

Algerian Female Engineers' Construction of Professional Identities at Engineering Workplace

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Abstract:

The present study explores the discursive construction of Algerian female engineers' professional identities at engineering workplace in Algerian Sonatrach Company. In attempting to explore the experiences of Algerian female engineers in light of the present constraints in the domain of engineering, two main data collection instruments were selected. First, the questionnaire aims at exploring participants' perceptions and experiences at engineering workplace. Second, the interview aims to explore the discursive construction of females' engineers' professional identities in light of the available engineering discourses of masculinity. The study reveals that engineering workplace is discursively gendered. Moreover, the data reveal a picture of the masculine culture that affects their coping strategies. Female engineers suggest that establishing gender equality through eliminating gender differences at engineering workplace will enable females to regain recognition as professional engineers.

Key words: gender, identity, discourse, Algerian female engineers.

I- Introduction:

the integration of Algerian women in male-dominated careers has been subject to constant debate, what used to be a male territory witnesses increases in female workers including police services, civil engineering, automobile mechanics, firefighting occupations, air plane pilots, and taxi drivers. Based on the premise that occupational sex segregations are assigned by social norms of placing men and women in the Algerian society, the scope of the present doctoral research revolves principally around exploring the experience of Algerian female engineers and examining the discursive construction of their professional identities. This study is meant to identify the present restrictions and barriers which constrain the career choices of Algerian female engineers. It is through this thesis that female engineers' underrepresentations are voiced. Our aim is to examine how these discourses of gendered workplace represent Algerian females' identities.

The problematic of this research springs from the contradictions noticeable in comparing between laws about women's equal rights and women's lack of representations at workplace. As a matter of fact, women who are enrolled in men's fields seem to experience underrepresentations, discrimination, and exclusion.

1. The theoretical framework of the study

To theoretically found the research at hand, a solid conceptual apparatus has been designed. To investigate Algerian females' engineers' construction of their identities in male-dominate workplace, Fairclough's approach to Critical Discourse Analysis as a framework was chosen. This theoretical framework draws attention on analysing and discussing females' engineers' status in relation to the masculinities of engineering, since CDA considers discourse as an interactive activity that contributes to produce socio-cultural knowledge and constitute a site for the reconstruction of social identities. Elaborating on the previously mentioned theoretical ground, the Vortex framework, advanced by Patricia Lewis & Ruth Simpson (2010), was used to unveil power dynamics and gender inequalities that are indoctrinated along male-dominated engineering discourse.

The research methodology was carefully chosen along with adequate methods, research instruments, and diversified approaches to contribute to the feasibility, validity, and

credibility of the findings that this research puts forward. To begin with, the methodological part of this research refers to a mixed methodology framework which combines both quantitative and qualitative approaches. The former was used to identify minorities and majorities in relation to participants' views and perceptions about Algerian females' engineers' identities construction at engineering workplace. The later, has been used to identify participants' different answers and categorizing them in different typologies. By the same token research instruments, two main research instruments have been used to collect data: the questionnaire and the interview. The questionnaire aims at collecting data related to participants' perceptions and experiences at engineering workplace, and discusses professional strategies used in engineering work. It also aims at highlighting the work challenges that Algerian female engineers participants face on a daily basis. The questionnaire was designed for both Algerian male and female engineers. It was administered to 50 male and 50 female engineers (a total number of 100 participants) working in the Algerian company of Sonatrach. The interview which was administered to 15 Algerian female engineers working in the Algerian company of Sonatrach was used to explore Algerian females engineers' discursive construction of their professional identities at engineering workplace by means of investigating Algerian females' lived experiences.

2. The Findings

The aim of the present research is about exploring the discursive construction of Algerian female engineers' identities. It identifies the participants' perceptions, attitudes, and experiences at Sonatrach Company as a male-dominated domain. The analysis of data relied on two main data collection instruments; questionnaire and interview. The responses of the participants play a crucial role in the identification of the reality, the complexities, and the masculinities of engineering workplace. The data gathered throughout this section addressed the research questions of the current investigation. Females' interviews findings were analysed and also linked to the previously obtained findings in order to cross-check the results of the questionnaire employed in this research study.

