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Diversity and perception of gender equality in exact science programs at UFRGS

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ABSTRACT

In this study, we analyzed the percentage of women and racialized students and professors in undergraduate programs in Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry at the Federal University of Rio Grande do Sul (UFRGS). Based on the statistical data presented, we carried out a qualitative analysis on the perception of students in these programs regarding the issue of gender in the academic context. In particular, we assessed what drives female students to pursue a degree in these areas and the obstacles they face. We also sought to understand what distinguishes the sub-areas within the exact sciences that have greater participation of women, such as Chemistry, when compared to the other areas analyzed. Data were collected anonymously in an online questionnaire with closed- and open-ended questions. The results reveal a difference in participation in terms of gender, but not race, and there are several reasons that affect women's interest in the exact sciences, such as the influence of family, society, or female role models that stand out in science.

KEYWORDS: Gender. Science, Technology, Engineering and Mathematics (STEM). Exact Sciences.

INTRODUCTION

Although the right for women to enter Higher Education in Brazil only began in 1879, the participation of women in education is growing. Today, women make up the majority of undergraduate, masters, and doctoral students in Brazil (BARRETO, 2014; INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA [INEP], 2020). This equality of human resources, observed in national studies and work undertaken by the Elsevier publishing company, suggests that Brazil has the most equal balance between men and women as authors of papers (ELSEVIER, 2016), leading to the idea that Brazil is a successful case of gender equality.

However, the increase in female participation in Higher Education in Brazil is heterogeneous, with a greater female presence in professions or areas with little social status (BARRETO, 2014). Notably, women are a minority in the areas of Science, Technology, Engineering, and Mathematics (STEM).

The lack of interest of women in certain areas of knowledge stems partly from the educational process. Although children are curious about all subjects, there is a decrease in the number of young females who identify with and choose STEM subjects as they progress through the school system. This phenomenon has been called the crystal labyrinth (LIMA, 2007), representing the constant, invisible obstacles that women face in order to advance in STEM careers. The crystal labyrinth is an allegory for their journey through STEM; for women it is full of challenges that are imperceptible to the rest of society.

In addition to the lack of equality between male and female students in certain areas of study, the percentage of women decreases as they advance in their academic careers. The absence of women in positions of power is a phenomenon known as the glass ceiling, an expression that alludes to the fact that although there is the impression that women have equal opportunities to men, in reality, they reach positions of power at a lower rate than their participation in the area. The lack of women in leading positions can discourage more young women from pursuing STEM careers (BREDA *et al*., 2020).

The process by which men assume positions of power and dominate areas of knowledge takes place within the context of androcentrism. The ideology of androcentrism creates social instruments, identified by Bourdieu as instruments of domination and processes of cultural capital, that are accessible only to men (BOURDIEU; KÜHNER, 2012). These processes create prejudice called intelligentsia racism (ARÊAS; SANTANA; BARBOSA, 2020), which leads to the normalization that primarily men are in positions at the top of their careers and perform activities that are specifically intellectual or exceptional difficulty.

Women continue to be seen as intellectually incapable of occupying spaces of power as well as positions in STEM. In the social imagery, these areas require cognitive skills which, for many, women do not possess (BIAN; LESLIE; CIMPIAN, 2017). This prejudice results in gender-biased evaluations of curricula (MOSS-RACUSIN *et al*., 2012) and leads to distortions in self-esteem; women do not see themselves as capable (MARSHMAN *et al*., 2018) of competing for higher positions in their career (ABOUZAHR *et al*., 2017).

The advances related to women's increased participation within universities has given rise to some misconceptions. The first is that of equal participation of

men and women at all levels within the academy, including positions of power. Studies have shown that this perception is incorrect. Analyses of the percentages of scholarship holders in Physics (BARBOSA; LIMA, 2013) and Computing (MAIA, 2016) over a decade, showed that the percentage of women in these positions is much lower than that of men and these numbers have changed little over time.

The second myth is that the entry of women into STEM has improved and that the participation of women has significantly increased over time without the need to establish specific policies to address the issue. Unfortunately, in Brazil, this is not the case. The percentage of students in STEM areas, independent of the level (undergraduate or graduate), has either remained stable or has decreased over the last 15 years (MAIA, 2016).

In an attempt to understand what leads students to select STEM subjects and the impacts of this choice, Santos, Canever and Frotta (2013) showed that women, primarily selected programs in the areas of teaching, law, biological sciences, and health. Based on a questionnaire, another study found that girls reject subjects they consider "difficult" such as Mathematics, Physics, and Chemistry (QUEIROZ; CARVALHO; MOREIRA, 2014). These studies identify the propagation of such stereotypes (BIAN; LESLIE; CIMPIAN, 2017), but the occurrence of stereotypes is not restricted to gender issues. When professional preferences are analyzed with a racial lens, it appears that Black men and women opt for specific areas such as teaching, nursing, primary care, and education (ARTES; RICOLDI, 2015).

Caran *et al*. (2010) sought to identify the existence of moral harassment among professors at a Brazilian university and found that among the 54 professors that made up the sample, not one person was Black. This highlights an important issue regarding the presence of Black men and women in spaces that, historically, they have not occupied, as is the case of teaching in Higher Education. Another more recent study by Brito *et al*. (2022) shows that among the victims of moral and sexual harassment, women and Black men and women make up the majority. These studies seem to indicate that there is a common mechanism of exclusion of Black men and women, and women in general, from certain areas of knowledge. Is this universal or are there subtleties in the process of exclusion in the context of STEM?

