

Women in Mechanical Engineering: A case study of the Faculty of Engineering of the University of Porto in the last 20 years

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Abstract

Mechanical Engineering is often considered a course for men, however, during the past few years, the number of women enrolling and concluding the course is increasing, particularly in Portugal and at the Faculty of Engineering of the University of Porto (FEUP). The present study aims to analyze the female students that finished the Mechanical Engineering course at FEUP from 2001 to 2020, the motives behind their choice of the course and how being a woman has influenced, in their understanding, their path in this field.

Introduction

It is common sense that the involvement of women in engineering-related activities is low compared to that of individuals of the male gender; nonetheless, that fact is particularly notable for Mechanical Engineering (Mcllwee and Robinson 1992; Carter 1989; Régner et al. 2014). This occurs mainly because this area is still associated with activities requiring muscular strength in particularly heavy and dirty environments. Throughout the 20th century and well into the 21st century, women were traditionally underrepresented in professional careers and courses related to Mechanical Engineering, regardless of race/ethnicity, and there are several

justifications for this occurrence (Régner et al. 2014). For a considerable time it was believed that women were less suited for Science, Technology, Engineering, and Mathematics (STEM) and more suited for social sciences and, when they went into the scientific fields, they were usually directed towards health or laboratorial activities (McIlwee and Robinson 1992; Casad, Hale, and Wachs 2017), not only for intellectual reasons but also mainly for reasons of physical aptitude and social status.

Analysing the situation in the most socio-economically developed countries (Europe and North-America), during the majority of the 20th century, women, as in previous centuries, were educated to stay at home and be in charge of the children's education and household management (Anderson and Gilbride 2003). The industrial environment was seen as hostile to the female gender, especially in management positions. And, regarding Mechanical Engineering, there was a stereotype that it was not a job suited to women and girls, and those working in this profession were stigmatised as "tomboys". Rahm et al. (Rahm and Charbonneau 1997) stated that stereotypes formed during childhood, most probably influenced by their social environment or the influence of the media, remain largely unaffected by the subsequent passage through high school and college, despite the fact that numerous real-life figures engaged in scientific activities are presumably encountered throughout those formative years. This means that if such stereotypical thoughts regarding Mechanical Engineering are transmitted to children, they are more likely to choose a different area of studies when the time comes. The same train of thought applies to men regarding professions usually attributed to women, such as nursing or jobs that involve working with children.

When thinking of an engineer, there is a generalized stereotypical image of a Caucasian man. This sort of socially-ascribed stereotypes, such as the idea that women are less capable in mathematics, threat functions on a cognitive level (e.g., reduced working memory, rumination, self-monitoring) as well as a physiological level (stress-response) (T. Schmader, Johns, and Forbes 2008). Research studies have demonstrated that stereotype threat affects women in engineering roles, are highly gender identified, find the task demanding and perceive the environment as threatening (J. Aronson et al. 1999; J.J.E.I. Aronson 2004; Spencer, Steele, and Quinn 1999; T. Schmader, Johns, and Forbes 2008; T. Schmader, Johns, and psychology 2003; T.J.J.o.e.s.p. Schmader 2002). A study led by Logel et al. (Logel et al. 2009), revealed that, if women in engineering-related activities interacted with a male stakeholder who behaved in a sexist manner, their performance was significantly worse on an engineering test than that of women who had experienced non-sexist male interactions. Thus, the researchers concluded that "environments can be a potent source of threat creation" (Logel et al. 2009). It can be assumed that the facts reported are responsible for dissuading a large number of women from pursuing an engineering career because they do not want to be the people often portrayed in the media and be intimidated by an environment they perceive as hostile (Hoh 2007).

This scenario remained valid worldwide during most of the 20th century, except for brief moments, such as during World Wars (WW), when women found themselves in a different social scenario due to the lack of man available for such work roles, and occupied positions previously unreachable to the female gender. In addition to the idea that women were less suited to engineering, there was also less interest among women in pursuing activities related to Mechanical Engineering. However, this justification is valid for the majority of the countries that had an active position in 2nd WW, namely countries like UK, USA, URSS, France, Italy and Germany (Hoh 2007). Portugal was one of the few countries in the world to maintain a neutral

position in this war, by not sending men into battle and, therefore, there was no need for women to replace men in industrial and engineering-related activities. That gender role was not even changed during the Colonial War, at which Portugal fought against its colonies (1961 - 1974) (Ramos 2019). Therefore, labour relations were not altered throughout the 20th century, until 1974 when the dictatorship fell in Portugal. The end of the dictatorship was one of the main milestones that changed social interactions in Portugal and, consequently the role of women in society in general, giving them officially the same rights men had, and particularly in labour activities (Amâncio and Santos 2021). Portugal was under a dictatorial regime (Estado Novo) for 48 years, between 1926 and 1974. At that time Portugal was one of the least developed countries in Europe, and the only one to retain colonial power (Nogueira, Paúl, and Amâncio 1995). Before the 25th of April of 1974 revolution that ended the regime, women were treated as inferior to men, and this classification was considered in the Portuguese constitution. Individual liberties of the Portuguese women population were subjugated to the status of second-class citizens in Portuguese society during the dictatorship. In the ideology imposed by the Estado Novo (Portuguese dictatorship), the woman existed to be a strict mother and wife and should be responsible for the maintenance of the household (Rosas 2001; B.J.d.S. Marques and Guarda 2020). From a very young age, women were educated to practice their role and act according to the patriarchal power. António de Oliveira Salazar, dictator responsible for the Estado Novo, did not allow the social order to be questioned and all whispers of feminism were silenced (M.A. Marques et al. 2019). Under the prevailing ideology, women's rights were significantly limited since they could not vote; they could not be a judge, diplomat, military or police officer. Portuguese industrialisation took women out of home, but the truth was that a work contract was worth less than a marriage contract. To work in commerce, leave the country, open a bank account or take contraceptives, a woman had to ask her male figure, usually her father or husband, for permission. Moreover, they earned almost half the salary paid to men (Pimentel and de Melo 2015; Beleza 2010). These and other laws were torn up on April 25th, when, a year after the revolution, women's rights were enshrined in the Constitution of the Republic. In 1974, the Portuguese scenario was very different from that experienced in the rest of Europe; there was obscurantism and even ignorance among the general Portuguese population. Education was one of the legacies most affected by the regime, since the schooling was kept to a minimum, being the mandatory time in school correspondent to four years, time that was commonly disregarded. In the 1960s, more than 40% of the Portuguese population could neither read nor write and only 0.6% had reached higher education (Barreto 1995). Contrary to what was experienced in Europe and North America, Portugal did not have, until 1974, major changes in social trends. Great student protest such as those known as May 1968 in France or the Hippie movement, inter alia, drew attention to major social dilemmas, among them the role of women in today's society (Kaufmann-McCall and Society 1983; Evans 2009). In almost 50 years, Portuguese society has had a long way to consolidate democracy, and other social and economic transformations, aimed at changing the country from "a backward, socially underdeveloped country into a modern nation", to equalize the values already established in the most of the countries of Western Europe (Amâncio and Santos 2021; Pinto and Santos 2015). Nevertheless, with the fall of the dictatorship and the improvement of education by the democratic regime, it was not enough to bridge the gender gap in illiteracy, as thirty years later the rate of illiterate women (21%) was still twice as high as that of men (11%) (Nogueira, Paúl, and Amâncio 1995). The accelerated progress of women in compulsory education was confirmed in the 1991 population census, which reported that 48% of the population with

higher education qualifications were women and they were also the majority of graduate students (53.9%). Moreover, women kept progressing in education with sociological research demonstrating how educational credentials represented a necessary condition for intergenerational mobility for women, while the same was not true for men. In recent European statistics on education and science, women formed the majority of PhD graduates and Portugal exceeded the average of EU countries on this indicator (Nogueira, Paúl, and Amâncio 1995; Mendes and Editora 1998; (EIGE) 2019).