Data gathered from the questionnaire and the interview are analysed qualitatively and quantitatively to gain reliable findings and to increase the credibility of the findings of the research project. First, quantitative data analysis focuses on the findings about participants' perceptions, attitudes, and experiences at engineering workplace. It covers data from the

questionnaire with male and female engineers working at Sonatrach Company. Second, qualitative data analysis covers the findings about the participants' experiences concerned with the discursive construction of their professional identities with regard to engineering complexities. The qualitative data are mostly obtained from the semi-structured interviews with female engineers working at Sonatrach Company. Data analysis also presents the findings along certain graphs and tables that systematically structure and give meaning to data collection.

■ Questionnaire's aim

The analysis of the questionnaire relied on female and male engineers' depiction of their perceptions, experiences, the strategies female engineers use to cope with the workplace culture, and the identification of workplace challenges. The questionnaire results are intended to fully capture the experience of engineers and the representation of women engineers in male-dominated engineering workplace. Further, the questionnaire was administered to 50 female and 50 male engineers. The participants of this study were allowed to skip questions that they don't please in order to answer the questionnaire. Besides, the questionnaire was designed in Arabic and translated to English. It takes approximately 10 to 15 minutes to be answered.

■ Interview's aim

The analysis of the data gathered from the interview relied on 15 female engineers, portraying their lived experiences at engineering workplace in Sonatrach Company, since they are loaded with full indications about the professional settings, and about their experiences in light of prevailing power dynamics in their work setting. It summarizes main issues connected with analysing the qualitative data set. One central issue is the role played by the researcher to reduce and filter the large volume of data collected and the new emerging themes in the analysis process. The analysis of the data resulted in the identification of central themes that were of particular importance. The findings offer a significant explanation to the existing body of knowledge about women working at engineering. Every individual experience deserves to be representative of the daily lived experiences of women engineers. Although their experiences varied, they revealed aspects of collective identities because of their common types of experiences and the themes that remain significant to fully understand the nature of their workplace.

The findings summarize and give detailed results of the participants' answers, including perceptions about themselves in their domain through their experience that effects their professional identity negotiation. It is noteworthy to mention that the data analysis is reported into five sections which are presented as follows:

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The present study is devoted to explore female participants' construction of their professional identities at engineering workplace in the Algerian Sonatrach Company, giving importance to the effects of the workplace culture and discourses to construct their identities. It also attempts to determine the strategies that Algerian female engineers adopt to cope with the complexities of the engineering workplace. This study attempts to answer the following questions:

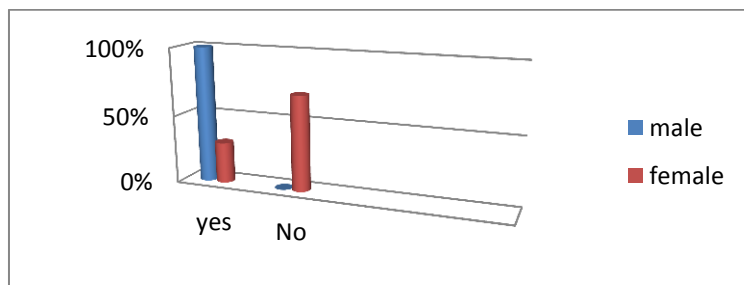
Are you welcomed at Engineering Workplace?

This question attempts to give a clear image about engineering settings. Particularly, it aims at exploring participants' sense of belonging and membership in the community of engineering.

