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ECONOMICS AND
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Women in Engineering

A Qualitative Study on Womens' Experiences in an International
Engineering Company

by

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Abstract

This paper examines the experiences of women working in the field of engineering. The specific focus of this qualitative interview study is female employees in a factory at an international engineering company. Previous studies have found that women face major barriers to success in the profession, including gender bias in recruitment processes (Kessler, Low & Sullivan, 2019), lower chances of obtaining promotion compared to male counterparts (Yates & Skinner, 2021), and more difficulties in finding work-life balance when pursuing the profession (Chew, Atay and Bayraktaroglu, 2020; Crutchfield 2017). Our study found that the perceptions amongst women in engineering vary, but that there are common denominators, such as expressing mostly positive experiences of working in male dominated teams yet wishing for more even gender distribution in their teams. Participants describe that male dominated work environments have different social dynamics, with some of the women pointing out challenges in regards to for example the use of vulgar language. Furthermore, our study confirms previous research which found that women struggle with being seen as less capable than their male colleagues in some instances (Yates & Skinner, 2021). The findings of this study contribute to a richer empirical basis for the body of research on the topic, as well as provide practical insights for employers in the industry.

Keywords: diversity, gender diversity, women in engineering, STEM, diversity recruitment

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1 Introduction

The introduction chapter aims to give an overview of this thesis and an introduction to the research topic. It covers background and problematization, which gives context to the research question; aims and objectives, which explains our goals with the thesis; research purpose, where the reasons for writing this thesis are presented; delimitations, where general pitfalls of the thesis are discussed; and lastly, the outline of the thesis, where the reader is introduced to the structure and content of the rest of the thesis. After reading this chapter, we hope that the reader has understood the context and background of the problem this thesis aims to examine.

1.1 Background and Problematization

When girls and boys in year five in the Swedish school system are asked about their interest for technical education, the rate of interest is similar between the genders. But four years later, in year nine, the interest amongst girls has dropped by a comparatively significant amount - boys interest drops from 88% to 70%, whilst girls interest drops from 86% to 37% (Skolverket, 2014). When it comes to upper secondary education, 81% of students in the technical program are male (Skolverket, 2021). At university level, 61% of students enrolled in higher education are female, yet only 35% of those graduating from the civil engineering program are women (SCB, 2021).

Similar statistics regarding the underrepresentation of women in engineering can be found in other countries. Whilst 49% of the total workforce in the UK consists of women, only 14% of those working within the engineering industry are female (Engineering Council, 2020). In the US, the percentage of women working within architecture and engineering occupations is 17.4% (U.S. Bureau of Labor Statistics, 2022). 20% of US engineering graduates are women, but it is estimated that as much as 40% of women with engineering degrees either never pursue a career within engineering or leave the profession (Silbey, 2016).

Despite the large underrepresentation of women within the engineering profession, firms are looking to recruit a diverse workforce. In a study about diverse hiring, it was found that 90% of firms consider increasing racial and gender diversity as a positive factor in their hiring (Kessler, Low & Sullivan, 2019). This poses a major challenge for companies and recruiters within the

industry - how can they find qualified candidates and increase gender diversity in their teams? And considering that up to 40% of women with engineering degrees leave the profession (Silbey, 2016), how can firms also satisfy and retain the female talent they attract?

These are questions that lead us to our research topic, which regards the perception of the engineering industry amongst women. We want to explore women's thoughts and opinions, and hence contribute to the larger understanding of external or internal factors which affect the work motivation and career choices of women in the engineering field. In order to achieve this, the following research question will be explored:

How do women experience exposure to the engineering profession during their work in the factory of an international engineering company?

The context in which we will explore this question is in a large organization that offers products to industrial customers in more than 100 countries. The company employs thousands of engineers and has different training programs for engineering students and graduates. One of these programs is a student talent program that gives students the opportunity to try out working in a factory during their studies. In the factory, part-time employees from the student talent program work alongside full-time engineers. In our research study, we aim to interview both part-time and full-time female employees from this factory.

1.2 Aim and Objectives

The overall objective of this thesis is to comprehensively and thoroughly answer the above stated research question. We hope that this will generate insights and a fuller understanding of the motivators and demotivators for female talent in the engineering field. From these findings we aim to derive implications that will be useful both for future academic research in the area, as well as for employers and recruiters in the engineering industry.

We aim to interview women that are currently working a factory based job at an international engineering company. Some of the women are currently pursuing or have plans to pursue engineering studies at university level, whilst others do not. Our purpose for interviewing these women is to gain in-depth insight into their personal perceptions of the engineering industry, in order to draw conclusions about how engineering companies can better attract and retain female talent.

The results from our study will be analyzed through the lens of previous literature and theories. By contrasting our findings with results from similar studies, we wish to add nuance to the current body of research. Our contribution to the research field consists of adding empirical evidence in a new context. We aim to bring new perspectives from studying an international company based in Sweden; and in terms of focusing specifically on factory based engineering work. Furthermore, the previous research studies mostly focus on women with engineering degrees, and thus neglects to recognize the experiences of all of the women who work in the engineering industry but do not have an engineering degree. Our study encompasses women who work in the factory of an international engineering company, where some of them are studying to become engineers, and some do not have any academic background in engineering. We hope that this will contribute with a new and more diverse set of perspectives relating to the experiences and perceptions amongst female talents in a blue collar setting.

1.3 Research Purpose

When deciding what our research topic would be, we decided fairly quickly to focus on human resources and people management, due to our own interest and career ambitions in the area. We decided to research the topic of gender diversity in engineering due to our personal experiences of the challenges companies in the industry seem to face. We were deeply curious not only about learning how to more efficiently attract and retain female engineering talent, but also to understand the perceptions, opinions and ambitions of these women. In order to understand, dissect and explore these parameters, a qualitative research approach was deemed most suitable.

Not only do we think that our interview-based research on the topic is interesting for us personally - we also believe that there is a need for research of this nature to give insights to the engineering companies struggling to improve their diversity. In the long run, our hope is that this thesis makes a concrete contribution to the development and improvement of the engineering industry's practices when it comes to attracting, retaining and fostering a culture that values diverse talents.

The findings from the body of research on women's experiences of the engineering field are broad and diverse. Many findings from different research studies contrast and contradict each other, which is why we believe that this topic is important and relevant to keep studying. In order to unify the body of knowledge surrounding how engineering companies can better attract, retain and satisfy female talent, more research is needed. We aim to contribute with one more empirical

study on the topic, with the hope that it will clarify some of the contradictions in previous research.

1.4 Delimitations

A major delimitation of our thesis is the scope of our research study. Our interview sample is limited to nine participants, which is a narrow selection. This narrow selection consists of women working at an engineering company in a Swedish context, which also has implications for the possibilities to apply our findings in an international context. We recognize the difficulty in generalizing the results of these interviewees to represent the whole population of female talent in the engineering industry. The goal of the research study is to understand these nine interviewees' viewpoints and perspectives in-depth, rather than gaining an objective and fully accurate insight to the whole populations' perceptions.