Within the STEM areas, Chemistry has shown a higher percentage of women in leadership (FERRARI *et al*., 2018), particularly in Brazil. Perhaps young women choose chemistry because they can find more women working in this area in society. This phenomenon may help explain why women distance themselves from other STEM areas and whether the same process occurs in terms of race.

In this study, we analyze the participation of students and professors in undergraduate programs in Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry at the Federal University of Rio Grande do Sul (UFRGS) in terms of gender and race. In the first stage, we sought to confirm if there was any common pattern of participation of women and Black men and women in Higher Education.

After detecting a greater participation of women in Chemistry undergraduate programs and as professors when compared to other STEM areas, a pattern not identified for race, we decided to analyze the perceptions of undergraduate students about their degree program in the exact sciences, Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry at UFRGS. To do so, we

issued a questionnaire aimed at students in these areas, seeking to understand why Chemistry, an exact science, is more attractive to women than the others.

The perception analysis is compared with data on the evolution of the percentage of women entering these programs over time. Thus, it is expected that the data and results of the questionnaires discussed here can help to identify the challenges that permeate the issue of gender in science.

METHODOLOGY

This study consists of two phases: an analysis of the percentage of students and professors in a set of programs; and a questionnaire. The first phase evaluated the entire set of students enrolled between the years 2015 to 2019 by race and gender and the percentage of active professors by gender in 2019 in Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry programs at UFRGS.

Data were provided by the Dean of Undergraduate Studies at UFRGS upon formal request for access to information. In this first phase, we also included an analysis of the percentage of students and their distribution by race. If the exclusion mechanisms that occur in certain programs in terms of race is the same as with gender, we expected to find a lower participation in certain programs for Black men and women than in others.

The choice of programs was due to the limited percentage of women in these areas, since in programs such as Computing and Information and Communication Technologies (ICT), women make up less than 15% of graduating students (INEP, 2020). Therefore, it becomes relevant to investigate in practice the reasons that lead women to opt for these programs, despite the predominance of males, in addition to understanding the implications of this choice from the perspective of the students themselves. Following national studies on the subject, a questionnaire was developed to address these issues.

In the statistical analysis, we found that the Chemistry undergraduate program had a higher percentage of women than the other programs. We decided to analyze this difference. This fact was not reflected in the percentages of racialized students, which were very low for all areas analyzed. Thus, we decided to focus the questionnaire on the issue of gender.

The second part of this study was carried out through a questionnaire answered by 154 students, 71 women and 83 men, from the teaching and bachelor's undergraduate degree programs in Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry at UFRGS.

Data collection took place through a semi-structured questionnaire (attached) with closed- and open-ended questions, using the online tool Google Forms. The questions were prepared by the authors and sought to identify whether women and men opted for the area of study based on different motives, cultural capitals, or similar reasons.

A striking feature of research using questionnaires is the ability to assess the characteristics of a given group with the goal of identifying opinions, beliefs, or attitudes. Thus, it is understood that, when using a questionnaire, the research fits

into the data collection technique, as it aims to collect information about the interviewees in relation to a given problem (GIL, 2002).

The study was submitted for ethics approval via Plataforma Brasil, protocol number CAAE 04347418.9.0000.5347. After approval, an email was sent to the Graduation Commissions (COMGRADs) of the respective programs, which was then forwarded on to the students inviting them to participate in the study. The email contained general information about the research such as the title, objective, possible contributions, and approximate completion time. The link to the questionnaire was also made available. When accessed, the students were first asked to read and accept the Free and Informed Consent Form (TCLE) to proceed with completing the questionnaire.

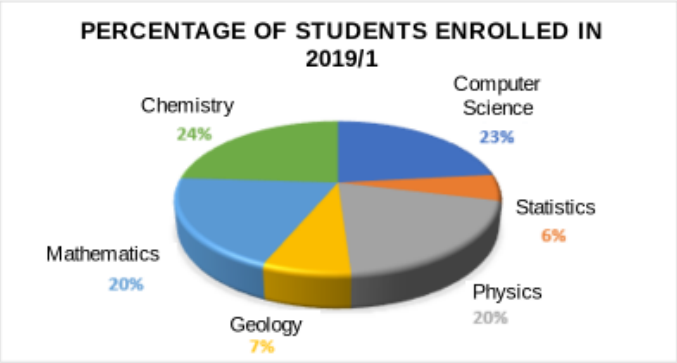
The questionnaire had two sections. In the first, the respondent identified themselves, indicated how they see the program in terms of diversity, and provided information on their hopes for their future in terms of employment. In the second section, which was exclusively for female respondents, the questions were related to the different barriers or prejudices they had faced. In this section, we sought to understand the invisible obstacles faced by women, or the crystal labyrinth.

RESULTS AND DISCUSSION

In the first stage, we analyzed the environment in which the students are a part in terms of diversity. We evaluated the percentage of students and professors in STEM undergraduate programs at UFRGS to identify whether there is any area that is more favorable to women and whether this coincides with race.

