RESIGNIFYING SPACES: WOMEN'S MOTIVATIONS FOR ENGINEERING COURSES

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ABSTRACT

The school is a strongly constructed and reinforced space for the legitimization of gender identities, whether through its formal or informal curriculum (based on pedagogical practices, for example). Louro (2001) indicates that several problems that are linked to education and gender relations are reproduced and/or omitted in school and curricular spaces that end up not respecting social diversity. Our objective in this manuscript is to problematize the motivations that led the students to choose the engineering course at a public university in Portugal. The research is characterized as qualitative and was designed from an interview intervention (zoom platform) carried out with 12 female students inserted in a Public University in the North of Portugal. We will use interviews, a typical technique of qualitative methodology, to collect data in a more in-depth way. The statements of the interviewed students show that we obtained testimonies, although not representative, that emphasized the occurrence of barriers and confrontations with the family in the choice of the course.

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INTRODUCTION

For a long historical period, women were made invisible and had their intellectual capacities underestimated, being deprived of access to the production of knowledge (Borsatto, 2022). Among the various achievements resulting from these struggles, the insertion of women in education and in the labor market were the most important that enabled female emancipation (Olinto, 2019).

The role of women in society as a whole, for a long time, represented a secondary importance when compared to that of men. According to Donna Haraway (2000), there is not only one way to name "being a man" or "being a woman", it is precisely a very complex category that is constructed by "sexual scientific discourses". It is important to point out that the problematization and treatment of gender inequality still continue to manifest itself in the area of Education. The category 'woman' is thought of as including biological traits, as well as socially constructed aspects (Piscitelli, 2001). However, if the emphasis given to biological aspects placed the category 'woman' in a potentially limited space, in the field of Education it was no different.

The school is a strongly constructed and reinforced space for the legitimization of gender identities, whether through its formal or informal curriculum (based on pedagogical practices, for example). Louro (2001) indicates that several problems that are linked to education and gender relations are reproduced and/or omitted in school and curricular spaces that end up not respecting social diversity. Gender is a fundamental factor in social interactions and is crossed by power relations in an unequal way for men and women, installed at the individual level, of social institutions and organizations (Scott, 1996).

The academic and professional path of women who enter these areas is an arduous path, full of challenges and confrontations, where a series of resistances arise (Tozzi, 2010). Historically, the women who occupied such spaces did not always have their scientific achievements recognized, and their participation was excluded or made invisible in the records of the sciences (Silva, 2008).

Our objective in this manuscript is to problematize the motivations that led the students to choose the engineering course at a public university in Portugal.

The challenge of developing gender awareness in the academic space also requires teachers to learn, understand and make visible the situations involving gender issues in the classroom. Regarding gender relations and education, Carvalho (2003, p.73) indicates that "they are not something that can be distanced from, like other curricular contents, because

in a more or less implicit way, they structure school work, the relationships between teachers and students, and constitute personal and professional identities".

METHODOLOGY

Our research is characterized as qualitative and was designed from an interview intervention (zoom platform) carried out with 12 female students inserted in a Public University in the North of Portugal. We will use interviews, a typical technique of qualitative methodology, to collect data in a more in-depth way.

The qualitative methodology makes it possible to deepen the knowledge of the participants' experiences, using, for example, the interview technique, as was our case. For Silveira & Códova (2009), qualitative research is not concerned with numerical representativeness, but rather with deepening the understanding of a social group, an organization, etc. For Minayo (2001), qualitative research works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, of processes and phenomena that cannot be reduced to the operationalization of variables.

DEVELOPMENT AND DISCUSSION

The data analyzed in this section bring the statements collected in the interviews and the excerpts refer to the motivation for choosing the course, organized from the dimension "Motivation for choosing the course". In this excerpt, we sought to identify the motivations that led the participants to enter engineering. We also analyze how/if motivations are linked to the family aspect and/or affinities in the disciplines.

The participants bring about their reality and motivation for choosing that "I always liked challenges, I was totally against what my family always studied and worked, I think it was a good choice" (excerpt from interview, P11). "I was a bit confused when it came to choosing, most of my family are on the health side, and I am the first in the family to go into the engineering field. It's my path." (excerpt from the interview, P4). Confronting the excerpts of participants 4 and 11, Luchiari (1996) shows that the choice that children have is often inserted in a family line, where the past is a fundamental part of the representation they make of themselves and what they want to study. The family values that are experienced and transmitted can end up influencing the decisions of choice, either including or completely rejecting such values. In this sense, it is worth reflecting and

considering that, sometimes, the experiences acquired in the family environment can end up redirecting the path of generations (Neiva, 2007).

Studies (Falco & Summers, 2019; Baker, 2013) reveal that women who have greater support from the family have greater success in their careers, as they do not feel limited and feel greater support in decision-making power.

Oliveira, Ramos & Caglioni (2020) show that the choice of higher education course presents several challenges, ranging from the expectations of the family itself and the future student in relation to the chosen course, to the cost of this training.

P5 refers to her curiosity since she was a child and brings that "my mother tells me that since I was a child I was always very curious to open the toys, and I remember that I was always curious to understand how they worked, I believe that this is where the initial motivation came from" (excerpt from the interview, P5). In childhood, when families encourage or recriminate children's decisions and/or behavior, these interferences end up determining, in part, the formation of the individual's habits and interests (Soares, 2002). Thus, it is essential that the family builds and welcomes the various possibilities of being a child, establishing a welcoming coexistence based on dialogue disconnected from the gender factor.

