

Experiences and trajectories of graduates of integrated high school in Informatics: a qualitative analysis on the project Meninas Digitais no Cerrado*

Ramayane Bonacin Braga^{1,*}, Thalia Santos de Santana¹, Sara Luiz de Farias¹,
Mirelle Amaral de São Bernardo¹ and Marcos de Moraes Sousa²

¹Instituto Federal Goiano (IF Goiano) – Campus Ceres, GO-154, Km 218 - Zona Rural, Ceres – 76300-000, GO – Brasil

²Instituto Federal Goiano (IF Goiano) – Campus Rio Verde, Rod. Sul Goiana, Km 1, Zona Rural, Rio Verde – 75901-970, GO – Brasil

Abstract

Female empowerment projects in the field of Computing have been a strategy for including and increasing the presence of girls in traditionally male courses. The aim of this article is to present the results of a qualitative case study on the experiences and trajectories lived by female students graduating from integrated high school in Informatics between 2016 and 2021 who took part in the Meninas Digitais no Cerrado project. Ten interviews were conducted with a semi-structured script, using Grounded Theory procedures as a method of data analysis, allowing for personal, professional and academic contributions.

Keywords

qualitative analysis, grounded theory, integrated high school, female empowerment, computing,

1. Introduction

Historically, the presence of women in areas linked to STEM courses (science, technology, engineering, and mathematics) is low compared to male participation, due to various economic, social, and cultural factors, which include the historical erasure of the achievements of important women [1]. In effect, these pioneering women faced obstacles related to public recognition due to invisibility and stereotypes constructed by the patriarchal society. An example is the brilliant scientist and Hollywood actress Hedy Lamarr (1914-2000) responsible for creating frequency hopping in 1940, which served as the basis for the creation of Wi-Fi, receiving an honorable mention only in 1997 for her contribution during World War II [2].

In view of the above, the concept of female empowerment stems from the feminist movement and originates from discussions that lead to female autonomy and the overcoming of gender asymmetries that affect women in their reality [3]. For Sardenberg [4], empowerment starts from the premise of questioning power relations constituted mainly from capitalism and the strengthening of patriarchal society, and thus must act to modify such existing relations, being, therefore, a path for the social transformation of structures faced by women and other forgotten classes. Women's empowerment, in this sense, can also figure through increased opportunities for access to education and their participation in the labor market, but mainly with the possibility of assuming positions of power with parity of conditions [5].

Thus, we highlight the importance of education as a scope of transgression to the unjust and unequal structures that constitute social and economic relations. Therefore, Professional and Technological Education (EPT in Brazilian Portuguese) in Brazil contributes to shortening borders between school

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*Corresponding author.

†These authors contributed equally.

✉ ramayane.santos@ifgoiano.edu.br (R. B. Braga); thalia.santana@ifgoiano.edu.br (T. S. d. Santana);

sara.l Luiz de Farias@ifgoiano.edu.br (S. L. d. Farias); mirelle.bernardo@ifgoiano.edu.br (M. A. d. S. Bernardo);

marcos.moraes@ifgoiano.edu.br (M. d. M. Sousa)

ORCID 0000-0002-2543-4011 (R. B. Braga); 0000-0003-1899-4819 (T. S. d. Santana); 0009-0007-8821-196X (S. L. d. Farias);

0000-0003-3537-7273 (M. A. d. S. Bernardo); 0000-0003-3096-9384 (M. d. M. Sousa)



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training and the labor market, through discussions about themes that guide female equity in all environments, and a wide availability of free courses [6]. The EPT Education System [7] was created with the main principle of integral formation, developing not only professional technical capacity but also human formation, offering from technical high school level to postgraduate studies, enabling verticalization between its different levels and modalities of education. This interdisciplinary, integral, and omnilateral educational model provides student continuity and success through access to educational retention policies guided by the tripod of teaching, research, and extension.

According to notes by Araújo and Oliveira [8], the female trajectory in Brazilian education within the EPT itself also went through difficulties, since access to formal education was a place socially constructed from male hegemony. However, over the years, women have conquered spaces in different technological axes in the EPT, reaching 50.3% of enrollments under 30 years old and 58.9% above 30 years old in Brazil [7].

Considering the technology area, data taken from the "Map of Higher Education in Brazil" report, prepared by Semesp (in Brazilian Portuguese Secretariat for Specialized Education Modalities) in a special edition in 2021 regarding Information Technology (IT) courses in the country, reveal that only 16.5% of enrollments in that year in Computing courses were women. In contrast, when analyzing the entire contingent of higher education courses, female enrollments exceeded the male percentage, indicating a total of 60.7%, meaning more women are seeking access to Brazilian Undergraduation Courses.