1.5 Outline of the Thesis

After the introduction chapter, the literature review follows. This is where previous research findings are presented, discussed and contrasted with each other. Thereafter, the methodological approach to our research study is described and discussed. Results from the study are presented and analyzed in the light of previous literature in the analysis and discussion chapter. The conclusion chapter ends the thesis by summarizing our main findings and their implications, as well as discussing what potential gaps that future research could fill.

2 Literature Review

In the following chapter, a review of existing literature and theories on the topic of diversity in recruitment and the female perception of engineering will be presented. The selection of literature is based on relevance to the research topic. In accordance with the nature of the research, the chapter is divided into two sections: diversity in business context, which aims to give an insight into the broader topic of diversity management for international companies; and womens' experiences in the field of engineering, which covers the perceptions amongst the female talent in the industry.

2.1 Diversity in a Business Context

Diversity in a work related context has been the subject of many research studies over the past 60 years (Triana, Gu, Chapa, Richard, & Colella, 2021), and continues to be on the agenda in discussions about companies' social responsibilities and ethical duties. In this thesis, diversity is defined as the visible and non-visible differences between people in the workforce, in terms of age, gender, race, disability, working style and other parameters (Georgiadou, Gonzalez-Perez & Olivas-Luján, 2019). With geographically distributed operations and the possibility of adopting remote work policies, diversity management is especially relevant for international firms today. Diversity management lies on the presumption that the workforce is inherently diverse, and that leveraging diversity in an organization can generate content employees whose talents are used to their full capacity, as well as higher productivity for the organization (Georgiadou, Gonzalez-Perez & Olivas-Luján, 2019). The following sections will dive deeper into the existing research on diversity, specifically in relation to recruitment practices and hiring strategies.

2.1.1 The Rationale Behind Workforce Diversity

There are two major viewpoints of the benefits of promoting diversity and equality, the first being the social justice rationale. This approach implies that promoting diversity and equality is simply the right thing to do from a moral perspective, and strongly relies on the strive for fairness. The second viewpoint is the business case, which implies that promoting diversity and equality is

economically beneficial for firms. The economic benefits revolve around leveraging diversity in order to obtain a competitive advantage, for example by having a workforce that mirrors a diverse customer base and thus perhaps easier obtaining insights regarding customer needs. Avoiding costs associated with discrimination can also be an economic incentive to promote diversity and equality (Moss, 2009).

Academic scholars have different views on the purpose and outcome of private firms' diversity programs. Some believe that these initiatives are purely created for superficial reasons, such as appealing customers or avoiding legal repercussions. Others argue that these programs are, regardless of the intent, potentially counterproductive for achieving diversity. One reason for this could be backlash from members of the majority group, who often hold the positions of power and thus have great influence over the execution of for example recruitment. Some scholars do however argue that diversity programs are in fact valuable for underrepresented groups, and that they result in tangible benefits (Rivera, 2012).

2.1.2 Lack of Diversity in Recruitment - a Pipeline Problem?

When it comes to diversity in recruitment, there are two possible focus points to consider. These are the selection system, where the emphasis is placed on how the recruitment process is designed; and the applicant pool, where the emphasis is placed on what candidates apply. Historically, the academic focus has mostly been on the selection system and its design and components. But during the 90's, a shift occurred and the applicant pool was recognized as a highly influential factor in the outcome of the recruitment process (Newman & Lyon, 2009).

In a qualitative study of diversity recruitment amongst elite firms, employers viewed lack of diversity as a pipeline problem rather than a hiring problem, meaning that they dedicated their efforts to broadening the applicant pool instead of focusing on the recruitment process (Rivera, 2012). The author points out that having a diverse applicant pool does not necessarily ensure a diverse selection in the end, if the people authorized to make recruitment decisions do not value diversity - implying that the diversity in the talent pool does not matter if non-diverse talents are favored in the recruitment process. This somewhat contrasts Newman and Lyon's (2009) view, which is that increasing diversity in the applicant pool is ultimately more effective for increasing diversity in recruitment than focusing on the selection process.

2.1.3 Recruitment Strategies for Diversifying the Applicant Pool

Research has shown that there are several potential strategies to achieve a more diverse pool of applicants. Scholars like Newmann and Lyon (2009) recommend using images of diverse employees in recruitment ads, adjusting wording to appeal to people with certain attributes, and having recruiters that mirror the targeted applicants in terms of both demographics and traits. The rationale behind these measures is the *similarity-attraction paradigm*, which suggests that similar attracts alike (Newman & Lyon, 2009). This is further explored in a higher education setting in a study by Kazmi, Spitzmueller, Yu, Madera, Tsao, Dawson and Pavlidis (2021), where the findings indicate that when a chair or members of the search committee are women or from underrepresented minority groups, the share of women and people from underrepresented minority groups in the applicant pool increases. The authors explain this through the *homophily theory*, which suggests that people associate, relate to and bond with others who are similar to themselves (Kazmi et al., 2021).

In their qualitative study on diversity, cognitive ability and conscientiousness, Newman and Lyon (2009) also concluded that whilst informal recruitment by for example employee referrals may be the most effective strategy to obtain high performing talent, women and minorities may be more inclined to respond to formal recruitment, such as career fairs, traditional recruitment advertisements and employment agencies. Furthermore, targeting recruitment solely on cognitive ability was proven to skew diversity in the applicant pool due to sub group differences, which the authors suggest to counter by focusing more on personality traits such as conscientiousness (Newman & Lyon, 2009).

When it comes to job pursuit intentions, minority group job seekers are more inclined to pursue a job in an organization they believe values diversity (Avery, Volpone, Stewart, Luksyte, Hernandez, McKay, & Hebl, 2013). According to the authors, this is due to the fact that they think their identity will be affirmed. Another influencing factor when it comes to job pursuit intentions is the perceived likelihood of getting the job - applicants who think they may get offered the job will pursue it more diligently (Newman & Lyon, 2009). This is explained by the *expectancy theory*, which suggests that candidates will seek cues about the likelihood of getting hired and adjust their efforts accordingly.

In their speculative recommendations based on the findings from their study, Newman and Lyon (2009) recommend firms to utilize academic track records to find high achievers with both well developed cognitive abilities and high levels of conscientiousness. In order to at the same time broaden the diversity in the applicant pool, the authors suggest focusing on finding these high achievers through minority focused events, organizations or divisions, in order to increase the share of minority group candidates. Lastly, they suggest that internships, training and mentoring

may constitute a good entry point for minority applicants, and that the share of candidates with a minority background may increase if the company ensures access to social networks and internal referral (Newman & Lyon, 2009).

2.1.4 Pitfalls of Targeted Recruitment Practices

The above stated recruitment strategies for increasing the share of candidates with minority background in the applicant pool are not uncriticized. Scholars warn that using diverse images in recruitment ads when the real teams are not as diverse may pose an array of issues. Avery (2003) points out that previous research tends to treat minority groups as homogenous, which is not necessarily accurate. The author studied how white people and black people reacted to diverse images in recruitment advertisements, and found that the effect on the candidates vary widely within their demographic group. What was found to be more important for the black candidates than merely being represented in the images, was that they could see that diversity persists in higher-level positions in the organization (Avery, 2003).