In the first semester of 2019 (2019/1), there were 2,963 students in the six undergraduate programs analyzed. Of these, 711 were Chemistry students, which corresponds to 24% of the total number of students who received the questionnaire; 689 in Computer Science, about 23% of the total number of students; 596 in Physics, equivalent to 20% of students; 583 Mathematics, 20% of the students; 219 in Geology, 7% of students; and 165 in Statistics, around 6% of the total number of students who received the questionnaire, as shown in Figure 1.

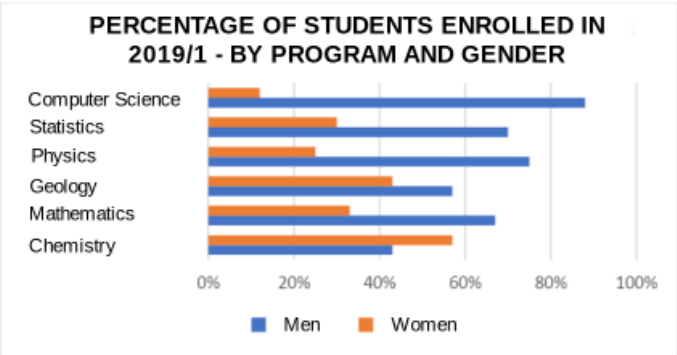
Figure 1 - Percentage of students enrolled in UFRGS undergraduate programs in 2019/1.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figure 2 shows the percentage of men and women enrolled in the first semester of 2019 in each undergraduate program studied. Of the areas analyzed, only Chemistry presented gender equality among students during that semester. The percentages are similar to those observed in other institutions in Brazil (VIANA; SOUZA; ANJOS NETA, 2017; SANTOS; CANEVER; FROTTA, 2013; BARRETO, 2014).

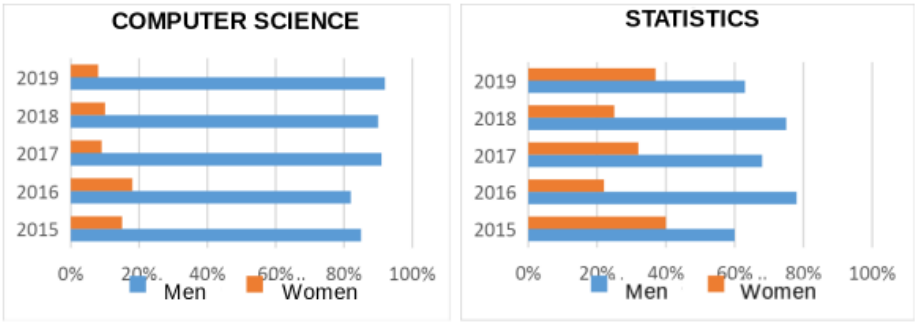
Figure 2 - Percentage of students enrolled in UFRGS undergraduate programs in 2019/1.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

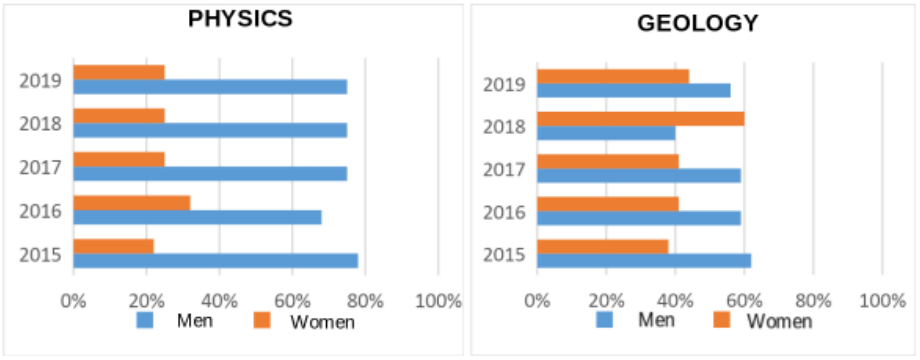
We then analyzed the percentage of women enrolled in the exact sciences at UFRGS from 2015 to 2019, as illustrated in Figures 3a-5b.

Figures 3a and 3b – Percentage of students enrolled in Computer Science and Statistics from 2015 to 2019.



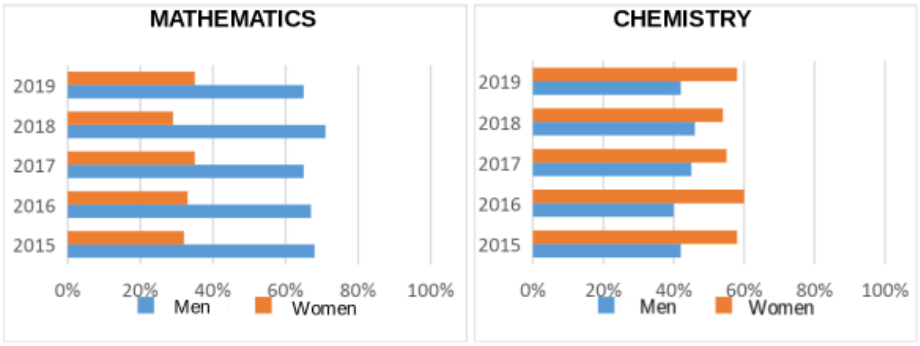
Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 4a and 4b – Percentage of students enrolled in Physics and Geology from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 5a and 5b – Percentage of students enrolled in Mathematics and Chemistry from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