Table (1). Male and Female Engineers' Sense of Belonging (Membership) at Engineering Workplace

Response	Number of the respondents		Percentage of the respondents	
	Male	Female	Male	Female
Yes	50	35	100%	30%
No	/	15	/	70%
Total	50	50	100%	100%

Figure (1). Male and Female Engineers' Sense of Belonging (Membership) at Engineering Workplace

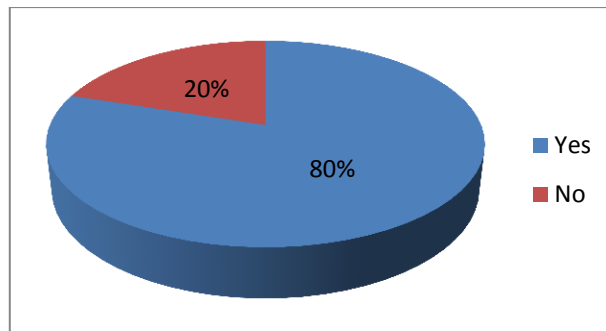


The questionnaire's data presented in the figure (1) clearly show that all male participants state that they feel welcomed at engineering, reflecting their status of belonging to the workplace. When analyzing the data displayed by female participants, prevalent differences are clearly stated in their responses, the majority of female participants by 70% claim that they are not welcomed at engineering compared to 100% of males who claim the same view. Only 15 of females by 30% claim that females do not belong to engineering. The questionnaire's data presented in figure (1) indicate that men and women are not equally treated on the basis of their gender categorization.

Table (2): Female Engineers' Sense of Belonging (Membership) to Engineering Workplace

Response	Yes	No	Total
Number	12	3	15
Percentage	80%	20%	100

Figure (2). Female Engineers' Sense of Belonging (Membership)at Engineering Workplace



The interview data displayed in figure (2) show that the majority of female participants by 80% agree that they do have a sense of belonging to engineering workplace setting. By contrast, 20% of the female participants claim that they belong to engineering community. The results demonstrate that engineering in Algerian Sonatrach Company is exclusively masculine domain that tends to exclude females from participation

The participants' answers attract much attention; male engineers perceive the engineering workplace as their natural space which reflects their belonging to engineering community. However, female participants argue that they are aware of the exclusion practices, since most of them are not welcomed; they articulate the gender biases and the stereotypical notions about females working at engineering.

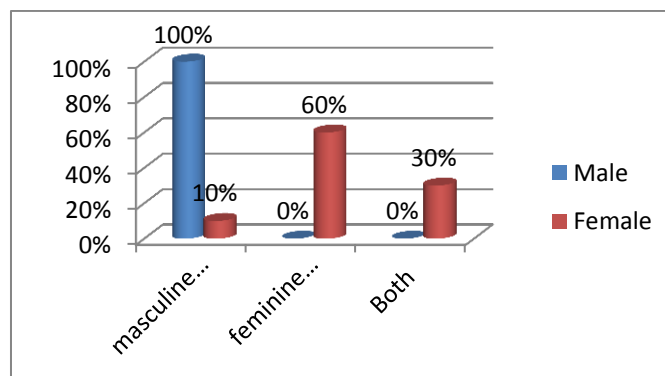
What are the strategies that you adopt to do your work?

This main question structures the core of this research. It aims at exploring participants' professional strategies to fit the nature of the work. This worth considering question has three possible answers which are extremely important to present vivid assumptions which define how the participants perceive their workplace nature at the Algerian Sonatrach Company

Table (3). *Male and Female Engineers' Professional Strategies at Work*

Response	Number of the respondents		Percentage of the respondents	
	Male	Female	Male	Female
Masculine strategies	50	5	100%	10%
Feminine strategies	/	30	/	60%
both	/	15	/	30%
Total	50	50	100%	100%

Figure (3). *Male and Female Engineers' Professional Strategies at Engineering Workplace*



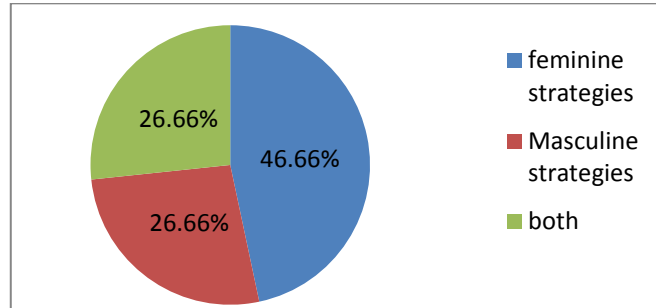
According to figure (3), the total percentage of male participants by 100% state that they use masculine strategies compared to only 10% of females who use the same strategies. Interestingly, 60% from the entire simple of females declare using feminine strategies compared to none of the males. Respectively, 30% of female participants consider using both male and female strategies as adequate in doing engineering work compared to none of the males. The data indicate that most of the participants prefer using masculine strategies that are professionally adequate at engineering workplace.