In the EPT panorama, data collected from the Nilo Peçanha Platform, used to present information transparently and statistically for the EPT Network, demonstrate that the female occupancy rate in Informatics courses is 36.26% [9]. Therefore, the disparity between the number of women attending IT courses is visible, with this number being even more incipient outside the EPT context.

Thus, actions aimed at promoting female empowerment in technology become necessary, with the intention of fostering the entry and permanence of girls and women in IT areas, encouraging the choice of the profession in the future [10]. In this way, there may be the establishment of an interlocution with the world of work, and consequently, influencing social changes in terms of gender relations in the labor market, especially in areas and positions dominated by men. In this bias, besides the social point of view to which gender diversity provides benefits, studies point out that from the economic inclination, diverse teams demonstrate greater productivity and efficiency, while companies that have at least one woman in executive positions tend to be more productive, with greater possibilities of increasing their profitability [11].

Aiming to resolve this problem, the *Meninas Digitais no Cerrado* (Digital Girls in the Cerrado) project was created in 2016, dedicated to developing actions that corroborate female empowerment, especially in the Computing area, by working with students of integrated high school and higher education in the informatics area. It is based in the Brazilian state of Goiás (GO), specifically in a federal educational institution named *Instituto Federal Goiano (IF Goiano) - Campus Ceres*. Throughout its history, the project has consolidated itself institutionally as an interdisciplinary initiative capable of contributing to female empowerment and professional insertion in STEM, through the realization of activities that promote the valorization of women in informatics, while discussing aspects of gender and feminism that involve female roles throughout Western history [12].

The present work brings the following guiding question: "How do the experiences of the students participating in the *Meninas Digitais no Cerrado* project of *IF Goiano - Campus Ceres* reflect on their trajectories, expressed in their personal, professional, and academic choices?". Based on this problem, this work aims to present the personal, academic, and/or professional implications in the trajectory of students through participation in the *Meninas Digitais no Cerrado* project.

2. The project *Meninas Digitais no Cerrado*

The *Meninas Digitais no Cerrado* initiative is intended for female students of Informatics courses, the courses offered at the *IF Goiano - Campus Ceres* being: i) Technician in Informatics for the Internet and

ii) Bachelor in Information Systems. The project, the object of this study, develops extension, research, and teaching activities that, in an inseparable way, represent opportunities for education and human formation regarding the entry and permanence of girls in technology environment. The executing team of the project is composed of teachers and students of the technical course integrated to High School and the undergraduate degree, in addition to alumni students. The project is also part of a network of projects with the same intent, linked to the Brazilian Computer Society (SBC in Brazilian Portuguese), through the Digital Girls Program (PMD in Brazilian Portuguese) [13].

In the context of the project, female empowerment was conceived as a counter-discourse that proposes alternative representations of the feminine, capable of deconstructing crystallized stereotypes about women's aptitudes and intellectual competencies. The impact of the initiative has been reverberating beyond education and professional contexts, where gender and feminism aspects are topics of discussion, so that activities with a human formation bias permeate the actions carried out, these actions being resignified also as opportunities for dialogue and information, incorporating aspects of feminist theory in the construction of scientific and professional knowledge.

In this scenario, female empowerment collaborates with the formation of women who recognize their own space in society, and this type of discussion points to the importance of other notable women who collaborated and still collaborate so that the impact of gender imbalance can be mitigated in the environment of universities and educational institutions, in addition to establishing support networks and the practice of sorority. For bell hooks, an American feminist and anti-racist theorist, "the feminist movement strengthened when it found the path of the academy" [14], serving as a basis for critical thinking about the reality that guides them, and thus forming women through a perspective of feminist education and empowered even in predominantly male and sexist coexistence.

Analogous to the *Meninas Digitais no Cerrado* project, there are other projects linked to the PMD that address the same theme of female empowerment in Computing in Brazil. As an example, Holanda, Walter, and Araújo [15] report the "Meninas.comp" project, present in the Department of Computer Science at the University of Brasília (UnB) since 2010. This extension project disseminates Computing to high school girls through lectures, activities, or short courses, helping to break gender stereotypes and presenting the area as a possibility for a future profession.

Another partner project of the PMD that originates within the EPT is known as "Mermãs Digitais". Viana et al. [16] present the referred project linked to the Federal Institute of Maranhão - Campus Imperatriz (IFMA), which attends students from the Brazilian public education system through workshops, reporting the creation of 2D games. In addition, inspiring women in the gaming area are highlighted—such as pioneers Carol Shaw and Kim Swift—promoting the inclusion and empowerment of students.