In a study of the underrepresentation of women in the technology and computing sector, it was found that using images of a diverse workforce to increase minority group applicants is in fact a common practice amongst tech companies. However, misrepresenting the current state of diversity in an organization may cause applicants to perceive these diversity cues as insincere. This was shown to depressed interest and cause identity threat concerns amongst women (Kroeper, Williams & Murphy, 2022).

Other pitfalls related to common targeted recruitment practices include concerns about repelling majority group applicants with diversity initiatives. This is however disproved by a study which found that the negative effect on majority group applicants is limited, and can even be positive for some candidates (Avery et al., 2013). Another one relates to the quality of the applicant pool, where excessive focus on obtaining diverse demographics may result in that minority applicants are disproportionately unqualified, which would counteract the original purpose of increasing diversity in recruitment (Newman & Lyon, 2009).

Scholars stress the importance of having a long-term perspective rather than looking for quick fixes when it comes to diversity. Using images, policies and recruiters that represent diversity may be harmful to the long-term retention of minority group employees, if it gives them false expectations of the actual working environment. Instead of using short-term solutions and focusing on numerical goals, companies are advised to focus on fostering a workplace climate that truly values diversity, in order to retain minority group employees and thus obtain diversity in the long run (McKay & Avery, 2005).

2.2 Womens' Experiences in the Engineering Field

Despite 90% of employers claiming to consider increasing racial and gender diversity as a positive factor in their recruiting efforts, research shows that they do not have any positive aggregate for women and minority group candidates in their resume rating process. Employers in the STEM field, meaning the Science, Technology, Engineering and Mathematics field, even showed significant preference for white males. When it comes to STEM majors, women and minority group candidates had to have a GPA score of 4.0 in order to achieve a resume rating equal to that of a white man with a GPA score of 3.75. Furthermore, a prestigious internship increased white males' resume ratings by 50% more than it did for women and minority group candidates with the same internship (Kessler, Low & Sullivan, 2019).

One precaution that the employers displayed in regards to recruiting women and minorities is the belief that these candidates are less likely to accept a potential job offer. This may mean that the employers pursue these candidates less out of fear that they won't accept an offer in the end anyways. One plausible explanation as to why this precaution exists is that employers may think that women and minority candidates are more likely to be favored in recruitment processes, which would result in them having several offers to choose from. This explanation does however contradict the fact that employers within the STEM field displayed unconscious bias against women and minorities. The unconscious bias got larger as the resume rater got more fatigued and spent less time on each resume (Kessler, Low & Sullivan, 2019).

Studies like the one from Kessler, Low and Sullivan (2019) give insight into some of the barriers that women and minorities face in the STEM field. But how do women in the industry, and specifically in engineering, experience their work? This is the topic for the following sections of the literature review.

2.2.1 Challenges and Success Factors for Female Engineers

In a UK based study exploring the linkages between underrepresentation of women in engineering and women's perceptions of career development opportunities, several limiting factors for female engineers were identified. It was found that women in engineering have a harder time developing competencies that lead to success in the profession, as well as more difficulties convincing senior management of their motivation and competence. Furthermore, the study concluded that promotions are more likely granted to those who are widely known and audible, those who are granted high status, and those who fulfill the ideology of the ideal worker. People who satisfy these criteria are most often men (Yates & Skinner, 2021).

The interviews in the UK study showed that women are in some instances perceived as less capable than men, and this perception exists amongst women as well. The women of the study furthermore proclaimed that men are often seen as more reliable, which is a trait that was perceived as highly valued in their workplaces. Especially challenged amongst the women were the mothers, who struggled to obtain work-life balance and who felt that men are not as affected by having children as women are (Yates & Skinner, 2021).

Work-life balance is a recurring theme in research about women in engineering. Chew, Atay and Bayraktaroglu (2020) recommend focusing on work-life balance and flexibility in order to retain female engineering talents. Research from Crutchfield (2017) supports that this is a good idea, considering that the leading factor for female engineers to leave the profession is the absence of work-life policies that are flexible.

Chew, Atay and Bayraktaroglu (2020) conducted a study in Turkey about female engineers' happiness and productivity, the authors contributed with a new theoretical lens by applying the *social exchange theory* in a collectivistic culture. The social exchange theory implies that humans in an interaction behave in accordance with how they perceive the fairness between the interacting parties, and the perceived fairness generates implicitly stated obligations. In a work related context, this could mean that an employee who perceives their employer as fair, will feel more responsibility for its actions to and for the employer. When studying female engineers' career development and work satisfaction in relation to this theory, the authors found that these factors can be positively influenced by fair human resource practices, career fit, and well rounded application of paternalistic and supportive leadership approaches (Chew, Atay & Bayraktaroglu, 2020).

2.2.2 Counter-narratives

The women in the interviews showed different views of the reason behind the prevalent inequalities in the engineering field. Counter-narratives amongst the interviewed women in the UK study existed - some of the women did not believe that sexism was the cause of inequalities in the engineering field (Yates & Skinner, 2021). Doerr, Riegle-Crumb, Russo-Tait, Takasaki, Sassler and Levitte (2021) found that most of the women in the study believed that their organization was meritocratic irrespective of gender. The different narratives found amongst different interviewees is a supporting argument for Avery's (2003) claim that minority groups are not homogenous, despite being portrayed as such in previous research.

Doerr et al. (2021) argues that women's explicit or implicit denial of racial and gender related inequalities in the engineering field likely contributes to the continuation of these inequalities. They furthermore conclude that a possible explanation for the lack of opposition against gender inequalities amongst the women they interviewed is a conscious or unconscious adaptation to avoid the social sanctions that could follow. This leads the authors to argue for the importance of commitment from both women and men when it comes to working towards gender equality and racial equality in the engineering industry.

2.2.3 Intersectional Perspectives

Although this paper is focused around gender underrepresentation and its implications for women in STEM, it is crucial to acknowledge that women's experiences are likely not shaped solely by their gender, but rather caused or influenced by other factors as well. We therefore recognize that other demographic factors, such as race, age and sexual orientation, may be shaping the interviewed women's perceptions of their workplace and profession. The intersection between gender and racial inequalities for young female engineers was studied by Doerr et al. (2021). The interview responses from women of color and white women were contrasted to each other. The general findings for all the interviewed women include that most of the women believed that gender was irrelevant at their workplace and that the organizations operate meritocratically, but also that many young or newly hired women feel like they are not listened to. When comparing the subgroups of women, racial divergence was discovered. Women of color tended to feel like outsiders to a greater extent than white women (Doerr et al., 2021).

2.3 Chapter Summary

In the literature review, several studies regarding diversity in the workplace were discussed. Firstly, the rationale behind diversity was brought up, and it was pointed out that there are two major motivations: the social justice rationale, and the business case (Moss, 2009). Academic scholars also have different views of whether diversity programs are productive for achieving diversity or not (Rivera, 2012). Nevertheless, there are two major focus points when it comes to diversity in recruitment - the applicant pool, or the selection system (Newman & Lyon, 2009). Employers tend to see their diversity challenges as a pipeline problem rather than a hiring problem (Rivera, 2012). Whilst some researchers argue that broadening the applicant pool is the more efficient way of increasing diversity in recruitment (Newman & Lyon, 2009), others argue that a broad applicant pool won't necessarily result in diverse hirings (Rivera, 2012).

