FEMINISMS AND TECHNOLOGIES

AN EXPLORATORY STUDY FROM PARAGUAY

FEMINISMS AND TECHNOLOGIES

AN EXPLORATORY STUDY FROM PARAGUAY

Technology & Human Rights

This research was conducted as part of the "I like the free Internet" project for **TEDIC**'s "Cyborgfeminista" initiative, with the support of **Brot für die Welt** (Bread for the World).

TEDIC is a non-governmental organization founded in 2012, whose mission is the defense and promotion of human rights in the digital environment. Among its main topics of interest are freedom of speech, privacy, access to knowledge and gender on the Internet. Cyborgfeminista is a project by the organization for anyone interested in understanding and exploring where gender and technology intersect.

FEMINISMS AND TECHNOLOGIES:
AN EXPLORATORY STUDY FROM PARAGUAY

MARCH 2025

AUTHORS
Montserrat Fois
Verónica Villalba M.
Jazmín Sánchez

COORDINATION
Pamela Peralta

EDITING AND PROOFREADING
Pamela Peralta
Mariela Cuevas

COVER DESIGN
Ivanna Serratti

ILLUSTRATION
Adriana Peralta

LAYOUT
Horacio Oteiza

COMMUNICATION
Araceli Ramírez

ABOUT THE AUTHORS

Montserrat Fois

Bachelor's degree in Political Science (UCA). Master's degree in Social Anthropology from the Faculty of Philosophy and Letters (UBA). Currently pursuing a PhD in Social Anthropology (FFyL-UBA).

Verónica Villalba M.

Bachelor's degree in Communication Sciences (UCA), Master's degree in Gender and Development (Universidad Complutense) and Specialist in Public Policy and Gender (FLACSO).

Jazmín Sánchez

Bachelor's degree in Political Science (UCA). Candidate for a Specialist degree in Contemporary Studies of America and Europe (UBA) and Master's degree in Communication and Culture (UBA).

RESUMEN

Este trabajo analiza las intersecciones entre feminismos y tecnologías en Paraguay desde una perspectiva crítica e interseccional. Basado en un enfoque del sur global, la investigación interroga sobre cómo se construyen las herramientas tecnológicas desde una mirada feminista, indagando en las dinámicas que configuran el movimiento ciberfeminista y en qué medida el sur global influye en la búsqueda de autonomía y emancipación tecnológica en la región. Se trata de un estudio exploratorio y cualitativo que combina una revisión bibliográfica y entrevistas a referentes clave para reflexionar sobre la tecnología como una construcción social, política y no neutral que trasciende su dimensión técnica. A partir de un marco teórico situado en el sur global, la investigación propone estrategias para promover tecnologías inclusivas y emancipadoras, favoreciendo la justicia social y la igualdad de género.

PALABRAS CLAVE: *feminismos, género, tecnología.*

ABSTRACT

This work analyzes the intersections between feminism and technology in Paraguay from a critical and intersectional perspective. Based on a global south approach, the research questions how technological tools are constructed from a feminist perspective, investigating the dynamics that shape the cyborgfeminism movement and to what extent the global south influences the search for autonomy and technological emancipation in the region. This is an exploratory and qualitative study that combines a bibliographic review and interviews with key references to reflect on technology as a social, political and non-neutral construction that transcends its technical dimension. Based on a theoretical framework located in the global south, the work proposes strategies to promote inclusive and emancipatory technologies, favoring social justice and gender equality.

KEYWORDS: *feminisms, gender, technology.*

TABLE OF CONTENTS

1. PRESENTATION

"Women still, in many cases, do not write our own history"

(Mirtha Rodríguez, SOPAIA activist)

This research project emerged as a challenge posed by TEDIC to the Paraguayan Association of Feminist Researchers (APIF): to analyze and reflect on the role of technology in Paraguay from a deeply feminist perspective. This invitation was particularly significant because it asked us to engage with a topic we initially considered outside our usual focus, which is centered on issues such as the care economy, women's history, gender-based violence, politics, urban and archaeological concerns, among others. We faced a complex question: with what authority could we speak about technology if we were not experts in computer science, software development or engineering? However, as we delved deeper into the analysis, we realized that technology is not separate from feminist concerns. On the contrary, it is a field thoroughly shaped by power relations, structural inequalities and systems of exclusion that operate through the lenses of gender, ethnicity and class.

Consequently, we accepted the academic challenge of addressing technology not simply as a neutral set of technical systems, but as a space where gender gaps, violence and barriers to the full exercise of human rights are both reproduced and can be subverted. As we began our research, we realized we were not alone in initially thinking that technology had little to do with our work. Academics, scientists and feminists shared this belief, often seeing themselves as irrelevant figures in conversations about technology. A similar issue arises with economics: because we are not economists, we believe we are not qualified to speak, let alone debate, about it. In that field discourse is typically reserved for economists (mostly men) or male journalists, regardless of whether they have the relevant credentials. Similarly, discussions about technology are often dominated by male programmers, engineers or even tech enthusiasts who position themselves as the only legitimate voices on the subject.