However, the industrial and economic panorama has changed in recent decades with the growth of high-tech industries. Careers in STEM fields rank among the fastest-growing (Cadaret et al. 2017). Consequently, engineering has achieved greater visibility in the occupational hierarchy (McIlwee and Robinson 1992). Although engineers still do not enjoy the status of doctors and lawyers, has brought greater attention to engineers who must develop the technologies of the future, and women have not been indifferent to this turnaround in the economic panorama. Moreover, nowadays women feel encouraged to practice engineering, contrary to what happened a few decades ago, both by the support felt by the working community, the family and society in general. The influence of the media in bringing women into engineering also played a key role. In recent years, we have witnessed a movement of women's empowerment, in which they are shown that there are no professions associated with gender, but rather with calling. The influence of this movement is expected to be particularly noticeable in the generations to come, bringing a gender equality (Kar et al. 1999; Naved 1994).

This study aims to observe the last 20 years in the number of women graduating in Mechanical Engineering at the University of Porto. The University of Porto, founded in 1911, is one of the largest and most prestigious universities in Portugal and its Faculty of Engineering (FEUP) is responsible for training a large proportion of Portuguese engineers, with about 8 thousand students at the moment. Since 2000, this faculty has graduated 2430 Mechanical Engineers, of which 311 are women. In the same period, 1.4 million students graduated in Portugal, which makes Mechanical Engineering at FEUP 0.18% of the students graduating in the country. Dividing by gender, men represent 0.45% of the national graduates and women 0.04%. To understand the reason for choosing this course, whether their current profession is correlated to the course and to perceive the advantages and disadvantages of being a woman in this field, a survey was conducted and answered by 29% of the female students that finished their studies since 2001.

1. Characterization of the study group

This study focused on the last 20 years of the Mechanical Engineering course in the FEUP, targeting the female students that finished the course throughout these years (2001-2020). This choice is justified by significant changes that happened in the course in 2001, mainly in the facilities where the course was taught.

Figure 1 exhibits the number of students that graduated in Mechanical Engineering over the past 20 years, divided by their graduation year and gender.

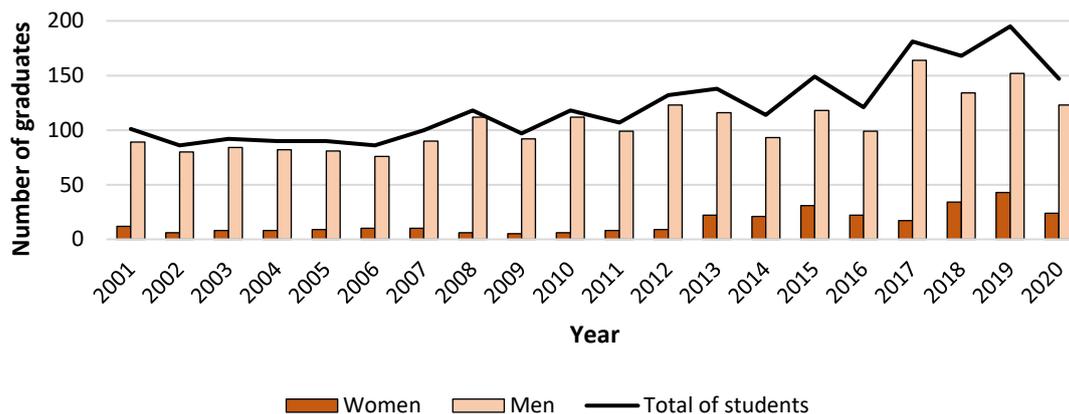


Figure 1: Students that graduated in Mechanical Engineering in the period considered.

The number of students that enrolled and, consequently, finished the course increased over the years. By dividing students into five-year intervals, it can be seen that there is an approximately linear increase of graduates (Figure 2a). Additionally, it is important to understand how the women/men ratio changed over time (Figure 2b), which increased from about 9% in 2001-2005 to 17% in 2016-2020.

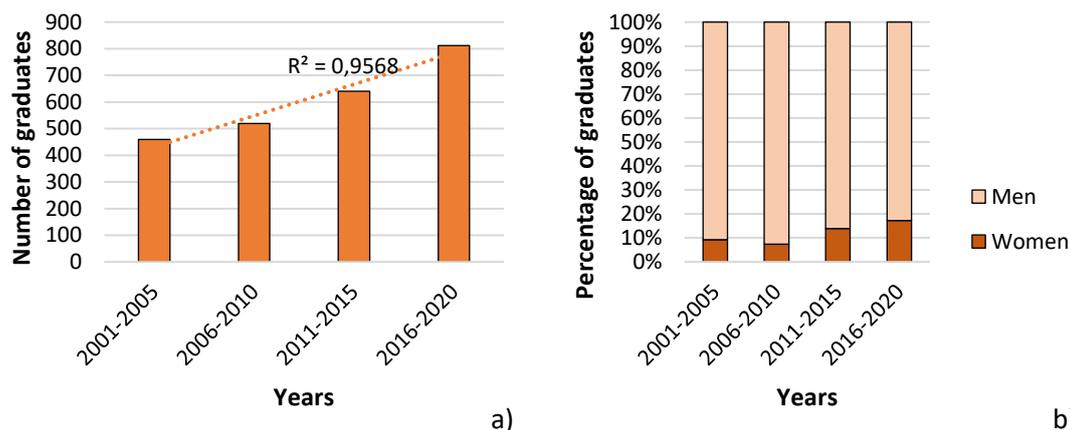


Figure 2: Students that graduated in Mechanical Engineering in the period considered a) and ratio of male to female students b), divided into five-year intervals.

As said, the ratio of women to men graduated in Mechanical Engineering by the University of Porto is increasing over the years. However, when compared to the total of female higher education graduates in Portugal and, even particularizing, in the field of Engineering, Manufacturing and Construction, it is still fairly low (Figure 3).

Over the past 20 years, the ratio of women graduating in Mechanical Engineering at FEUP is 20% of the ratio of women graduating in Portugal and 22% of the ratio of women graduating in Engineering, Manufacturing and Construction in Portugal (Fundação Francisco Manuel dos Santos 2021). From Figure 3 it is clear that most of Portuguese’s graduates are women, since the ratio of women that graduated in Portugal (given by “Total”) is consistently above 50%. However, that does not reflect the work market in the same country, since according to the Organisation for Economic Co-operation and Development (OECD) report in 2021, men find jobs more easily and women earn about 73% of what men do, in the same position (OECD 2021).