Just as such initiatives are being carried out in the Brazilian scenario, there are others that address female empowerment and education globally. Consistently, Montoya-Noguera et al. [17] describe actions aimed at gender equity in Engineering at Universidad EAFIT (Colombia), such as programming workshops for girls, support networks for women in technology, and pedagogical strategies that make female contributions in the area visible, aiming to stimulate the permanence and leadership of women in the scientific and technological field. Another example is Niñas Pro, a non-profit initiative held in Chile, which promotes programming and computer science workshops aimed at high school girls. According to Vidal et al. [18], the project is structured on four pillars: development of socio-emotional skills, encouragement through inspiring female models, introduction to technologies with practical workshops, and deepening for students who wish to follow in the area, aiming to empower, inspire, and expand girls' access to STEM careers.

Therefore, the *Meninas Digitais no Cerrado* project represents one of the initiatives existing worldwide by working on stimulating girls and women in technological careers, while fostering female empowerment based on the perspective of gender equity.

3. Materials and Methods

This study aims to analyze the path traversed by the *Meninas Digitais no Cerrado* project in the experiences and trajectories lived by the students who participated in it. To this end, a qualitative approach was chosen, through semi-structured interviews using coding procedures derived from the Grounded Theory method in the analysis of the collected data.

The research method adopted was the descriptive case study, whose main characteristic is to analyze an object deeply [19]. This research is qualified as a case study because it is a study that addresses the results of a unique and realistic project, having participants with their different points of view as a source. The case study analyzes the specific aspects of a phenomenon and its consequences. This qualitative method originated in Medicine and became one of the main modalities of qualitative research in the field of human and social sciences and had its procedures adapted from the work of Robert Yin in the 1990s [20].

Through a deep and exhaustive immersion in a delimited object, the case study enables penetration into a social reality, not fully achieved by a sample survey and exclusively quantitative evaluation [21]. The choice of the descriptive case study is justified by the fact that the research object deals with the results achieved by the *Meninas Digitais no Cerrado* project, based on the practice of describing and exploring the experiences and trajectories experienced by the students who participated in the project in the period from 2016 to 2021.

According to Godoi, Bandeira-de-Mello, and Silva [19], the analysis of data derived from a case study presents characteristics such as: data segmented by relevant units, categorized into some organization system, and adopting comparison as a practice. Such points should culminate in a reflective activity, helping to form categories and find evidence that allows consolidated information about a field of analysis to emerge, in order to understand the reality of individuals.

Thus, within the case study, one of the analytical procedures pointed out in the literature for this type of research is Grounded Theory [19]. This method represents a way to perform analyses of a social nature, this strategy having been created in the 1960s. According to the Straussian aspect, Grounded Theory suggests a series of structured procedures and techniques aiming to obtain a theory emerged from the data. As observed by Silva [22], Grounded Theory is of great relevance when there is research of an evolutionary nature with strong social interactions, and in education “it constitutes a privileged space for its use”.

Thus, qualitative research can be traversed by different investigation paths, whose steps performed in the present study are being represented in Figure 1 below.

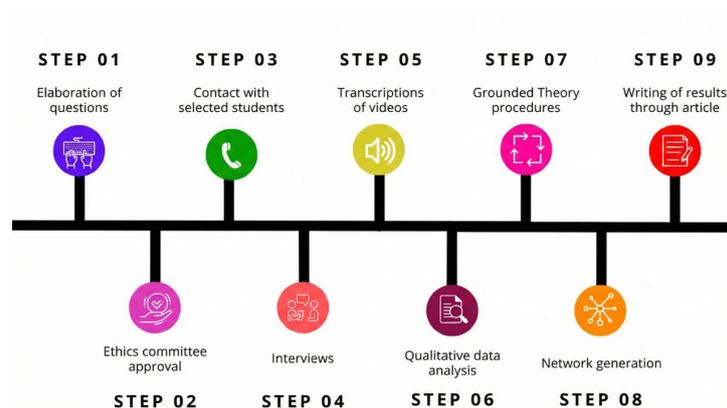


Figure 1: Stages of the qualitative research performed. Source: Elaborated by the authors.

At first, it was necessary to delimit the data collection instrument. The interview is an instrument widely used in qualitative research, as it aims to record a more personal impression of the interviewee. The choice of the interview as a tool for data construction was due to the possibility of collecting a greater wealth of details from the interviewed students. The semi-structured format enables spontaneity

to explore new meanings arising during the interview that were not initially foreseen [23].