In order to diversify the pool of applicants, some researchers recommend strategies such as using images representing a diverse workforce in their recruitment advertisements, adjusting the wording in the advertisements and utilizing formal recruitment processes rather than informal ones (Newman & Lyon, 2009). Further recommendations include having women and minorities in search committees (Kazmi et al., 2021), showing commitment to diversity (Avery et al., 2013), and targeting minority focused events and organizations (Newman & Lyon, 2009). Many of these strategies are however criticized for being too oriented towards the short term, and scholars warn that consequences can include having an applicant pool where minority group candidates are disproportionately unqualified (Newman & Lyon, 2009); giving minority applicants false expectations of the current state of diversity, which can damage long term retention of talent (McKay & Avery, 2005); and diversity cues being perceived as insincere, which can depress interest and cause identity threat concerns amongst candidates (Kroeper, Williams & Murphy, 2022).

Furthermore, the literature review showed that female engineers face a multitude of barriers in the workplace, including being discriminated against in resume ratings due to unconscious bias amongst employers (Kessler, Low & Sullivan, 2019); being less likely than men to get promoted, due to for example having disproportionate difficulties with convincing senior management of their competence (Yates & Skinner, 2021); and struggling with finding work-life balance (Chew, Atay and Bayraktaroglu, 2020; Crutchfield 2017). There is a racial divergence between women of color and white women, whereas women of color more often report having experienced a feeling of being an outsider in their role as an engineer (Doerr et al., 2021). Researchers have found that there are some female engineers who do not believe that the inequalities in the engineering field are related to sexism (Doerr et al., 2021; Yates & Skinner, 2021). Doerr et al. (2021) suggests that these counter-narratives - which could be a result of consciously or unconsciously avoiding social sanctions that could follow when speaking up against gender discrimination - may be a contributing factor to the continuation of inequalities in the engineering industry. The diverse experiences amongst female engineers that previous research has uncovered shows the importance of further studying this area. Our study aims to explore experiences from more female engineers, and hence provide a broader basis of empirical evidence on the topic.

3 Methodology

In this chapter, the methodological approach of our research study is presented, discussed and reflected on. The chapter aims to give insight into how we conducted this study, as well as explain why the study was designed the way it is. An outline of the different steps taken to address and answer the research question is presented, and the limitations of our chosen method to do so are critically analyzed.

3.1 Research Approach

In order to answer the research question - "*How do women experience exposure to the engineering profession during their work in the factory of an international engineering company?*" - a qualitative research approach was deemed appropriate. Qualitative research deals with words instead of numbers, and is due to its interpretivist epistemological position concerned with understanding the social reality by examining its participants' interpretations of it (Bryman & Bell, 2011). This makes it especially suitable to address our research question, as our aim is to understand how female talent in the engineering field experience their circumstances.

Qualitative research furthermore adopts an inductive approach to theories. This entails generating theories from the research rather than doing the reverse, which is usually the case for quantitative research. The ontological position of qualitative research is a constructionist one, meaning that its viewpoint is that individuals create the social reality through interaction, and that this social reality is hence constantly evolving (Bryman & Bell, 2011).

3.2 Research Design

Our research study entailed conducting interviews with nine women who work in part-time or full-time positions in the factory of one specific engineering organization. Some of the participants are part of a student talent program in the organization, in which they get the opportunity to work part-time in different teams in the factory, alongside their engineering

studies. The participants who are enrolled in the student talent program constitute four out of nine interviewees in this study. The remaining five participants work in full-time positions in the same factory, and do not necessarily have an academic background in engineering. This sample and context was chosen firstly due to the novel perspectives we believe it could add to the current body of research, as it encompasses a sample of women with different levels of academic experience as well as narrows down the scope to focusing on blue collar roles in an international engineering company. The second reason behind our choice of sample was the availability to us, whereas we could practically access the organization, the factory and the interviewees.

The research design for our study was a form of qualitative case study. Case studies are commonly associated with studying certain geographical locations, such as one particular organization, and aims to thoroughly examine the setting (Bryman & Bell, 2011). The organization in this study is an international company within the engineering industry, and it employs thousands of people across the world. It has customers in over 100 different countries and sells its products to customers in the industrial sector. The company employs both white collar and blue collar employees, and has several different training programs for students and graduates in engineering that aims to give practical experience and an opportunity to try out different roles in the broad profession of engineering. One of these programs is the student talent program, which aims to give students an insight into what different blue collar roles in their factory entails. This study focuses exclusively on the blue collar employees in one of the organization's factories that is based in Sweden.

3.3 Data Collection Method

Our choice of qualitative interview type was the semi-structured interview. This entails that an interview guide with questions that outline the interview was created, but there was no strict schedule for the interview and there was also a great deal of flexibility for the researchers to add other questions along the way (Bryman & Bell, 2011). This flexibility made sure that the interviews could be tailored to every participant, and that follow-up questions could be asked in order to profoundly explore each interviewees' unique experiences. The semi-structured approach did however also provide structure, which was needed to ensure that the interviews stayed on topic and that the different participants were asked the same questions to at least some extent.

The interview guide was constructed by formulating a set of questions divided into the following themes: background information, education related questions, talent program questions and future improvements & expectations. Our aim was to formulate open questions that were specific to the

research question but not too narrow. In order to ensure that the interviews are as efficient as possible, we recognize the importance of being well acquainted with the interviewees' situation, as well as that the interviews take place in a private and quiet environment (Bryman & Bell, 2011).

The international engineering company we decided to conduct our study in was available to us through having work experience in the particular organization. The company in question employs thousands of people and offers products to industrial customers in over 100 countries. Initially, our intention was to interview female engineers exclusively, but due to better access we decided to include women working in a specific factory with engineering related tasks, yet who have not necessarily obtained an engineering degree. The interviewees were sampled by collecting the contact information for the women who are currently enrolled in the organization's student talent program, as well as the women who work in full-time positions at the same factory. The student talent program aims to give current engineering students practical experience of the profession. The interviewees consisted of nine women, and interviews were conducted digitally.

3.4 Data Analysis

After conducting the interviews, the next step was transcribing the recordings. Although this is a time consuming process, we deemed it necessary in order to get an accurate overview of the vast amount of data that ours just like most other qualitative studies generates (Bryman & Bell, 2011). In order to analyze the data, thematic analysis will be used. Thematic analysis is, according to Nowell, Norris, White and Moules (2017), widely used in qualitative research but not clearly defined. The authors state that thematic analysis is an accessible and flexible method for analyzing qualitative data, especially when the goal is to explore and compare different participants' perspectives or to identify key insights from large amounts of data.