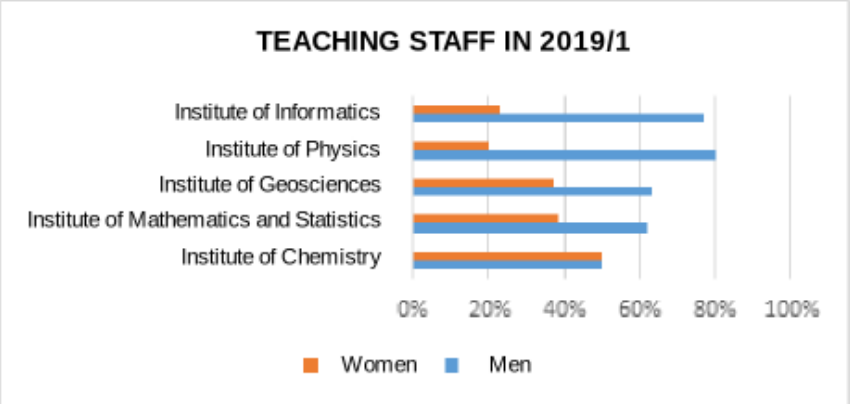
In five of the six programs analyzed, male students make up the majority. This is particularly notable in Computer Science, in which over the five years included in our analysis less than 20% of students were female. In 2018, the Geology program had 60% female students, the same percentage as the Chemistry program in 2016. It should also be noted that, with the exception of the latter, the percentage of women enrolled was much lower than that of men in almost all programs analyzed.

Although we did not observe an increase in the percentage of women graduating in the STEM areas, when we analyzed the percentage of undergraduate students in all areas of knowledge, an increase in women graduating over time is observed. Recent data shows that among researchers with National Council for Scientific and Technological Development (CNPq) research productivity grants, the percentage of women has increased by around 4% in the last 15 years (ARÊAS; BARBOSA; SANTANA, 2019). However, current research shows that in some areas not only is the percentage of women is not increasing, but it is decreasing (MAIA, 2016).

To understand the environment in which students are immersed, we analyzed the profile of the professors at the Institutes corresponding to the undergraduate programs analyzed, as illustrated in Figure 6: Institute of Informatics; Institute of Mathematics and Statistics; Institute of Physics; Institute of Geosciences; and Institute of Chemistry. We analyzed full, associate, adjunct, substitute, and invited

professors who presented a profile similar to that observed in other institutions abroad (BARTHELEMY *et al*., 2020) and in Brazil (MAIA, 2016).

Figure 6 – Percentage of professors in 2019/1.



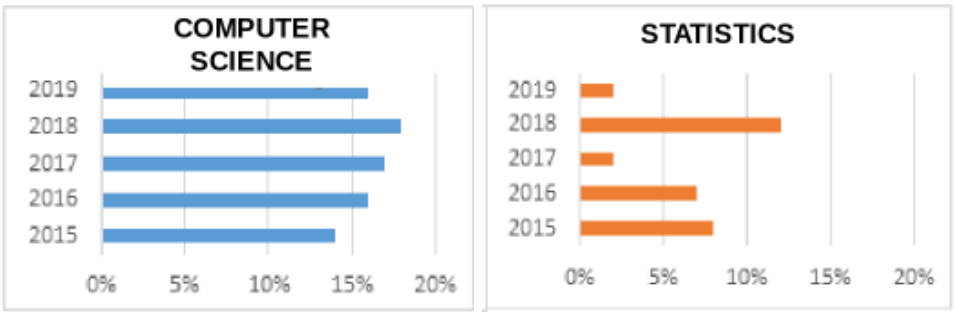
Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Comparing Figures 3a-5b with Figure 6, we can assess the discrepancy between the percentage of female students and professors in undergraduate programs, showing a divergent effect where the percentage of women decreases as one moves from student to professor. Among the studied programs, Chemistry was the only one that constantly presented a higher percentage of female students compared to male, as well as an equal percentage between female and male professors.

The Physics program had the lowest percentage of female professors among the analyzed programs, reinforcing previous studies (AGRELLO; GARG, 2009; FERRARI *et al*., 2018).

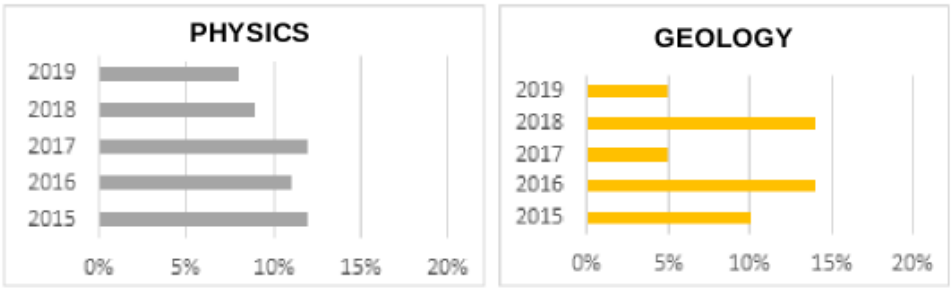
Another relevant aspect of the analysis of diversity in academia is the percentage of students according to color/race between 2015 and 2019. This aspect is significant for the research, as it gives us an overview of the percentage of students who entered the analyzed programs through race-based quotas, demonstrating the current situation of ethnic and racial diversity in Higher Education. In addition, it helps to understand whether the lower participation of women in Physics, Computer Science, and Mathematics when compared to Chemistry or even Geology is paralleled in terms of race. The coincidence would imply some common element of cultural capital between the two groups (BOURDIEU; KÜHNER, 2012).

