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Mulheres Tech: Flipped Classroom for the Digital Inclusion of Domestic Workers in Brazilian Cities

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ABSTRACT

The Mulheres Tech project longs to promote digital inclusion and socio-emotional development among domestic workers in five Brazilian cities, addressing a group often excluded from technological advancements. With a focus on reducing inequalities, the project targets approximately 200 domestic workers who lack digital literacy skills. The methodology applied is an adapted version of the flipped classroom approach, where university students from five higher education institutions deliver basic digital literacy lessons under the supervision of professors. The language used during the classes are clear and value-neutral, avoiding biased; The project not only aims to equip domestic workers with essential digital skills for greater autonomy and better access to employment opportunities, but also to foster a sense of social responsibility among the students who taught the classes to the workers. Results demonstrate that 87.4% of domestic workers were very satisfied participating with the initiative, which highlights the effectiveness of empowering a marginalized demographic and contributing to their professional and personal development. The project demonstrates how academic collaboration can play an important role in bridging digital divides and fostering social inclusion.

1. Introduction

Tech aims to develop socio-emotional skills and social responsibility in undergraduate students from these five institutions. To achieve this goal, the digital inclusion course proposed by the project is taught by the students themselves, under the guidance of teachers, to approximately 200 domestic workers, who will be referred to as "students" in this article and throughout the project. The Brazilian Constitution establishes the fundamental rights to work, education and

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income. These rights are supposed to guarantee the population's dignity, living conditions and opportunities. In contrast, the post-pandemic reality in Brazil presents a scenario of increasing poverty rates, reaching 30.4% of the population, according to a study conducted by IBGE (Brazilian Institute of Geography and Statistics, 2021). Social inequality, associated with the legacies of colonialism, exacerbates the difficulty of accessing formal employment opportunities for a massive portion of the population. In this context, domestic work emerges as an alternative source of income for around 6 million Brazilians, 91.4% of whom are women. Among them, 67.4% are Black women, highlighting a historically rooted pattern of social exclusion that is more pronounced within the Afro-descendant population. However, employment in domestic work is characterized by informality, low wages, and a lack of labor rights, which perpetuates income inequality and limits these workers' access to quality education. This project addresses these critical issues by combining digital literacy with professional qualification, opening up new opportunities for domestic workers to access formal employment and improve their living conditions.

To reverse this scenario, it is essential to adopt a combination of public policies and initiatives from private, philanthropic, and academic sectors that provide specific educational opportunities for domestic workers, aiming at their professional qualification. This study is innovative in using a collaborative, academic-led approach to training that involves university students in providing these opportunities. Academic projects, in which students collaborate with professors to offer free courses to the public, can play a vital role in this process by promoting professional skills and broader access to education. These initiatives not only provide immediate skills but also strengthen the relationship between academia and the community, empowering participants with the knowledge and tools necessary to expand their opportunities in the job market. The unique contribution of this project lies in its ability to foster both the digital empowerment of domestic workers and the development of social responsibility in university students.

These efforts, whether through public, private, or academic channels, should focus on expanding the prospects for domestic workers to enter the formal labor market, ensuring the possibility of pursuing other professions and choosing domestic work as a dignified option, rather than as the only alternative. In doing so, the goal is to promote a future where these women can access better living conditions and greater autonomy, breaking the cycle of vulnerability and exclusion that characterizes the sector.

The Mulheres Tech project is a collaboration between Ânima HUB - the technological innovation area of the Ânima Educação ecosystem in Brazil, Themis - an organization focused on gender, justice and human rights, and FENATRAD, with the support of the 'Movimentos e Tecnologia' project, CARE and CUMMINS. The project is led by students and teachers from five higher education institutions of Ânima Educação: (i) UniFG - University Center of Guararapes, in Recife, Pernambuco; (ii) UniRitter - Ritter dos Reis University Center, in Porto Alegre, Rio Grande do Sul; (iii) IBMR University Center, in Rio de Janeiro; (iv) USJT - São Judas Tadeu University, in São Paulo; and (v) Unifacs - University Salvador, in Salvador, Bahia. Ânima Educação is one of the biggest educational groups in Brazil, with over 400.000 students enrolled in 18 higher education institutions across the country.

In order to deliver this training, we have used an adapted version of the active learning technique known as the flipped classroom, a methodology that will be explained in detail throughout this paper.

By promoting digital literacy among students, domestic workers can gain greater access to digital resources, become more independent, and improve their dialogue and information access skills. Therefore, the main objective of this initiative is to promote digital

democratization, enabling greater inclusion of these women in the job market and in a world that is increasingly dependent on digital tools. In addition, the project uses digital technology to empower domestic workers to influence public policies that guarantee their social rights and those of their communities.

As a result, the project has an important level of satisfaction among domestic workers, and there has been an elevated level of engagement among the university students who have been part of this initiative. One of the students who participated in the project emphasized that their participation changed their limited perception of the needs and difficulties of the domestic worker class, and they also realized how much citizens can contribute to the transformation of realities through the sharing of knowledge.

1.1. Contextualization

Global connectivity is facilitated by hundreds of everyday tools. However, this is not the reality for many low-income, domestic, and black women living on the outskirts of Brazil. The Mulheres Tech project has been specifically designed to address this problem. The project aims to contribute to women's access to information and digital inclusion. In particular, it aims to address the following inequalities:

- ***Social:*** Throughout history, women have faced obstacles in the workplace, from initial exclusion to salary subjugation in relation to men. The segregation of duties based on gender and sex has contributed to maintaining pay disparities. In Brazil, Decree No. 21,417-A and the 1934 Constitution represented advances in the protection of women's labor rights, prohibiting salary discrimination. However, despite legal guarantees, gender inequalities persist in Brazilian society. This underscores the urgency of reflecting on women's working conditions (Caldas et al., 2023).
- ***Stigmata*:** In Brazil, there is a historical and cultural stigmatization of care work as being akin to servitude and even slavery. Women, blacks and undocumented immigrants are the main groups working in this sector (Andrade et al., 2022).
- ***Cultural*:** Historically, care work has been associated with the development of capitalist society and has been undervalued, poorly paid, and of low social status. In Brazil, women often occupy informal roles such as domestic workers, day laborers, nannies, and caregivers for the elderly, reflecting the dynamics of migration and the sexual division of labor (Andrade et al., 2022).
- ***Lack of resources*:** Domestic workers face numerous challenges, exacerbated by inadequate resources, low wages, and the need to work in multiple households to support their families. The Brazilian Constitution emphasizes the need for financial literacy to make informed decisions and stresses the importance of education for full development and preparation for citizenship (Rocha, 2023).

