONELGAZ Case Study

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Abstract

The Algerian labour market is marked with significant gender gap especially in male dominated fields such as the energy sector. Therefore, this study aims to investigate implicit gender bias in the workplace. Sample of eleven female engineers from SONELGAZ group were chosen as a case study using semi-structured interviews and observation notes. Qualitative analysis of primary data reveals a marked favouritism towards females in engineering position which is experiencing shortage. The later is the result of the influence of social norms and gender roles on the workplace.

Key words: implicit bias, social norms, gender roles.

Résumé

Le marché du travail algérien est marqué par un écart important entre les sexes, en particulier dans les secteurs dominés par les hommes comme le secteur de l'énergie. Par conséquent, cette étude vise à étudier les préjugés implicites sexistes en milieu de travail. Un échantillon de onze femmes ingénieurs du groupe SONELGAZ on été choisi comme étude de cas à l'aide d'entrevues semi-structurées et des notes d'observation. L'analyse qualitative des données primaires révèle un favoritisme marqué à l'égard des femmes en postes d'ingénieur qui connaît une pénurie. Ce dernier, est le résultat de l'influence des normes sociales et des rôles de genre sur le lieu de travail.

Mots clés : préjugés implicites, normes sociales, rôles de genre.

ملخص:

يتسم سوق العمل الجزائري بفجوة كبيرة بين الجنسين، ولاسيما في المجالات التي يهيمن عليها الذكور مثل قطاع الطاقة. لذلك، تهدف هذه الدراسة إلى التحقيق في بين الجنسين في مكان العمل. تم اختيار عينة من إحدى عشرة مهندسة من المجموعة كدراسة حالة باستخدام مقابلات شبه منظمة وملاحظات مراقبة. ويكشف التحليل النوعي للبيانات الأولية عن محاباة ملحوظة تجاه الإناث في وظائف الهندسة التي تعاني من نقص. ويعتبر هذا الأخير، نتيجة لتأثير على مكان العمل.

الكلمات الدالة: التحيز الضمني المعايير الاجتماعية , أدوار الجنسين

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Introduction

Female empowerment is a catalyst for change, reducing the gender gap in Science, Technology, Engineering and Mathematics (STEM) education areas could help reduce skills gap, increase employment and productivity of women and reduce occupational segregation. Eventually this would promote economic growth via both higher productivity and increased labour market activity. However, women currently earn the majority of STEM degrees, yet the number of females in engineering professions compared to that in education is questionable. It doesn't look like education or skills are the problem. Women already empowered enough to make a clear impact. These approaches fail to address the key systemic problem: Unconscious bias.

Bargh and Raymond (1995) claim that those people who discriminate are often not aware of it and how it prospectively affects those who get affected. They also argue that the lack of awareness can be related to the unintentional influence when making stereotypes informing impressions of other people. Implicit attitudes are also persist and more difficult to change (Wilson, Lindsey & Schooler, 2000, cited in Dovidio et al., 2011).

Women face greater barriers and rely on strategies for advancement that are different from those of their male counterparts (Lyness and Thompson, 2000). Algerian female engineers are underrepresented in engineering profession only 40% of the female engineering graduates get a job in engineering. To explain this gap, this study seeks to investigate unconscious gender bias with focus on the Algerian female engineers in the energy sector, designed to analyze qualitative data on female engineer's perceptions, attitudes, experiences, and on the concerns of the topic.

The study is divided into four main chapters that inter connect to the central aim of this research. First chapter is about the research problem and the methodological frame; the importance and the aims of this research are stated in this chapter the methodology, of both collection and analysis of primary, data are also elaborated. Second chapter deals with the literature review and theoretical frame, the gender concept and gender system is demystified along with the relevant gender theories related to economy and economic growth. To finally carryout with the female participation in the Algerian labour force. Third chapter mainly gives detailed information's about the group of SONELGAZ and its structure in order to understand where exactly the study has been conducted and the importance of the group chosen. Finally, we presume with the last chapter in where the finding of the study are presented and discussed in order to validate or deny the hypotheses.

Chapter I: Problem Statement and Methodological Frame

This chapter highlights the objectives of this study, statement of the research problem, hypothesis, methodological choice and the background of the targeted population.

1. The objectives of the study

In reality, women are yet to encounter numerous barriers and bear with persistent stereotypes, in general, and most importantly in the work place these barriers may not be plain clear but their effect is undeniable. Whether it was on purpose or unconsciously in certain disciplines the phenomenon is more manifest.

“No country today can afford to leave aside 50% of its creative genius, 50% of its innovation, 50% of its economic drivers. This is why gender equality in engineering is so important” Irina Bokova¹, Director General of UNESCO. She emphasizes that science and engineering hold answers for promoting gender equality, for making the most of the creativity of every member of society. Clearly, despite the importance of engineers in improving societies, everyone does not participate equally. *“We need to help them transition into the employment market”*.

Science and engineering hold the key answers to a sustainable development and climate change questions, gender equality is one of the main four goals to achieve these aims. On that account this study aims to investigate unconscious gender bias in SADEG Company and its impact on performance. Female engineers of Tiaret concession were chosen as a sample to conduct this study.

2. Research Question

According to the World Bank, the percentage of women studying engineering and the sciences in the Middle East and North Africa is comparable to and higher than in more developed countries 50%. Yet only few women graduating with engineering qualifications go into engineering professions. Close to 40% of women with engineering degrees either leave the profession or never enter the industry. Recent study published in psychological science by the psychologists Gijsbert Stoet, of Leeds Beckett University, and David Geary, of the University of Missouri indicates that females seek financial freedom through STEM professions in countries with higher gender inequality

¹Irina Bokova, former Director General of UNESCO, in her message to the participants in a workshop on women in engineering in Africa and the Arab States for further information check: *Workshop on Women in Engineering in Africa and the Arab States at*. (2013, December 6). UNESCO.
<https://en.unesco.org/news/workshop-women-engineering-africa-and-arab-states-unesco>

Engineering is seen to be bold and women to be fragile, in such male dominated field implicit gender bias can occurs leading to errors in judgment and decision-making that may unwillingly and unintentionally affect female hiring and career advancement in such field with this being said is unconscious bias the reason behind the gender gap in engineer professions?

Main question:

Are female engineers of SADEG's company being unconsciously biased?

Sub questions:

1. From where is it stemming from?
2. How is it affecting the female engineers of the company?

3. Hypotheses:

We anticipate with a main hypothesis that female engineers are confined to administrative position instead of doing their real job.

In matter to clarify our hypothesis we propose to divide it to two sub-hypotheses. Firstly, it is stemming from social norms and stereotypes.

Secondly, unconscious gender bias is holding back female engineers from advancing in their careers.

4. Methodology stance:

A methodology is a theory of how research is done or should be carried out (Harding, 1987). It responds to ontological and epistemological assumptions of a research. A method is a technique for gathering evidence (Harding, 1987). In this inquiry, both primary and secondary data are collected using inductive qualitative research methodology. The secondary data used has been critically evaluated and has been collected from relevant literature, databases and Internet sources.

Qualitative research generally attempts to generate, elaborate, test or induce radical change in theory (Lee et al., 1999; Yin, 1984; 2003). In this case, the area of research is relatively unknown, and we are engaged in theory-building and theory elaboration type of research that seeks to answer how and why questions (Eisenhardt, 1989; Ghauri & Grønhaug, 2002).

Moreover, Ghauri and Gronhaug (1995) and Creswell (2010) state that studies of complex subjects, such as human or organizational behaviour qualitative research are the most suitable.

5.Methods and Research Design:

This research was designed to investigate unconscious gender bias towards female engineers of Sonelgaz group taking in consideration both internal and external factors that may be the reasons behind this phenomena and how is it effecting both females engineers and the company in general. In order to answer the research questions it is essential to utilize the relevant tools and methods not only to accomplish the research but also to increase the reliability and validity of the material and data collected.

Qualitative methods are best for describing, interpreting, contextualising, and gaining in-depth insight into specific concepts or phenomena. Thus, observation and qualitative semi-structured interviews were chosen to collect required primary data.

Qualitative semi-structured interviews are one of the most dominant and commonly used methods of data collection within the social sciences (Bradford & Cullen, 2012). They are valuable because they allow researchers to explore subjective viewpoints (Flick, 2009). Setting an interview schedule will also enable the researcher to address the desired topic whilst allowing the respondent to answer in their own terms (Choak, 2012). Semi-structured interviews allow the participants the opportunity to talk and act freely yet planning the interviews in advance will limit the conversation around key questions (Postholm, 2010).

5.1. Sampling:

“In qualitative research, it is their relevance to the research topic rather than their representativeness which determines the way in which the people to be studied are selected” (Flick, 1998, cited in Neuman, 2011, p. 241).

During my internship in the company, I had the opportunity to exercise observation as first tool of the investigation (or pre-investigation) in following eleven female engineers. Yet, it is necessary to emphasize that the number represents all the female engineers employed in the company. While accomplishing the observations, I dedicated to each female engineer in her office along with her co-workers notes were taken for later data analysis.

In our pre-investigation, the observations allowed us to construct a semi-structured interview. The questions were designed based on the observation notes taken from my interaction with the first participants aiming to investigate implicit biases; from where specifically the biases are stemming from and how are they effecting them. Once done, we conducted the interviews with all the eleven female engineers. Interviews took a place in each engineer's office, and lasted approximately three hours each. Answers were recorded by note-taking.

5.2. Data Analysis:

In this sector, primary data collected on the field is evaluated based on qualitative economic gender bias indicators. Considering the source of information and the way in which this information is interpreted and used. Qualitative indicators are more suitable to analyze the data extracted from less formal surveys such as interviews, observations.

“Qualitative analysis is used to understand social processes, why and how a particular situation that indicators measure came into being, and how this situation can be changed in the future. “Qualitative analysis can and should be used at all stages of the project cycle, and should be used alongside quantitative and qualitative indicators”(the Canadian International Development Agency).

Observations notes were critically analyzed then compared with the data collected from the interviews for the purpose of measuring participant's awareness of the implicit bias and its impact. Interviews transcripts were first translated to English then analyzed using thematic analysis, starting by developing codes which represents the central part of qualitative data analysis, sorting the data into categories will make it more lucid to read and analyze.

5.3. Reliability and validity:

Our sample concerns only female engineers of one of the group's subsidiaries, which may decrease the reliability of the results. Yet the topic has been profoundly studied by other researchers, and results can be compared with the previous studies to increase its reliability. During the interviews, we tried to maintain our objectivity by making sure not to influence the interviewees in any way possible and to make the measurement for this inquiry consistent and self-conscious.