Figures 7a and 7b – Percentage of non-white students enrolled in Computer Science and Statistics from 2015 to 2019.



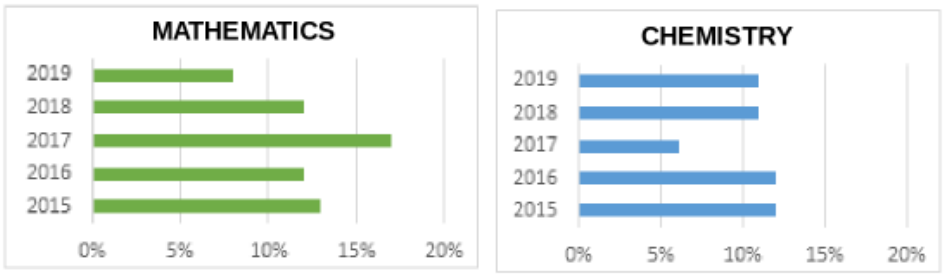
Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 8a and 8b – Percentage of non-white students enrolled in Physics and Geology from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 9a and 9b – Percentage of non-white students enrolled in Mathematics and Chemistry from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

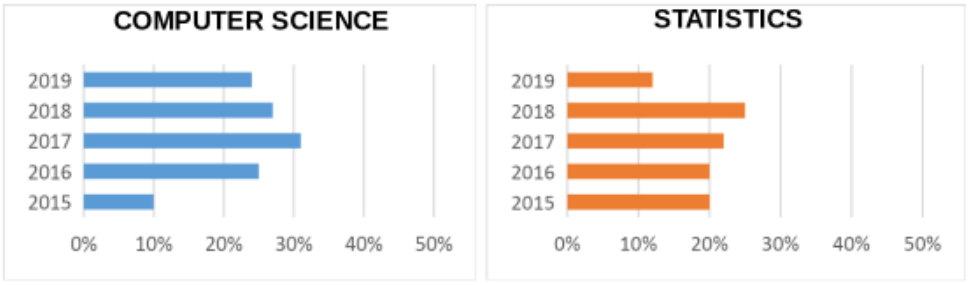
When analyzing Figures 7a-9b, we can see that the percentage of racialized students is less than 20% in all years. In the Computer Science program, this percentage showed little variation over the years, ranging between 10% and 20%. In Statistics, this percentage is less than 10%, with an increase only in 2018 to around 12%, the highest in all studied years of the program. The percentage in Physics fluctuated little, maintaining a percentage of less than 15%. In the Geology program, the years with the highest percentage of racialized students were 2016 and 2018. The Mathematics program had its maximum in 2017 with 17%, unlike Chemistry which, in the same year, showed the biggest drop with only 6% of Black, mixed-race, Asian descendent, and Indigenous individuals among the students.

Despite not being the focus of this study, it is clear that the percentage of racialized students in the last five years was much lower compared to white students and those who did not declare their color/race. This constitutes a social

marker of difference that ends up segregating and influencing the social position of men and especially women in Higher Education in Brazil. We emphasize that during all years, the enrollment of Black students showed a limited increase. These data are concerning: the implementation of affirmative action policies aimed at the Black population is still not "sufficient" to close the gap between Black and white participation at the university.

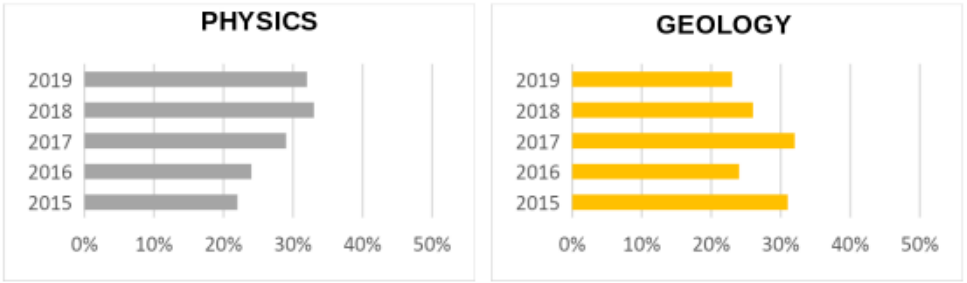
We sought to identify, among enrollees from 2015 to 2019, the percentage of students who chose not to declare their color/race, shown in Figures 10a-12b. Data on color/race are still difficult to measure accurately, as many students choose not to declare.

Figures 10a and 10b – Percentage of students enrolled in Computing and Mathematics that did not declare race from 2015 to 2019.