This article is organized as follows: In Section 2, a brief review of the state of the art in teaching and learning methodologies for digital inclusion is presented. Section 3 presents the concept of inverted classroom methodology that supports the development of this research. The new approach proposed in this article and the results of the application of this approach are discussed in Sections 4 and 5, respectively. Finally, section 6 presents the conclusion and discussions arising from this work.

2. Related Work

Relevant literature on digital inclusion, student engagement, flipped classrooms, social equity, and education will be presented in this section. These topics will be analyzed in order to

evaluate teaching-learning methodologies, outcomes, opportunities, and limitations for vulnerable social groups.

Among the works presented in the literature, the research of Aleti et al. (2023) stands out for its investigation of the socialization processes of elderly people in improving their digital literacy and how different socialization agents influence these processes. The study used a conversation and interview group (face-to-face) with elderly participants to explore these dynamics.

Another important contribution to the field of digital literacy is the work of Sujarwo et al. et al. (2022), which utilizes the Example-Based Instruction methodology. The authors were able to increase local sales for a group of saleswomen through training in the use of social networks for the promotion of their products on the Internet.

Table 1 presents a summary of relevant studies in the literature regarding various academic methodologies to foster digital inclusion among different groups. This table maps the methodologies used, the results achieved, and the opportunities or limitations found in each work. Among these studies, the work of Akçayır, G. (2018) is of particular note for its comprehensive review of the advantages and challenges of the flipped classroom methodology.

Table 1.
Summary of Related Works Found in the Literature

Reference	Methodology	Results	Opportunities and Limitations
(ALETI ET AL, 2023)	Group Discussion/ Deductive Approach	Identification of three forms of socialization that are used in learning and using technologies: Reciprocal Socialization; Self-socialization and Outsourcing.	Project carried out only at the one university and in a way that does not absorb other national and international audiences.
(KIM ET AL., 2023)	PRISMA	They highlighted that there are different terms in the literature to indicate the hesitation, discomfort and anxiety behaviors of the elderly.	Despite conceiving the existence of terms for behavior, an association is not made between them and their predictors, so no means or actions are suggested to work on these habits.
(RIADI ET AL., 2022)	PRISMA-P / RoB 2.0	It was raised that to guarantee success in digital interventions, there must be social interactions, human support and adaptation of interventions to each person's individual conditions.	The studies do not have qualitative components, making it impossible to understand the basis that caused the failure or success of each intervention.
(AHMAD ET AL., 2022)	ROSES	They concluded that when instructing elderly, it is necessary to prioritize environments for socialization to maintain interest, in addition to providing a safe environment for feedback, but without evaluation criteria.	During the review, no materials were presented regarding the population of South America in general, so this area of analysis is requested.
(KOKOR ELIAS ET AL., 2022)	PRISMA	It was noticed that when using technologies to support the hospital-home transition, it is beneficial to prioritize Web tools and use tablets and mobile applications to monitor body function and health status (including mental status).	The review was unable to bring heterogeneity to the study group, meaning that the perception of characteristics of education, race, ethnicity and culture, in addition to age, was lost.

Reference	Methodology	Results	Opportunities and Limitations
(CHEN ET AL., 2020)	Exploratory Review Approach	The perception was obtained that the disparity in skills between native and immigrant elderly people is linked to language proficiency, socioeconomic status and other factors, in addition, there approximates internet access capabilities between the groups.	The articles returned in the review tend to homogenize the immigrant public, so that the individual diversities and problems of each group are erased, thus future research with ethnicities is necessary.
(CHOUDHARY ET AL., 2022)	PRISMA	There was an increase in the level of self-realization from the participants. It was noticed that developed countries work more with the elderly population and developing countries work with populations in vulnerable situations.	The research method employs keywords in the English language as parameters, which may limit the method's reproducibility in other languages and the comparison of other papers.
(SUJARWO ET AL., 2022)	Instruction based on examples	The public who received the digital training began publishing routines on social networks, which positively affected their sales.	Local tourism was promoted in the locality and the use of technology contributed to reaching more customers. On the other hand, the rural infrastructure and the need for continuous support with the new work tool made this process more challenging.
(BALADAN ET AL., 2016)	Observational data with two measures: attendance and preparation rates.	Students performed better in comprehension, application, and analysis questions. The performance improvement was 6.9 percentage points.	When the study was applied in two different semesters, they could find different results because they were applied in unequal ways. Moreover, the researchers were also unable to model the student's effort, since the lack of randomization in the two proposed formats was another limitation.
(Al-Zahrani, A.M.., 2015)	Analyzed data using statistical software (SPSS). The reliability of instruments was confirmed with Cronbach's alpha.	The flipped classroom group scored higher than the traditional group (impact on creative thinking among students). They also reported moderate satisfaction, as they were able to enjoy reviewing lectures, enriched learning experiences, and improved collaboration.	Opportunity: creativity helped increase the ability to generate novel, flexible, and fluent ideas. Limitations: not prepared for flipped classes; dependence on technical resources that may fail; just locally focused.
Sohrabi, B. ET AL., 2016)	Online learning resources for interactive activities. Quantitative data were collected through Likert scale surveys.	Survey results indicated improvements in self-directed learning, communication with instructors, and collaboration with colleagues.	Global competencies have been improved. Difficulties occurred with technological resources; difficulty in aligning content with the course objective.