Of course the interviews are anonymized and each participant is coded by a number; example: participant “1” quotes also were added word by word as the participant said it with no modifications.

5.4. Ethics:

According to Hennink, Hutter and Bailey (2011), there are several different ethical considerations a researcher needs to be aware of, such as:

- “Informed consent. Individuals should be provided with sufficient information about the research, in a format that is comprehensive to them, and make a voluntary decision to participate in a research study.
- Self- determination. Individuals have the right to determine their own participation in research, including the right to refuse participation without negative consequences.
- Minimization of harm. Researchers should not do any harm to participants or put them at risk.
- Anonymity. Researchers should protect the identity of research participants at all times.
- Confidentiality. Researchers should ensure that all data records are kept confidential at all times” (Hennink et al. 2011, p. 63).

After introducing myself and explaining my topic and research objectives, permission was taken from every participant to both observation notes taking and conducting the interview, time and date was set by them.

Before conducting the interviews anonymity was ensured to all the interviewees, details of each participant were kept anonymous, it was very important to not harm the participants and make them feel comfortable enough to answer honestly.

Chapter II
Literature review
And
Theoretical frame

On this chapter, we aim to tackle the gender system, starting from the definition of different gender concepts, introducing gender and implicit gender bias, social norms and stereotypes and how to eliminate the bias in the work place to the impact of the gender system on the economy. In order to, demystify the gender concept and understand the studied phenomena. Furthermore, we carry out with the link between gender and both social and human capital throughout the association of the studies to the Algerian labour force by an analysis of the female labour force evolution in Algeria.

1. Understanding gender and unconscious gender bias:

By introducing a new philosophical approach to understanding gender, Butler²(1990) has nuanced perception in which she unites the concepts of performativity and gender. In her attempt to demystify the two concepts, she accentuates the fact that there is indeed a difference in the terms gender performance and gender performativity. Butler states in an interview with IMF(International Monetary Fund): "When we say that gender is performed, we usually mean that we have taken on a role; we're acting in some way...To say that gender is performative is a little different...For something to be performative means that it produces a series of effects. We act and walk and speak and talk that consolidate an impression of being a man or being a woman...We act as if that being of a man or that being of a woman is actually an internal reality or simply something that is true about us. Actually, it is a phenomenon that is being produced and reproduced all the time."

For Butler (1990), gender is not an essential, biological quality or an inherent identity, but is repeatedly performed, based on, and reinforced by, what social psychologists call gender norms and stereotypes, or gender schemas. It is an identity tenuously constituted in time through a stylized repetition of acts, and thus it is performative.

Unconscious gender bias is thus defined as unintentional and automatic mental associations based on gender. In our daily life, we tend to make decisions that can be influenced by our knowledge, a knowledge that comes from norms, culture, experiences, the people in our life, the places we visit, the books we read and so many other situations. Using that knowledge the brain creates shortcuts to make assumptions about an individual based on gender and gender stereotypes unconsciously and without being fully aware of it.

²Judith Butler an American philosopher, a gender theorist and the author of the book: gender trouble(1991).

According to the Harvard Business Review³, “Most of us believe that we are ethical and unbiased. We imagine we’re good decision makers, able to objectively size up a job candidate or a venture deal and reach a fair and rational conclusion that’s in our, and our organization’s, best interests. But more than two decades of research confirms that, in reality, most of us fall woefully short of our inflated self-perception” (Banaji et al., 2015).

2. Gender norms: (or gender schema)

Yvonne Hirdman, professor in history, has introduced the concepts of gender and gender systems in Sweden (SOU 1990: 4). According to her, each society creates and maintains a system where women and men are assigned different tasks, roles and positions. Gender system is compound of four elements: gender norm, gender roles, gender socialisation and gendered power. Gender norms are the elements that keep the gender system intact.

On the words of gender schema theorists⁴ (Bem 1981; Martin and Halverson 1981) gender norms are developed and applied by children at an early age. There are two types of gender-related schemas (Martin & Halverson 1981). The first is a general ‘superordinate’ schema that helps children categorize objects, characteristics, and traits into basic male and female categories. The second is a more narrowed version of schema, called the ‘own-sex’ schema, children use to identify and learn in-depth information consistent with their own sex. These two schema types allow children to process information about events, objects, attitudes, behaviours, and roles and, in turn, categorize these aspects in terms of masculine or feminine (Martin & Halverson 1981).

3. Gender roles and stereotypes:

“Gender roles are consensual beliefs about the attributes of women and men” (Eagly & Karau, 2002, p. 574). In earlier research Eagly, also claimed that “these beliefs are more than beliefs about the attributes of women and men: Many of these expectations are normative in the sense that they describe qualities or behavioural tendencies believed to be desirable for each sex” (Eagly, 1987, cited in Eagly & Karau, 2002, p. 574). Furthermore, in Eagly’s and Karau’s role congruity theory (Eagly 1987, cited in Sümer, 2006), roles are

³How (Un)ethical Are You? December, 2003, Harvard Business Review. <https://hbr.org/2003/12/how-unethical-are-you>

⁴Gender schema theory is a cognitively based theory that uses an information processing approach to explain how gender development occurs.

divided into two norms or expectations; (1) *descriptive norms* (or stereotypes), which are expectations concerning about what a group of people actually do, and (2) *injunctive norms* which are expectations concerning about what some people ought to do or ideally would do (Eagly & Karau, 2002). They predict one's educational and occupational aspirations and choices (Eccles et al., 1983; Schoon & Parsons, 2002).

According to the theory of social role, perceivers infer that there occurs a correspondence between the types of actions people engage in and their inner dispositions. As a consequence, the descriptive aspect of gender roles originates in perceivers' correspondent inferences from the observed behaviour of men and women to their personal traits that are from the activities that they commonly perform in their typical social roles to the personal qualities that are apparently needed to undertake these activities (Eagly, 1987; Eagly et al., 2000). Gender stereotypes thus follow from observations of people in sex-typical social roles especially, men's occupancy of breadwinner and higher status roles and women's occupancy of homemaker and lower status roles (see Eagly et al., 2000).

Both the descriptive and injunctive aspects of gender roles are well documented. Evidence that descriptive norms or stereotypes are associated with women and men is abundant: People believe that each sex has typical and divergent traits and behaviours (e.g., Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Diekman & Eagly, 2000; Newport, 2001; J. E. Williams & Best, 1990a). A key proposition of social role theory is that the majority of these beliefs about the sexes pertain to communal and agentic attributes (Bakan, 1966; Eagly, 1987). Communal characteristics, which are ascribed more strongly to women, describe primarily a concern with the welfare of other people for example, affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturant, and gentle. In contrast, agentic characteristics, which are ascribed more strongly to men, describe primarily an assertive, controlling, and confident tendency—for example, aggressive, ambitious, dominant, forceful, independent, self-sufficient, self-confident, and prone to act as a leader.

4. Gender impact on the economic growth:

“Gender equality will encourage new solutions and expand the scope of research; it should be considered a priority by all if the global community is serious about reaching the next set of development goals.” Sophia Huyer⁵

Marianne A. Ferber and Julie A. Nelson (1993) state that gender and economy must be understood in terms of socially constructed relationship that are interrelated in an important way, where gender influences both content and method of economics. They also suggest that the discipline of economics could be improved by freeing itself from masculine biases.

Era Dabla-Norris is a Division Chief in the IMF's Fiscal Affairs Department talked also about the importance of gender equality, she accentuate the fact that men and women are equally talented yet they bring different skills to the economy, the valuation of these complementary skills boosts economic growth and raises living standards. (Dabla-Norris &kochar, 2019).

Among the studies finding that gender inequality hurts economic performance, there are profound disagreements on the size of the effects. While Duflo (2012) finds them to be generally modest, stimulation studies by the McKinsey Glob. Inst. (2015) recently estimated that the removal of all gender gaps in labour markets (participation, hours, and pay) alone would add a whopping US\$28 trillion or 26% to world gross domestic product (GDP), equivalent to the combined size of the US and Chinese economies.

Women’s economic empowerment is the highest contributing factor to close the gender gap. According to the World Bank, addressing gender inequalities by focusing on women’s empowerment is not only essential to reduce poverty but is also “Smart Economics”. Better gender equality enhances productivity and improves development and outcomes for future generations. Women represent 40% of the entire global labour force and more than half of the world’s university students. Increasing productivity is directly related to empowering women by making it easy for them to access education, develop competency in a skill set, and pursue opportunities to use their talents.

⁵Sophia Huyer(b. 1962: Canada) is Executive Director at Women in Global Science and Technology. She is also Gender and Social Inclusion Research Leader of the Climate Change, Agriculture and Food Security Program of the Consultative Group on International Agricultural Research. She holds a PhD in Environmental Studies from York University in Toronto (Canada).

5. How to unconscious gender bias attenuation in the workplace:

Williams (1991; 1992) studied both men in predominantly female occupations and women in predominantly male occupations. Williams found out that gender bias is affecting both gender, that not only women but also men working in female jobs experienced discrimination. Most of the time people don't realise the implicit bias they have towards one gender, from both men and women, especially in the workplace as it affects not only women but all. Second, after being fully aware of the later it should be put to question; why does it happen and how to explain it? How to attenuate it? Researchers put certain possible explanations for implicit gender bias in the workplace:

- Gendered occupational sex segregation: refers to the concentration of women and men in different occupations, women are more likely to do certain jobs and men others. The jobs women are more likely to work in have been dubbed “pink-collar” jobs. While “white collar” describes well-paying managerial work and “blue collar” describes manual labour predominantly done by men with a full range of income levels depending on skill, “pink collar” describes mostly low-wage, female-dominated positions that involve services and, often, emotional labour. The term *emotional labour*, developed by sociologist Arlie Russell Hochschild (1983), is used to describe work in which, as part of their job, employees must control and manage their emotions. For instance, a waitress risks being fired by confronting rude and harassing customers with anger; she must both control her own emotions and help to quell the emotions of angry customers in order to keep her job. Any service-based work that involves interacting with customers (from psychiatrists to food service cashiers) also involves emotional labour. The top three “pink-collar” occupations dominated by women workers—secretaries, teachers, and nurses—all involve exceptional amounts of emotional labour.
- Job level sex segregation: “the specific positions that workers hold within specific establishments” (Reskin, 1993, p.243). The extent of job level segregation is much higher than sex segregation by occupation during the 1970s a study found that the index of job level segregation was 30% higher than that of sex segregation by occupation (Beilby& Baron, 1984).
- Feminized work: work thought to be “women’s work” is not only underpaid, it is also socially undervalued or taken to be worth less than work thought to be “men’s work.” Care work is an area of the service economy that is feminized, involves intense

emotional labour, and is consistently undervalued. Caretakers of children and the elderly are predominantly women. Economist Nancy Folbre (2001) has argued that care work is undervalued both because women are more likely to do it and because it is considered to be natural for women to know how to care. Women have traditionally done care work in the home, raising children and caring for sick and dying relatives, usually for free. Perhaps this is because women bear children and are stereotyped as naturally more emotionally sensitive than men. Women are stereotyped as having natural caring instincts, and, if these instincts come naturally they are more likely to do these jobs. In reality, care work requires learned skills like any other type of work.