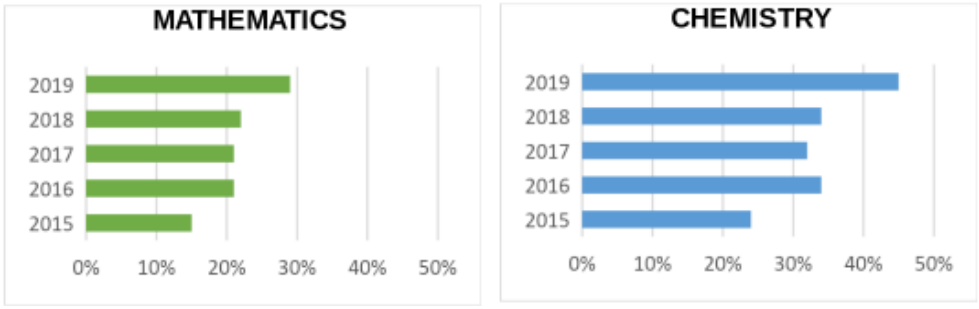
Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 11a and 11b – Percentage of students enrolled in Physics and Geology that did not declare race from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

Figures 12a and 12b – Percentage of students enrolled in Mathematics and Chemistry that did not declare race from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

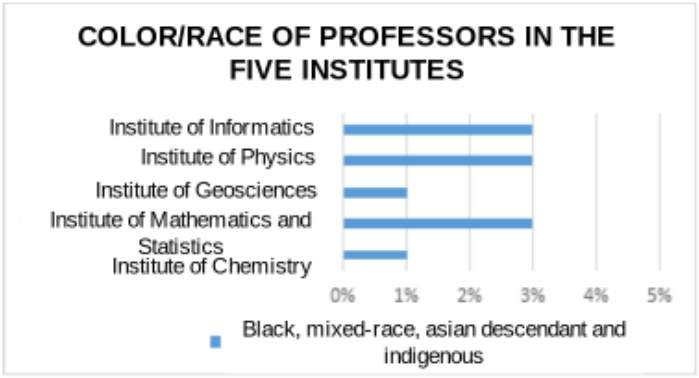
As demonstrated in the previous figures, between 10% and 45% of all undergraduate students did not declare their color/race in the years 2015 to 2019.

This issue may be linked to the fact that the student him/herself did not feel comfortable in declaring his/her ethnic/racial affiliation or the institution staff chose not to complete the field, instead choosing the option "student did not want to declare color/race", making it difficult to obtain data from Higher Education censuses (SENKEVICS, 2017).

The race of the professors in the undergraduate programs was also analyzed, shown in Figure 13. The information refers to the academic institutes where the professors are allocated. Institutes can offer more than one undergraduate program, as is the case with the Institute of Geosciences, which has 89 professors who work across the programs of Geology, Geography, and Cartographic Engineering; however, only 14 of these work in the Geology department, which offers undergraduate degrees in Geology.

Mathematics and Statistics programs are taught at the Institute of Mathematics and Statistics, and the Computer Science program is taught at the Institute of Informatics. The Physics program is taught at the Institute of Physics and the Chemistry program at the Institute of Chemistry.

Figure 13 – Percentage of non-white professors in exact science programs from 2015 to 2019.



Source: Dean of Undergraduate Studies at UFRGS (2019/1).

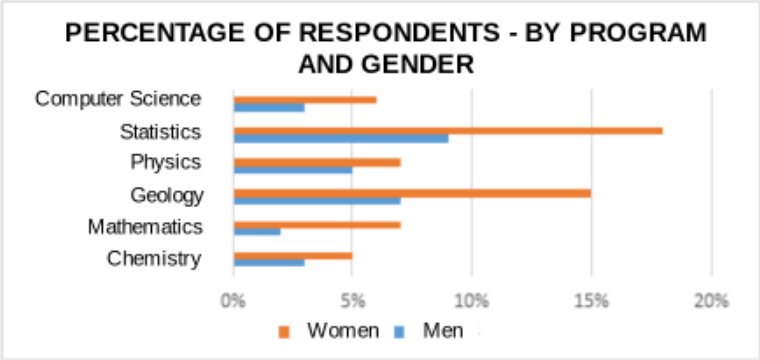
The low percentage of Black, mixed-race, Asian descendent, and Indigenous individuals among the teaching staff is very evident, as there are less than 5% in each undergraduate program. The most extreme case was in the Institute of Geosciences, with only one self-declared Black person working as a professor at that institute in 2019/1. The focus on race is important, as the relation between race, gender, and education enables us to see the stereotypes at play in STEM. According to data from the Brazilian Institute of Geography and Statistics (IBGE), the percentage of white women that have completed higher education is more than double that of Black or mixed-race women, reaching two to three times higher. The percentage of white women with higher education is more than three times that found for Black or mixed-race men (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA [IBGE], 2018).

Race and gender data did not present consistent profiles. Women are more present in the Chemistry program and racialized men and women make up lower percentages than those indicated through racial quotas. Further, among the programs analyzed, we found no indication of an area in which racialized students make up a higher percentage as is the case of women in Chemistry. This may indicate that the cultural capital of these groups differs.

We decided, therefore, to focus our analysis on the issues that lead women to opt for STEM programs and leave the issue of race for another analysis, as it presents a different dynamic than that observed for gender.

Consequently, in the second stage of the study, we analyzed the answers to the questionnaire proposed by the researchers. About 154 students voluntarily responded to the survey, of which 76.6% were from bachelor's degree programs and 23.4% from teaching degrees. Figure 14 shows the percentage of respondents, separated by program and gender.

Figure 14 – Percentage of respondents by undergraduate program and gender.



Source: Research data (2019).