Initially, a script with 12 questions was elaborated, addressing the theme of girls' participation in the project, in addition to the importance of the EPT System in the personal, professional, and academic life of the participants, and the choice of high school in Informatics. The script underwent validation by expert professionals, being one person from the Computing area, one person from the Education area, and one person from the Linguistics area, in order to eliminate possible biases in the questions. The following criteria were used: organization, clarity, ease of reading, and understanding of the questions. Thus, the scores ranged from zero (0) to ten (10) and, to be validated, they needed to reach at least a score of 8.0. Once validated, the script was fit to be used in the semi-structured interviews.

The choice of the interviewed girls occurred in a varied way, having as guests both scholarship holders of the project and mere participants in proposed activities. The only requirement was that the guest had assiduous participation with the project in the period from 2016 to 2021 and was a graduate of the integrated high school in Informatics at *IF Goiano - Campus Ceres* in the same period. One of the authors contacted them via the instant messaging application WhatsApp and individually invited each of the interviewees.

All ten chosen girls who were invited agreed to participate in the interview. The interviews took place between August and September 2022, and were previously scheduled according to the availability of the guests at varied times. The interviews took place in person and virtually, depending on where the interviewees resided at the moment. The location chosen for the face-to-face interviews was *IF Goiano - Campus Ceres* itself, and the tool for virtual interviews was Microsoft Teams, due to its ease of use, gratuity, and allowing recording. All interviews were recorded with the participants' authorization. Among the interviewees, six of them were scholarship holders of the project in different axes of action.

On the day of the interview, before starting the conversation, the script with the questions that would be asked was presented to each guest, and the signing of the free and informed consent form (in Brazilian Portuguese TCLE) was requested, as well as the term approving the use of image and testimonials. The two documents were previously approved by the Research Ethics Committee of the *Instituto Federal de Educação, Ciência e Tecnologia Goiano* (protocol number 55345422.7.0000.0036) in order to follow the ethical guidelines of the resolution. At this moment, verbal authorization for recording the interview was also requested to continue the process. None of the participants refused to proceed with the interview.

After the execution of the ten (10) interviews, the recordings totaled 329 minutes of video, averaging five and a half hours of content for analysis. The process of manual transcription of the videos into text documents was carried out in order to proceed with data analysis. The manual transcriptions were reviewed at least twice, aiming at checking the data transcribed by the authors. For each interview, a text file in .docx format was generated, used as input in the qualitative analysis tool. The transcribed content totaled 79 pages of raw data.

As a data analysis technique, Grounded Theory [24] seeks to understand and investigate phenomena or scenarios qualitatively. To this end, the Atlas.TI version 9 tool was adopted during the process of analyzing the data arising from the interviews. According to Moreira [25], it is one of the best-known software for use in qualitative research. Atlas.TI was employed in the perspective of the open and axial coding phases, and among its resources, it allows generating a visual representation of a network of relationships inherent to the codes arising from the data.

The data analysis process began with open coding, which aims to generate and validate properties and categories arising from a meticulous reading of the data [19]. At this moment, the interview transcriptions were read in full by one of the authors, analyzing the excerpts in order to answer the guiding question of this study. After the markings, relevant information was associated with citations in the tool, and subsequently, assigned to specific codes. A code allows the phenomenon under analysis to be named to reflect the object of interest, giving meaning to the highlighted citation excerpt. In this stage, several iterations were performed during the selection of codes, performing constant comparisons in search of representative codes inherent to the reports collected in the interviews, which resulted in the reduction of the number of previously existing codes.

Figure 2 presents the example of an interview excerpt, with its respective code, thus linking a citation

to a named code. It is emphasized that the same excerpt can present one or more associated codes. Then, during axial coding, the existing relationships identified between the codes are examined. In this perspective, the present study grouped related codes into groups (or categories), in addition to defining their relationships through the analyzed data, which were expressed in a visual representation in network format. Such relationships can represent, for example, causal conditions, associations, properties, among other connectors [19].

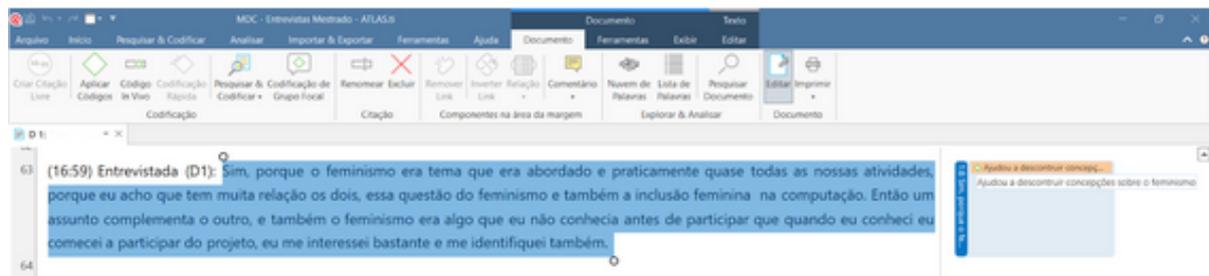


Figure 2: Example of a passage with open coding applied, assigning the highlighted quote to the code “It helped to deconstruct conceptions about feminism”. Source: Prepared by the authors.