This analysis reveals a profound epistemic injustice: knowledge about complex and highly relevant issues has been systematically dissociated from women's capacities and active roles. The belief that only men are suited to speak and think in these fields has been deeply entrenched for far too long, relegating women academics and scientists to a marginal role. This separation not only reinforces archaic stereotypes but also limits the transformative potential of public debate, preventing the inclusion of diverse perspectives that are essential to building inclusive and emancipatory knowledge.

Despite facing a more limited space for these debates in Paraguay, global and regional academia has produced a significant body of critical work on the effects of technology. In this context, we acknowledge the efforts of civil society organizations such as TEDIC, which have led important initiatives to raise awareness and promote the analysis of the role of technology from a human rights perspective.The urgency and relevance of this issue are undeniable, especially as we witness a rapid acceleration of technological change that brings with it socioeconomic and political effects, abruptly transforming how we work, relate to one another, raise children, earn a living and, ultimately, understand the world. This is why we decided to undertake this research with strong ethical and political commitment and academic rigor, offering a reflection that approaches technology as a set of complex social and political constructs that profoundly shape how we imagine our collective future.

This raises critical questions: How can technological tools be built from a feminist, transformative and emancipatory perspective? Is cyborg feminism a consolidated movement in the struggle for technological autonomy? What role does the Global South play in advocating for truly autonomous and emancipatory technologies? In the national context, it is urgent to strengthen critical thinking at the intersection of technology, gender and feminism, fostering these debates and encouraging ongoing reflection.

With this vision in mind, this work accompanies the launch of TEDIC's *CyborgFeminista* website, conceived as a space to foster reflection, offer tools and explore possible futures for a more just and equitable society in relation to technology. With the aim of inspiring more people to question and reimagine the intersection of technology and gender from an academic and feminist perspective, we advocate for a model of technological development that is inclusive, equitable and transformative. The narrow interests of a handful of tech magnates must no longer take precedence over the well-being of society as a whole, especially that of the most vulnerable communities.

2. INTRODUCTION

> [...] My dad introduced me to a very technical environment. I remember being seven years old and sitting at the table in ACEPAR, which was a very big factory where there were hardly any women. If I saw any women, they were secretaries. There were 1,500 people working there. There were these huge dining halls: one for engineers and another for the laborers—they were the ones who did more of the heavy work. My dad, who was an engineer, would always take me to the laborers' table, to the laborers' dining hall, and we'd sit there. I was a little girl and all the laborers were big men.
>
> (Carolina Urquhart, Senior Programmer).

Technological advancement has radically transformed how contemporary societies interact, produce knowledge and access resources. However, this process has been neither homogeneous nor equitable. There is ample evidence that technological innovations not only reflect but also amplify pre-existing structural inequalities, especially those related to gender and the economy (Wajcman, 2004; Svampa, 2019; Benjamin, 2019).

From a general perspective, technology can be defined as "tools made by humans, as efficient means to an end, or as an ensemble of material artifacts. But technology also encompasses instrumental practices, like the creation, fabrication, and use of means and machines; it includes the whole ensemble of material and non-material techno-facts; it is closely connected with institutionalized needs and ends-in-view that technologies serve" (Rammert, 2001, para. 1). In the social sciences, the concept of technology goes beyond its utilitarian dimension and is understood as an extension of the human being which, according to some authors, functions as a prosthesis that compensates for human limitations. From this perspective, technology and humanity are seen as co-constitutive, meaning they shape one another in a relationship of mutual interdependence (Blanco & Berti, 2016).

This broader understanding, which underpins this work, allows us to critically examine the role technologies play in consolidating structures of power and domination. One illustrative example is the concept of affordance, drawn from design theory, which refers to the possibilities for interaction offered by an object or environment. Technologies are not equally accessible to everyone, creating advantages for some groups and barriers for others (Costanza-Chock, 2020). Therefore, technologies must be analyzed in relation to the social contexts that shape their development, access and appropriation.

Reflecting on technology through feminist lenses constitutes a critical, intersectional and emancipatory project. It combines the critique of structural inequalities with the pursuit of transformative alternatives, particularly within the context of gender and technology. Feminism is understood here in the terms proposed by Maffia (2016), who defines it as the acceptance of three principles: a descriptive one, which statistically shows that in all societies women are in objectively worse conditions than men; a prescriptive one, which identifies and denounces the injustice of this situation; and a practical one, which involves a moral and ethical commitment to act and transform the structures that perpetuate inequality. This triad—empirical evidence, value judgment, and committed praxis—forms the theoretical and operational foundation guiding the critique of technology and its transformative potential towards a more equitable society.

If feminism is based on empirical evidence, the critique of structural inequalities and the ethical and moral commitment to intervene and transform these conditions, then gender stands out as a key category of analysis that feminisms draw upon, from diverse approaches to understand these realities. In relation to technology, it is a fundamental category for understanding the dynamics that are produced and reproduced in this field.