Nowell et al. (2017) do however point out that there are potential drawbacks associated with using thematic analysis, such as the lack of clear guidelines for the use of the method as well as the risk of presenting themes from the data that are unclear or inconsistent. Being aware of these drawbacks is important when proceeding with the use of thematic analysis. Nowell et al. (2017) suggest following these steps when using thematic analysis: familiarizing with the data; generating codes; looking for themes; evaluating themes; defining themes; and subsequently writing the report. These are also the guidelines we intend to follow throughout the analysis of our qualitative data.

3.5 Research Quality

There are certain factors relating to research quality that are especially important to consider in this study. The validity and reliability criteria that is commonly applied to quantitative research is not necessarily applicable to qualitative research, which is why the criteria needs to be adjusted in order to ensure they are relevant when used to evaluate the quality of qualitative research (Bryman & Bell, 2011). Different scholars have different views on how to best adjust the criteria.

Firstly, in terms of the nature of the qualitative case study, external validity is a common concern (Bryman & Bell, 2011). This is due to the fact that the study is conducted in a specific setting and with a small sample, and is not necessarily generalizable to other social settings. In the case of our research study, this may mean that the perceptions and experiences of the women we interview are firstly not applicable to the rest of the women working in the same organization, and secondly that they furthermore are specific to their organization and thus not representative of women in other organizations. The problem with external validity is however not exclusively tied to the organization, but could also be relevant in terms of other contextual factors, including geographic location, education background and other aspects that our interviewees have in common. Overall, the external validity relates to transferability and it questions whether the findings are applicable to other social contexts or not (Bryman & Bell, 2011).

A second concern regarding the research quality is the internal validity. When adjusted to the nature of qualitative research, this relates to the issue of whether the results of the study matches the theoretical ideas that the researchers form or not (Bryman & Bell, 2011). Because our study does not have an ethnographic research design where us researchers obtain a prolonged participation in the research subjects' social context, the internal validity should be kept in mind when reading this thesis. With only one short interview per participant, we only get a shallow snapshot of their circumstances, and therefore there is a risk of lack of congruence between the observations we make and the theoretical conclusions we draw.

In terms of reliability, there are two potential concerns, whereas the first one is internal reliability. Internal reliability in qualitative research refers to the level of agreement that the different members of the researcher team share in terms of what they hear and see in the study (Bryman & Bell, 2011). As we are three researchers, we recognize that we may occasionally have different interpretations of the meaning of statements in the interviews. The second potential concern is external reliability, which in qualitative research refers to how easy or difficult it is to replicate the study (Bryman & Bell, 2011). Although we describe the methodological approach in-depth in this chapter, we recognize that qualitative research is impossible to imitate with full accuracy and

that researchers who try to replicate our study would likely face issues in terms of access to interviewees, lack of knowledge about the research setting, as well as challenges relating to the fact that social settings are subject to continuous change.

Although these traditionally quantitative measures of research quality have been adapted to the qualitative research sphere as explained above, some scholars argue that they should instead be replaced by completely new frameworks for evaluating qualitative research. One example of this is using *trustworthiness* and *authenticity*. Trustworthiness can be split into four different criteria, including *credibility*, which refers to the research being conducted with standards of good practice and that the researchers' understanding of the research subject has been confirmed to be accurate; *transferability*, which refers to the extent of which researchers provide in-depth descriptions of the context of the research study so that readers can make their own judgments about the transferability of the findings to other contexts; *dependability*, which refers to adopting an auditing approach where all research material is accessible so that peers can assess the accuracy of the theoretical inferences made; and lastly, *confirmability*, which refers to the acknowledgement of subjectivity and attempt to limit the researchers personal values or perspectives effect on the research and its findings (Bryman & Bell, 2011). The second part, authenticity, revolves around the impact of the research. It questions whether the research fairly represents the research subjects; helps to improve understanding of the social environment; contributes to the appreciation of different perspectives in the social environment; acts as a force for creating change in members' circumstances; and finally, pushes members to take action (Bryman & Bell, 2011). The trustworthiness and authenticity criteria are not commonly used (Bryman & Bell, 2011), but gives an alternative to the validity and reliability criteria that was originally developed for quantitative rather than qualitative research.

Finally, we want to highlight one last example of alternative quality criteria that can be used in qualitative research. The first parameter is *sensitivity to context*, which regards both the social context as well as theory and ethics. The second one is *commitment and rigor*, which refers to having the necessary skills and significant engagement with the research subjects. The third point is *transparency and coherence*, referring to the importance of specifying the details of the methodology thoroughly. Fourth and last is *impact and importance*, which entails that the research should have a significant impact on theory, research setting and practitioners (Bryman & Bell, 2011).

3.6 Limitations

Due to the above mentioned concerns regarding external validity and transferability, it is important to highlight that the findings of this study is not possible to generalize to the whole population of female talent in the engineering field. We do not expect our research case to be typical or representative of other cases as well, and we advise the reader to not do so either. Generalizing results from this study may lead to assumptions about the collective view and experience of all women working in the engineering field, which is not the purpose of this research. Instead, we encourage the reader to see this piece of research as one part of a larger puzzle. This is hence a complement to the existing body of research, where we contribute with the insights from one particular organization's talent program, from which nine female participants have had the opportunity to share their experiences and perspectives in-depth.

A common critique against qualitative research is that it is too subjective, especially in terms of the reliance on the researchers' own opinions about what is significant and not (Bryman & Bell, 2011). This is important to bear in mind throughout the study, as the sample of information presented from the interviews is selected by us researchers. As we present the interviewees' perceptions as we understand them, our interpretations of their answers to our questions will hence have a significant effect on the outcome of this study. Although we attempt to be as unbiased and neutral as we possibly can, our own perceptions, views and opinions are unavoidably an influential factor in the findings of this thesis.

Two additional critiques that are commonly applied to qualitative research are that it is often lacking in transparency, for example regarding how the participants were selected, as well as that it is often difficult to replicate (Bryman & Bell, 2011). In order to counteract these risks, we have tried to diligently describe each step of the research methodology, including how the sample of participants was selected, in this section of the paper. There are however factors that lie outside of our control, such as the accessibility of our research objects for other researchers in case they attempt to replicate the study, as well as the constant emergence of new social realities over time.

Moreover, the small scope of this study is also a limitation. Only nine participants were interviewed, and they are all working in the same organization and location. The small scope allows us to dive deep into the thoughts and perspectives of the participants, but it is important to note that this also affects the outcome of the study significantly.

When it comes to the transparency of the interviewees, it is crucial to remember that us in the researcher team have close ties with the organization in which the interviewees work. This may be a hindering factor in obtaining honest, transparent and truthful information about the

participants' experiences in the organization. We therefore have to assume that the perceptions portrayed in this study may somewhat diverge from the interviewees' actual perceptions, and hence not be a completely accurate representation of the experiences amongst the women in the organization.

3.7 Ethical Considerations

In order to ensure a high ethical standard throughout our research study, attention was paid towards four main areas of ethical issues: lack of informed consent, harm to participants, invasion of privacy and deception (Bryman & Bell, 2011). To mitigate these issues, being transparent towards the interviewees was of utmost importance to us. Keeping and respecting the anonymity of the interviewees was done by changing their names in the paper, not providing the name or any other identifiable information of their employer in the paper, as well as not giving anyone unauthorized access to the recordings of the interviews. Furthermore, we made sure that interviewees were aware of the purpose of our research, as well as understood and consented to the recording of the interviews.