3. Inverted Classroom

This paper presents the benefits of the pedagogical approach known as the "Inverted Classroom". The approach was used in the Mulheres Tech digital literacy project, which aims to promote digital inclusion for domestic workers. University students taught the classes to the enrolled participants.

According to Bishop & Verleger (2013, p. 1): "The flipped classroom is a new pedagogical method, which employs asynchronous video lectures and practice problems as homework, and active, group-based problem-solving activities in the classroom". In this model, students are expected to independently study the materials provided by the teachers and then engage in group activities, discussions, and problem solving related to the topics covered during face-to-face instruction. In this methodological format, students are expected to engage in debates related to the material studied and to interact with their teacher and classmates in the learning environment. Through this process, students can consolidate their knowledge and develop a deeper understanding of the subject matter.

In addition to the flipped classroom method described earlier, Mulheres Tech aims to promote literacy and digital literacy to access information and resources through the use of digital resources such as computers, utilities, and Internet access in the teaching-learning process.

Technological advances have made information more accessible. Unfortunately, not everyone has equal access. To address this problem, the project invites domestic workers to attend university classes, where they can benefit from the full infrastructure of computer labs and libraries, and the entire university experience. In this way, technological exposure begins, intensifies the use of equipment, and models the tools necessary to facilitate digital development and learning.

As noted by Soares (2020), despite the digital infrastructure and teaching methods, domestic workers may face obstacles to the learning process during the course, such as cognitive, social, and basic literacy difficulties. In order to address these issues, there is a need for social and psychological support throughout the project, and there is also a need for adaptation of the content and teaching methods.

4. Proposed Approach

The Mulheres Tech project was developed using an adapted flipped classroom approach, where students not only discuss the content taught by teachers in the classroom with their peers, but also teach the same content to domestic workers under the supervision of a teacher. This reinforces learning and helps students develop skills such as public speaking, organization, communication, creativity, empathy, teamwork, self-management, social awareness, relationship building, and decision-making. The project aims to provide a comprehensive learning experience for all involved.

This initiative was the result of a collaboration between Ânima Educação, FENATRAD and the social organization Themis. It was initially aimed at a group of domestic workers, with the aim of providing them with a basic understanding of the technologies available. In the post-3rd industrial revolution era, digital information literacy is becoming increasingly important. In a post-pandemic context, where the world is rapidly moving towards digitalization, this knowledge is particularly important.

The group consisted of an average of 40 women per class, totaling approximately 200 students. Five different Brazilian cities hosted the training: Rio de Janeiro, São Paulo, Salvador, Recife, and Rio Grande do Sul. Participants were selected through a collaboration between the social

organization Themis and FENATRAD. The process took place through their website. Teaching was organized according to where the participants lived and worked. A visual representation of the project development process, from inception to completion, is shown in Figure 1.

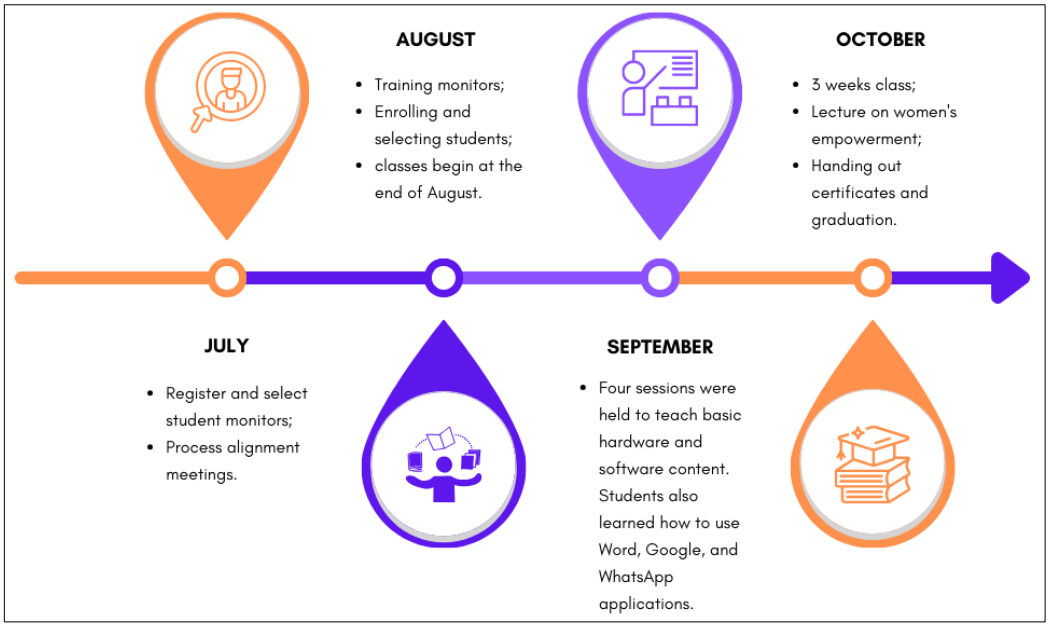


Figure 1. The Project Development Timeline

4.1. Educational Tools

The educational material that was used consists of a booklet that has been created by a specialized team from THEMIS and Ânima Educação. This booklet covers concepts ranging from the most basic level, such as the definition of a computer, to advanced guidelines on how to access and exercise rights on browsing platforms. The main objective was not only to train the target audience in the personal use of the technology, but also to equip them for its application in professional environments. Figure 2 illustrates the tools used and how they got implemented during the educational process.