Furthermore, according to Strauss and Corbin [24], an additional stage (called selective coding) composes the Grounded Theory method together with the others. This coding phase focuses on listing a core category capable of integrating all others, expressing the essence of the study. The process would be finalized when theoretical saturation is reached, that is, when the addition of new data does not bring significant gains regarding the evidence obtained in concepts and their relationships.

However, even though Grounded Theory is traditionally associated with theory construction, it allows researchers the flexibility to apply selected procedures to meet specific research objectives [24]. In this study, we opted not to select a core category at this time (not performing the selective coding stage) since this can only be done when theoretical saturation is reached [24], which, given the small number of interviewees in our study, cannot be affirmed with just one round of interviews.

One of the authors was responsible for carrying out the open and axial coding process, creating the respective codes and their groups. In addition, aiming to mitigate possible biases, another author with experience in Grounded Theory studies carried out, jointly, the review of code segments employed in the Atlas.TI software. The review was guided by discussions regarding the revision of nomenclatures adopted to express the real syntactic and semantic meaning aimed for, as well as an analysis of the connectors and relationships used in the networks created in the axial coding stage.

At the end of the referred coding stages (open and axial), 28 distinct codes were obtained, associated with three (3) code groups, that is, categories aiming to answer the guiding question of this work: “How do the participation and experiences of the students participating in the *Meninas Digitais no Cerrado* project of *IF Goiano Campus Ceres* reflect on their trajectories, expressed in their personal, professional, and academic choices?”.

4. Results and Discussion

Through Grounded Theory procedures, the data analyzed in the interviews with the graduated students were refined and transformed into tangible information, after the open and axial coding stages. Thus, it was possible to identify dimensions of i) personal, ii) academic, and iii) professional contributions. The participating students were named D1 to D10, allowing the identification of interviewees in a way that guarantees the confidentiality and anonymity of the graduates.

The results of each category are presented below through networks—visual representations constructed in the Atlas.TI tool. In general, codes that have a greater degree of magnitude (number of times a code was applied in citations) and greater degree of theoretical density (number of relationships between one code and another) were highlighted.

4.1. Personal Contributions

Figure 3 presents the network created that aimed to select the codes representing the personal contributions provided by the *Meninas Digitais no Cerrado* project, perceived in the interviewees' statements. Among the contributions, part of them relate to the stimulation of soft skills, such as communication, teamwork, leadership, among others, in addition to the sense of community expressed in the graduates' speeches. Specifically, issues such as communication and oratory were described by participants as important items associated with the development of students' self-confidence. Nevertheless, one of the highlights was the empowerment of participants, marked by the real understanding of the term feminism and by sorority among women participating in the initiative as part of the empowering process. The following statements confirm these points.

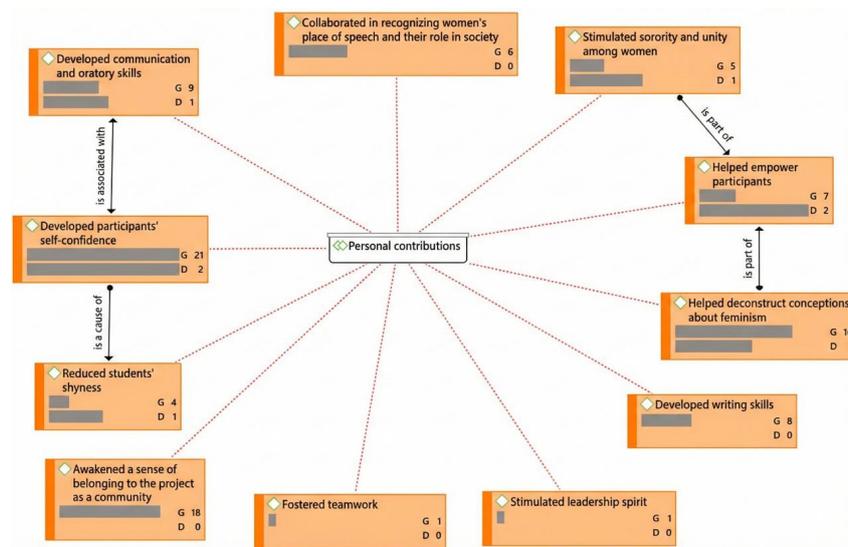


Figure 3: Graphic representation of the project's personal contributions. Source: Elaborated by the authors.