According to the data obtained in the questionnaire, 64.5% of the students revealed that their favorite subject at school was Mathematics and this crossing ended up participating in the motivation for choosing the course and is strengthened in the interviews (P6, P7, P10). P7 points out that he "has always liked mathematics" and also P10 indicates that "more approximation with numbers, calculations and mathematics". Gender metaphors have been and continue to be impregnated in Mathematics and most of the time it ends up being seen as a field of male predominance, in which women's achievements are made invisible and scientific activities of greater power and prestige are denied (Menezes and Lima and Souza, 2012). The understanding of the mathematics attributed to masculinized prerequisites gives rise to the idea that there is a 'natural' destiny for men and women and ends up harming the permanence of students in engineering.

P2 says that he thinks about the "professional opportunities I can have, that's why I chose." According to the testimony of this interviewee, more specifically, her choice of course was guided by the job market and the opportunities that the area of Engineering may have. However, it is worth pointing out that, with regard to the salary remuneration of women, in the field of Engineering, although it is already expected: discrimination and

salary difference is present. In other words, even with a wage advantage that is associated with a higher level of education, women earn less than men in all OECD countries (OECD, 2021). In addition to receiving lower salaries, they still have little or no female presence in leadership positions (occupational discrimination), "they are more vulnerable in terms of dismissals" (Serpa, 2010, p.22).

Kergoat (2015) points out that this is an issue that comes from a historical and cultural construction of the categories of masculine and feminine and that aims to structure a clear hierarchy. Such an understanding shows that this historical and cultural construction strengthens patriarchy and maintains this logic of domination that aims to preserve the subordination of women.

When analyzing the participants' answers, it is noted that the affinity for exact disciplines, curiosity behaviors in childhood and the search for challenges were some of the factors that led them to choose Engineering. Regarding family participation, P3 indicates that the parents were not surprised by the choice of course, however, they still thought it was a masculinized course.

 It is important to point out that the influence of teachers can also cross the process of choice. To this end, Teixeira & Costa (2009) suggest that it is valid to understand that there is a great participation of basic education teachers in the training and in the direction of a less stereotyped mentality. For the authors, this participation "may allow the greater insertion of women as citizens interested in the knowledge of calculations in general". In this sense, if the teacher has a sexist view of academic and professional spaces, there will certainly be a distinction in the stimuli of the teaching-learning process according to the student's gender. Carvalho & Rabay (2013) indicate that school education is formative and higher education is a reinforcement of vocations.

According to the statements of 5 participants, the affinity with the area of exact sciences was a key factor for the choice of the course, so it is necessary to discuss and problematize the issues that involve gender relations from basic education. If before there was a "simple" exclusion of access to formal knowledge, with the expansion of education, there was the inclusion of girls in schools. However, this inclusion was represented by segregation, with discouragement of access to certain areas of knowledge, which were strengthened as masculine spaces: calculus for boys, embroidery for girls (Beltrão & Teixeira, 2004). According to the OECD report (2019), girls reported fear of failure more often than boys. Given the great challenge for girls to succeed in STEM sciences, due to

self-imposed pressure, the fear of failure is associated with the gender stereotypes they face at home, at school, and in society (OECD, 2019).

When asked about what led the participant to choose the Engineering course, P7 informed that: "I always liked to work with computers, and as I took the professional course in Informatics, I wanted to continue in this area" (excerpt from interview, P9). Considering the cut made in this section, prioritizing the look of women inserted in Engineering, we understand that the spaces for training and study based on affinities are produced from various fields, including those of access.

Echazarra (2018) points out that boys tend to report a higher frequency of using technologies outside of school for leisure than girls. According to the OECD (2019), 53% of 15-year-old boys play collaborative games on a daily basis, while 10% of girls of the same age reported using them. Having access to technology, therefore, makes it possible to expand opportunities that permeate the various spaces (family, school, environment, etc.).

By problematizing gender issues in the process of living higher education courses, we will be able to understand how sexual differences in education and professions were consolidated and in the possible insertion in the labor market of the students surveyed. As Schiebinger (2001, p. 39) points out when he argues that what "is needed is a critical understanding of gender, of how it works in science and in society". Understanding how gender crosses science and how it communicates with society is a key factor for us to have a critical understanding of these relationships. Such an understanding will allow the rupture of situations that still occur in a naturalized way and are based on predominantly male power relations.

FINAL CONSIDERATIONS

The statements of the interviewed students show that we obtained testimonies, although not representative, that emphasized the occurrence of barriers and confrontations with the family in the choice of the course. From this perspective, it was observed that the factors that led the students to choose the course vary from affinity with the exact disciplines, professional opportunities and indirect participation of family members.

In summary, we can say that we have identified three major types of motivation: academic affinity; professional future; and family members. In the interviewees' statements, as motivations, we had: professional opportunities (2); affinity with computers and technologies (2); affinity with calculations (5); family factors (3). Such motivations

corroborated the studies of Soares (2016), Beltrão & Soares (2014), Kergoat (2015) and Menezes and Lima and Souza (2012).

Professional opportunities are seen as motivations and the reason for preferring a certain area is related to the job market, identification with the area, status of the profession (Carvalheiro, et al., 2018). The affinity with calculations and computers and technologies end up encompassing the academic affinity and they are related as external motivations crossing with family factors, considering that the family context can end up encouraging or distancing contact with computers and technologies. Finally, choosing a course to which one has affinity and desires, both professional and learning, can result in greater student satisfaction and will result in good professional performance.

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