Such stereotypes are proven to impact careers in the form of the two phenomena as:

- Glass ceiling: women face difficulties in being hired and promoted to higher-level positions in the organization, mainly women working in male-dominated fields. One example of the glass ceiling and gender discrimination is the class action lawsuit between Wal-Mart and its female managerial staff. Although Wal-Mart has hired some women in managerial positions across the country, they also have informal policies, at the national level, of promoting men faster and paying them at a different wage scale. While only six women at Wal-Mart initiated the suit, the number of women that would be affected in this case numbered over 1.5 million. Wal-Mart fought this legal battle over the course of ten years (2001-2011). The case was finally decided in June 2011 when the US Supreme Court sided with the defendant, Wal-Mart, citing the difficulty of considering all women workers in Wal-Mart's retail empire as a coherent "class." They agreed that discrimination against individuals was present, but the fact that it could not be proven that women, as a class, were discriminated against by the Wal-Mart' corporation kept them from being found guilty (Wal-Mart Stores Inc. v. Dukes, et al., 2011).
- Glass escalator: is that when men participate in pink-collar jobs, they get easily hired and actually advance to higher-level positions faster than comparable women. This phenomenon, in contrast to the *glass ceiling*, is known as the *glass escalator*. (Williams, 1992)

Certain solutions are found to help attenuate implicit gender bias inside the company:

- Anonymized Job Applications: removing the information that may triggers the bias in the first place will eliminates the possibility of it to impacting decisions.

- Structured performance evaluation: implementing a structured evaluation system will allow supervisors to assess their subordinates according to specific uniform criteria related to work performance. This will help stopping all kinds of implicit biases from influencing the evaluation process.
- Training employees: companies have invested in diversity training to change attitudes and behaviours. However, the insights of experts on this topic indicate that training aimed at promoting awareness of unconscious bias in general is not enough to overcome it. According to McKinsey and Company (2016), almost all companies offer anti-harassment/ discrimination training but far fewer offer employees training to eliminate bias in hiring (67 per cent) and in performance reviews (56 per cent). When employees do not understand how bias works, they are less likely to identify it in themselves and come to fair and accurate decisions. They are less likely to push back on bias when they experience it.

6. Human capital and social capital:

Economist have linked economic growth with gender through two essential factors human capital and social capital, most relevant literature has illustrated the negative impact of gender inequality on economic growth considering that a fixed capital can promote economy (e.g. Galor & Weil 1996).

Dollar & Gatti (1999) - Gender inequality decreases the average of Human Capital, because talented females would be superseded by unqualified males which can lead to inefficient economy.

Galor & Weil (1996) - Thirwall (2003) - Increasing the level of female Education, declines fertility levels and child mortality levels which have a positive effect on Economic Growth.

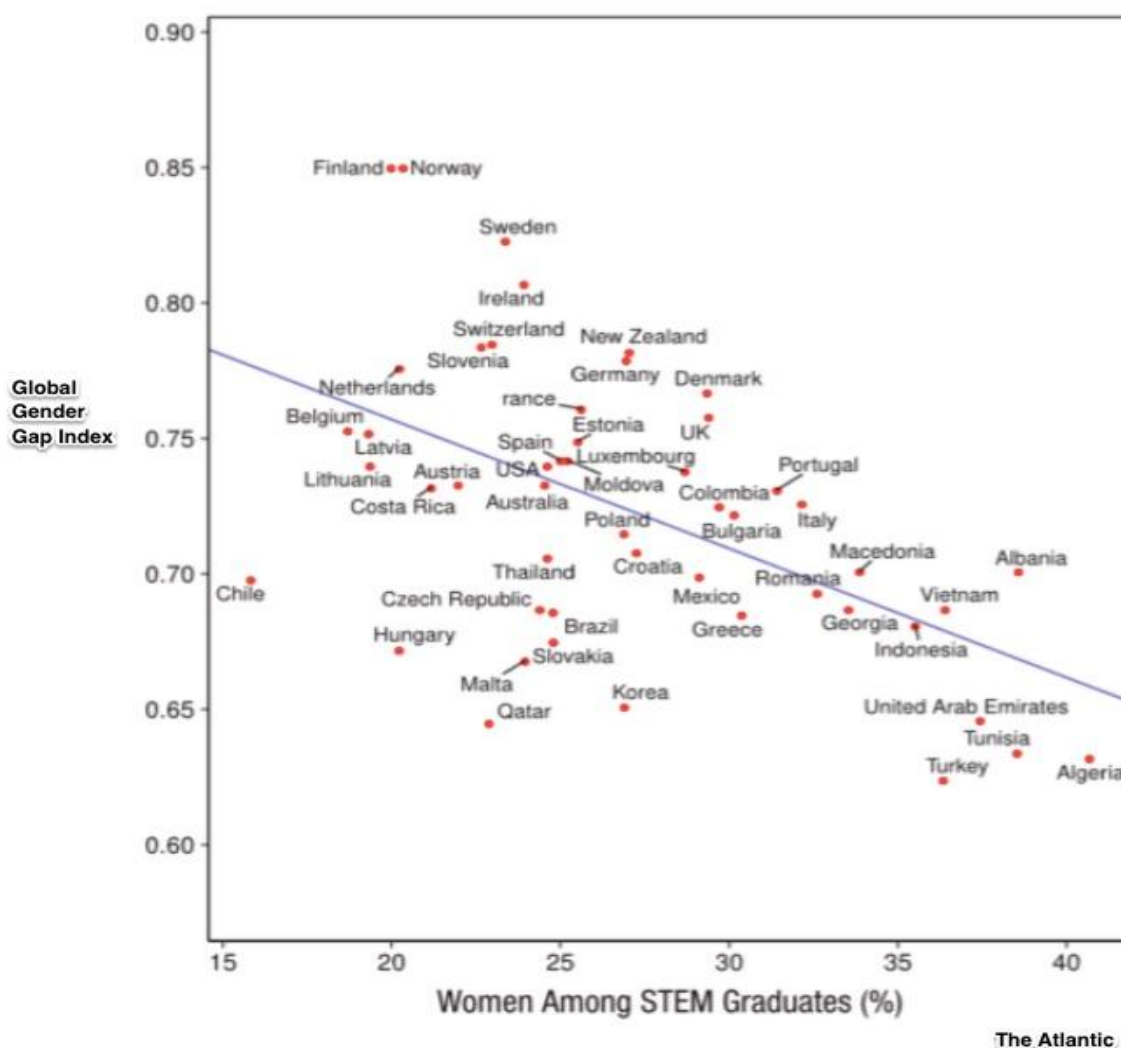
Mark Blackden et al. (2007) - Gender inequality in Employment can lead qualified females to quit the Labour Market, therefore the level of labour force performance decreases and Economic Growth would decline.

Anand Swamy, Omar Azfar, Stephen Knack and Young Lee (2001) - Females with power are more reputable than males; in addition men are more nepotistic than women. Therefore economic performance by women would improve.

6.1. Ratio of Algerian female to male students in tertiary level education

World Bank data provide the following data for Algeria from 2004 to 2018. The average value for Algeria during that period was 1.45 percent with a minimum of 1.08 percent in 2004 and a maximum of 1.67 percent in 2016. The latest value from 2018 is 1.66 percent. For comparison, the world average in 2018 based on 60 countries is 1.31 percent. The highest value was in Qatar: 7.82 percent and the lowest value were in Afghanistan: 0.35 percent, Algeria in the eighth place with 1.66 percent (World Bank Data). A recent study also shows that Algeria is among the countries with the least gender gap in education and the highest percentage of female STEM graduate is more than 40%.

Figure 1: A scatter plot of countries based on their number of female STEM graduates and their Global Gender Gap



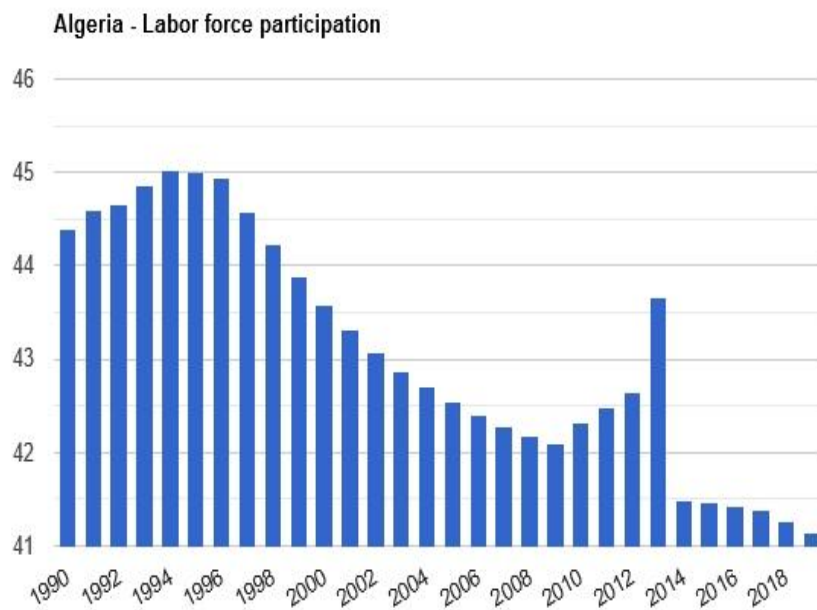
The scatter displays the gender STEM gap, a measure of opportunities for women. Algeria, as it is known, with 41 percent of college graduates in the fields of science, technology, engineering, and math are female, is among the countries with the least gender gap in STEM education.