- Developed participants' self-confidence:** "The project helped me a lot to manage to interact more, for example, I was a very shy person, I couldn't talk to people, I couldn't present any work to several people and in the project, I managed to develop this a lot. I managed to have more self-confidence and nowadays it is being good for me, because for example in my work environment I can talk to anyone, explain what I know and know that this is no problem, all this was developed in the project, that's why I said it didn't develop me only for the professional area, but also personal. Because <interviewee's name> before the project wouldn't be today as I am, because I can interact more, I have less shame when presenting some work, when talking to someone. This is all the fruit of my participation in the project." (Interviewee D1, on personal contributions).
- Helped to deconstruct conceptions about feminism:** "And regarding the project, I think it conveys a vision of feminine strength, not necessarily feminism, but this strength, this union, this solidarity among women. And then I understood what feminism was, which is this union among women, sorority, empathy, and the goal of building a support network for women. So it went from being just a book chapter, just any movement among others, to a lifestyle, an action, it is a living experience." (Interviewee D6, on personal contributions). "Feminism for me before entering the IF was something bad, women couldn't walk naked on the street, women wouldn't depilate, women couldn't be housewives, women were equal to men. For me, that was feminism. Upon entering the project, I realized that feminism gave women the right to vote, the woman could be whatever she wants, if she wants to walk naked on the street she can, but if she doesn't want to she also can. For me, I thought feminism didn't accept having children, upon entering the

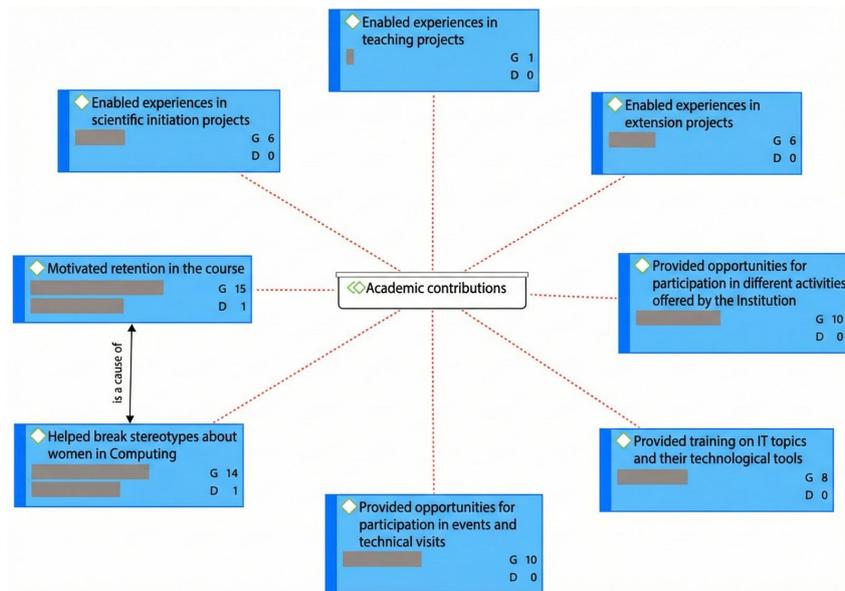


Figure 4: Graphical representation of the project's academic contributions. Source: Prepared by the authors.

project I saw it was quite different, feminism even supports women to have children to perpetuate their chain because a feminist woman will teach her child to be feminist too. And this changed, I started seeing that feminism was something very good, mainly to value us more especially in the labor market which is a very big struggle fought". (Interviewee D9, on personal contributions).

- **Awakened a sense of belonging to the project as a community:** "My maturity, my way of seeing the world, my way of seeing society, my way of seeing women, seeing women in the technology area because sometimes we have so much prejudice, the world is sexist and we are sexist and go along with this thing of 'We can't do it anyway, let's call someone else to solve it', so I managed to leave the *IF Goiano* having a totally different vision, that I am a woman, I am capable, I can do it and I have a more than absolute vision that who managed to put this in your head, was the participation, was the vision of the *Meninas Digitais no Cerrado* project that I speak of with great pride, I carry the logo with me to this day, t-shirts, whenever my participation is needed, if I can, I am here always, because it literally changed who I am today and my formation as a woman". (Interviewee D2, on personal contributions).