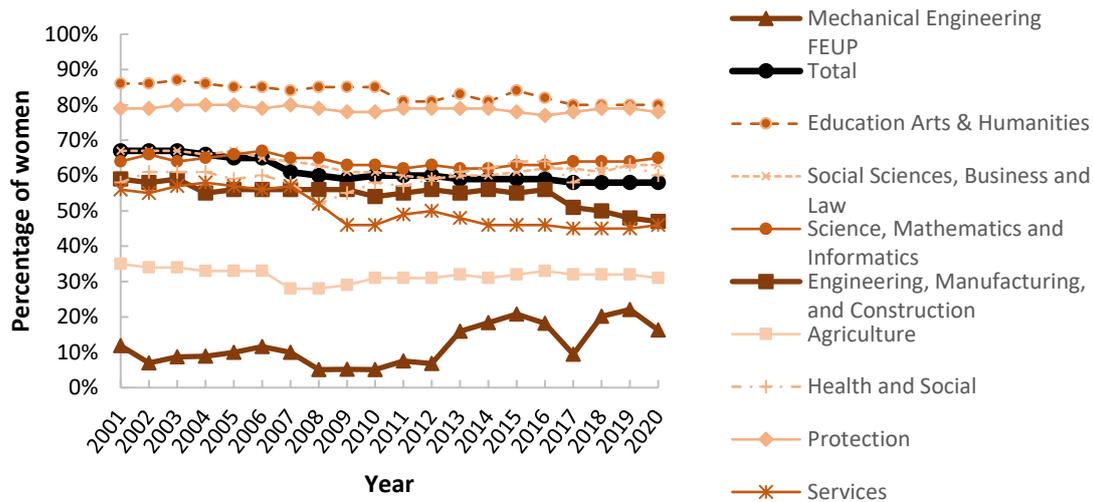


Figure 3: Ratio of women graduated the Mechanical Engineering at FEUP, when compared to the ratio of women graduated university in Portugal and the women graduated in each field of courses in Portugal.

Since the data is being analysed from the year of course conclusion, it is important to understand how long the students require to finish their studies, how that changed over time and how it differs between men and women (Figure 4).

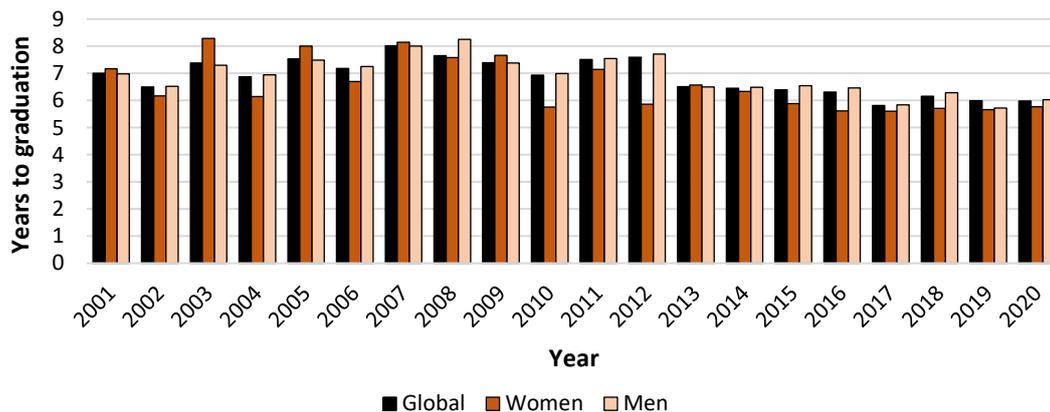


Figure 4: Number of years required for students to graduate Mechanical Engineering at FEUP over the years: global, women and men.

Overall, the students finished the courses quicker as time progressed, which means, on average, that the graduates in 2020 enrolled in FEUP six years before. However, for example the graduates in 2007 enrolled eight years before. This trend might be related to the increase in the entrance grades of students in the last years. The entrance grade of one course is determined by the average of the last student that ingresses. For Mechanical Engineering at FEUP, the entrance grade increased significantly in this interval, which starts reflecting on the time needed to finish the course for the students that graduated between 2012 and 2013.

2. Study approach

After analysing the study demographic, the group of students that finished their studies in Mechanical Engineering between 2001 and 2020, a survey was sent to the female students through their emails, as well as the faculties' social media. This survey aimed to evaluate their academic and professional path, as well as the effect of their gender on said paths. The survey had six main sections.

Section *A* intended to characterize the participant, by their personal and academic data such as entrance and graduation year and if they interrupted their course. Section *B* aimed to evaluate their current professional situation such as if they were employed and how much they earned per month. Section *C* focused on why they chose the Mechanical Engineering course and what were their main sources of information to clarify the choice. Section *D* focused on their time in the Mechanical Engineering course, and if the students felt positively or negatively discriminated for being a woman. Section *E* discussed the period right after leaving the university, when they were looking for a professional project. Finally, Section *F* was about their working experience and how being a woman has influenced it. Along the survey, there were also sections designated for the participants to elaborate on their opinion.

The former students were asked on several questions to rate criteria from 1 to 5, where 1 is strongly disagree (or similar) and 5 is strongly agree (or similar). Afterwards, the influence of that factor was defined in Equation 1.

$$\text{Influence factor} = \frac{\sum_{i=1}^5 N_i n_i}{\sum_{i=1}^5 N_i} \quad (1)$$

where N_i is the number of participants that answered each agreement level and n_i a factor that is 1 for strongly agree (5), 0.5 for agree (4), 0 for neither agree or disagree (3), -0.5 for disagree (2) and -1 for strongly disagree (1).

3. Results analysis

3.1. Characterization of the group of alumni that answered the survey

This section focuses on the analysis of sections A and B of the questionnaire. The questionnaire was sent to the women that finished their studies for the past 20 years at FEUP and 29% of the target audience answered it. The number of graduates that answered the survey divided by their graduation year is presented in Figure 5.

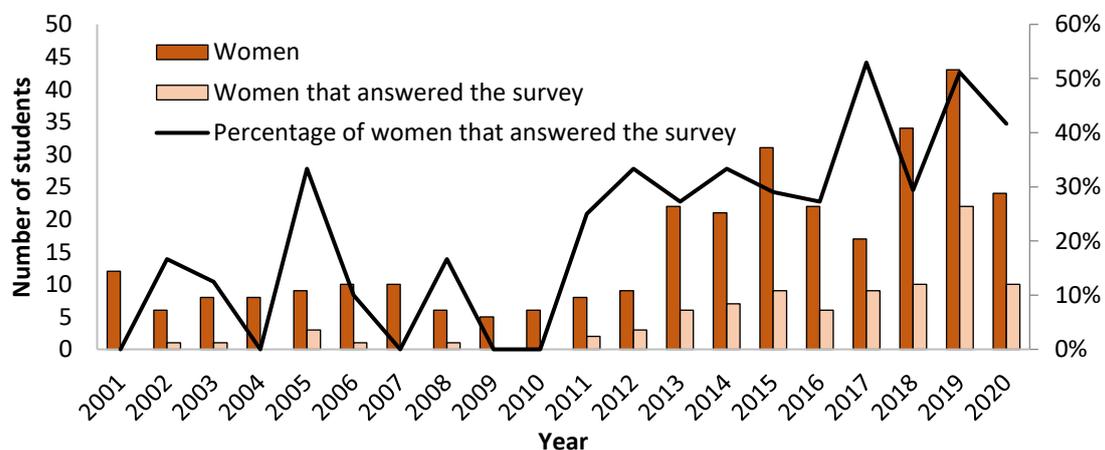


Figure 5: Graduates that answered the survey divided by their graduation year.