Similarly, it is essential to highlight the contributions of Donna Haraway, who introduced the notion of situated knowledge in her work *Simians, Cyborgs and Women: The Reinvention of Nature* (1991). This theoretical-epistemological concept, deeply rooted in feminist principles, argues that knowledge is constructed within specific social contexts and shaped by the concerns and political and ideological commitments of those conducting the research. Situated knowledge, then, not only dismantles the idea of a neutral and objective reality but also strengthens feminist analysis by showing that the versions of the world we co-construct are complex and meaning-laden, opening new horizons for social and technological transformation.

Within this theoretical framework, the concrete realities of Paraguay, as part of the Global South and given its peripheral position in global technological developments, acquire an urgency that calls for immediate reflection and action.

The general objective of this research is to analyze the relationship between feminisms and technologies, incorporating insights from theoretical developments generated in the Global South. Several guiding questions are posed: How are technologies designed and developed from a feminist perspective? What is the role of the Global South in building emancipatory technological autonomy? How do digital technologies reproduce or challenge gender inequalities in Paraguay? What strategies and policies can contribute to greater gender equality in the technological field?

From a feminist and intersectional perspective, this work is based on the premise that, while technological tools can create opportunities to improve living conditions, they are also shaped by dynamics of exclusion, violence and control that unequally affect women and people with diverse gender and sexual identities. It presents a theoretical and methodological framework that sheds light on inequalities often overlooked by analyses grounded in universalist assumptions historically imposed by patriarchal, colonial and capitalist systems. The methodology combines a qualitative approach with literature review and interviews with key actors, including representatives of civil society organizations, academics and feminist activists. Secondary sources include academic literature, reports from national and international organizations and data from recent studies on technology and gender in Paraguay.

The relevance of this study lies in the scarcity of systematic academic research on the relationship between feminisms and technology within the Paraguayan context. However, it is worth noting that Paraguay has not remained entirely absent from these discussions. For instance, in 2014, Asunción hosted the 10th Ibero-American Congress on Science, Technology, and Gender, organized by the Paraguayan Network of Gender, Science and Technology (Repagcyt), which brought together researchers and academics from across Ibero-America to critically debate the intersection of technology and feminisms. Furthermore, the current political and economic context, marked by ultraconservative policies and limited investment in science and technology, underscores the urgent need to deepen these discussions and promote transformations that benefit broad segments of society.

The document is organized into eight sections, establishing an interdisciplinary dialogue with other fields of knowledge such as digital sociology, technological ethics and gender studies. This research seeks to offer an opportunity for collective learning through a situated analysis that contributes to reimagining both the present and the future.

3. FEMINIST THEORY OF TECHNOLOGY AND FEMINIST PHILOSOPHY OF TECHNIQUE. THEORETICAL AND CONCEPTUAL ASPECTS FROM NORTH TO SOUTH

3.1. PERSPECTIVES FROM THE GLOBAL NORTH

feminist theories and the philosophy of technique, understood as a branch of philosophy that examines the nature of the artificial, the distinct forms of technical knowledge and the ethical and moral questions they raise, converge in their critique of the power structures embedded in technological development (Vergés Bosch et al., 2011). The intersection between feminist theories and the philosophy of technique has produced a significant body of literature in the Global North. This literature addresses the relationships between gender, technology and power from critical perspectives, demonstrating how technologies are designed, implemented and used in social contexts shaped by multiple inequalities. It also addresses issues related to the ways in which technological development reproduces and amplifies gender, ethnic and class inequalities.

Considering the economic, social, political and cultural differences between countries in the Global North and the Global South, this discussion of feminist theories from the Global North and their contributions to technology also seeks to highlight the power and hegemony this region holds in knowledge production. These disparities influence how technologies are developed and implemented, as well as the voices and perspectives from different feminist theoretical currents.

In this sense, the distinction in concepts and terminology used reflects the differences between studies in the philosophy of technique and those in the philosophy of technology. As Fischetti and Torrano (2018) note, the former is predominantly used in the French tradition, while the latter is more common in the Anglo-Saxon tradition. Furthermore, “feminists who have theorized about technology use this notion [technology] and not that of technique” (2018).

Feminist Theories of Technology (FTT) generally emerged within the context of second-wave feminist movements in the Global North, primarily in the United States and other Anglo-Saxon countries. While the second wave of feminism arose between the 1960s and 1980s, FTT began to develop in the 1970s, meaning the second wave was already underway when these theories first emerged (Bosch, 2013a).

Thus, FTT gained momentum in the context of feminist currents from the 1970s onward, as well as in relation to technological advancements. It is therefore possible to trace how these theories have been articulated in connection with various feminist currents over time, and how they have conceptualized technology in relation to sex and gender.

Although the theories and debates in question have been reframed and further developed from the Global South, making a strict North–South divide untenable today, retaining that distinction helps clarify their origins and evolution and situates this study within its proper context.

The following section presents a summary of the evolution of technology theories, feminist currents and their conceptions of technology. It then delves deeper into key theoretical figures and their major contributions.