4.2. Academic Contributions

Regarding the contributions provided in the academic scope, Figure 4 presents the representation in network format from the codes describing what the project fostered in the graduated students within this dimension. An important contribution presented by the students was that participation in project activities helped break stereotypes regarding women in Computing and, consequently, motivated them to remain in the course.

Furthermore, the project also enabled experiences in scientific initiation, teaching, and extension projects—being the tripod of the EPT Network educational institutions. In addition, given the capillarity of the project and its actions, there was also a great impact on student participation in technical visits and events, inside and outside *IF Goiano - Campus Ceres*. The following statements reaffirm such indications.

- **Motivated permanence in the course:** "I was considering the possibility of giving up in the third period because it really was very complex, but staying in the project, in the actions, in the trips, in the workshops and in the things we did was like an escape valve. So it was very good, it was an escape valve because besides learning with the actions, you had the issue of support,

so for example: 'You won't give up, we are together in this, anything we help each other', so I think the project was important both for me, for <colleague's name>, for <colleague's name> too and <colleague's name> because she already participated in some things we did. So I believe so". (Interviewee D3, on academic contributions) .

- **Helped to break stereotypes regarding women in Computing:** "I think it represents the hope of being able to see that it is an area that is also ours, you know? When I entered higher education, we were 8 girls in a room of 40. So you end up saying 'Damn, but is this area really for me?' Then when you see a group like *Meninas Digitais no Cerrado* that is supporting each other, is showing 'No, this is your area yes', I think it brings this hope that one day we will have a room 50% and 50%, that it is an area for women too, the technology area". (Interviewee D5, on academic contributions)
- **Provided opportunities for participation in events and technical visits:** "As I said, I entered computer engineering more also because of the *Meninas Digitais no Cerrado* project, because before I was in doubt about which engineering I wanted, if it was electronic, electrical, computer, or software. I didn't know for sure which engineering, with the project and with the informatics course itself parallelly, I got to know computer engineering both because of the articles we sent to congresses and the presentations. I saw that as I participated in these events, saw others giving lectures and presenting other articles and I liked these areas a lot, which talked about computing itself and wanted to go to computer engineering, which deals with both hardware and software, it is not only focused on one area. In these events, I saw that electronic engineering is not for me, it was more computing indeed, because I liked programming, messing with Arduino, I still like messing with Arduino, programming, and hardware and I think this is for me. So because of the project, I sent the articles and I managed to see and open my mind to this area of computing itself". (Interviewee D8, on academic contributions) .

4.3. Professional Contributions

Regarding professional contributions, Figure 5 represents the network created according to the codes intended to present the contributions to the professional career of the participants of this research. Thus, among such contributions, professional hiring opportunities stand out as a consequence of a differential in the curriculum, offered by participation in project activities. Another highlight contribution is the demystification of the Computing area as a professional field of activity that is directly associated with the characteristic of generating identification with the technology area. In this perspective, participation in the project opened paths for entry into the labor market, while also unveiling a possible career in technology that had not been envisioned by the students before. Below, the citations that collaborate with these statements.

- **Demystified the Computing area as a professional field of activity:** "That's the differential of *Meninas Digitais*, because then when she sees a teacher who doesn't talk about women, she doesn't start feeling good about the course, she doesn't know if the course is for her, then she thinks: 'There is a project here. The project has an activity. I'm afraid to pick up the computer, to touch the parts. Is there an activity that the girls are giving? Wow, how cool this bunch of girls doing these things!', you start to recognize yourself, you see in a lecture that there was a female programmer, then out of nowhere the project takes you to an event where you see a woman who is working in a super sensational company, and suddenly the woman says: 'I work here in the software projects part', or 'I work in the database area', or 'I work in the data security part'. Here we are in a bubble, when we start the project and have access to these opportunities, events, activities, go to other places, other institutions, we see the amount of women that exist and that we are missing connecting. The moment we meet other women and we get inspired, come back with a warm heart, and think: 'How cool, that's how I want to be when I grow up.'" (Interviewee D10, on professional contributions).

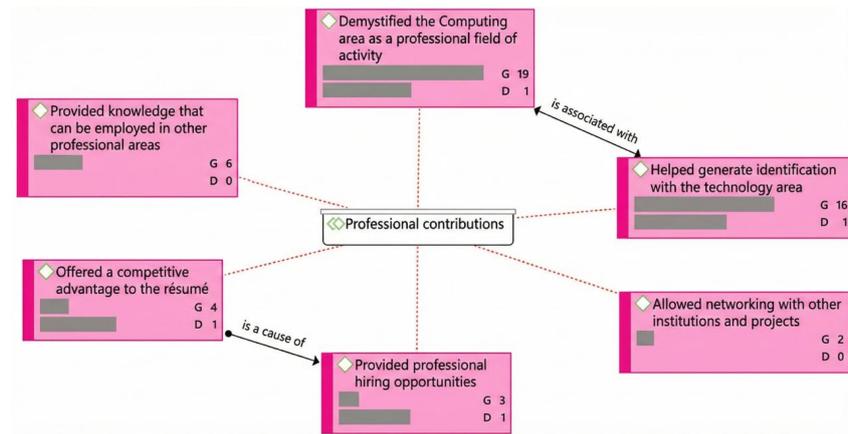


Figure 5: Graphical representation of the professional contributions to the project. Source: Prepared by the authors.