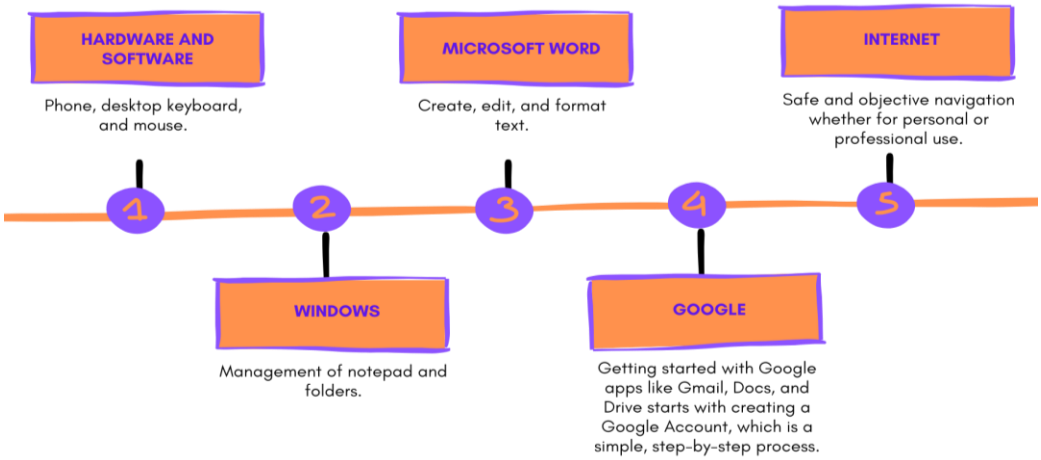
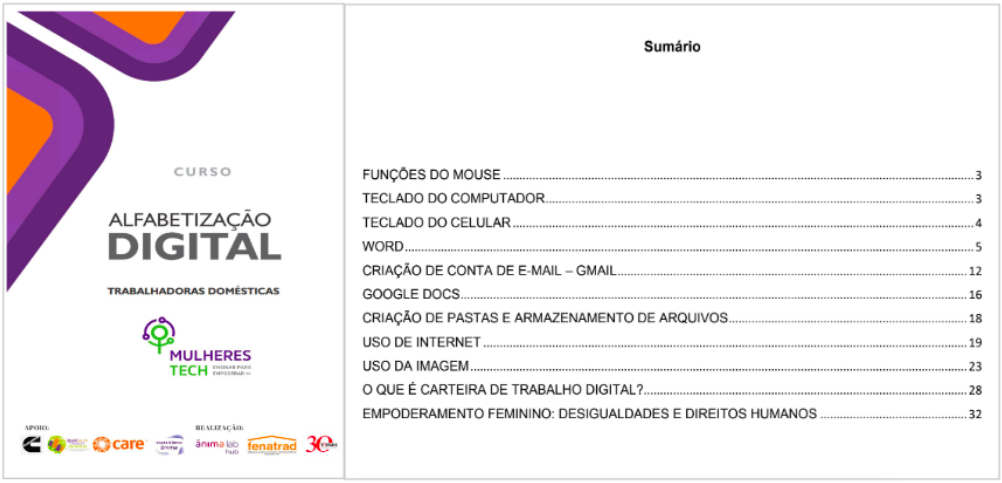


Figure 2. A Model Flow Chart

Classes were held in computer labs provided by Ânima Educação to ensure a practical and effective approach. This strategy allowed monitoring the students' theoretical understanding and practical application of the knowledge acquired. To illustrate the intersection between

theory and practice, Figures 3 and 4 show a sample of the materials developed and used during the course.



CURSO

ALFABETIZAÇÃO DIGITAL

TRABALHADORAS DOMÉSTICAS

MULHERES TECH

Sumário

Figure 3. Booklet Cover and Summary - in Portuguese, the language in which the course was held

Para conhecer o documento na íntegra, acessar: https://www.unicef.org/brazil/declaracao-universal-dos-direitos-humanos.

RACISMO E DIVERSIDADE RACIAL

Elaborado a partir da aula para Curso de Trabalhadora Doméstica com Direitos - **Simone Cruz*

Fonte: internet

O QUE É RACISMO?

Racismo é uma forma de discriminação que leva em conta a raça como fundamento de práticas que culminam em desvantagens ou privilégios para indivíduos, a depender do grupo racial ao qual pertençam. Preconceito racial, o juízo acerca de um determinado grupo racial baseado em estereótipos que pode ou não resultar em práticas discriminatórias nocivas. Discriminação racial é a atribuição de tratamento diferenciado a membros de grupos racialmente identificados.

O Racismo é constituído de vários fatores e sua existência nas relações sociais está ainda invisível pela desigualdade estrutural sofrida pela população negra no Brasil. Esta invisibilidade ocorre em função do processo histórico, desde a criação de nosso país, marcado pela colonização europeia em que povos indígenas foram dizimados e povos africanos foram escravizados. A lógica que estruturou a sociedade brasileira foi orientada pelo princípio de hierarquia de superioridade de pessoas brancas em relação às pessoas negras e racializadas.

O QUE É RAÇA?

O conceito de **raça** teve um intenso uso ideológico no século XIX para justificar a ideia de termos raças superiores e inferiores, legitimando a subjugação e exploração de povos considerados, sob esta lógica, como biologicamente inferiores (racismo científico).

A ciência do século XX, especialmente a genética, demonstrou que este conceito biológico de raça não tem sustentação científica porque há mais diferenças entre indivíduos considerados da mesma raça, do ponto de vista genético, do que entre as supostas raças.

Hoje – o termo raça é utilizado para informar como determinadas características físicas, como cor da pele, tipo de cabelo, e também manifestações culturais, influenciam, interferem e até mesmo determinam o destino e o lugar dos sujeitos na sociedade brasileira, em função da

Na voz de minha filha
se fará ouvir a ressonância
o eco da vida-liberdade.

Vozes-Mulheres
Conceição Evaristo

O QUE É O FEMINISMO?

O conceito de feminismo como o conhecemos surgiu no século XIX como um movimento social, filosófico e político. Sua principal característica é a luta pela equidade entre gêneros e, por consequência, a participação e respeito às mulheres na vida em sociedade, no sentido de que todos os gêneros tenham os mesmos direitos e as mesmas oportunidades.

O feminismo já foi considerado universal, mas ele precisa ser explorado mais a fundo. Somos todas mulheres, mas não somos todos iguais. Mulheres negras, indígenas, trans, lésbicas, bissexuais, cada uma parte de um ponto em sua própria vivência. Não há como pensar de forma universal pois isso traz um privilégio para alguns grupos que podem oprimir outros.