The number of graduates that answered the survey is higher from 2011 to 2020. This was expected since these are the former students that finished their courses recently and, therefore, are more connected to the university its social media networks and the email given when their courses were finished. Additionally, in the most recent years, the number of female graduates is higher and, therefore, it is simpler to obtain a significant number of responses. Since the number of graduates that answered the survey is not constant over the years, and there are years without answers, the results were analysed as a group and their evolution throughout the years was not accessed.

A disclaimer must be done regarding the results presented, since only former students that finished the course were considered. Therefore, although students that interrupted their studies and resumed them afterwards are being taken into consideration, students that dropped out of university are neglected. From the participants, two women have interrupted their studies, one for 6 months, finishing the course in 2012 and another one for 5 years, finishing the course in 2020.

From the graduates that answered the survey, the ratio of employed graduates is very high, with only three unemployed women, all of which finished their studies a maximum of 4 years prior to the questionnaire (2017, 2018 and 2020).

The employed participants were asked on the seniority of their current professional project (Figure 6a), and current monthly income (Figure 6b).

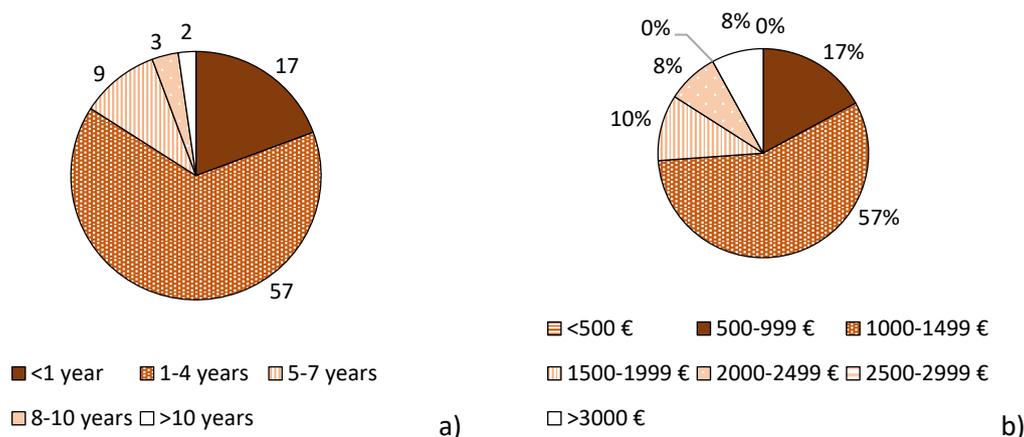


Figure 6: Seniority of their current professional project a) and their current monthly salary b).

Most of the graduates have recent professional projects, with 84% for less than 5 years and, out of those, 19% for less than 1 year. Regarding the monthly wage, most participants, at 83%, earn more than 1000€, however, only 36% earn more than 1500€ and 16% more than 2000€. For comparison reasons it is important to point out that the Portuguese minimum wage, at the time of writing, is 665€ , the average monthly salary of employees 1005€ , and the vast majority of participants in the survey were working in Portugal, which means most of the participants has a monthly income that is very close to the Portuguese average. No correlation was found between the duration of the professional project and the current wage. However, some of the participants that are earning more than 3000€ mentioned they were working abroad in other European countries with a higher minimum and average salary.

3.2. Choice of the Mechanical Engineering course

This section focuses on the analysis of section C of the questionnaire. The participants were asked on their choice of Mechanical Engineering course to evaluate moment of choice, motives and the main sources of information used.

It is important to understand if these women always knew and though this would be a possible career for them in the future or if they chose their path very close to the end of high school, Figure 7.

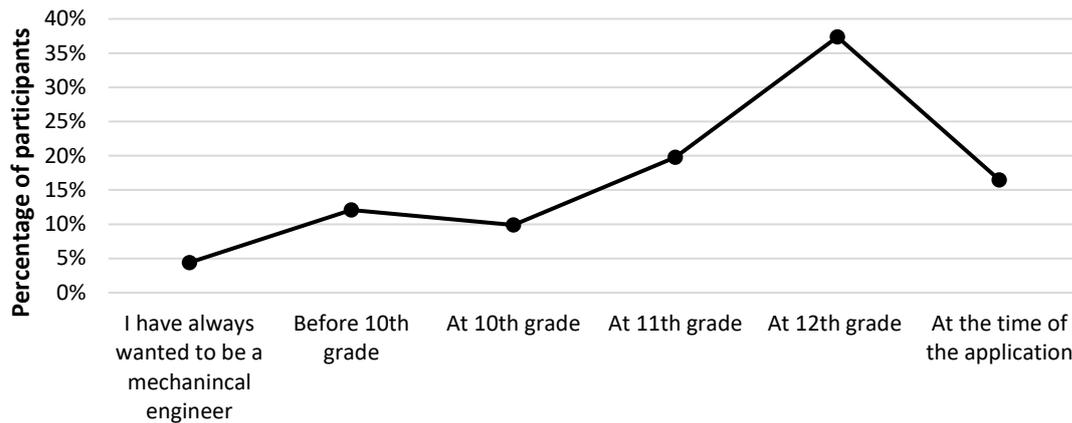


Figure 7: Seniority of their current professional project a) and their current monthly salary b).

Only about 5% of women always wanted to be a Mechanical Engineer, with about 37% choosing it in the last year in school and 16% right before they enrolled in the university, this makes the total of female graduates choosing the course in the last year possible about 53%, over half. [Duarte et al. \(2020\)](#) distributed a similar survey to all of the graduates that enrolled on the Mechanical Engineering course in 2020. In this survey, the responses were not divided by gender. However, when asked the same question about when they decided their course, the percentage of graduates that answered “at the 12th grade” and “at the time of the application” moves from 53% to 44%. This trend could be due to the women initially not considering Mechanical Engineering as a course they could pursue and, at the 12th grade, confronted with the deadline to choose what they want to enrol as their main field of studies, they do more research and better understand what the course discusses and what the study plan is and choose this course. This conclusion is supported by the graduates choosing the study plan as their main source of information with an influence factor of 0.3, calculated as described by [Equation 1 \(Figure 8\)](#). The other sources of information ([Figure 8](#)) are the option of parents or guardians, information on the course and FEUP website.