- **Offered a differential to the curriculum:** “It was a very big differential and I say this because when I came to Goiânia I started library science at UFG, so the things I learned during the project on how to write an article, set up a project, make presentations, when I arrived at UFG I already knew, I already had a notion of this. So for example, there was a specific class that was to make the Lattes curriculum, I was like: ‘Guys, I already have it’. So I kept helping other people who were still doing theirs, and it was very top. The first job interview I participated in for my first job I only got because I started talking about the projects, and specifically about *Meninas Digitais* and the girl who was interviewing was getting enchanted, she diverted from the interview and started asking a bunch of things about the project. So I think this is one of the reasons I am so proud to have managed to finish the course, to have made an effort and to have accepted to participate in the project.” (Interviewee D4, on professional contributions).
- **Helped to generate identification with the technology area:** “When I came to take the selection process here, there were three courses, agriculture, environment, and informatics. I remember my mother saying, I already wanted informatics, but my mother said: ‘Do info because it’s more of a woman’s area, you won’t like agro’. And when I arrived here I said: ‘Guys what do you mean woman’s?’, I remember that my class didn’t have such a big difference, but the other 2nd and 3rd-year classes already had a greater disparity. When I entered, my class of 40 students had 11 girls, and you think that wasn’t such a big difference, it’s because the others had even fewer. And I remember I was shocked: ‘How come there aren’t so many girls?’, and it hadn’t been a big issue, I only stopped to really analyze when I arrived inside and mainly after *Meninas*. In my 1st year when I had programming logic, it was a shock because it is a complicated discipline, you learn a new way of thinking. At that first moment I questioned myself a little: ‘Is this area for me? Should I not have chosen the Environment course?’. But with time it passes.” (Interviewee D7, on professional contributions).

5. Final Considerations

In order to report the experiences of the participants of the *Meninas Digitais no Cerrado* project, a qualitative research of the descriptive case study type was carried out. Through the analysis of data obtained in interviews, considering procedures arising from Grounded Theory, it was possible to identify important contributions that the participants obtained with participation in the project, of personal, academic, and professional nature in a perspective of women’s empowerment.

The experiences reported by the graduates described in this article indicate the importance that female empowerment projects, such as the *Meninas Digitais no Cerrado* initiative, can have on the experiences and trajectories of the participants. It was possible to identify the strong sense of belonging and bond

they have with the project, even after having completed the integrated high school in Informatics, perceiving the relevance of the experiences lived in the school period for their past and future trajectory. Furthermore, the very perception of concepts of feminist theory was unveiled through insertion in the project, resignifying terminologies mistakenly disseminated by common sense.

The analysis of the dimensions was carried out in isolation by type of contribution (personal, academic, and professional), however, the relationship between the distinct aspects is perceptible, for example, academic and professional contributions, when students point out that by participating in events and technical visits (academic contributions), they recognized themselves in the Computing career (professional contributions). The same happens regarding personal contributions, which also impacted the professional environment, such as communication skills necessary at a personal and professional level. In this sense, it is believed that the integration between the distinct axes represents aspects of an omnilateral [26] formation, aimed by the EPT System, and which is developed by the *Meninas Digitais no Cerrado* project in an inseparable way.

Regarding the limitations of this study, taking into account the number of students already impacted by the initiative, this research brings a limited number of participants, not being possible to establish generalizations for the entire contingent of students who passed through activities carried out by the project. However, the perceptions gathered by the interviews bring strong indications of the relevance of the project and its impact through the participants' trajectories, the project being a propelling agent to expand the world perceptions of young academics, incorporating aspects that transcend only the academic and professional perspective.

As future work, it is intended to continue the analysis from the perspective of how the experiences lived by graduates of integrated high school within the scope of EPT impact their trajectories, including the issue of verticalization of education, in which it is possible to complete all levels of formal education, from high school to postgraduate studies at the same Institution.

6. Declaration on Generative AI

The authors have not employed any Generative AI tools.

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