3.1.1. Feminist Currents and Technology Through Their Evolution

As mentioned earlier, Feminist Theories of Technology (FTT)[1] developed alongside the various feminist currents, articulating with them and within the context of the respective eras in which they emerged. Therefore, concepts about technology, as well as actions related to it, have been shaped by these diverse feminist expressions. Below, you'll find a timeline organized by period and year of the feminist currents, along with their concepts and contributions regarding technology.

- **Timeline of feminist theories of technology**

1970s **Early stages and technological optimism**	■ Radical Feminism: ▸ Views technology as a tool with the potential to free women from biological limitations and domestic responsibilities. ▸ Proposes a future where technology would enable the transcendence of sexual differences and lead to a more egalitarian society. ■ Liberal Feminism: ▸ Promotes greater inclusion of women in science and technology, considering technology neutral and identifying the problem as the underrepresentation of women in these fields. ▸ Focuses on reclaiming the history of women in technology and exposing the barriers that hindered their access to education and technological work.
1980s **Critique of technological neutrality and the rise of pessimism**	■ Radical Cultural Feminism: ▸ Questions the neutrality of technology, arguing that it is inherently patriarchal and its effects on women are predominantly negative. ▸ Focuses on the effects of technology on women's bodies and sexuality, viewing reproductive and aesthetic technologies as mechanisms of control and exploitation. ■ Socialist Feminism: ▸ Critiques the supposed neutrality of technology, linking women's oppression to class structures and the capitalist system. ▸ Analyzes technology's impact on women's labor conditions, in both public and private spheres, demonstrating how technology often reproduces the sexual division of labor.
1990s **Postfeminism, ICT, and new Perspectives**	In this decade, the emergence of postfeminism and the expansion and development of Information and Communication Technologies (ICT) marked a turning point in FTT. Their contributions have even become key to understanding postfeminism itself. Cyborg Feminism: Proposes the figure of the cyborg as a symbol of the hybridization between the human and the technological, challenging traditional dichotomies such as woman/man and feminine/masculine, and opening up new possibilities for identity and politics (Haraway, 1984). Cyberfeminism: Emphasizes the potential of ICT for women's empowerment and the creation of spaces for resistance. It also explores the possibilities of cyberspace for networking, artistic expression and social transformation.

1 Co-constitution refers to the idea that two entities mutually shape and influence each other. In the context of gender and technology, it highlights that technology is not neutral; it is shaped by existing gender norms and roles. For example, early video games were often designed for a male audience and reinforced gender stereotypes. In turn, technology also influences how gender is constructed and perceived. For instance, the rise of social media has enabled new forms of interaction and gender expression.

21ST CENTURY **Consolidation and new challenges**	In this century, FTT have evolved into an interdisciplinary field of study. They integrate perspectives from different feminist currents and analyze the impact of new technologies on the lives of diverse women, considering their multiple and complex intersections. Its main expressions are technofeminism, postcolonial feminism and queer feminism. ■ Technofeminism: ► Coined by Judy Wajcman, it analyzes the co-constitution between gender and technology2, arguing that technology is not neutral but rather reflects and reproduces existing power relations. ► Addresses technological design, with an emphasis on women's lack of participation in this process and its consequences. ■ Postcolonial Feminism: ► Critiques the ethnocentric view of some FTT, highlighting that women's experiences with technology vary depending on their cultural context (e.g., regarding their race and origin). ► Analyzes the exploitation of women as cheap labor in technological industries, as well as the differences in women's participation in the design and use of technology across countries. ■ Queer Feminism: ► Questions heteronormativity, gender binarism and the nature of sex and gender in relation to technology. ► Analyzes the construction of gender in cyberspace and the possibilities of ICT for the expression of non-heteronormative identities. Based on its contribution to gender performativity3 it aims to destabilize gender norms and create spaces for the multiplicity of identities and expressions.

2 Judith Butler, one of the most well-known figures in queer studies, argues that gender is performative. This concept is based on the idea that gender is not an innate essence or a fixed category, but rather a social construct produced through the repetition of acts, gestures and discourses. Thus, gender is not a natural expression of biological sex; because it is performative, it emerges from the repetition of a series of acts and behaviors that are adopted and repeated over time (Lluch & Valero, 2021).

3 Sadie Plant acuñó el término ciberfeminismo cuando publicó su libro "Zeros and Ones: Digital Women and the New Technoculture", 1997; en él desarrolla las intersecciones entre el feminismo y la tecnología, desde una visión crítica sobre el rol las mujeres con respecto a la tecnología (Galloway, 1997).

3.1.2. Sex, gender[s] and technology: contributions to the debate

FTT have approached the issue of sex and gender in relation to technology from various perspectives, offering a critical analysis of the cultural and social constructs surrounding what it means to be a woman.

In the early 1970s, the primary focus was on women and technology. Liberal feminism, for instance, addressed the underrepresentation of women in science and technology fields, advocating for greater inclusion and access to technological education and employment (Vergés Bosch, 2013).