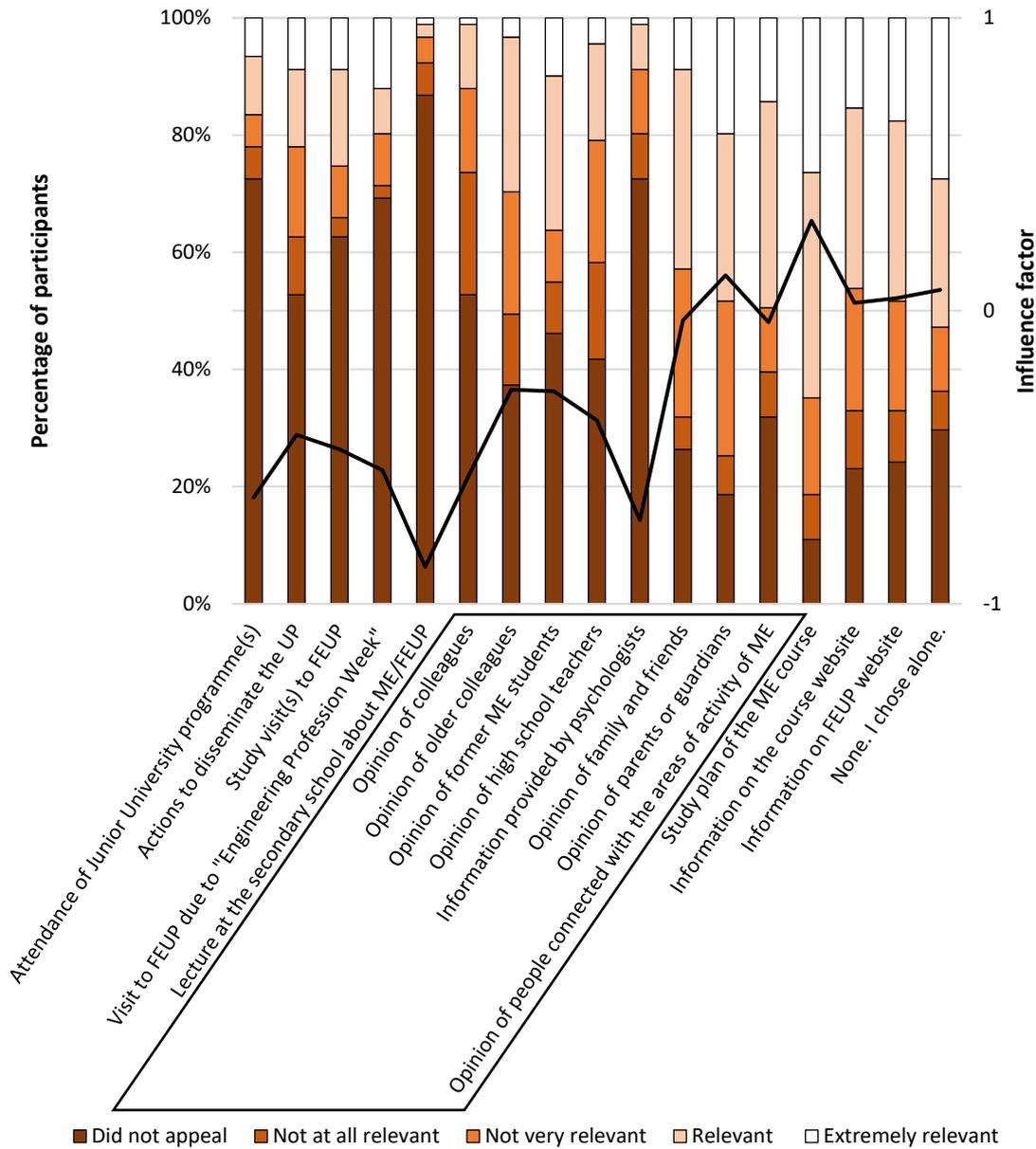


Figure 8: Seniority of their current professional project a) and their current monthly salary b).

The sources of information were logically grouped by categories, as suggested in Figure 8, to facilitate the result analysis: promotion actions, study visits or summer courses at FEUP, opinion of others and study plan and information on the course or faculty website (Figure 9). This made it clear that the most important sources of information are the study plan and university websites, followed by the opinions of others, with the less relevant being promoting actions.

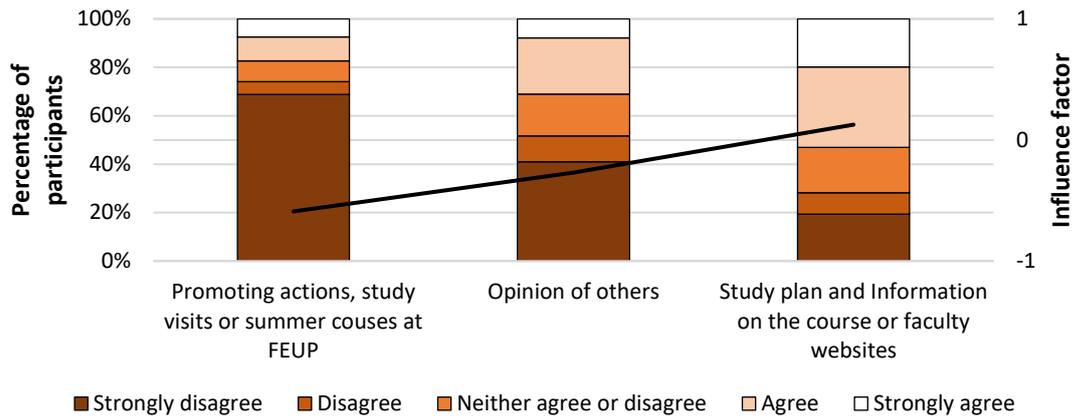


Figure 9: Sources of information used to choose the Mechanical Engineering course grouped by categories.

After understanding what sources were used to choose Mechanical Engineering, it is important to analyse the motives that led to the choice (Figure 10). The main motives for the choice of the course are related to the future prospects the course offers, such as the versatility of choices and professional performances, prospects of employability and expectations of professional achievement. Other important topic for this choice is the faculty and course itself, through the expectations of a solid and quality education and access to a broad and diverse education.