Of the six STEM programs, all had a higher percentage of female respondents. A similar outcome was discussed in a survey conducted in 2010 among Business Administration students at the Federal University of Santa Maria (UFSM), concluding that women are more receptive to participating in online questionnaires than men (VIEIRA; CASTRO; SCHUCH JÚNIOR, 2010).

In the first round of open-ended questions, students were asked about their interest in the program they chose. These responses were grouped into nine themes: liking the area/program (30%); interest in research/science/technology (18%); curiosity/interaction with the environment (12%); interest in teaching (9%); pedagogical/complementary training (7%); several opportunities in the career/labor market (7%); already has a technical diploma in the area (5%); it was the only option/the area closest to that they wanted to study/the program they "could get into" based on the entrance exam (ENEM) (4%); others (8%). The theme "others" covers subjects such as: influence of family and friends; helping people; change of program and consequent adaptation, etc. In this category, women were the majority when stating that they chose to enroll in undergraduate teaching degree programs, for example, due to the influence of their family.

Students from the Geology, Physics, and Computer Science programs highlighted that there is a predominance of male students in these programs, which may be associated with family issues, the social situation to which the student is exposed, jobs related to the area, and especially the issue of gender. This difference is more pronounced in the bachelor's than in the undergraduate teaching degree programs. This difference can be attributed to the consistent imposition of machismo over the years, where men tend to choose professions that offer higher salaries, as is the case of engineering, for example (SANTOS; CANEVER; FROTTA, 2013).

The Chemistry program was the only one in which most respondents believe that there is equality between genders, as shown by the percentage of female students that was higher than males. This greater participation of women in Chemistry is a worldwide phenomenon and is linked to several factors, such as the culture of the area, the perspective of employability, and stereotypes that associate genius with certain areas and not with others (BIAN; LESLIE; CIMPIAN, 2017).

Our analysis shows that about 27% of respondents have some type of scholarship and, of that percentage, more than half are men. At UFRGS, women made up 50% of undergraduate scholarship holders. The percentage of students with a Scientific Initiation (IC) scholarship was 8% and Student Assistance (PRAE) scholarship holders was 13.4%. There was a greater number of IC scholarship holders than the average for the university, which is related to the fact that exact sciences programs do more research. The lower number of PRAE scholarship holders than the university average may be due to the profile of students in the exact sciences.

When asked about what they intended to do after graduating, both men and women respondents had the same anxieties related to job insecurity and the difficulties of entering the job market without a qualification. Responses showed that 42% percent of respondents wished to specialize versus 31% who were either already in or planning to enter the job market. While the first option may in the future lead to higher remuneration, the second allows for immediate professional stability. The remaining respondents were still undecided.

The second round of questions was directed at female students only. It began with a question about whether they had already had negative experiences as a women in their undergraduate programs. Of the female respondents, 44% indicated that they had suffered some form of prejudice/harassment in their programs. Of this percentage, 1% indicated that they had been through offensive hazing, while 17% said that they had heard offensive and/or degrading comments from a professor that caused embarrassment as the comments were generally made in front of their colleagues, mostly men. Among the respondents, 10% of women have been interrupted by teachers or male colleagues during their presentations, received multiple explanations of something they already knew, or even witnessed colleagues from their same group receiving extra points for their participation in class, while being interrupted when they tried to contribute.

At least 8% indicated that they received sexist and misogynistic comments from their colleagues suggesting that women are less capable to carry out such activities, especially during field trips or in practical laboratory classes. Only 5% of women said they had not experienced any uncomfortable situation but had heard reports from other women who had been embarrassed, while 3% said they had experienced something similar, but preferred not to provide details. Finally, 1% indicated that they had been subjected to offensive hazing. Most of these comments were from students in Geology, Physics, and Computer Science programs.

One consequence of these experiences is that, when asked if they believed they would have more difficulties entering the job market than men, 64% of women responded yes. Most of these students think that motherhood can be a factor that exacerbates this difficulty, as many private sector employers do not like

to employ professionals who are mothers. Another factor that affects women in terms of employability is stereotypes. Even government hiring procedures, which are meant to be fair and transparent, may have a gender bias during curriculum and practical assessments which are not anonymous (MOSS-RACUSIN *et a*l., 2012).

The unfounded perception that men are better at exact sciences, again, is not unique to Brazil. A study carried out in the United States shows that when evaluating the same curriculum vitae (CV) for a laboratory assistant position, CVs with men's names received more positive evaluations than those with women's names, despite having the same content (MOSS-RACUSIN *et al*., 2012).

One aspect that may be responsible for the low self-esteem or low expectations of female students is their perception of how their female professors are treated. Another study carried out in the United States shows in university teaching women are given less respect than men for their intelligence (ATIR; FERGUSON, 2018).

The last question in the questionnaire was about the female role models that respondents look up to for inspiration. About 25% of the respondents indicated that they had no role model. Of the remaining 75%, 45% named undergraduate professors as role models, 22% named well-known researchers, particularly Marie Curie, 4% named high school teachers, stating that they were responsible for their choice to pursue a degree in a STEM field, and 4% said that a friend or coworker that was their reference in the area.

FINAL CONSIDERATIONS

Statistical data collected on the percentage of students and professors by gender and race in Computer Science, Statistics, Physics, Geology, Mathematics, and Chemistry at UFRGS showed that equality does not exist. In particular, we identified a greater participation of women in the area of Chemistry than in the other areas analyzed. In terms of race, we found what was expected, considering the effectiveness of race-based quotas; however, we did not identify a difference in the participation of racialized men and women across the different areas studied.