7. The Evolution of female labour force in Algeria:

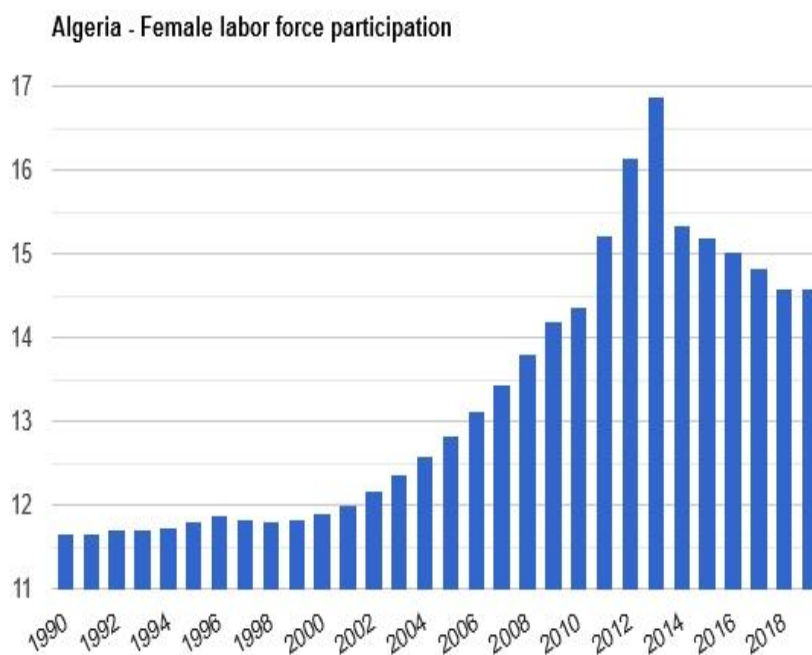
Definition: Labourforce participation rate is the proportion of the population ages 15 and older that is economically active: all people who supply labor for the production of goods and services during a specified period (World Bank, 2019).

According to the statistics from the world bank female labour force has been noticeably increasing the past fifteen years in contrast the male labour force has generally decreased, yet the female labour force participation with 17,63 % in 2019 it is still marginal in compared to the male labour force participation in Algeria. The latest ONS⁶ statistics also indicates that there were 11 million workers in Algeria in 2018, including 9 million men and 1.9 million women.

⁶ National Statistics Organisation, <http://www.ons.dz/>

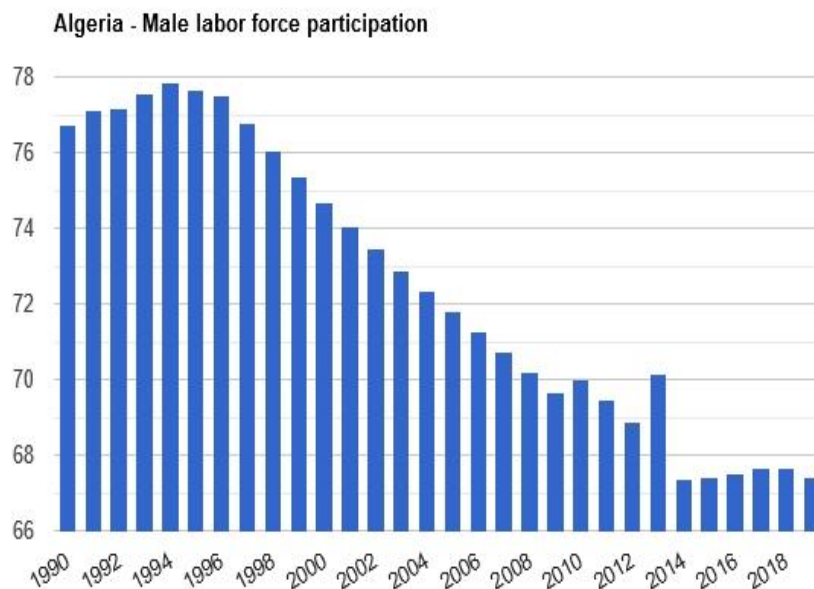
Figure 2: Algeria labour force participation from 1990 to 2018

Source: TheGlobalEconomy.com, The World Bank

Figure 3: Algeria female labour force participation from 1990 to 2018

Source: TheGlobalEconomy.com, The World Bank

On one hand, Even though labour force has decreased in Algeria in the last six years, female participation has noticeably increased in the last twenty years to stabilise between 14 and 16 percent in the last six years. The percentage is still incomparable to that of male's participation in the labour market.

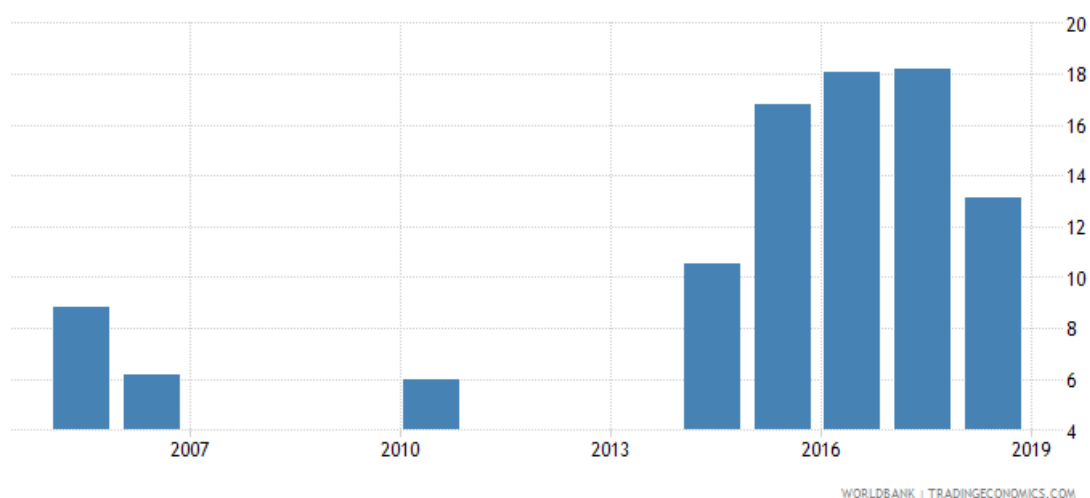
Figure 4: Algeria male labour force participation from 1990 to 2018

Source: TheGlobalEconomy.com, The World Bank

On the other hand, male labour force participation has been increasing in the last twenty year and remarkably more in the last years which explains that the decrease witnessed in the Algerian labour force is mainly related to male.

7.1. Algerian Female students in tertiary education enrolled in engineering:

On the contrary of some European and Asian countries, Algeria among a number of other developing countries, has a sizeable proportion of female engineers (32%). At least three out of ten engineers are women. Yet only 40% of the female engineer graduates actually get recruited (UNESCO, 2019).

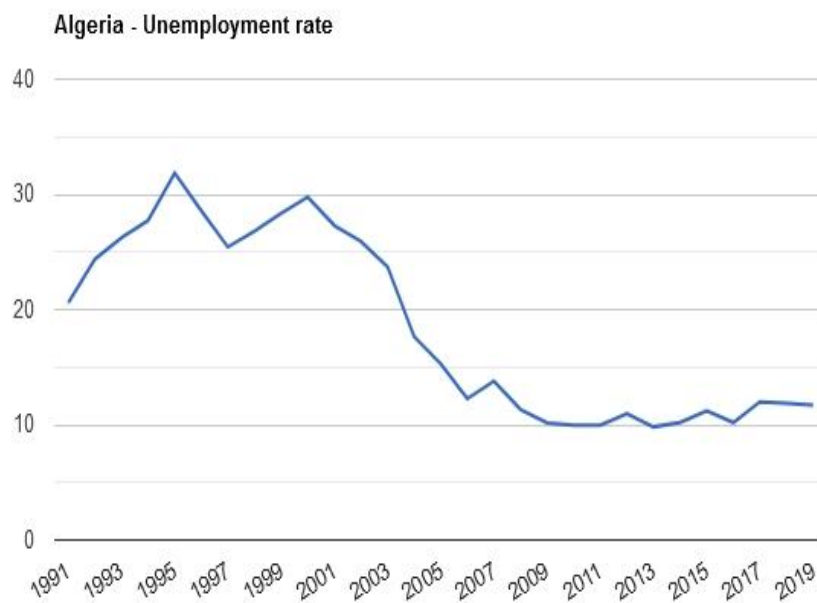
Figure 5: Algeria female students in tertiary education enrolled in STEM

Dalila Iamarene Djerbal, an Algerian sociologist, emphasizes on the devaluation of girls who have completed technical and scientific studies, many of whom “find themselves confined to offices, to administrative positions.” “In the hydrocarbon sector, for example, where we have female engineers, the first drill was recruited in 2016 or 2017”.⁷

7.2. Algeria unemployment rate:

Data provided for Algeria from 1991 to 2019. The average value during that period was 18.45 percent with a minimum of 9.82 percent in 2013 and a maximum of 31.84 percent in 1995. The latest value from 2019 is 11.7 percent. For comparison, the world average in 2019 based on 182 countries is 7.04 percent. (Gender Data Portal, 2019).

⁷RCD Symposium on "Political and Socioeconomic Participation of Women in North African Countries" "In Algeria, women represent 18% of the working population" El Watan, 2018.

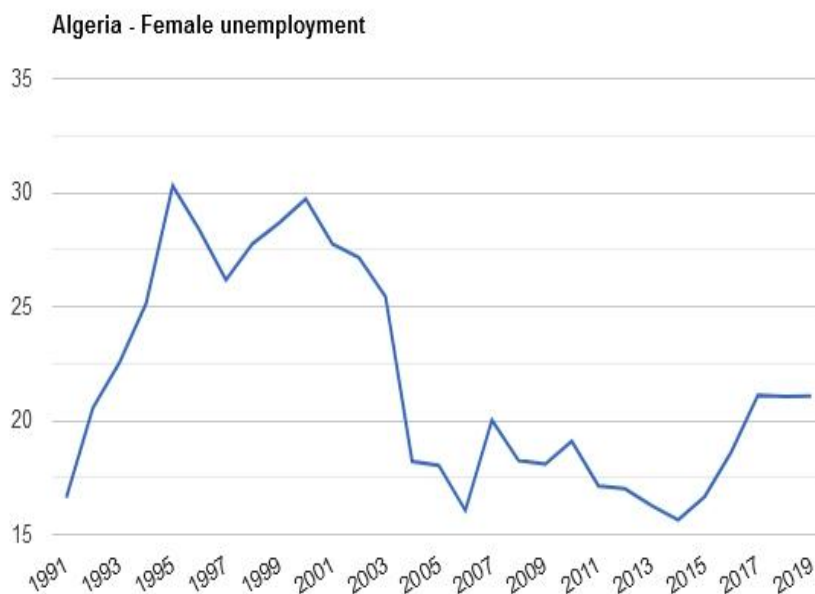
Figure 4: Algeria unemployment rate

Source: TheGlobalEconomy.com, The World Bank

Unemployment rate has decreased by almost 20 % in the last ten years in Algeria.