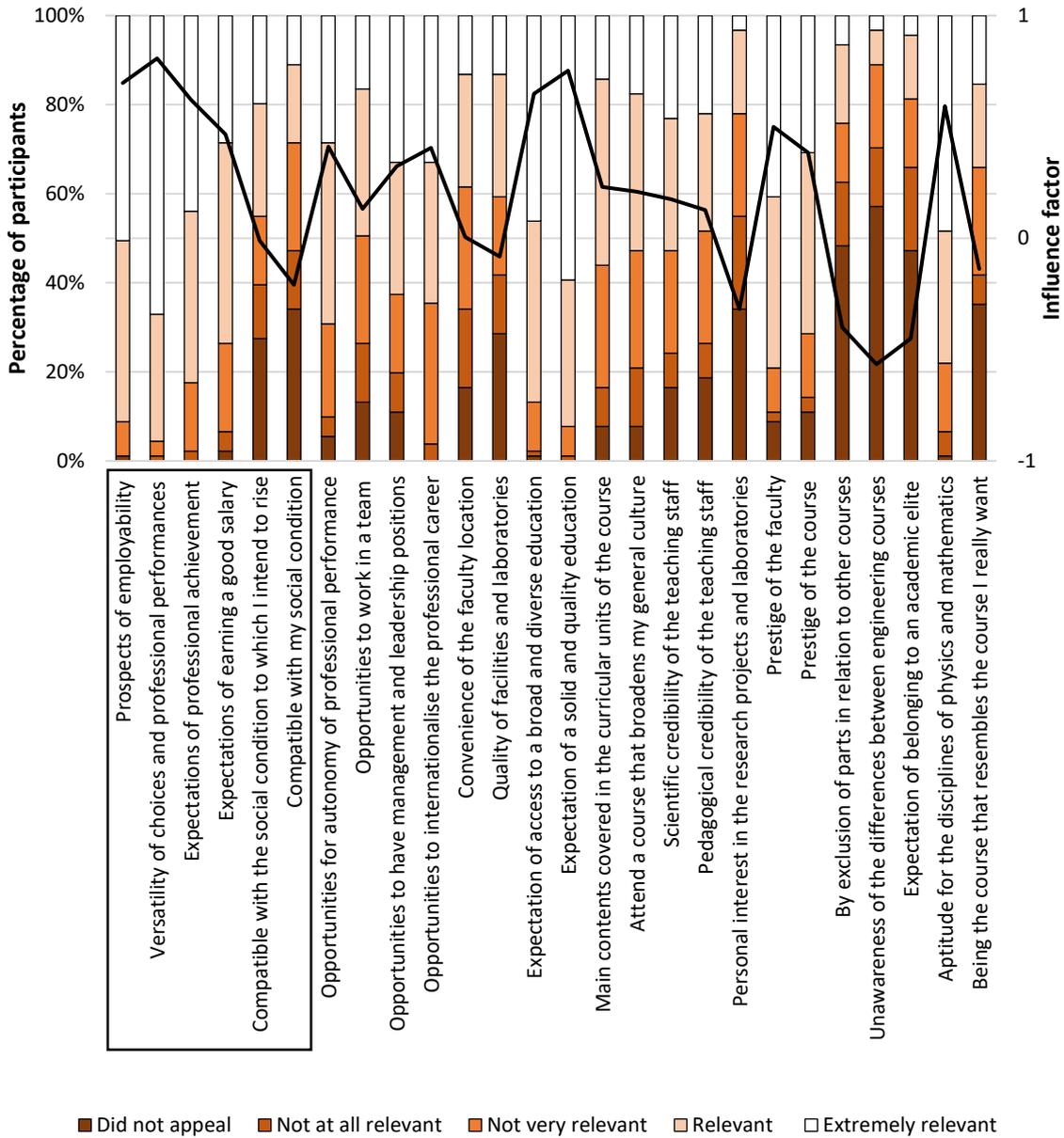


Figure 10: Motives for choosing Mechanical Engineering.

The results were, again, grouped by categories (Figure 11). Participants point professional aspiration as the main motive for choosing Mechanical Engineering, followed by the opportunities provided by the course, such as autonomy, teamwork, possibility of holding high positions and work in other countries and the faculty and academic path during the course.

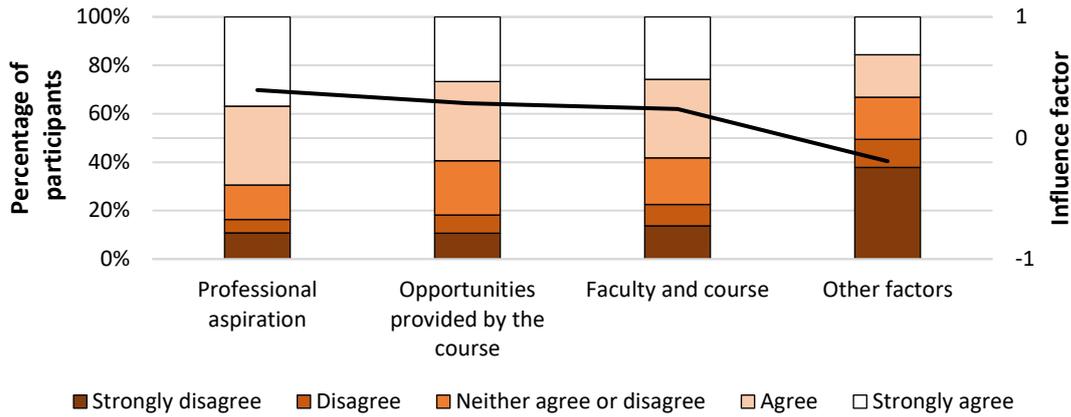


Figure 11: Motives for choosing Mechanical Engineering grouped by categories.

3.3. Academic path

This section focuses on the analysis of section D of the questionnaire. The women were also asked on their academic path and how they were positively or negatively discriminated for being a woman. Generally, women did not consider they were positively discriminated (benefited or preferred), with an influence factor of -0.56 (Figure 12). However, when asked about the agents of discrimination, women give a higher score to male colleagues and male professors, although with an influence factor close to 0. Regarding male professors, participants mentioned that, although the professors tried to discriminate them positively, sometimes, that was excessive, such as when a student addresses to a professor’s office, usually female students are better treated than male students are, and women would prefer to be treated in the same manner.

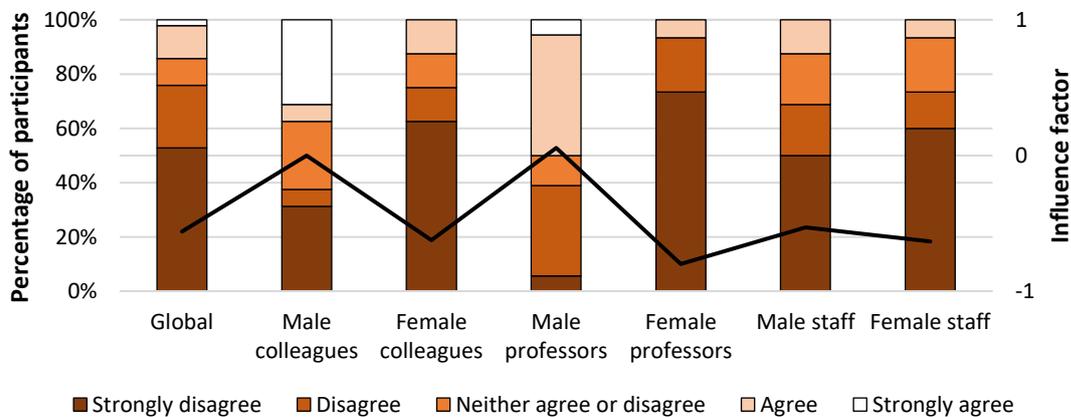


Figure 12: Positive discrimination of women during their studies and its agents.

Regarding negative discrimination (disadvantaged, limited or excluded), a similar situation is observed (Figure 13). However, in this case, the global feeling of discrimination has a more significant factor and the negative discrimination felt by male professors has a more significant factor, at 0.1.