3.8 Chapter Summary

In the methodology chapter, we have described and discussed the method used for obtaining an answer to our research question. This entails using a form of qualitative case study by conducting semi-structured interviews with nine women that work at a factory in an international engineering company. After transcribing the recordings from the interviews, thematic analysis will be conducted in order to identify key themes amongst the interviewees perceptions. We recognize that there are several limitations related to thematic analysis, qualitative case studies and qualitative research in general, especially when it comes to transferability and subjectivity. Limitations to our study include that the scope is rather narrow, as well as that us researchers are in a biased position in terms of our relationship to the organization and thus to the interviewees. We also point out the importance of taking into account ethical considerations, such as anonymity and informed consent, when conducting our research study.

4 Analysis and Discussion

In the following section, the empirical study of this paper will be analyzed. A selection of the answers from the interviews will be presented in accordance with the key themes we have identified. The insights will be compared to the findings from previous empirical studies and theories on the matter.

4.1 Why engineering?

More than half of the interviewees in our study are currently enrolled in or plans to enroll in engineering studies. In order to gain an insight into the motivating factors behind the decision amongst women to become engineers, interviewees were asked why they chose to pursue an engineering degree. Most interviewees indicated that they did so because of their personal interest in the subject. An interest in either mathematics, chemistry or technical subjects was stated as the major drive for choosing to study engineering.

One of the interviewees felt that her decision to pursue engineering was inspired by her sister. Her sister had also decided to study engineering - with a different specialization however - and the interviewee stated that this likely influenced her decision. This could be seen as a practical example of the *similarity-attraction paradigm* (Newman & Lyon, 2009) or the *homophily theory* (Kazmi et al., 2021), where the interviewee may have felt more inclined to pursue engineering after observing someone demographically similar and closely related to themselves do it first.

4.2 Gender distribution

As stated in the problematization, there is an underrepresentation of women in the engineering field. In Swedish universities, the percentage of women who graduate from civil engineering programs corresponds to 35% (SCB, 2021). The interviewees in our study who are pursuing an engineering degree alongside their work in the factory confirmed this underrepresentation in the classroom. They do however point out that gender distribution varies significantly between different specializations within engineering - one of the interviewees stated that her specialization, which is mechanical engineering, has a higher percentage of women in the class. Another interviewee pointed out that the gender distribution may appear as more even due to the fact that female engineering students take part in more of the social student life than male

engineering students do. She estimated that the gender distribution in the student activities is around 60% women and 40% men, whilst the gender distribution in her program is closer to 30% women and 70% men.

One of the interviewees shared her views regarding the uneven gender representation in the classroom, and stated that she is used to being in a male dominated environment as she studied a STEM related program before pursuing a university degree as well. This is well aligned with the statistics regarding the sharply declining interest in technical education amongst teenage girls (Skolverket, 2014), and the fact that a mere 19% of the students who pursue technical programs in Swedish upper secondary education are girls (Skolverket, 2021). The interviewee said that the underrepresentation of women is not something she thinks about much, and that she appreciates her classmates and that they are nice people. However, she added that she thinks it would be more fun if she had more female classmates.

At the factory in the engineering company where all of the interviewees work, the representation of women is generally low but varies throughout different departments and teams. One interviewee stated that she was very happy with the fact that there were many women in her round of the talent program, and estimated that the percentage of women was around 40%. Another interviewee who works in a team where a third of the employees are women, spoke positively about working in one of the departments with most female employees.

Most of the interviewees did however state that their teams have a much lower share of women, and two of them are the only women in their teams. One interviewee brought up the fact that most of the people in her team are older men, but clarified that this is not a problem for her as she enjoys working with them regardless of their gender and age. At the same time, she did however express that she is positive towards the recent increase of the share of women in her department, which implies that she is not completely neutral towards the state of diversity amongst her colleagues. Furthermore, she expressed that she hopes for more women to be added to the team during upcoming recruitments.

4.2.1 Divergence Between Different Roles

We assume that the perceptions of the women in our study are not only shaped by their gender, but also a range of other demographic and non-demographic factors. One factor that was brought up during several interviews was the fact that there are differences in the social environment in the workplace depending on what department, team and role the interviewee works in. A few of the interviewees pointed out that they experience or assume that there are differences within the

hierarchy of the company when it comes to group dynamics and culture. There are differences in not only the perceived social dynamics, as well as in the actual gender distribution, when the factory setting is compared to departments “*higher up in the organization*”. It was also brought up that some perceive that there is a difference between how employees in white collar roles are viewed, compared to blue collar employees. Office employees are, according to one interviewee, perceived to have higher status than factory workers, and some of the office employers look down upon the factory workers as they view them as less important. Another interviewee, who has worked in both an office role and a factory role, stated that she enjoys the office environment more, partly because of the nature of the work tasks and partly because of the more even gender distribution in the office.

4.3 Womens’ Perceptions of the Work Environment

4.3.1 Positive Experiences

Many of the interviewees described their experiences at the factory as majorly positive, and most claimed to be satisfied with their workplace. Some positive aspects of working in the factory that were brought up was that the organization is not perceived as very hierarchical, and that the colleagues are kind and helpful. Some interviewees furthermore highlight the recruitment process as a smooth and positive experience, and this is especially true for interviewees who received referrals from someone else within the organization. Although informal recruitment through referrals is proven to be an effective way of obtaining high-performing candidates, previous research has also shown that women may respond more positively towards formal or more traditional recruitment channels (Newman & Lyon, 2009). The women in our study do however claim to be fully satisfied with the informal recruitment process, which somewhat contradicts the previous research findings.

Two of the interviewees brought up that their managers were good at providing support and making sure the employees always know that they can turn to them if anything goes wrong. The managers were adamant that if anything was to happen that crossed any professional boundaries, the interviewees should always seek their support. Moreover, the managers proactively asked if there was anything the employees wanted to talk about or if anything questionable had ever happened, which the interviewees were at first a little worried about. They were surprised over the direct questions and first thought that the reason for asking was that there already were problems of this nature in the workplace, and thus they worried that they would encounter sexism

during their work time. These interviewees luckily never did so, and both claimed to have only good experiences of working in the factory. The managers checked in continuously to make sure all was well, and this resulted in the interviewees feeling supported.

Having a good support system at the workplace can be an important factor in the success of integrating and retaining minority talent (Newman & Lyon, 2009). One of the interviewees who undertook the student talent program in the factory said that being mentored was a crucial part for her whole experience. This confirms the previous research that suggests that having access to mentoring can be a positive entry point for women and minorities (Newman & Lyon, 2009).