Table (4). *Female Engineers' Professional Strategies at Engineering Workplace*

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Response	Feminine strategies	Masculine strategies	Both	Total
Number	7	4	4	15
Percentage	46.66%	26.66%	26.66%	100%

Figure (4). *Female Engineers' Professional Strategies at Engineering Workplace*



The data in figure (4) show female engineers' preferred strategies of doing their work. 46.66% of the female being interviewed identify using feminine strategies as their most favourite strategy i.e. they prefer valuing their femininity and assume the fact of being different from the male-dominated culture other. 26.66% of them prefer using masculine strategies i.e. assuming their similarities to the male-culture and disguising their difference to the norm, while the same percentage of female participants (26.66%) assume adopting both feminine and masculine strategies in doing activities that depend on the context of their workplace. The participants state some professional requirements of the job

- *Participant 09: "Engineering is in fact dominated by male engineers but it is not something given by God. It is something that is imposed historically by society if we look at the history of engineering and this doesn't mean that women cannot do well in engineering in light of the constraints and difficulties women face concerning their feminine bodies"*

The results show that the majority of participants use masculine strategies because they believe they are adequate to do engineering work that correspond with the nature of the workplace. Further, the results show that male strategies are most popular among male and female workers. To a certain extent, male strategies may reflect the engineering workplace nature which favours masculine norms

What are the skills that engineering require?

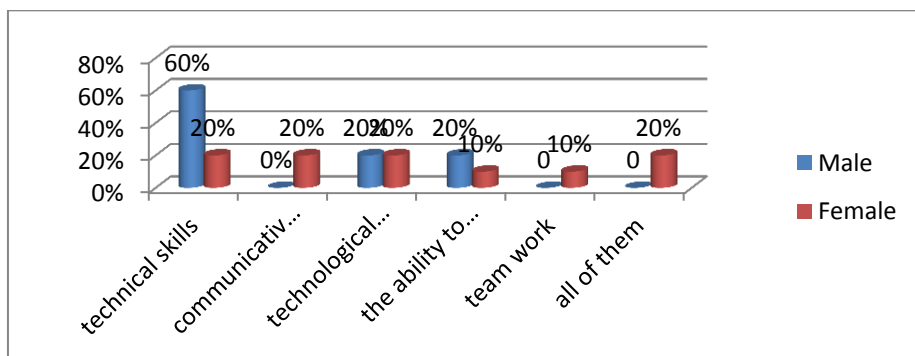
This question aims to report the engineering skills and techniques that engineering requires. The respondents are asked to give various professional skills of a professional

engineer. Its main purpose is to bring their perception and understanding of a professional engineer

Table (5). *Male and Female Engineers' Professional Skills at Engineering Workplace*

Response	Number of the respondents		Percentage of the respondents	
	Male	Female	Male	Female
Technical skills	30	10	60%	20%
Communicative skills	/	10	/	20%
Technological skills	10	10	20%	20%
The ability to solve problems	10	5	20%	10%
Team work	/	5	/	10%
All of them	/	10	/	20%
Total	50	50	100%	100%

Figure (5). *Male and Female Engineers' Professional Skills at Engineering Workplace*



The results in figure (5) represent that 60% of males and 20% of females categorize engineering strategies into technical skills. Other 20% of females report that engineering requires communicative skills. 20% of males and only 10% of females consider the ability to solve problems in engineering work. Also, we find the same percentage of males and females by 20% who claim that engineering requires technological skills. Only 10% of females state that team work is important in engineering practice. While only 20% of females state that engineering requires all the above mentioned skills. It can be stated that males and females have different work strategies in approaching their work. Central to this, males prefer technical skills and females preferring social ones. The results indicated significant differences that exist between the respondents from both groups in their

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categorization of a professional engineer .