Interseccionalidade é a palavra definida para entendermos as discussões acerca das diferentes formas de dominação ou de discriminação que geram opressão sob determinados grupos. A interseccionalidade não existe para segregar ou dividir as pessoas em categorias, ela existe para entender-se como sujeito construído em vários cenários e sentidos.

É importante pontuar que feminismo não é o oposto de machismo, pois o machismo é uma construção social que promove e justifica atos de agressão e opressão contra as mulheres. Já o feminismo, conforme mencionamos, é o movimento social que luta contra as manifestações do machismo na sociedade.

Fonte: Manual para Roda de Conversa Feminista da Nossa Causa está licenciado sob CC BY-NC 4.0. Para ver essa licença, acesse: https://creativecommons.org/licenses/by-nc/4.0/deed.pt_BR.

QUAL É A IMPORTÂNCIA DO MOVIMENTO FEMINISTA?

Grande parte de nossa cultura está alicerçada numa sociedade patriarcal, pautada na dominação masculina. Em outras palavras: o homem, além de ser o membro mais importante da família, desde muito tempo, tem sido o foco principal. Ele é aquele que possui privilégios em relação às mulheres, chamadas equivocadamente de "sexo frágil".

Em contrapartida a esta situação, o movimento ideológico feminista, que é liderado por mulheres e defende a igualdade de direitos, se expandiu por todo o mundo. Em geral, até o século XIX, a mulher era vista como um ser inferior aos homens e não possuíam os mesmos direitos básicos que eles. Ao falarmos sobre privilégios, nem tocamos ainda em pontos maiores como direito ao voto e liberdade de expressão, mas em questões mais básicas mesmo, como por exemplo: ler, escrever, estudar, guerrear. Enfim, escolher.

Diante disso, a figura feminina foi construída de forma que colocava a mulher numa posição submissa ao homem, em que as atribuições delas estavam restritas aos afazeres domésticos e à educação dos filhos. Desde cedo, as meninas eram educadas para ajudar as mães nos trabalhos domésticos, casar e ter filhos. Nesse contexto, não podiam trabalhar fora, ao mesmo tempo em que não tinham acesso aos assuntos relacionados com política ou economia.

Figure 4. Part of the Material that Addresses Female Empowerment - in Portuguese

This material was created as a reaction to the social inequality which pervades Brazilian society, especially regarding education. Despite the constitutional right to education, the Brazilian public education system still faces significant challenges in fully complying with this obligation. Consequently, private institutions must collaborate to facilitate access to educational opportunities for disadvantaged communities, as the domestic workers, for instance. The goal is to integrate them into an increasingly digitized world. We recognize that information is essential to the empowerment of individuals and is a valuable tool for the improvement of quality of life.

4.2. Sessions

The instructional design consisted of seven sessions. It was intended to facilitate a step-by-step understanding, moving from general concepts to more specific details. Since most of the

students had no previous computer experience, this approach was chosen. The instructional program covered everything from basic elements, such as using the keyboard and mouse, to more advanced topics, as shown in Figure 5, which deals with using the Internet in a safe and appropriate manner.

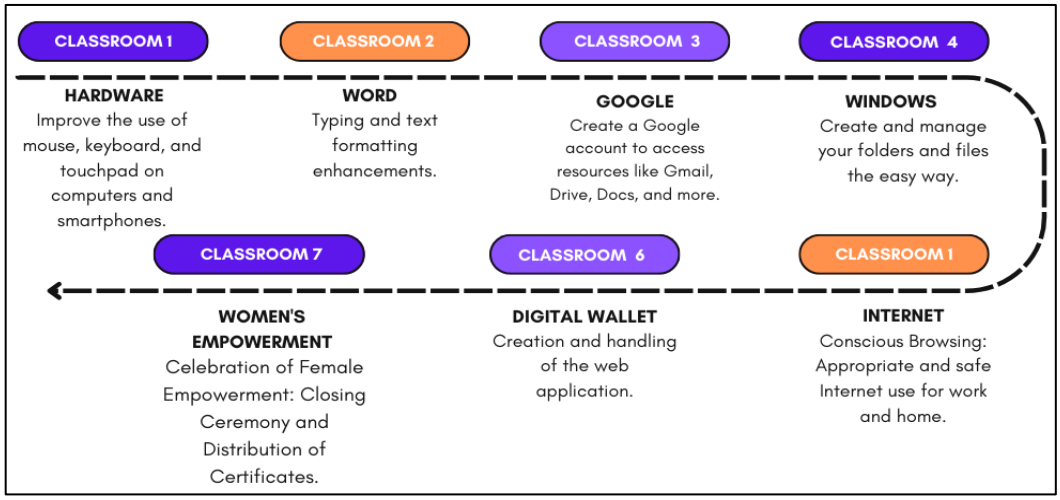


Figure 5. Flowchart of The Classes

4.3. Application of the Methodology

The study was conducted over six weeks, during which the flipped classroom methodology was implemented to observe its impact on student autonomy and engagement. We chose this approach due to its proven potential to promote active learning, allowing students to access theoretical content independently and reserving class time for interactive practices such as problem-solving and group discussions. This structure is particularly effective for fostering collaboration and practical application of knowledge.

Participants were divided into groups of five students, representing diverse fields such as Business Administration, Human Resources, Marketing, Economics, and Information Technology. Each group included two students who took on the role of instructors responsible for presenting the content, while the other three acted as tutors, assisting their peers and clarifying doubts. A supervising professor oversaw the entire process, making continuous adjustments to ensure methodological fluidity and clarity of instructions.

Data collection was designed to comprehensively assess the methodology's effectiveness. The physical layout of the classroom was strategically planned to optimize engagement and visual and auditory accessibility for all participants, even those positioned at the back of the room. The layout involved clusters of six desks arranged horizontally, creating small workgroups that encouraged interaction and facilitated following the explanations. To enhance data collection, we utilized multiple evaluation instruments, including both formative and summative assessments, to capture a well-rounded view of student progress and engagement.