During the course of the interviews, a few of the participants shared positive views of how the managers and organization handle matters regarding gender equality and non-discrimination. One of the participants said that her manager has the highest share of women in his teams, and added that “*he doesn't care at all about gender matters*”. Another participant said that despite some harsh language use amongst the men she works with, she thinks that the culture in her location is generally non-discriminatory against women. These statements do align with previous research that suggests that most women in the engineering field do believe that their organization is meritocratic and that gender does not matter (Doerr et al., 2021), and that some women do not believe sexism to be the cause of gender inequalities in the engineering industry (Yates & Skinner, 2021).

The fact that at least some of the women in our study have positive perceptions of the fairness of their employer and its human resource practices is good news for the organization. In accordance with the *social exchange theory*, and the research that Chew, Atay and Bayraktaroglu (2020) conducted on the relationship between the social exchange theory and the happiness and productivity of female engineers, the perceived fairness likely generates a feeling of responsibility for the employer amongst the employees. Making sure that the women in the organization feel fairly treated is thus a win-win scenario, where not only the female talent is more satisfied, but the employer is also rewarded with female employees who are more likely to stay loyal to the company.

4.3.2 Negative Experiences

Several of the interviewees point out that the underrepresentation of women has an effect on the workplace culture and group dynamics. When the majority of the team consists of older men, many interviewees describe the culture as “*different*”, without specifying exactly how it is different. Although one of them pointed out that the men she works with are very nice and treats

her well, she did feel that there were some topics that she would want to discuss with her colleagues but felt as though she couldn't due to the fact that all of them are male. Other interviewees explained that the language used is different in male dominated teams, and that the way the male colleagues behave and talk to each other is different when it is only men compared to gender mixed teams.

Another interviewee who is working in a team with only male colleagues said she felt that she does not get asked to help as much as her male colleagues do. The men she works with seem to prefer to ask their male colleagues for a hand, rather than their female colleague. The interviewee expressed that this is something she struggles with, and that it does bother her.

One interviewee described how she, as the only girl in the team, felt "*stared out*" by her male colleagues. She did however express that this was not necessarily a problem, and that she thinks that the same thing would happen to a man who entered a team with only women. This explanation for a situation caused by the unequal gender distribution in the team, is similar to some of the explanations seen in the study by Yates & Skinner (2021), where some interviewees felt that gender related inequalities in their workplace were not related to sexism.

An event was brought up by an interviewee, where an older, male colleague was repeatedly using a racial slur. It was not directed to anyone in specific, but the mere use of it made the interviewee upset. She opposed the use of the word and an argument between her and three male colleagues followed. She felt that at that moment she did not have any support, as she was alone with these three men and no one else was around. She never brought this event up with her manager, but she did think that she would have received their support if she would have decided to do so. This event could be seen as an example of how oppression related to gender and race may intersect, and a confirmation that women of color are more likely to have negative experiences of their workplace in the engineering field than white women (Doerr et al., 2021).

Although the above mentioned negative experiences in regards to working in male dominated teams as a woman were brought up during the interviews, none of the participants expressed disappointment in the organization's actions or lack of actions when it comes to handling or preventing these situations. None of the participants claimed to have brought up their negative experiences with their manager or any other person in the organization. Doerr et al. (2021) suggests that denial of gender inequalities and/or a lack of opposition against gender inequalities in the workplace may be a result of consciously or unconsciously attempting to avoid potential social sanctions that could be a consequence of highlighting problems or negative experiences relating to gender discrimination or inequalities. Whether this is the case for the women in our study or not is difficult to establish, but none of the participants expressed any explicit worries about escalating potential problems to their managers. Nonetheless, it is important to keep in

mind that the women in our study may have reason to consciously avoid sharing negative experiences relating to the employer, out of precautions regarding their anonymity as us in the research team have close connections to the organization. The participants may in other words feel the need to filter their thoughts due to the position of the interviewers, in order to not suffer from sanctions, such as negative effects on their prospects of advancing in the organization in the future. Thus, unconscious avoidance as described by Doerr et al. (2021), or conscious avoidance due to the researchers involvement in the company, may give reason for the interviewees not to be completely transparent with their experiences and perceptions as well as their level of satisfaction in regards to the employers anti-discrimination practices.

4.3.3 Challenges and Hopes of Women in Engineering

In their research on young women in the engineering field, Doerr et al. (2021) concluded that young women do not feel listened to. Yates and Skinner (2021) moreover discovered that promotions in engineering organizations generally are awarded to those who are widely known and audible - which most often happens to be men. These previous findings align with the perception of one of the interviewees, who stated that the biggest challenge for women in the engineering field is to be heard and seen. She also stated that she finds it difficult to be taken seriously as a woman in the factory setting, and that it is perceived differently when she asks for help compared to when a male colleague does so. When she asks for assistance in her team, she feels that her male colleagues assume that she is less capable of completing the tasks than her male counterparts are. The perception of women being less capable than men corresponds with findings in previous studies as well, and this perception has been found to exist amongst both women and men (Yates & Skinner, 2021).

A recurring theme in the body of research relating to women in engineering is managing stress and work-life balance. Focusing on flexibility and work-life balance is suggested as a key success factor for retaining female talent in the engineering field in research conducted by Chew, Atay and Bayraktaroglu (2020). The fact that the main factor for women in engineering deciding to leave the profession is lack of flexibility when it comes to work-life policies (Crutchfield, 2017) indicates that this is in fact an important topic to consider. In our study, stress was also brought up by the interviewees. One of them pointed out that there are high levels of stress in her team due to being understaffed, but that she is hopeful that the organization will care enough to solve this issue fast, which she generally does not have trust in that large organizations do.

The participants in our study pointed out the use of language as different in male dominated teams and fields. One of the interviewees brought this up as one of the major challenges for

women in the industry. Although she thinks her department generally has a respectful tone, and that the culture in the area where she works is not discriminative towards women, she did still bring up the use of vulgar language as a challenge for the future.

When asked about challenges and hopes for the future in regards to women in the engineering field, one interviewee answered that she did not know. She did not have any specific hopes, because she does not “*feel any less than a man in there*”. The displayed differences amongst interviewees when it comes to their narratives regarding challenges for women in the engineering field confirms Avery’s (2003) research, which suggests that minority groups are not homogenous with unambiguous, collective perceptions - despite previous research sometimes portraying women and minority groups as such. Our research aligns with the idea that differences in the perceptions as well as the explanations for their circumstances are a natural outcome when interviewing a diverse group of people, such as women in the engineering industry.

One interviewee brought up her worries about the physical challenges related to the work tasks in the factory. She pointed out that the factory setting is largely adjusted to the body of a man, with especially height adjustments being a major problem. She explained that the equipment is not built for someone who is shorter, which makes her worry for her and other women’s long term health and wellbeing.

When it comes to hopes for the future, one participant stated that she hoped to one day obtain a leadership position, such as project manager. Research suggests that when pursuing this dream, she will statistically face more barriers than her male counterparts (Kessler, Low & Sullivan, 2019; Yates & Skinner, 2021). In the application process for a role in the STEM field, her resume would likely be rated lower than an identical resume from a male candidate (Kessler, Low & Sullivan, 2019), which would naturally make it more difficult for her to compete for the position. The participant did express a wish to stay in the same organization for a long time to try different roles and eventually climb the corporate ladder. But being promoted will also be statistically more difficult for her than her male counterparts, as previous research suggests that she will likely have more difficulties when it comes to convincing senior management about her commitment and competence, developing core competencies that will lead to success in her profession, and ultimately being promoted (Yates & Skinner, 2021).