The same author also notes that, as FTT evolved, the focus shifted towards gender and technology, recognizing the social construction of gender and its intersection with other categories such as race, class and sexual orientation. This shift was also partly due to critiques from radical cultural and socialist feminists, who challenged the supposed neutrality of technology and argued that it reflected and reproduced existing patriarchal structures.

Likewise, from the 1990s onward, with the mass adoption of ICTs, concerns about sex and gender in FTT also turned towards the potential of new technologies for women's empowerment. Cyberfeminism, for instance, celebrated the possibilities ICTs offered for networking, artistic expression and social transformation. At the same time, it also emphasized the need to address the digital gender gap and the importance of increasing women's participation in the design and development of these technologies.

The concern also centered on how technology can perpetuate gender inequality through various mechanisms such as:

- **Informatics of Domination:** Donna Haraway (1995) coined this term to describe how technology is used to integrate and exploit women within a global system of production and reproduction. This system is marked by increased insecurity and weakened support networks for individuals in vulnerable situations.

- **Feminization of labor:** New technologies are feminizing labor, making it more precarious and exploitable. This is evident in the "homework economy", where labor is restructured to reflect traits traditionally associated with women's work (Haraway, 1995).

- **Control over the Body and Sexuality:** Communication technologies and biotechnologies are redefining sexuality and reproduction, subjecting women to increased surveillance and control over their bodies. Haraway (1995), for instance, points out how medical imaging technologies can be used to intervene in women's bodies, particularly in the realm of reproduction.

Similarly, gender has been conceptualized as a form of technology. This perspective challenges traditional views that frame it as a binary, natural and immutable category. As a social construct, gender is understood as a set of practices and discourses that produce and regulate bodies and identities (Pérez Riedel, 2015). In this sense, gender functions as a technology, that is, a system of power that shapes subjectivities and social relations.

Within this framework, theorist Teresa de Lauretis proposes a definition of gender that goes beyond sexual difference. She understands gender as the result of everyday and institutionalized practices, a set of effects produced on bodies, behaviors, and social relations through the deployment of various technologies. This conceptualization is inspired by Michel Foucault's work on sexuality as a dispositif (or apparatus), a term he uses to describe the mechanisms of power that regulate sexuality. According to Foucault, these technologies are not repressive but rather produce and control sexuality through institutions such as the State, the Church, medicine and law (Pérez Riedel, 2015).

In this direction, and taking Foucault's ideas further, Preciado proposes understanding sexuality as a technology, arguing that gender is fundamentally prosthetic, that is, it exists only in the materiality of bodies and is constructed through technologies that modify and transform them. This view critiques the traditional dichotomy between technology and nature, asserting that this opposition underpins the naturalistic construction of the sex/gender system, as well as colonial and postcolonial racism (Pérez Riedel, 2015). From this standpoint, technoscience has rendered the boundary between natural bodies and artificial technologies indiscernible. The examples cited in this analysis include cyberimplants, hormones, organ transplants, and the web (Lluch & Valero, 2021).

For Preciado, it is impossible to separate the body's nature from the technologies that produce it. Unlike Judith Butler, who focuses on the aesthetic and performative aspects of gender identities, Preciado emphasizes the biotechnological production of nature, that is, the physical, sexual, social and political transformations of bodies that produce what is considered natural (Fischetti & Torrano, 2024a).

In these terms, Lluch and Valero (2021) point to some examples of technologies through which social and cultural constructs of gender can be understood and analyzed, going beyond the female/male or woman/man binary. These include:

- **The birth control pill:** Often seen as a symbol of female sexual liberation, it can also be analyzed as a technology that medicalizes and controls reproduction.

- **Hormones and sex reassignment surgeries:** Preciado highlights the role of these technologies in the material construction of gender, showing how they intervene in bodies to produce identities.

- **Assisted reproductive technologies:** Often designed under heteronormative logic, these technologies can also challenge traditional models of family and motherhood, as in the case of lesbian women who use them to conceive.

- **Virtual assistants:** Most virtual assistants (like Siri, Alexa, or Cortana) have female and white-coded voices, which perpetuates gender stereotypes and surveillance dynamics. "The name Alexa refers to the Library of Alexandria, a metaphor for the source of all knowledge. Alexa's voice is coded from whiteness, in the sense of having no race because race only applies to non-white people who represent humanity. This is why it avoids identifiable cultural inflections, like in neutral Spanish, because accents are tied to stereotypes. Virtual assistants are a class marker that conceals historical racist exploitation" (Fischetti & Torrano, 2024a). They also contribute to surveillance as they share information between their "boss" and the company they are part of, but they do so while projecting trustworthiness like a human secretary, drawing on a gender stereotype that assigns and naturalizes the female role for certain tasks.

- **Microwaves, telephones, and other household appliances:** Everyday objects designed for daily tasks are often shaped and used according to gender norms, reinforcing traditional gender stereotypes and perpetuating inequalities.

Overall, FTT have played a crucial role in making the gender dimension in technology visible, demonstrating that technology is not neutral but rather reflects and reproduces existing power dynamics. By analyzing various technologies and their effects on women's lives, FTT have challenged traditional gender roles. Moreover, by questioning the binary categories of gender and sex themselves, they have moved beyond focusing solely on women to include other identities and differences. In doing so, FTT have opened new possibilities for building a more just and egalitarian society.