To better understand the process of women entering STEM, we conducted questionnaires with students pursuing degrees in these areas. The analysis of the questionnaires showed a perception that STEM programs are not usually chosen by women, which reinforces the gendered division of work through their choice of programs. Many students report feeling some insecurity in attending an undergraduate program that is male dominated because they feel they are intellectually incapable of keeping up with their male peers. Unfortunately, this is something that permeates our sexist society, resulting in women opting for programs related to the biological, health, and human sciences, while men choose careers within STEM.

When asked if they had experienced uncomfortable situations (because of their gender) in their undergraduate program, some students said yes. For that reason, they had doubts about their academic future, due to prejudice and the feeling of inferiority they experienced, especially in bachelor's degree programs where they are exposed to unnecessary comments and harassment from colleagues and professors. This context shows us the importance of giving voice

and listening to these students, adopting strategies to avoid women dropping out of STEM programs, and the need to address the small percentage of women in the exact sciences in the coming years.

Complementarily, one of the reasons why men might choose bachelor's degree programs is the difference in remuneration in the labor market in relation to an undergraduate teaching degree. The teaching profession is still dominated by women and generally offers lower wages than in industry. Therefore, the growth in demand for teaching degrees among women may be linked to the possibility of more immediate employability.

In the case of Chemistry, which showed a balance in the percentage of men and women, an interesting debate about the growing interest of women in this discipline is related to the example of Marie Curie and Pierre Curie, a chemist and physicist, respectively. As they tend to have superior manual skills, women may identify with jobs related to Chemistry, as they involve carrying out experiments, for example. For men, the interest in physics may have occurred, and continue today, due to their assumed theoretical skills, being seen as cognitively superior to women (GUIMARÃES, 2012).

Aspects related to the ethnicity/race of students and professors were also crucial to thinking about existing problems in policies related to access to Higher Education. As much as race-based quotas favor access for students by promoting ethnic diversity in the academic environment, actions must be undertaken to ensure these young people continue in their studies.

From this perspective, when we look at the percentage of racialized professors in the undergraduate programs analyzed, there is a clear obstacle that must be overcome so that young people who enter public universities through race-based quotas feel represented and are encouraged to become undergraduate professors. Our results seem to reinforce the existence of cultural capital that is more accessible to men than women and is related to gender stereotypes (BOURDIEU; KÜHNER, 2012).

DIVERSIDADE E PERCEPÇÃO DE IGUALDADE DE GÊNERO NOS CURSOS DE CIÊNCIAS EXATAS DA UFRGS

RESUMO

Neste trabalho, analisamos o percentual de mulheres, de negros e negras nos cursos de graduação e na docência em Ciência da Computação, Estatística, Física, Geologia, Matemática e Química da Universidade Federal do Rio Grande do Sul (UFRGS). A partir dos dados estatísticos apresentados, realizamos uma análise qualitativa sobre a percepção dos estudantes nesses cursos com relação à questão de gênero no contexto acadêmico. Em particular, analisamos o que leva as estudantes mulheres a buscarem essas áreas e os obstáculos que elas enfrentam. Buscamos, igualmente, compreender o que distingue as sub áreas das exatas com maior participação de mulheres como a química quando comparadas com as demais analisadas. Os dados foram coletados anonimamente na forma de um questionário *on-line* com perguntas fechadas e abertas. Os resultados revelam uma diferença de participação no que se refere a gênero, mas não a raça, e que há diversas razões que interferem no interesse das mulheres pelas exatas como a influência da família, da sociedade ou de referências femininas que se destacaram na ciência.

PALAVRAS-CHAVE: Gênero. Ciências, Tecnologias, Engenharias e Matemáticas (CTEM). Exatas.

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QUESTIONNAIRE

You are being invited to answer an online questionnaire that is part of a doctoral student's research, entitled *Interest in the areas of Science and Technology (S&T): from school to university* which will be developed in 2019. Its main objective is to assess your interest in choosing the undergraduate program (bachelor's/teaching degree) in this educational institution. The survey will last up to 30 minutes, depending on what you decide to share with us. Your information will remain anonymous.

Please feel free to answer the following questions:

1) How old are you? _____

2) Indicate if you are: ( ) Male ( ) Female

Mark with an X the option that best describes your profile.

3) Indicate your degree:

( ) Teaching degree ( ) Bachelor's degree ( ) Technology Diploma

4) What undergraduate program are you studying:

( ) Computer Science ( ) Statistics

( ) Mathematics ( ) Physics

( ) Chemistry ( ) Geology

5) What stage of the program are you in?

( ) Between the 1st and 3rd semester

( ) Between the 4th and 6th semester

( ) Beyond the 7th semester

6) Briefly write about why you chose this degree program.

7) Have you noticed the presence of more men or women in your program?

8) Do you receive any type of scholarship? If yes, specify.

9) After completing the program, do you intend to enter the job market or specialize? Please justify your answer.

If you are a woman, please answer the following questions:

10) During classes, have you ever experienced any uncomfortable situations (prejudice, harassment, etc.)? If yes, please give examples.

11) Do you believe that you may have more difficulty entering the job market than your male colleagues?

12) Do you have any female role models in your field of study? Who?