To monitor student progress and identify areas for improvement, evaluation forms were administered at the end of each class, in which students shared their understanding of the content and their overall experience. These evaluation forms included both closed-ended questions for quantitative data and open-ended questions to gather qualitative insights on student experiences, providing a holistic view of the learning environment. These forms served as a critical tool for capturing both student learning and engagement within the flipped classroom dynamic.

The instructors also dedicated part of the time to addressing external questions brought by students beyond the main content. This facilitated a more holistic learning environment, where additional questions were promptly addressed, fostering a trusting atmosphere and enhancing students' understanding of related topics.

Additionally, practical exercises were conducted in each class to assess immediate understanding of the content. Immediate feedback was provided by the instructors, addressing specific questions and reinforcing learning in real-time, which contributed to a solid foundation of knowledge for the upcoming modules.

We chose the flipped classroom as the primary methodology due to its proven effectiveness in previous studies that demonstrate its ability to foster greater student interaction and autonomy. The validity of this approach was supported by both the research literature and the positive feedback received through the formative and summative assessments, which showed consistently high student satisfaction and learning outcomes. The combination of formative assessments (practical exercises) and summative assessments (feedback forms) provided a solid structure for monitoring student progress and adjusting activities as needed. This approach allowed for the collection of rich and diverse data, essential for validating the method's effectiveness and making continuous improvements.

Questions included in the evaluation form:

- How do you rate the educational materials and course content?
- How do you rate the organization of course activities?
- How do you rate the duration of the course activities?
- How do you rate the clarity of explanations provided by the instructors/facilitators?
- How do you rate the space provided for dialogue and questions during the course?
- How do you rate the following aspects of the course/workshop? (Conditions of access to the activity)
- I believe I have learned the main contents of the activities?
- The activity met my learning expectations?
- My knowledge and/or skills improved after the activity/activities?
- With the knowledge I gained, I feel more prepared to handle certain situations in the future?
- With the knowledge I gained, I will be better able to support other women in the future?

5. Results

The Mulheres Tech is a partnership between Ânima HUB, Themis, FENATRAD and five higher education institutions of the Ânima Educação ecosystem. So, it is a collective effort aiming to promote digital inclusion among domestic workers. Figures 6, 7 and 8 show a photographic record of the project in each of the five institutions. The use of the image to publicize the project was authorized by the participants.

Figure 6. a) UniRitter, located in Porto Alegre, Rio Grande do Sul: 45 workers and 13 tutors. b) IBMR, located in Rio de Janeiro: 29 domestic workers and 10 tutors

Figure 7. a) UniFG, located in Recife, Pernambuco: 8 domestic workers and 6 tutors. b) Unifacs, located in Salvador, Bahia: 43 domestic workers and 6 tutors

Figure 8. USJTs, located in São Paulo: 16 domestic workers and 9 tutors

This digital literacy and education project aims to facilitate domestic workers' access to the digital world, enabling them to develop autonomy, expand their dialogue skills, and access information. The participants reactions and stories demonstrate the impact of digital literacy on their ability to navigate both their personal and professional lives. Promoting digital democratization and integrating these women into the labor market is one of the goals of Mulheres Tech. The majority of the project's female participants are between 46 and 60 years old, with the following percentages by state: Bahia (56.1%), Pernambuco (62.5%), Rio de Janeiro (34.5%), Rio Grande do Sul (35.6%) and São Paulo (50%), as shown in Figure 9. These demographic trends provide valuable insight into the target group's unique needs and opportunities for digital inclusion.

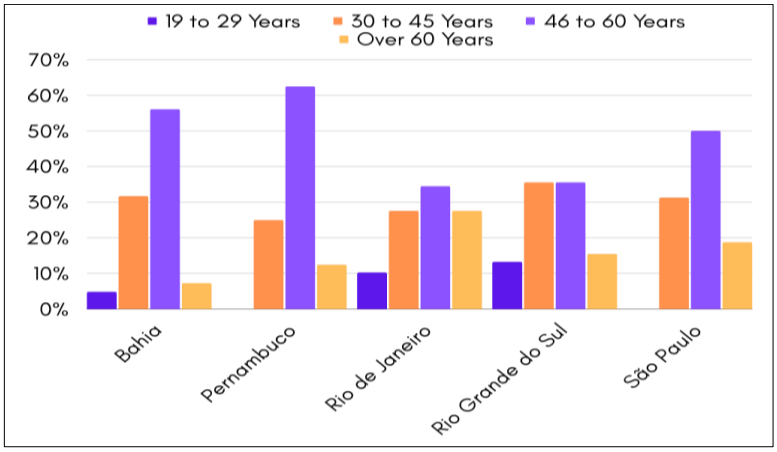


Figure 9. Project Participants' Age Range

This approach can help individuals to navigate with greater ease in an increasingly digital world. Additionally, the use of digital technologies empowers participants to advocate for their social and community rights in public policy. In fact, many participants have expressed a newfound sense of confidence in advocating for themselves and others, which speaks to the transformative effect of this initiative.

During the first week, the participants were provided with laudelina app t-shirts and a kit that included a folder, a pencil, an eraser, a pen, a notebook, and an ecological bag to support them throughout the course. The course covered several topics, including the use of computers and smartphones, formatting documents in word, google docs, gmail, and navigating the internet safely. Specific examples of improvements included participants learning how to create professional documents in google docs and using email to communicate with family members and service providers. Some participants shared how this new skill made their daily tasks much more efficient and connected them to online support networks.

At the end of the course, an evaluation survey was conducted, via google forms, with the domestic workers and the tutors of the project. The evaluation survey not only reflected the overall success of the training but also identified the challenges participants faced, such as initial fears of using technology and difficulties with internet access. These challenges, however, were overcome with tutor support and a gradual introduction of the technological tools. This approach provided a detailed understanding of participants' perceptions of various aspects of the project, contributing to a comprehensive analysis of its impact and effectiveness.

The Mulheres Tech project represented the inaugural university experience for a considerable proportion of domestic workers. It is important to highlight this fact here, as most of these women reported that they had never thought they would enter a university in their lives. A number of participants shared how the training, especially the computer skills, brought about a sense of empowerment that they had not expected. This project helped to break the barrier and demonstrated that this environment is not exclusive to certain groups of people. As a result, 87.4% of domestic workers were very satisfied with participating in this initiative, as shown in Figure 10.