3.1.3. Cyborg feminism, cyberfeminism and technofeminism: transformative movements and theories

- **Donna Haraway and the Cyborg as a critical metaphor for other feminist worlds**

As stated by TEDIC (2024), Donna Haraway's *Cyborg Manifesto* uses the metaphor of the cyborg—a hybrid of machine and organism—to challenge traditional binary dichotomies (man/woman, nature/culture, human/machine, etc.) and thus imagine alternative feminist worlds. Haraway (1995) argues that identity is fragmented and strategic, rejecting sex and gender identities as essential binary categories. She critiques essentialism within feminism and instead proposes forms of identity based on affinity. The text analyzes the impact of science and technology on social relations, especially for women, in the context of late capitalism and the informatics of domination.

Haraway also argues that technologies are not neutral; they are imbued with political and cultural meanings that can either perpetuate inequalities or open up spaces for resistance. The figure of the cyborg became a key symbol for understanding the relationship between sex, gender and technology, while also expanding the horizon for the inclusion of identities and ways of being that do not conform to essentialist binaries. The *Cyborg Manifesto* ushered in a new perspective on technologies and feminisms without losing sight of the critique of technology and its consequences for women in the integrated system. It marked a departure from the technophobic stance that had prevailed in feminist technology studies in the 1970s and 1980s, fostering a more optimistic—though still critical—view of technology (Torrano & Fischetti, 2018)

- **Judy Wajcman and technofeminism**

Technofeminism combines a constructivist analysis of technology with a feminist perspective. This approach recognizes both technology and gender as social constructs that mutually shape one another. Judy Wajcman, one of its leading figures, begins with a critique of what she calls gender blindness in social studies of technology, which often ignore or downplay the role of gender in technological development. She argues that the historical marginalization of women in the technological sphere has had a significant impact on the design, content and use of technologies (Fischetti & Torrano, 2024a).

Technofeminism emphasizes how technology is used, what people do with it and how it affects them. It is not merely about increasing women's access to technology, but about transforming technology itself to promote equity and social justice.

Below are some of Wajcman's key reflections on technofeminism, as discussed by Fischetti & Torrano (2024a):

- **The co-construction of gender and technology:** Technology is not neutral; it is deeply shaped by gender relations. The sexual division of labor, gender stereotypes and social expectations are embodied in technological artifacts. For example, some devices are designed specifically for women, such as hair dryers, which are often characterized by particular colors and intended uses. Others, like electric razors, are targeted at men and similarly coded through color schemes.

- **Gender performativity:** Wajcman (2004) draws on Judith Butler's (2007) concept of gender performativity to explain how technology plays a role in constructing gender. Technologies not only represent gender, they also produce and perform it.

- **Critique of determinisms:** Wajcman challenges technological determinism, the idea that technology alone determines social change. She argues instead that technology and society are mutually co-constitutive.

- **Analysis of Specific Technologies:** She has examined technologies such as the microwave, the telephone, the contraceptive pill and reproductive technologies to show how they are embedded in gender relations and how they can be transformed.

In contrast to other approaches like cyberfeminism and cyborg feminism, which focus on the hybridization of humans and machines, Judy Wajcman's technofeminism reflects on the social and material dimensions of technology. It advocates for technological policies that support women's emancipation, as well as for redesigning and reorienting technology to reflect values of equity and social justice.

- **Cyberfeminism: gender, technology, art and movement**

Cyberfeminism is a collection of feminist theories and practices that explore the relationship between gender and technologies, particularly digital technologies. Emerging in the 1990s, this movement views digital space as a battleground for challenging and transforming patriarchal norms (Vergés Bosch, 2013). It is not a monolithic movement but rather serves as an umbrella term encompassing various currents with diverse approaches. Among its main currents are (Fischetti & Torrano, 2024a):

- **Liberal Cyberfeminism:** This approach seeks the inclusion of women in the technology sector, generally without questioning existing power structures.

- **Critical Cyberfeminism:** This approach advocates for the radical transformation of technologies to prevent them from reproducing inequalities based on gender, class, race and geopolitical location.

Throughout its history, various theorists, as well as activists in art, culture and feminism, have influenced its development (Vergés Bosch, 2013). The most relevant figures are presented in the following table