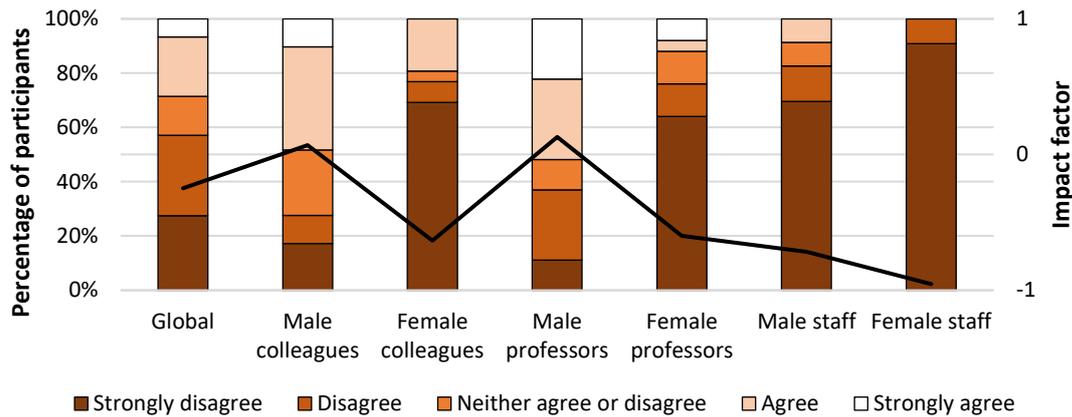


Figure 13: Negative discrimination of women during their studies and its agents.

3.4. Professional path

This section focuses on the analysis of sections E and F of the questionnaire. Participants were asked if they felt discriminated when they were looking for their first job and, afterwards, they were asked to give some examples. When asked directly, 6% said they were positively discriminated and 21% said they were negatively discriminated, Figure 14. However, when given a text box to further discuss their opinions, a significant number of women gave examples of discrimination, even the ones that said they did not feel it.

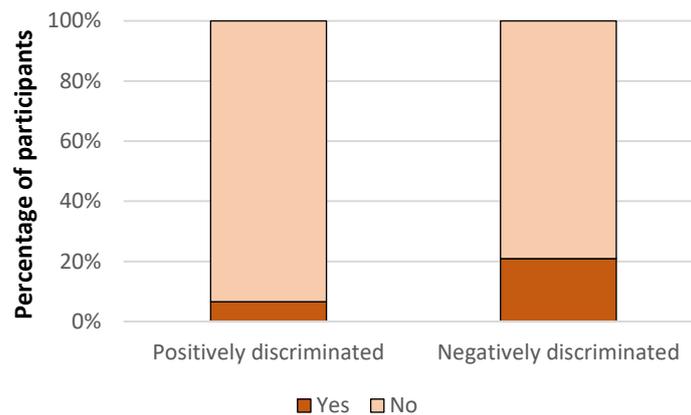


Figure 14: Positive or negative discrimination when searching for the first job.

January of 2018, the ratio of people of each gender for each management and supervisory organ of a company must be higher than 33.3% in the public sector and the same applies in the private sector as of 1 of January of 2020 . This law was motivated by the discrepancy in the number of men and women in the senior positions of companies. However, although this is pointed out as a positive discrimination, participants mention that they do not view it as a benefit, since this law is only in practice because companies, when facing the decision of employing a man or a woman with the same background, frequently employed man. There are also participants that mention having interviews in companies where no woman works because “women change the work environment” or that their company, after employing them, never hired another woman. This is particularly concerning in the Mechanical Engineering field, when compared to other fields, with job positions more commonly occupied by women. Generally, for a wide range of sectors, and reported in the answers to this survey, women report that employers ask if they want to have children or even if they have a boyfriend in job interviews, concerned with having to give them parental leave. However, in Mechanical Engineering specifically, there are also reports from the participants that

employers asked, “so you went to Mechanical Engineering, that is a man's course is it not?”. And, when explaining that the job description included supervision of factory environments and that in the first few months she would have to work in that environment to understand the stages of the productive process, said that “those are pretty heavy activities for a girl do you not think?”. There are also reports of employers that posed questions “on whether women can handle working under pressure, especially having a family”.

After being hired, during their professional path, when asked on whether they felt positive discrimination and which were its agents (Figure 15), in general women say they do not feel positively discriminated, with the higher influence factor being higher for male colleagues. As motives for positive discrimination, they point out that, mainly their colleagues, “try to be nicer” with them, talking in a “more polite manner”. Some of the participants, notice that “the possibility of getting the position is increased by the fact that, nowadays, there is a preference to hire women for technical positions” and that “the culture of valuing women leads to this being a factor in both recruitment choices and leadership positions because the professional environment is still dominated by men”. However, they also mention that they are offered more help and assistance than their male colleagues “for example for testing prototypes and assembling components” and that this poses an “assumption that help is needed, without question” and that they must prove that they are “capable of doing the work without help” as it is assumed men do. Additionally, it is noted that “often less is expected of us [women] simply because we are women. Now when they [the colleagues] see me [participant] disassembling the equipment and putting my hands to work it has happened to me to receive certain comments in the form of compliments simply because I took that initiative”. It must be understood that some of the participants that reported they were positively discriminated do not view it as an advantage, since they associate it to condescending behaviour.

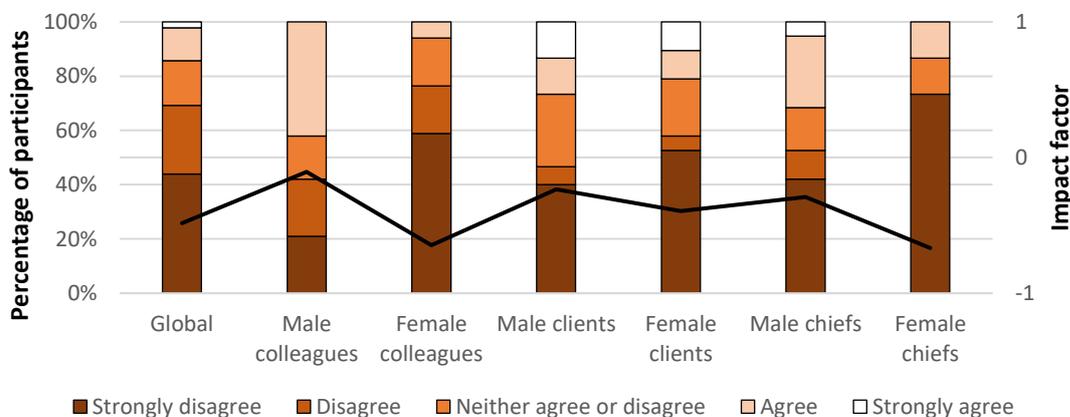


Figure 15: Positive discrimination of women during their professional path and its agents.

Regarding negative discrimination, [Figure 16](#), the influence factor of the global feeling of discrimination is closer to zero, therefore, higher than for positive discrimination, but still low. The main agents of discrimination pointed out are male colleagues and male chiefs.