3. The Discussion of the Findings:

The data display that female engineers agree that interpersonal and communicative skills are of significant importance in doing their work within their professional communities. Worthy to mention, the results show that the female participants agree that engineering job requires both communicative and technical professional skills.

The present section is concerned with Algerian female engineers' construction of professional identities. The findings indicate that female engineers perceive engineering as highly gendered, most of them are discursively affected by the male norm and the culture of their jobs. The gendered engineering culture legitimizes male's presence and practices that become exclusive for them. Interestingly, female's professional identities are negotiated through their submission to the culture as well as adopting both masculine characteristics and norms. They sometimes use ways which paradoxically represent both females' difficulties and the tension between "sameness", to fit in the masculine domain and "difference", to highlight their femininities, to represent themselves as professionally adequate for the job. Hence, engineering is discursively gendered; the gendered engineering culture legitimizes male's presence and practices. The data denote that participants negotiate their professional identities in light with the available institutional discourses of masculinity that reflect the nature of engineering workplace as a masculine domain. It is remarkable that there are significant responses between male and female engineers. Male engineers depict themselves as professionally adequate for the job, they state that the workplace is a setting they belong to since it is historically dominated by men. Throughout the responses, the participants clearly value and articulate their abilities as professional engineers. Additionally, masculine characteristics seem to be popular; the participants consider men as the norm and draw on the hierarchical values between male and female engineering characteristics where male characteristics are preferable compared to those of females. Hence, engineering setting validates the masculine characteristics that have high hierarchical values and mobilize men's characteristics and values as the natural norm. Moreover, the participants perceive their status as intellectually and professionally identified, using adequate professional strategies and requirement for the job. Male engineers value technical, technological skills and the ability to solve problems, whereas female engineers claim the importance of technological, communicative, technical skills,

the ability to solve problems and working in team work. The next section studies females' challenges at engineering workplace .

4. Conclusion

“Algerian Female Engineers’ Construction of Professional Identities at Engineering Workplace”, addresses the workplace and existing discourses that affect the construction of females’ engineers’ professional identities, including the strategies they adopt to cope with nature of engineering workplace.

Based on the hypothesis which states that Algerian female engineers demonstrate their self-positioning and engage in co-construction and negotiation of their professional identities despite unequal distribution of power at engineering workplace, the data denote that female participants negotiate their professional identities in light with the available institutional discourses of masculinity that reflect the nature of engineering workplace as a masculine domain. It is remarkable that there are significant responses between male and female engineers. Male engineers depict themselves as professionally adequate for the job, they state that the workplace is a setting they belong to since it is historically dominated by men. Yet, female engineers are aware about the nature of the workplace, they highlight their in/visibility and exclusion processes that they undergo since they belong to minority group. Throughout the responses, the participants discursively value and articulate their abilities as professional engineers, characterizing their professionalism with regard to the requirement of engineering job. The findings reveal that women are judged in terms of being different from men who represent the norm in engineering profession. The data, then, review specific experiences of female engineers living at the margins of engineering world and signify stereotypical assumptions claimed by men of women’s incompetence at engineering. They argue that engineering work requires more efforts and work than men, spending more time because their presence at engineering is socially perceived as unusual i.e. engineering as a masculine domain forces women to work not only to be successful, but to negotiate their professional identities in order to fit in the engineering culture. This is clear evidence about female engineers’ resistance at engineering workplace. Here again, the participants sound confident and self-reliant of their abilities to do their career job, confronting to the masculine culture that engineering entails. Also, the interview echoes women’s power and ability driven by their will to fulfill the engineering job. Like any other work, the participants assert their right to be involved at engineering because it is not

exclusive to men only. Yet, women's fear from exclusion forces them to make great efforts to gain acceptance and membership.

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