7.2.1. Female unemployment rate:

The provided data for females is from 1991 to 2019. The average value during that period was 21.67 percent with a minimum of 15.64 percent in 2014 and a maximum of 30.3 percent in 1995. The latest value from 2019 is 21.08 percent. For comparison, the world average in 2019 based on 182 countries is 8.47 percent (Gender Data Portal, 2019).

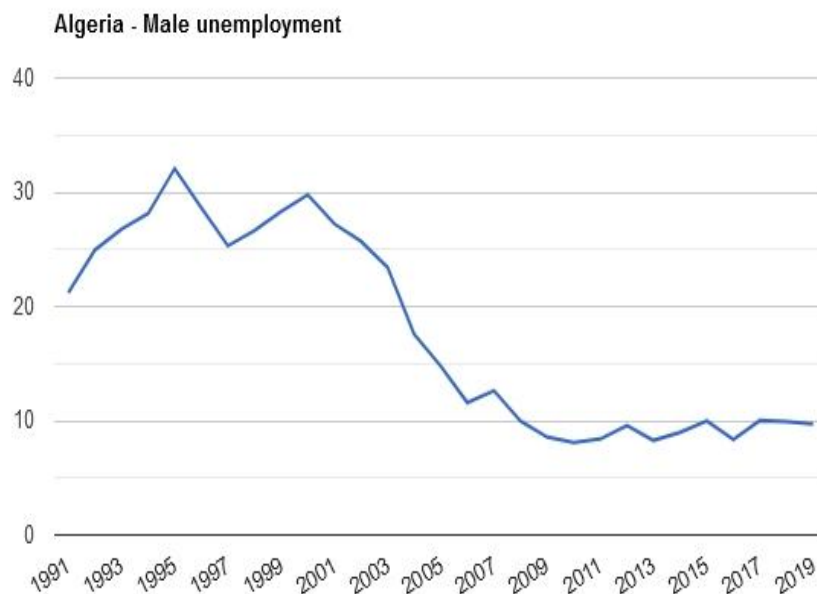
Figure 7: Female unemployment rate

Source: TheGlobalEconomy.com, The World Bank

Female unemployment rate has decreased between 10% and 15% which means in the last ten years more females has been employed.

7.2.2. Male unemployment rate

The provided data for males is from 1991 to 2019. The average value for Algeria during that period was 17.75 percent with a minimum of 8.11 percent in 2010 and a maximum of 32.07 percent in 1995. The latest value from 2019 is 9.7 percent. For comparison, the world average in 2019 based on 182 countries is 6.46 percent (Gender Data Portal, 2019).

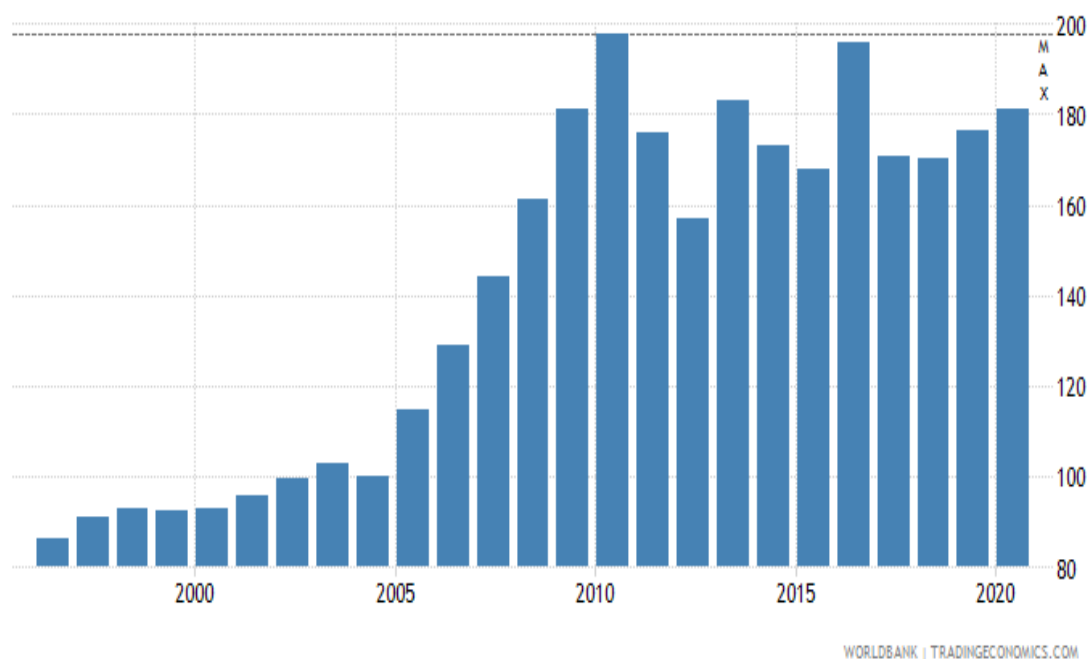
Figure 8: Male unemployment rate

Source: TheGlobalEconomy.com, The World Bank

Male unemployment decreased with 20% in the last ten years compared to that of females with the percentage of the total unemployment rate indicates that even though more females has been employed yet the number is still marginal compared to that of males.

7.2.3. Algeria female to male youth unemployment rate:

The ratio of female to male youth unemployment rate (% ages 15-24) in Algeria was reported at 181 % in 2020, according to the World Bank collection of development indicators, compiled from officially recognized sources.(Gender Data Portal, 2019)

Figure 9: Algeria female to male unemployment rate

The gendered unemployment rate has importantly increased in the last ten years. With a low female participation rate and a high unemployment rate the Algerian labour market is marked by some real persisting and significant gender disparities.

A recent study gave an alternative explanation for gender inequalities (Benhabib&Adair,2018). According to the study, females opportunities to access employment are limited, not only because of the deficit in high quality employment, but also because of the use of unofficial job search channels. A recent study highlights the prominent use of social networks in getting a job. Using a Logit model applied to employment survey data from the ONS, Lassassi and Muller (2013) show that women have less recourse to personal or family relationships in the job search process and when they eventually find a job this way, it is mostly less skilled. In addition, the size of the network affects job search strategies and therefore access to the labour market. The assumption that women's social networks are less developed than those of men implies that women have fewer opportunities to access employment in a context where access to information is limited (Stigler, 1962). In addition, some women choose not to participate in the labour market due to family and / or socio-cultural constraints (Benhabib& Adair, 2018).

Chapter III

Background of the study area

1. Group history:

1.1. Group Sonelgaz: EGA: ELECTRICITY AND GAZ OF ALGERIA [\(1947-1962\)](#):

At the end of the Second World War, France decided to industrialize Algeria with the objective of transforming the colony into a real industrial backbone of France. Thus, France envisaged launching industries such as the iron and steel industries with the creation of blast furnaces in Bône (Annaba) to exploit the Ouenza's iron ore, cement plants with the opening of facilities at Pointe Pescade and Sfisef, as well as other sectors such as earthenware, glassware, oil mill...

Before 1946, fifteen local limited companies were sharing power concessions in Algeria, dividing the Algerian territory into zones; each zone was managed by a Company.

1. North Africa hydroelectric company;
2. Electrical energy from western Algeria;
3. Mostaganem Gas and Electricity Company;
4. Lalla-Marnia Electric Power Company;
5. Saida's Power and Electrical Lighting Company;
6. Algerian Lighting and Strength Society;
7. Society of the driving forces of Algeria;
8. North Africa's Electric and Gas Union;
9. Gas and electricity company for France and Algeria;
10. Constantine electric power company;
11. Agricultural collective interest society of electrification of the Bône Plain;
12. Central Gas Lighting Company Lebon and Co;
13. Western Hydroelectric Union constantinois;
14. Company of the Bourbonnais;

15. Colonial Electric union.

Considering how essential electrical and gas energies and by the decree of June 5, 1947, The National Public Establishment “Electricity and Gas of Algeria” (EGA by abbreviation) was created. It had the monopoly of electricity and gas’ production, transport, and distribution. EGA brings together the former private-sector production and distribution companies, notably LebonetCie and SAE (Algerian Electricity and Gas Company), which fall under the 1946 nationalization law promulgated by the French State (SONELGAZ, 2020).

1.2. Creation of Sonelgaz:1969

On 28 July 1969, the new National Society of Electricity and GAS - SONELGAZ - was created dissolving the previous entity ÉlectricitéETGazd'Algérie (EGA) by the ordinance No. 69-59 of July 28, 1969 (published in the official gazette 63 of August 1, 1969). The ordinance has granted the company the monopoly on the production, transmission, distribution, import and export of electricity and manufactured gas (sections 4 and 7). (SONELGAZ, 2020)

The transformation has allowed Sonelgaz to contribute to the construction of the national economic infrastructure by giving the company the organizational and managerial capacities to support and sustain the country’s economic and social development. This includes the industrial development and providing as many people as possible with electrical energy (SONELGAZ, 2020)

1.3. Creation of works’ subsidiaries: 1983

In the mid-1970s, the company started the country’s total electrification program, in order to finish the program and to meet the ambitious objectives of infrastructures and networks’ development. The company decided to implement a new energy policy that would give it new capabilities to deploy and manage its projects in a constant dynamic environment. Thus, Sonelgaz knew its first restructuring in 1983, by creating five specialized work subsidiaries that has rapidly developed to become autonomous enterprises (SONELGAZ, 2020):

- The electrification works company – KAHRIF
- The electrical works and assembly company – KAHRAKIB

- The pipelining company – KANAGHAZ
- The infrastructure realization company – INERGA
- The industrial assembly company – ETTERKIB

1.4. SONELGAZ became an EPIC in 1995

By executive decree N ° 95-280 of September 17, 1995, Sonelgaz became a Public Establishment with industrial and commercial character operating under the sponsorship of the Ministry of Energy and Mines. The same decree assigns Sonelgaz the public service mission (SONELAZ, 2020).

1.5. SONELGAZ became a joint stock company (SPA) in 2002

Under Presidential Decree No. 02-195 of June 1, 2002 providing for the statutes of the Algerian Company of electricity and gas called "Sonelgaz. Spa", Sonelgaz went from a public industrial and commercial establishment to a joint-stock company whose capital is held by the State. This new status allowed Sonelgaz to hold a portfolio of shares and other securities and to take stakes in other companies (SONELAZ, 2020).

1.6. Subsidiarity of core activities: 2004

In January 2004 Sonelgaz restructured and created three autonomous companies in charge of its "core businesses":

- The Algerian Electricity Production Company (SPE)
- The Algerian company for the Management of Electricity Transport Network (GRTE)
- The Algerian Gas Transmission Network Management Company (GRTG)

This process has transformed the company to holding company driving a group of companies.