- **Key figures in cyberfeminism**

Donna Haraway	Her *Cyborg Manifesto* is a foundational text that inspired the idea of the cyborg as a figure that blurs the boundaries between human and machine. Although Haraway did not consider herself a cyberfeminist, her work laid the theoretical groundwork for the movement.
Sadie Plant	This British philosopher popularized the term cyberfeminism and theorized it as a movement aimed at dissolving gender barriers through digital technology. Plant (1997[4]) highlights the feminization of the workforce through automation and the historical connection between technology and textiles, traditionally associated with femininity.
VNS Matrix	This Australian art collective used provocative and sexualized language to challenge the patriarchal order in both art and technology. Their *Cyberfeminist Manifesto for the 21st Century* presents the female body as a site of contestation and pleasure within the digital realm.
Old Boys Network (OBN)	This international cyberfeminist group organized the First International Cyberfeminist Conference in 1997. Their 100 Anti-Theses reject a single definition of cyberfeminism, aiming to keep the concept open-ended and in constant transformation.
Faith Wilding	An artist and activist who criticized the lack of clear definition in cyberfeminism, arguing that the absence of a political stance could dilute its impact. Wilding advocates for a fluid yet affirmative framework that fosters solidarity and embraces diversity within the movement. (Fischetti & Torrano, 2024a).
Rosi Braidotti	This Italian-Australian feminist philosopher warned against the dangers of disembodiment in digital environments, emphasizing the importance of understanding the body as a site of contestation and power in its interaction with technology.
María Fernández	Together with Braidotti, she questions the lack of attention to socialist-feminist and anti-racist politics in certain strands of cyberfeminism.
Sandy Stone	A pioneer in transgender studies and communication technologies, Stone explored the construction of the body, gender identity, and desire in virtual spaces. She examined the interaction between technology and desire through cases such as phone sex and the creation of alternative online identities (Fischetti & Torrano, 2024a).
Judy Wajcman	A sociologist who coined the term technofeminism to analyze the mutual interaction between gender and technology. Wajcman (2004) critiques the utopian vision of cyberspace and advocates for a more materialist approach that addresses the persistent inequalities embedded in society (Fischetti & Torrano, 2024a).

4 "Territory, the place we occupy in the world, can be understood as something more complex than merely physical space. It is a place inhabited by who we are, individually and collectively, where our relationships with the environment materialize, and where a sense of commonality is built. Territory is thus a shared body, one that our own body both inhabits and is inhabited by". Lorena Cabnal (2010) uses the term "body-earth territory" to describe this inseparable unit. The body-territory is the result of relational networks (Painter, 2010) and, as such, constitutes a political technology (Elden, 2010). It is therefore necessary to understand the body-territory as a social space (Gargallo, p. 265) (Ricaurte & Quijano, 2023, p. 26).

3.1.4. Intersectionality and technology: The web of inequalities

"Voy a decirlo de entrada para el que quiera entender:
son penas muy encimadas el ser pobre y ser mujer"

Carmen Soler (1924-1985)

Intersectionality is a concept that describes how different forms of oppression (such as gender, race, class, and sexuality) intertwine and shape various kinds of discrimination connected to those forms of oppression. Kimberlé Crenshaw coined the term in 1989 to describe the specific experiences of Black women, who face discrimination that cannot be explained solely by either gender or race, but rather by the relationship between both (Lluch & Valero, 2021). In the context of the philosophy of technique, intersectionality allows us to analyze how technology can perpetuate and deepen existing inequalities, not through a single axis of difference, but through multiple, intersecting ones.

- **The Matrix of Domination**

Patricia Hill Collins expanded the concept of intersectionality by proposing the matrix of domination, which describes how different forms of oppression are organized and interact (Lluch & Valero, 2021). From this matrix, we can analyze, for example, the specific discrimination faced by racialized women concerning technology, based on the intersection of their gender, race and social class.

- **Intersectionality as an analytical tool**

The concept of intersectionality enables us to move beyond binary approaches to technological discrimination. It helps illuminate how Black women (and other marginalized identities based on ethnicity, origin, or disability, such as Indigenous or rural women, among others) experience specific forms of exclusion, for example, in access to technology or in how their cultures are represented through biased algorithms. As previously mentioned, technology is not neutral; it is shaped by power relations and the biases of those who design, develop and deploy it. An intersectional perspective thus helps to reveal the exclusions these biases reproduce.

3.2. PERSPECTIVES FROM THE SOUTH

this section seeks to synthesize regional contributions to feminist technology theory and the feminist philosophy of technique and technology. It begins by noting that within much of the continent's feminist theory, reflections on technology have received limited attention. Contributions to these debates have largely focused on issues of technological access and women's employment in science and technology fields, as will be discussed later (Torrano & Fischetti, 2020). However, for several feminist theorists working on technique and technology, these contributions are insufficient to address the complexity of the topic. This is because they tend to center the analysis on issues of access and use by women and gender-diverse people, without addressing the structural conditions under which technologies are conceived, which often disadvantage these very groups

On the other hand, there is also an interpretation that points to the origins of current technological development. One can and should ask whether technologies like those that form part of what some authors, such as Srnicek (2023a), define as platform capitalism would function in the same way if they had been conceived outside the current economic system.

Latin American feminist approaches to the philosophy of technique and technology are relatively recent. Nevertheless, the contributions emerging from gender studies, science and technology studies, and Latin American cyberfeminism are essential (Fischetti & Torrano, 2024a). These fields have critically examined the relationship between gender and technology from a Latin American perspective. Their contributions should be taken into account when advancing the scientific knowledge agenda within feminist studies of technique and technology.