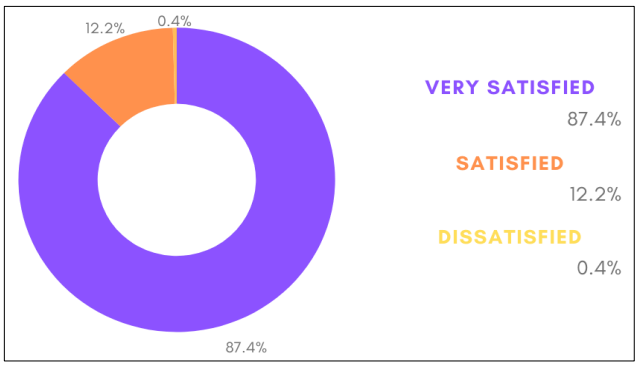


Figure 10. Project Participants' Satisfaction Rate

The project was well received by the tutors, with 71.4% of them stating that the initiative exceeded their expectations (Figure 11).

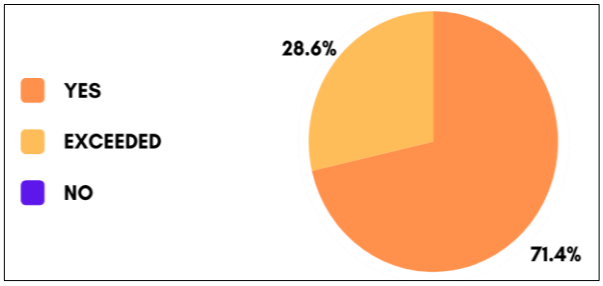


Figure 11. The Project's Tutors Perceived Achievements

Figure 12 a) shows some important analyses from a different perspective. One of these analyses is the personal development, which 85.7% of the tutors related as the project's biggest achievement. Interviews with tutor's revel that many felt a deeper connection to the community and gained new perspectives on social inclusion through their participation. Although 57.1% of the tutors had no previous experience as a tutors/teacher, 90.5% of them found it easy to teach classes thanks to the support of the project's supervising professors. With 71.4% strongly agreeing, the academic life of the tutors is positively affected. The development of analytical skills was perceived by the tutors to be the most important skill with 38.1%, followed by the development of management skills with 33.3% of the responses - Figure 12 b).

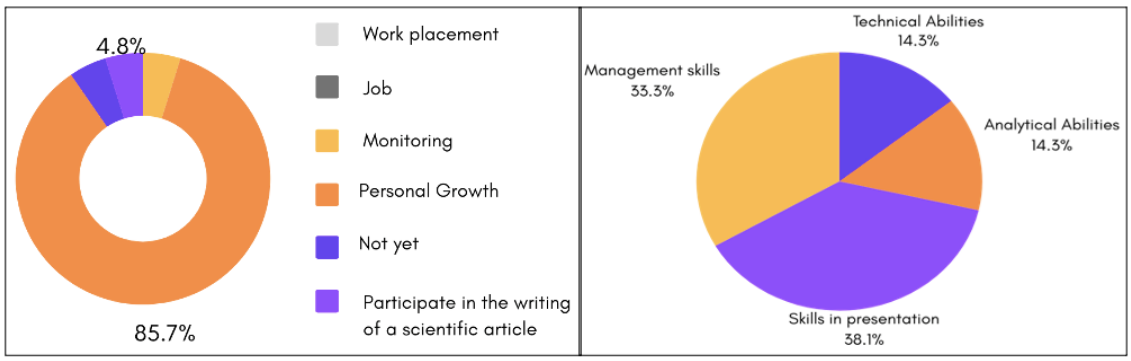


Figure 12. a) The Tutors Achievements. b) Skills Acquired with the Project

The implementation of the Mulheres Tech project in the above-mentioned higher education institutions (HEIs) was a successful choice, demonstrating that the origin of the participating women is not a significant obstacle. In the face of constant changes in the world, it is important not to remain inactive. The influence of the project stretches beyond the classroom, with many tutors reporting a deeper commitment to community engagement and social impact. The

project not only enriches the university experience, but also creates important links between tutors and students. This plays a crucial role in the success of the learning process and has resulted in a high satisfaction rate of 81% among students. The project impact assessment also involved the analysis of these five sentences below.

1. "I believe I learned the main content of the activity(ies)."
2. "The activity met my learning expectations."
3. "My knowledge and/or skills improved after the activity(ies)."
4. "With the knowledge, I feel more prepared to deal with certain situations."
5. "With this knowledge, I will be able to better welcome other women."

Each student responded to these questions using the scale presented in Figure 13, ranging from "strongly agree" to "strongly disagree". Responses revealed that many participants felt not only more skilled in technology but also more confident in their ability to handle online tasks. A key challenge mentioned was the initial lack of access to personal computers or reliable internet, which some participants overcame by sharing devices with family members or using public access points. These challenges, however, were overcome with tutor support and a gradual introduction of the technological tools.

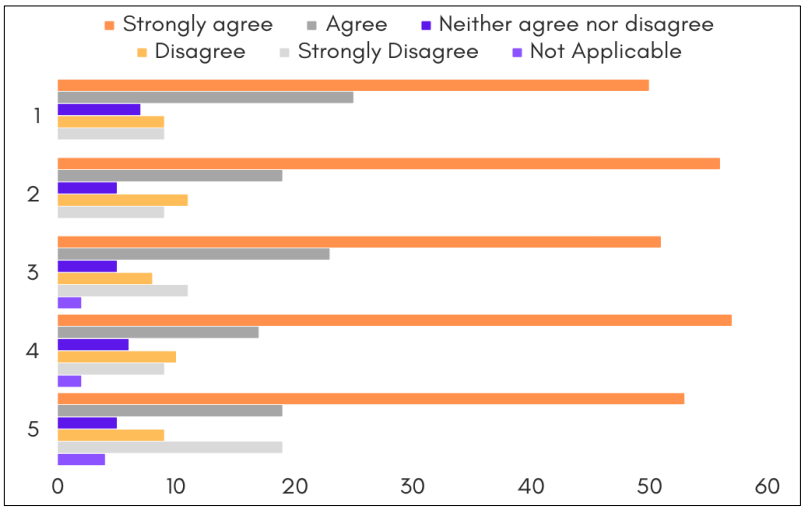


Figure 13. Participants' Feedback

The final survey results indicate that 58% of the students would like to see the course extended. Many participants highlighted the life-changing aspects of the course, including the sense of belonging to the academic environment and the practical knowledge gained.