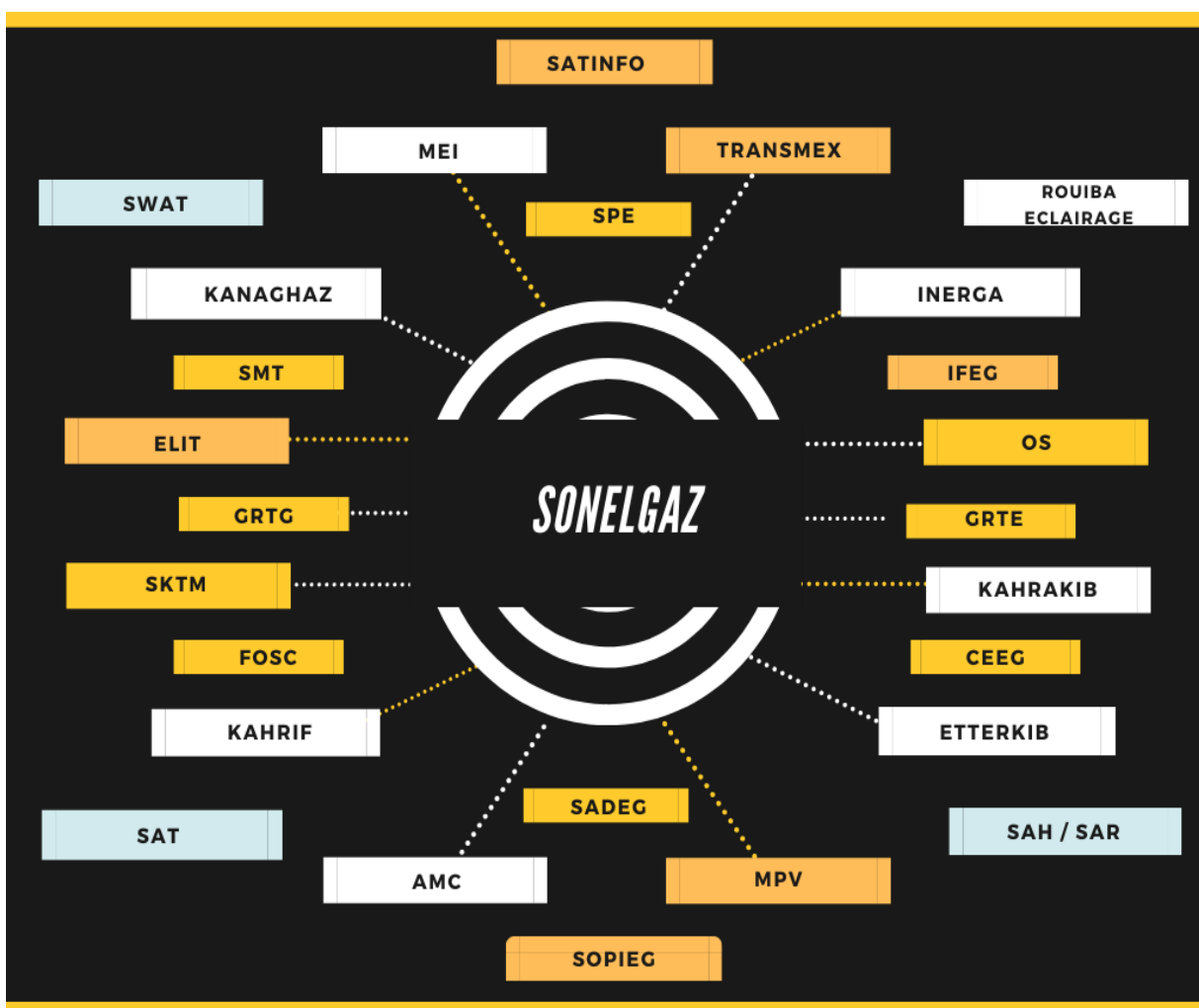
1.7. Restructuring Completion: 2009

After the big success the group made after the restructuring of its core businesses the need to grow more was essential, therefore, the group created three more companies:

- CEEG (Electricity and Gas Engineering Company)
- ELIT (El Djazair Information Technology),
- SOPIEG (Company of electricity and gas infrastructure and property)

Later on other subsidiaries joined the Group such as the Rouiba Eclairage in 2009; hence Sonelgaz is now an Industrial Group of forty companies (subsidiaries owned by Sonelgaz, direct participation companies and indirect holdings). In accordance with the law n° 02-01 of February 5, 2002 about electricity and gas distribution by pipelines, Sonelgaz SPA became a "Holding Company" on Monday, May 2, 2011, after the revision and the approval of its statute by the Ministers' Council. (SONELAZ, 2020)

Figure 10: Group SONELGAZ Subsidiaries after 2009 restructuring



1.8. Group Sonelgaz Subsidiaries:

Table 1: classification of Group SONELGAZ Subsidiaries

Professions	Industrial manufacturing	Services	Surveillance Companies	Participations
SADEG	INEGRA	ELIT	SWAT	SKB spa
GRTE	AMC	IFEG	SOR	SKS
GRTG	ETTERKIB	CREDEG	SAH	SKT
CEEG	KAHRAKIB	SMT	SOAT	SKD
OS	KAHRIF	CASEG		SKH
SPE	MEI	MPV		GEAT
SKTM	KANGHAZ	TRANSMEX		BHI
	ROUIBA	SOPEIG		VIJAI
	ECLAIRAGE			
		SATINFO		BAOSEM
		FOSC		COMINTAL
		HMP		ALGESCO
		SWAT		NEAL
				HYENCO

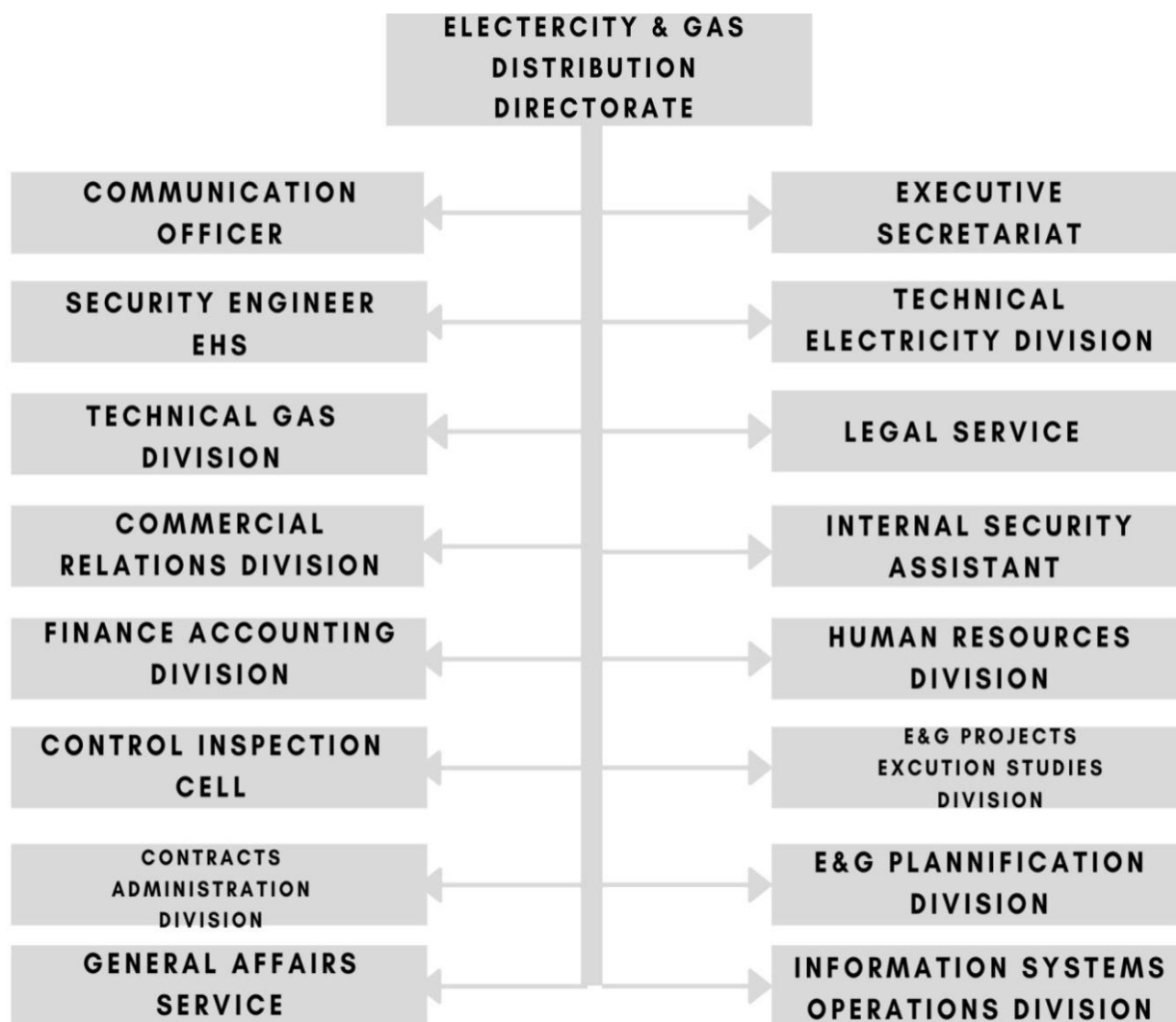
2. Algerian Society of Electricity and Gas Distribution (SADEG):

The new organizational plan for the distribution activity decided by the Public Authorities⁸ led to the creation of the Algerian Company for the Distribution of Electricity and Gas, called SADEG. Spa result of the merger-absorption of the companies SDC, SDE, SDO and SDA. Created on May 22, 2017, with a share capital of 64 billion Dinars, the Algerian Company for the Distribution of Electricity and Gas, called "SADEG. Spa", a joint-stock company whose head office is located at the level of the 500 offices building - Route

⁸by decision No. 6877/CEO. SDC of 27/11/2017

regionale n ° 38- Gué de Constantine- Algiers, manages through its fifty three (53) Distribution Departments, 48 electricity concessions and gas extending over the national territory. By virtue of its missions and attributions, SADEG places at the service of its customers no less than 187 Electricity Districts and 186 Gas Districts as well as 378 commercial agencies.⁹

Standardized Structural Organization of the Distribution Directorate:



⁹ SADEG. (2019). *Nous connaissons*. <https://www.Sadeg.Dz/>. <https://www.sadeg.dz/?option=rubrique&idr=43>

Chapter IV
Results' Discussion

Results

The findings of this study are presented into three main themes: implicit bias indicators, female work assessment, Stereotypes which falls under the topic of “**Gender roles and social norms**”. The themes are derived from the interview’s questions as it has been mentioned before in the methodology primary data was analyzed using thematic coding put into categories then themes. Then the themes were connected to consolidate results from secondary data in order to finally answer the research questions, observation notes were also included. Findings related to the interviewee’s background are also included.