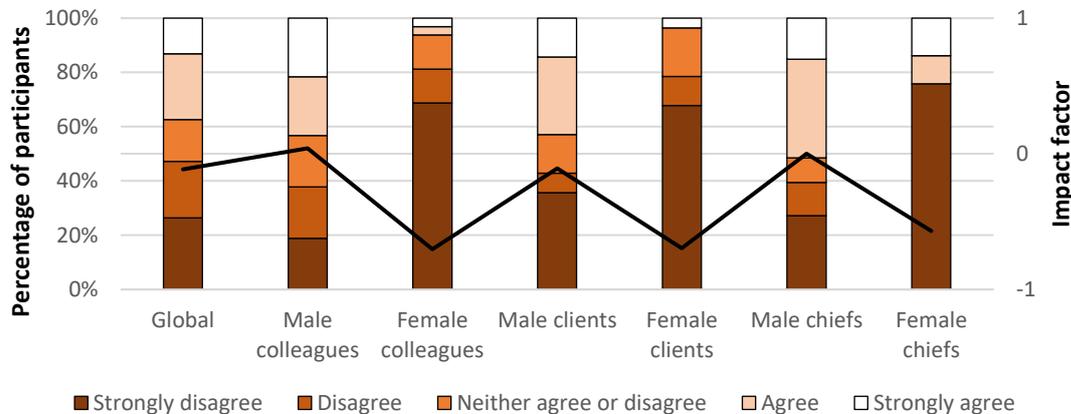


Figure 16: Negative discrimination of women during their professional path and its agents.

As examples of negative discrimination the participants said that “taking a leadership role in a factory and marking the position of women is still difficult nowadays”, this particular participant says that “fortunately, I [participant] am currently in a team management position in a factory (which has only male employees)” and that “there is still some reluctance to accept a woman Mechanical Engineer as the head of a section, especially the acceptance by older men”. Some participants say their manager “made it clear that she preferred working with men because they were less complicated” and that the company “hired a woman before and had had a bad experience in that hiring, so she [manager] was projecting this negative experience onto me [participant]” and even that they “told me [participant] that she had almost given up on women, but decided to hire me, and not to disappoint her”. These positions have been reported to be followed not only by male managers, but also female, as in the testimonies shown.

It is also referred that they felt “distrust by third parties”, such as clients, on whether they had “practical skills (hands-on)” but the doubts “ceased to exist” once the clients “tested” them, this point is raised by several participants saying employer and colleagues are also guilty of “not giving as much value to the opinion” of women and “mistrust my [participant] technical abilities because I have another gender”, adding they feel that people assume they have “less interest in on-site assembly” and that, even when they are team and project leaders they have “been approached by operators who question my [participant] academic background” because “they doubt my competences ‘on the factory floor’ because I am a woman”. The main concern points throughout the testimonies are that “it is not easy to be taken seriously when you are a young woman”, often feeling that they are “given less work and less pressure is put on me than on my [participant] colleagues” and that “it is hard to be seen as leaders instead of difficult or bossy”. Some participants also felt harassed saying that “over-sympathy and even “stalking” on social networks is common”.

Regarding job positions and monthly wage, it is said that they are aware that their male colleagues in the same position earn more money monthly and that “in my [participant] company the leadership positions are almost all occupied by men, there is a general bias whenever there are roles of increased responsibility to be distributed” adding that the company has “set targets of 25% women in leadership positions by 2025 and 30% by 2030 and

they want to reverse this”, which makes one particular participant “considering leaving the company”.

As pointed out in the search for the first job, it is also said that “pregnancy is seen as a setback”, and that employers “are afraid of compatibility between family and career”. In the other end of the spectra, it is said that “for not being married, abuse in the daily hours worked” and “overtime is not paid”.

To justify the severe difference between the examples explored and the impact factors presented, it must be pointed out that several of the women that gave these examples responded they were not discriminated for being women, starting their text answers by saying they were not discriminated more than what they were expecting.

In the survey, the main gender discrimination factors in the workplace were also asked, [Figure 17](#), with compatibility between family life and professional life, pregnancy/maternity, appearance and physical characteristics, being identified as the main concerns.

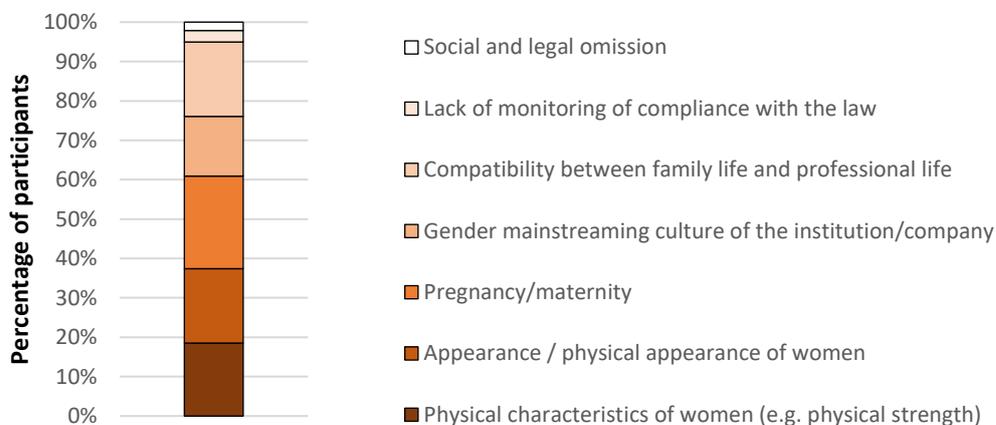


Figure 17: Main gender discrimination factors in the workplace.

As for the main gender discrimination practices, [Figure 18](#), the most voted option was discriminatory recognition / career progression policy, followed by discriminatory salary policy.



Figure 18: Main gender discrimination practices in the workplace.

Although most women that shared their testimonies are critics of their colleagues and chiefs, it is also pointed out that there has been an effort in several companies to even the ground and decrease women discrimination and that “Mechanical Engineering is still very much seen as a male profession, but I [participant] notice a significant improvement”.

4. Conclusions

In conclusion, it was seen that although the number of female graduates in Mechanical Engineering in FEUP is increasing, it is still low when compared to the graduates in Engineering, Manufacturing and Construction in Portugal, and the discrepancy is even higher if compared to the total number of students graduating in Portuguese universities.

During their studies, women only describe situations of discomfort as discrimination, both positive and negative. However, a significant number of women does not consider that discrimination, when asked to quantify how they felt during the course, since they describe it as expected occurrences.

When searching for the first job and during their lives at work is where more concerning situations are reported. Some of the occurrences can be transversal to several professional areas, such as the discrimination due to the possibility of a parental leave. However, as Mechanical Engineers, women feel condescending behaviour from male colleagues and chiefs that assume they are not fit for some positions because they cannot work in factory environments or conduct experimental and workshop work by themselves. There is still a very noticeable stigma associated to Mechanical Engineering being a course for men, and that translates into women being patronized as less capable individuals.

In the future, it would be interesting to further research and generate data on the job roles given to of men and women with the same background, as well as analyse the monthly salary of women and men in the same positions. This would be useful to understand if the general perception that it is easier to progress in industrial careers being man and that men earn more than women in the same positions is correct.

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