An important factor for the participant mentioned above is inspiring other young women to pursue their dream careers in the engineering field. She expressed a wish to obtain a leadership position, stay in the organization for a long time and really get to know all the different parts of it, and inspire other young women and girls to do the same. This can be seen through the lens of the *similarity-attraction paradigm* (Newman & Lyon, 2009), which suggests that similar attracts each other; as well as the *homophily theory* (Kazmi et al., 2021), which suggests that people

relate to and associate with those who are similar to themselves. Kazmi et al. (2021) studied the prevalence of women and underrepresented minority groups in applicant pools, and found that if the chair or members of the search committee are women or belong to other underrepresented minority groups, the percentage of female applicants and applicants who belong to other underrepresented minority groups increases. This could suggest that when a young woman sees another young woman, who she can associate with and relate to, in a leadership role in the engineering field, she may just be inspired to pursue a similar career.

4.4 Chapter Summary

In the analysis and discussion chapter, insights into the experiences of women working in a factory setting at an international engineering company were explored. In accordance with previous literature, our study showed that women's experiences and perceptions vary from person to person and are not unambiguous. It was however found that the interviewees generally enjoy their colleagues and some of them express appreciation for their supportive managers. The unequal gender distribution is however noticeable to the participants in terms of social dynamics, and negative experiences amongst the interviewees include the use of vulgar language, being perceived as less capable than male counterparts, and feeling like an outsider in the team. These experiences correspond with other researchers' findings in previous studies. None of the participants in our study claimed to have informed their managers about their negative experiences. When it comes to the participants' hopes for the future of the engineering industry, most express a wish for a more equal gender distribution of the workforce.

5 Conclusion

In the last section of this paper, we will share our concluding thoughts around the research presented in this thesis. We will revisit our research question, research purpose and aims and objectives in order to discuss how we developed the thesis in accordance. Furthermore, we will explain what implications we extract from our research findings, and how they can be applied and utilized in practical terms. Lastly, we give our suggestions on how future research can continue to deepen and broaden the understanding of womens' experiences in the field of engineering.

5.1 Addressing the Research Question

By conducting a qualitative study with semi structured interviews, we have attempted to answer the research question "*How do women experience exposure to the engineering profession during their work in the factory of an international engineering company?*". The insights derived from the interviews have been contrasted with previous research, and the main conclusion is that the experiences encountered amongst women in our study are fairly similar to those of previous ones.

Women have both positive and negative experiences of exposure to the engineering profession in their blue collar roles at the factory of an international engineering company. Positive experiences include feeling supported by their managers, enjoying working with their colleagues, and feeling treated no differently than male counterparts. Negative experiences include being exposed to vulgar language, feeling restricted by the social dynamics and conversational topics in the male dominated teams, and being perceived as less capable than male counterparts. Most interviewees expressed a wish for more even gender distribution, and some were passionate about themselves contributing to inspiring more young women to pursue engineering.

5.2 Theoretical and Practical Implications

In academic terms, this thesis provides additional empirical evidence to the body of research on women's experiences in the STEM field, and in male dominated industries in general as well. Previous research on the topic suggests that the experiences, perceptions and narratives of individuals belonging to minority groups are heterogenous and vary within the group (Avery, 2003). Our research confirms that women in the engineering profession do have different perspectives and opinions. At the same time, their perceptions do however share many similarities. These similarities include the tendency to avoid bringing up unpleasant experiences with managers, having an overall positive experience of colleagues and work environment, and wishing for a more equal gender distribution in the future.

As for practical implications, we believe that there are many key points derived from this thesis that international companies in the engineering field can benefit from. The learnings from the literature review underlined the importance of not just focusing on increasing diversity in terms of gender distribution, but ensuring that the work environment and organizational culture is inclusive and enjoyable for women and minorities (McKay & Avery, 2005). In other words, international companies should not focus on solely attracting diverse talent, but instead focus on retaining diverse talent.

Furthermore, we found that the women in our study appreciated the proactive support they received from their managers. Knowing that you have someone to confide in if there would ever arise problems was important for the participants. This did however not imply that the participants actually utilized the opportunity to confide in their managers whenever an uncomfortable situation or experience did occur. A lesson to be learned from this is that even though management may not hear about these negative experiences amongst their female employees, it does not necessarily mean that the women in their organizations do not experience such problems.

An additional implication worth noting is that women in the engineering profession do have different viewpoints of their circumstances. Whilst some of the women in our study did not have any particular hopes for the future regarding women's participation in the engineering industry, others were passionate about inspiring other young women to pursue engineering. Some did not think much about gender in the workplace, whilst others were very aware of the uneven gender distribution. For international companies to successfully retain female engineering talent, they must recognize that this variety of impressions is crucial to take into account when working with diversity, inclusion and equality in practice.

5.3 Suggestions for Future Research

Despite our attempt to contribute to a richer collection of empirical evidence on the experiences of women in the engineering field, we believe that there is still a great need for more research on the topic. One particular insight that we concluded was the apparent resistance amongst women towards bringing up negative experiences to their managers, which we believe to be an important area to further study. Learning more about why women prefer not to highlight unpleasant situations or experiences with managers could give a deeper insight into the thought processes of women in male dominated industries. Moreover, it could result in valuable insights for employers on how they can gain more insight into the experiences of their female employees. This could possibly lead to a better understanding of the situation for women in their organizations, which could potentially increase the satisfaction and retention of female talent.

Doerr et al. (2021) argues that commitment from men in the engineering industry is needed in order to achieve gender equality. To complement research studies such as ours, we believe that there is a great need for more research on men's perception of the engineering field and the implications of the uneven gender distribution. Combining and contrasting the perspectives of women and men could lead to a better understanding of the social setting of the engineering industry.

5.5 Chapter Summary

In the final chapter of this thesis, the researchers concluding remarks are presented. The research question, "*How do women experience exposure to the engineering profession during their work in the factory of an international engineering company?*", is addressed. The concluding answer to the question is that women in this study have both positive and negative experiences of exposure to the engineering profession, and that perceptions of the uneven gender distribution in the industry range from not giving it much thought to passionately trying to inspire other women to pursue engineering. Most participants do however express a wish for having more female colleagues.

This study contributes with a richer basis of empirical evidence regarding womens' experiences in the engineering industry, as well as practical implications relating to international engineering companies' ability to attract and retain female engineering talent. These practical implications include the importance of applying a long term perspective to managing gender diversity, the fact

that negative experiences amongst female employees may be difficult for management to detect, and that women in the industry possess different views, perceptions and narratives in regards to their circumstances as women in engineering. Finally, the suggestions for future research include exploring why there seems to exist resistance amongst women towards bringing up negative experiences in the workplace to their managers, as well as combining the female perspective of the industry with the perspectives of male counterparts in order to better understand the complex social reality of the male dominated engineering field.

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