1. Interviewee’s background:

First starting with the participant’s background: age, education, social life and ambitions. The average age of the interviewees is 41 year-old, the oldest is 52 year-old and the youngest is 27 year-old. All the interviews had almost the same background they all come from Tiaret and graduated from the same university except for two participants who graduated from two different schools. Participants said that all of their families are supportive and they do not have a problem with the nature of their work and are allowed to go out both to the field and on missions when necessary.

All eleven engineers chose to become engineers except for participant “3” and “5”, participant “5” wanted to become a doctor and “3” I quote: “*I chose what was available here as my family did not allow me to study elsewhere*”. But both said they do not regret studying it and are satisfied with their studies same as all the other participants. All of the participants grew-up here in Tiaret, three of them studied outside the rest graduated from the same university.

2. Implicit bias indicators:

2.1. Communication and work environment :

2.1.1. *Man speak with each other in a less formal way*

“When male are alone in an office they speak in a less formal way with each other, they joke around and sometimes even fight” participant number “2”

All the interviewees agreed that this was considered as a form of respect for the females and not based on any biases. Since most of the males are friends outside of the company so they can act sometimes in an informal way with one another inside the company.

2.1.2 Female engineers needs to be diplomatic with the agents

*“Agents are very difficult to deal with, they do not refuse an order but they stall plus I do not give orders like in a rigid way nor consider it that way, it is just their job and they have to do it.”*Participant number “5”

When it comes to communication I got the same responses from all the participant, it was based on mutual respect and limited to the work frame most of the time, the only worry female had was getting agents to do the job they are required to do. Agents cannot refuse to do it but females had to be more persistent with them to do the job.

2.2. Appearance and behaviour:

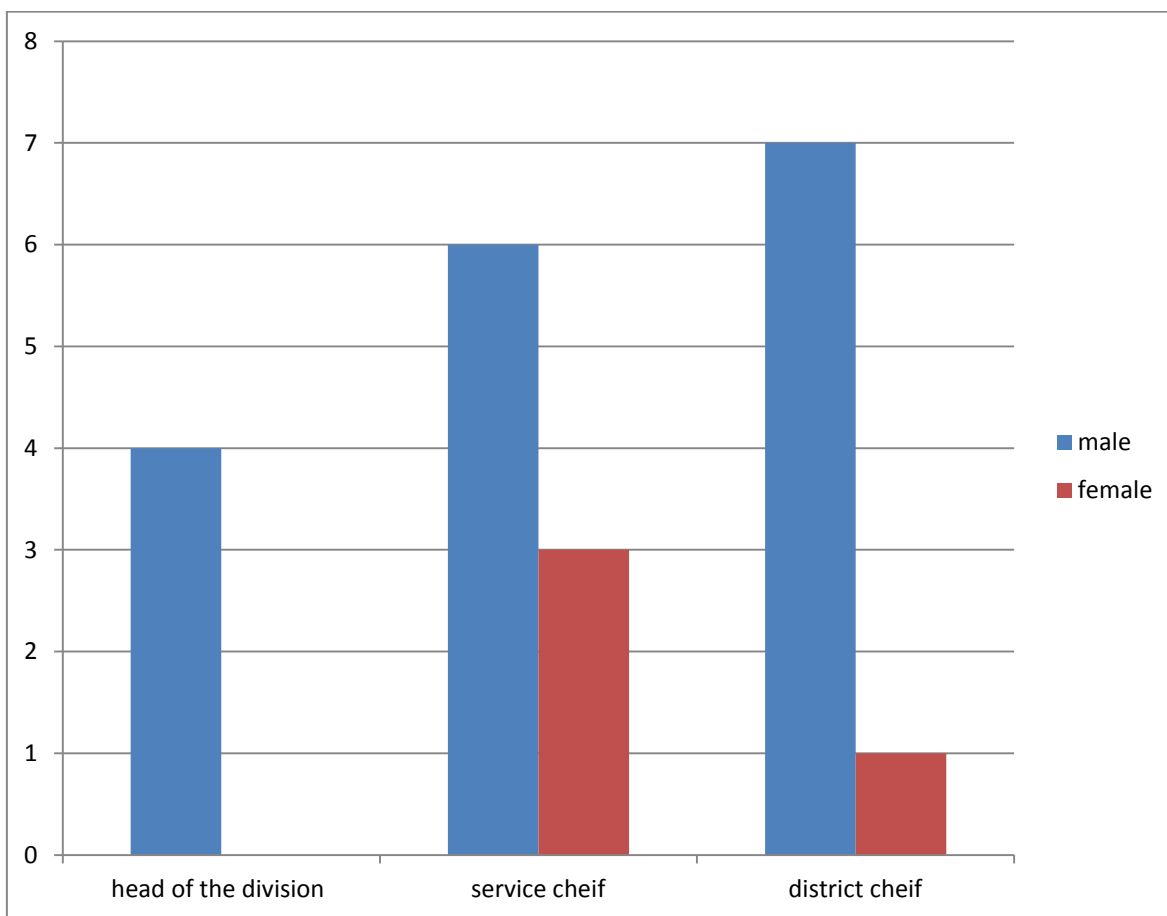
2.2.1. Female never faced any trouble considering their appearances

“All along my 20 years in this company no one has ever interfered with the way I dress or with anything personal and I never heard them interfere in others businesses too, if you respect yourself and them they respect you, plus the group has a strict laws and female rights are preserved”. Participant “6”

Considering appearance and the way of talking and acting females did not have any problem, as long as it descent and respecting the company’s regulations (ethics charter, interior regulations)

2.2.2. Male engineers occupy most of higher positions in the company than females

The number of male engineers in the company is far more than that of the female engineers with 50 male engineers and only 11 female engineers. This explains why there are few females occupying high position in the company. Out of eleven females five has occupied high positions, three others said that they are satisfied with their current positions, two others were newly recruited and they lack experience to apply for a higher position.

Figure 11: number of female and male engineers occupying high positions in the company

3. Female work assessment:

3.1. Women needs to work hard to prove themselves in such a field

“I believe that female give 100% in work and it is well known that female has to pull double efforts to prove herself especially in such domain. To succeed means you have to sacrifice something”. Interviewee number “5”

3.2. Daily tasks and job related problems

Engineers’ daily tasks are divided to two categories: field related tasks and administrative tasks plus night shifts. Not all engineers were concerned with field interventions and night-shifts; it depends on the engineer’s specialty and the job he/she occupies. This was taken into consideration in the analysis.

3.3. Field intervention:

Ten out of the eleven interviewees and forty-eight male engineers out of fifty were suppose to intervene in the field.

3.3.1. Lack of resources is an obstacle

“I do not go to the field as much as I am suppose to because we lack resources in the company, for example I need a car and a driver to go out and we only have two cars functioning in the entire directory” “1”

Most of the interviewees insisted on the fact that they prefer going out to the field to conduct the studies and collect the required data themselves, and agreed that it was due to the lack of resources.

3.3.2. When necessary

“Most of the time our male colleagues go out but when necessary we go, when it comes to something that we have to deal with personally” “4” “5”

The two participants clearly stated that they prefer staying in their offices, and only go out when necessary.

3.3.3. Men take the responsibility of most field related tasks as a favor for women

“We go instead of her since she prefers staying in the office, there is no law preventing females from doing their job, neither a law obliging us men to go instead of them, we do it as a favor for the females who cannot.”

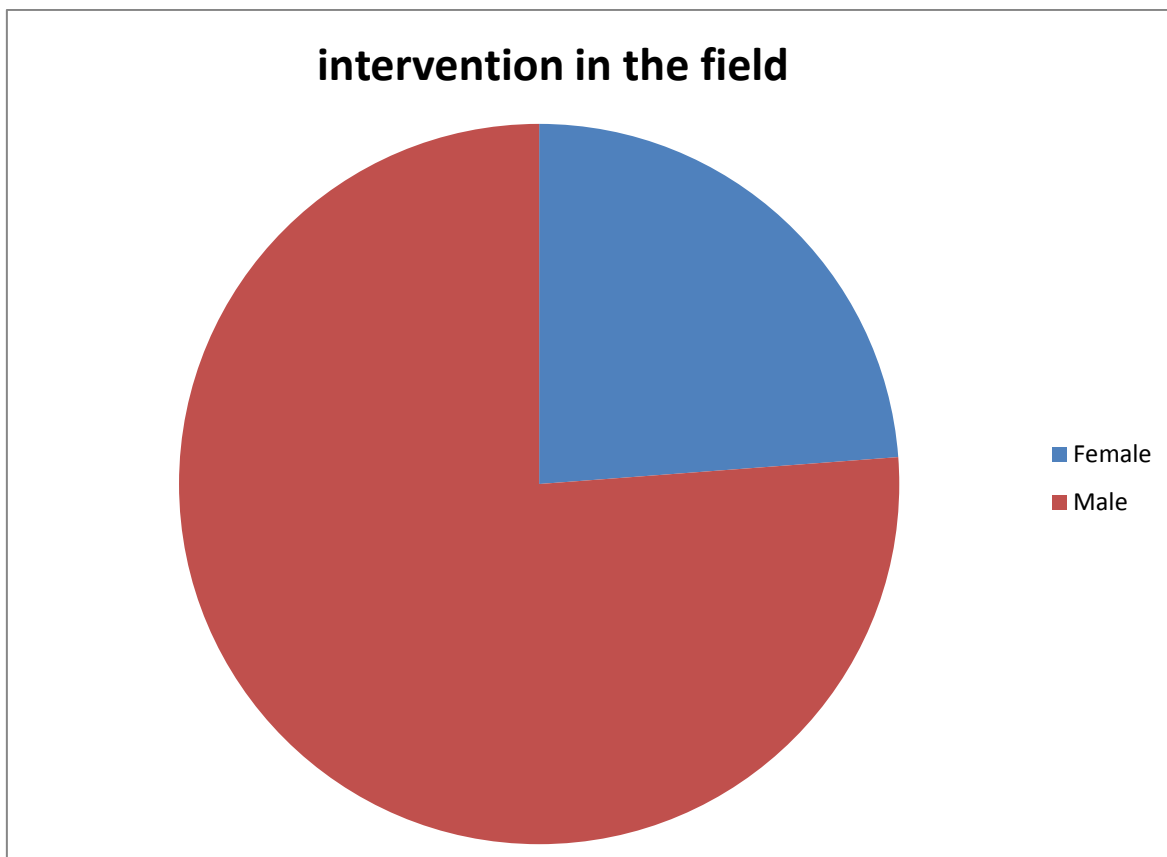
When working with the second participant I noticed that the other male engineers working with her went on missions and to the field more often yet she never did and thus the issue was raised, two male engineers were present and answered my question. The participant confirmed that she prefers sticking to her office, and thus eight of the participants were confined to their offices doing administrative tasks and rarely going to the field.