In conclusion, the project exceeded expectations and had a positive impact on all stakeholders, highlighting the need for more projects of this type regardless of socio-economic status, race or social group. The inclusion of first-time university attendees and the emphasis on social impact in addition to digital literacy provides a rich case study for future initiatives.

This work makes important contributions to the current literature on digital inclusion and educational methodologies. By focusing on domestic workers, the Mulheres Tech project addresses a gap in the literature, which often overlooks this demographic group. Previous research, such as that of Akçayır & Akçayır (2018), has explored the benefits of the flipped classroom approach, but our project adds value by applying this method to an underrepresented group. The flipped classroom, commonly used in formal education, is rarely applied to adults in the context of digital literacy. Moreover, while other studies focus on elderly or young populations, this project demonstrates how the flipped classroom can effectively support the digital inclusion of these women.

In comparison to previous studies, Mulheres Tech integrates both social inclusion and digital inclusion, combining technical skills training with the broader goal of empowering women to influence public policies that protect their rights. Specific examples of this inclusion included participants who, after learning basic computing, started participating in online forums and communities to discuss their rights and advocate for their needs. This dual approach distinguishes the project from other digital inclusion initiatives, which often focus solely on skills without addressing social empowerment. Additionally, the strong collaboration between academic institutions and social organizations enhances its impact, something less explored in previous works.

The project, primarily targeting women, has consequently had a significant impact on female empowerment by promoting digital literacy for a group that often faces barriers to accessing technology. Participants shared stories of how this empowerment allows them to reconceptualize their futures and provide new hope for their families. Digital inclusion empowers these women to develop greater autonomy, access crucial information, and engage more actively in their personal and professional relationships. The initiative has had a profound impact on the empowerment of domestic workers by democratizing access to knowledge.

The high level of satisfaction expressed by both participants and tutors indicates that the project successfully created a supportive and transformative learning environment. To further enhance these outcomes, it is recommended to expand the project to other regions and establish support groups for participants. Qualitative insights from both participants sand tutors suggest that the continuation of these support mechanisms will further strengthen the project's impact and sustainability. Continuing these efforts can strengthen digital inclusion and female empowerment across communities.

6. Conclusion

In today's world, technology plays a fundamental role in society, serving as an essential tool for many people in their daily lives. However, our research highlights that access to technology is not equally distributed among the Brazilian population. The data collected shows that specific social and economic groups, particularly those from disadvantaged backgrounds, often lack access to the necessary digital tools and information. This inequality presents significant barriers to digital inclusion, which initiatives like *Mulheres Tech* aim to address.

Although the project successfully provided valuable training and achieved a high satisfaction rate of 99.6%, it also revealed some important limitations. One of the main challenges was the limited financial and technological resources available to the participants. Many of the women involved in the program lacked access to quality equipment and adequate internet connectivity, both of which are essential for maintaining and expanding their newly acquired digital skills. These limitations raise questions about the long-term sustainability of such initiatives, particularly when participants return to environments that do not fully support continuous digital engagement.

The age demographic of the participants, primarily women between 46 and 60 years old, further complicated the learning process. While the flipped classroom methodology and support from tutors were instrumental in facilitating understanding, many of the women faced additional challenges, such as limited formal education and lack of family support. For instance, several participants reported that their family members, particularly their children, were unwilling or lacked the patience to help them navigate unfamiliar digital content. This underscores the need for comprehensive support systems beyond the classroom, including family involvement, to ensure that learners can continue to progress.

The implications of these findings are significant. While initiatives like *Mulheres Tech* can provide immediate benefits in terms of skill development and empowerment, they must be supported by broader systemic changes to ensure long-term impact. This includes addressing the structural inequalities that limit access to digital tools and infrastructure in low-income communities. Additionally, there is a clear need for scalable models that can adapt to different contexts, including rural areas and regions with less technological infrastructure.

To truly democratize digital inclusion, future projects must not only replicate successful models like *Mulheres Tech* but also innovate in ways that make digital literacy more accessible and sustainable. This includes creating partnerships between public institutions, private organizations, and educational entities to provide ongoing resources, such as low-cost devices, reliable internet access, and continuous learning opportunities. Furthermore, future research should explore how family and community support can be integrated into these initiatives to reinforce learning and help overcome barriers to digital engagement.

In conclusion, while the *Mulheres Tech* project was largely successful, there are limitations that must be acknowledged. The scope of the project was limited to a specific group of domestic workers in selected Brazilian cities, which may make it difficult to replicate this success in other regions or with different groups. Additionally, the technological infrastructure in some areas remains a challenge, limiting the long-term effectiveness of the training once participants return to their homes.

Future initiatives should consider how to scale the program and make it adaptable to various contexts, including rural or underdeveloped areas where access to technology is more restricted. It is equally important to explore how to offer continuous support to ensure that participants continue to develop their skills after the program ends. The importance of digital inclusion initiatives like this is underscored by the need to promote equal access to technologies and ensure that everyone can fully participate in the digital world.

Moreover, there is great potential to expand these initiatives to include more diverse groups and develop follow-up programs that offer ongoing learning opportunities. Another crucial point for future projects is to examine the role of family and community support in sustaining the skills learned. Collaboration between higher education institutions, public organizations, and the private sector is essential to broaden the scope of these interventions. The success of the *Mulheres Tech* project reinforces the need for continuity and innovation in the field of digital inclusion, promoting a more inclusive and accessible digital future.

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