3.3.4. Lack of resources is just an excuse

“Even if we lack resources if I have a work to do in the field resources service has to arrange it so I can do my job, after all I will not sign anything I have not seen with my own eyes.” “6”

The three participants number “1” “6” and “7” went to the field more often and as far as my observations male engineers where going out too often to the field and did not complain from the lack of resources.

Figure 12: ratio of female and male intervention in the field



3.4. Night shifts

3.4.1. Females do not do night shifts

“Honestly, even though my position requires that I take part of the on-call team but I have never been named neither were any of my other female colleagues. I do not know about other concessions but here females do not do night shifts.” participant number “1”

On the one hand, three of the interviewees; number “1” and “9” and “11” are supposed to be part of the on-call team, night shifts are prerequisite in the job they occupy, yet neither did nor any of the other females. On the other hand, thirty-three out of fifty male engineers are obliged to do night shifts and cannot refuse the order unless under certain circumstances such as: absence, sickness or on vacation.

4.4.1. *The norms of the society influence the norms of the company*

“According to the labour inspection; female engineers cannot be obliged to do the night shift unless they want to.”Participant number”5”

The female engineers were actually protected by the law and had the free will to choose whether to take night shifts or not yet some were not even aware of it, speaking from both genders, for them it was just the tradition of how work is done there.

4. Stereotypes:

4.1. Women are emotional

Two participants were for and the others nine were against. Participant number “5” said: *“You cannot be emotional in such field, female leave their emotions out of the workplace”*.

4.2. Men focus more on their careers

Four participants were for; three married and one single who said: *“Married women has more responsibilities towards their families”*. The rest were against, participant *“said the answer is objective: it depends on each female ambitions, if she loves her job and wants to advance in her career she would focus even if she encounters a lot of obstacles and has other priorities”*.

4.3. I cannot be a mother and leader in such a field

“I was the head of division gas and electricity for two years and I could not balance between my family and career the position requires 24/24h availability for a single female it might be possible but for me it wasn't, after all it depends on one's ambitions and careers aspiration”. Interviewee number “3”

The other two married interviewees number “9” and “10” reinforced what interviewee number “3” said highlighting their satisfaction with their current position not needing any extra responsibilities. The rest of the females are single, two of them were also satisfied with their current positions and the others seek to advance in their careers.

4.4. Men cannot treat women as equals

“Of course they cannot, the Algerian society is based on pure binary gender system, we were raised thus.”

Four participants were for the statement while seven were against but the most important thing is that the latter was not contemplated as a any form of bias for neither one of them it was seen as a normal thing.

4.5. “Good ole-boys” men help each other get promotions

“We do not have such a thing as men club but we do have male clans, a clan of male who are friends outside the company and another clan of males who are not necessarily friends some do not even like each other but they unite to help one another in their careers, get promotions, etc.” Interviewee number “6”

On this fact all of the participants agreed that men help each other even male who do not get along. The male of the clan shared the same purpose; advance in their careers and get promoted.

4.6. Women fear to take risks

“Well it depends on each individual it has nothing to do with gender especially since we are talking about work.”

All interviewees agreed that it has more to do with the individual’s nature and personality and not gender.

Discussion:

According to Freedman, Carlsmith and Sears (1970, cited in Ajzen & Fishbein, 1980, p.25) “Attitudes always produce pressure to behave consistently with them, but external pressures and extraneous considerations can cause people to behave inconsistently with their attitudes.”

Based on what has been mentioned in the results, it implies that the lack of resources was just an excuse used by the eight participants justifying their incapability to fulfill the job requirements, male engineers were also burdened with the extra share of the females yet they could not complain. Not all gender inequality is necessarily the result of discrimination. (Klasen, 2007) female engineers of this company were self-stereotyping themselves.

Since, according to social gender norms, it is more convenient for females to work in offices and for males to do the hard tasks and thus gender is performed (Butler, 1991) these implemented thoughts has affected both genders leaving female to stagnate in their offices not fully using their capacities nor doing what they were formed to do giving the impression of being less competent or adequate for such job. Man’s attitude towards the situation can have to explanations: it was either a reflection of what females wants or that males were also behaving according to their associated gendered social traits.

Laws and company’s policy prohibit discrimination to protect women from being discriminated, but what can we do about gender norms and stereotypes; thoughts, perceptions. We cannot force people to change their thoughts and perception of certain thing imbedded implicitly in people’s subconscious. Social norms might be difficult to change. People might also perceive things differently, and some stereotypes and prejudices might be perceived negatively among some people, while it is perceived less negatively among other people. However, comparing interviewees’ responses, the majority believes that there are no differences between them and males in the company, at the same time being a female had it advantages and disadvantages in the company.

Glass ceiling (Williams, 1992) is clearly present in the company the number of female engineers is marginal compared to that of males. Females are less recruited in this field. However, when it comes to promotions results are not enough to build an assumption, although interviewees presume that they are not being biased yet younger and less

experienced man have surpassed them. If females are not being biased and their rights are preserved there is only one explanation left; female are holding themselves back unconsciously fulfilling their gender role.

The absence of females in higher position is a result of female communal attributes (Bakan, 1966; Eagly, 1987). Women in our society, on the contrary of men even if single, have far more obligations towards their families, when females finds themselves between two choices, their career or their family, they often choose their family; as it is considered the more righteous choice to make and thus females were following their communal attributes. Maternal wall for example was very clear women feel the urge to prioritize their kids over their careers. Only few females happen to advance in their careers and find balance as it is very difficult like my participants stated.

Conclusion

This research aimed to investigate unconscious gender bias among the engineers of Sonelgaz group and based on the qualitative analysis of the qualitative primary and secondary data collected it can be concluded that gender roles are implicitly preformed in the company. Gendered social norms and stereotypes are linking both genders of the organization to their normative and descriptive roles, thus females are being their communal self, as for males results cannot assume even though agentic attributes were noticed in males behaviour in the organization. A similar studies focusing on males point of view and behaviour's interpretation can enhance results validity and reliability.

Policies are needed to address the marginalization of women in these fields by recruiting more females. A more equitable recruiting process may help bring more females to the field, which can eventually change the perception of females in STEM professions. Societies see women as delicate and engineering as bold. Showcasing how women have contributed to developing physical infrastructures can be the impetus for changing public understanding on the roles of women in societies and on economy.

Limiting the laws that trigger implicit bias can also help reduce, in favour of females, social norms influence on the workplace. Furthermore, conditions on the ground are often not adapted to women's needs. Lack of attention and supporting policies either force women to stagnate in their positions or drive them away from such careers altogether.

To conclude, engineers must recognize the overwhelming evidence that they each harbor bias that influences professional decisions. As the study showcases that it is hard for these women to choose between meeting their gender role expectations or fulfilling their job requirements. The challenge is to actively promote a more equitable engineering community. Diversity and gender equality in engineering is the key towards a better economy.

Limitations:

Qualitative data collection and analysis is usually time-consuming and considering the actual pandemic situation my internship and intern's access to the company has been strictly denied. Time dedicated to data collection and analysis was insufficient which may had negatively influenced the conduct of this study.

Qualitative data do not fit neatly in standard categories, which make it difficult to analyse. Some interview answers did not match the observation notes. Further, there were some

contradictions in the interviews responses. The contradictions had made it very hard to maintain objectivity.

The findings cannot be generalised to organizations of other communities, since the results were based on social norms and the organisation's policy, gender roles differs from a community to another, organizations also have different policies. Therefore, if the setting of the study changes results may vary. The participants were from the same city and working in the same company, the sample used was narrowed and homogenic which may have limited the scope in this research.

Implication for Further Research:

This study was mainly designed to investigate implicit gender bias and determine the causes and effects of it using qualitative approach. It is to be considered a first step towards shaping certain awareness in the Algerian companies.

Future studies can focus on studying it in more complex ways the relationship between social norms and females in male-dominated fields with a focus on measuring the effect of gender roles on females. A wider sample from different companies in the same sector may help illuminate more the relationship between gender roles and the disparities in the Algerian labour force.

The results can be useful for policy makers who are interested in the efficiency in work and production and not only for those interested in gender studies.

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I. Appendix A: Interview Questions

Dear interviewers this interview aims to investigate unconscious gender bias among SADEG Tiaret concession engineers, thank you for your time.

Name:

Age:

Family status:

Occupation:

Experience:

1. Tell me about your background, and how you chose to be an engineer?
2. In what conditions your choice to study STEM discipline was taken?
3. How was your first job?
4. Describe your work environment?
5. In your present occupation, what are your tasks?
6. Generally, intervening on sites is among the tasks of your job as an engineer, how do you assess your working out in sites comparing working in your office? Which part you prefer more and why?
7. Regarding your job, are the tasks meeting your expectations?
8. In which part you feel satisfactions?
9. Did your fulfilled tasks give you some fulfilment feeling and satisfactions?
10. How do you describe your working climate?
11. Despite the conditions, how do you assess?
12. Your performance?
13. Can you talk about the obstacle in your workday?
14. Has there been any challenging situations and how did you manage it?
15. Do you have any regret regarding your works?
 - a. What are your ambitions towards your career?
16. Did you have problems balancing between your private life and professional life?
17. As an engineer, do you think women engineer you are more judged than men?

18. Have any of the subordinate workers, whether they are men or women, refused to take orders from you?

19. Is there any place in your company, as a club, strictly reserved for man and where women are banned? In which way this restriction can bother you?

20. In your view, is there any discrimination in communication process especially between different genders?

21. According to your experience, did you feel, somehow, that your man-colleague spoke to you differently (positively or negatively) comparing with other man-engineers co-worker?

22. Do you have to consider your appearance in work?

23. Valid/invalid the statements below:

- Women are emotional.
- Women fear to take risks.
- Men focus more on their careers.
- Men cannot treat women as equals.
- “Good ole-boys” men help each other get promotions.

24. According to your experience, how do you assess the female work?