Another important aspect is the production of critical knowledge emerging from Latin America. Within a context of structural inequality shaped by the colonial, patriarchal and capitalist system, a body of research has developed around what Paola Ricaurte Quijano (2023) defines as forms of resistance related to technologies and their corresponding sociotechnical systems. These studies have focused on a range of issues, as summarized below.

From a feminist perspective, the relationship between sociotechnical systems and the exercise of violence is understood as deeply interconnected. These studies explore various layers of sociotechnical assemblages, such as data, infrastructure, usage and practices, environmental impacts and more. Within this body of research, there is a deliberate effort to make algorithmic forms of resistance visible. Several works propose reparative approaches to the classist, sexist, racist, and other biases that certain algorithms have been shown to reproduce. In both hardware5 and software6, there are also forms of resistance linked to activism, particularly in the pursuit of social justice. Ricaurte (2023) also points to research addressing infrastructures, everyday uses and practices of appropriation from feminist perspectives. More recent studies have examined the digital economy and its connection to labor.

A second group of studies focuses on the actions and forms of resistance led by various actors, particularly collective movements. A smaller set of studies explores resistance as it unfolds in everyday life and practices. A third group examines resistance in relation to geographic location, mainly in urban contexts. This includes work that explores the pursuit of technological sovereignty linked to community-based spaces. Finally, a fourth group approaches resistance in relation to technology as a processual phenomenon, marked by its own complexities and tensions (Ricaurte Quijano, 2023).

---

5 STEM is an acronym referring to Science, Technology, Engineering, and Mathematics.

6 Cesare Lombroso was a physician and criminologist from the late 19th and early 20th centuries, known for his ideas about the biological determination of criminals, which were later discarded. As a result, "Lombrosian" is used pejoratively to suggest that someone intends to engage in practices of this kind (Musumeci, 2014).

It is understood that, although the dimensions and reach of violence have been altered by technological change, the model retains its extractivist and dispossessing character. As a result, the forms of violence emerging from technological transformations are seen as a continuation of historical violence (Ricaurte Quijano, 2023). In the Latin American context, this reflects an ongoing legacy of colonial violence.

Feminists in Latin America, a region shaped by its colonial history, have recognized the need to incorporate an intersectional analytical framework into studies on technology. Approaching technology through the lens of intersectionality makes it possible to bring visibility to experiences, forms of oppression and debates that are often overlooked in more general analyses.

In this regard, it is relevant to revisit the concept of the coloniality of power, developed by sociologist Aníbal Quijano. According to María Lugones (2008), this notion refers to a system of power structured through relationships of exploitation and domination. In Latin America, due to its colonial history and the invention of the category of race as a mechanism of social hierarchization, a model of domination based on an unequal power structure was consolidated. From this perspective, Eurocentric capitalism is organized around the coloniality of power and modernity (Lugones, 2008).

In the current context of digital colonialism, the *coloniality of power* extends to the technological devices that shape the global order, giving rise to a *technological coloniality of power*. Large technology corporations, or Big Tech7, have ceased to be mere economic actors and have become political-corporate agents capable of displacing nation-states in strategic decision-making. As a consequence, state sovereignty is undermined in key areas such as technological and industrial development. At the same time, these companies have driven the creation of mechanisms for data extraction and monetization, conceived as a new raw material. In this process, forms of *algorithmic oppression* and *data-centric epistemic violence* emerge, reinforcing power asymmetries in the digital age (Tello, 2020).

To this, we must add that feminist thinker María Lugones pointed out the limitations of Quijano's concept when it came to addressing how the Latin American context shaped our understanding of gender. In response, she proposed the concept of the coloniality of gender, which offers a framework for reflecting on how many current technologies continue to reproduce colonial power relations linked to gender (Lugones, 2008). For example, on Instagram, there is a fairly standardized idea of who is considered beautiful (Loucas et al., 2024).

The unique historical situation of the region requires that debates originating in the Global North be adapted to the Global South. This is not a matter of theoretical colonization, but rather the necessity to address relevant issues from our own perspective, with nuances and roots in our territories (Torrano & Fischetti, 2020). After all, studies on technology and its relationship with gender, feminism and sexuality are produced in unequal quantities when comparing works from the Global North and South (Sívori et al., 2023).

For analyses produced within the region to be possible and to emerge from an intersectional framework, a feminist approach to knowledge production regarding technique and technology is necessary, guided by the concept of situated knowledge (Haraway, 1995). This concept helps make visible the relationship between our bodies, societies and subalternity. To rethink discussions originating in the Global North, they must be localized within the contexts where theory and practice take place (Haraway, 1995).

7 A program that uses artificial intelligence to generate images, developed by OpenAI.

In addition, while interest in technologies often includes communication technologies8, robotics9, artificial intelligence10 or biotechnologies11, it is equally important to consider other forms of technology, such as domestic or everyday technologies (Barbosa et al., 2024, p. 4). For this reason, gender and technology studies should incorporate traditional techniques into their analyses and designs, techniques that have often been marginalized by the dominant vision of technology. Below is an excerpt from *Manifesto of southern sympoietics: Feminists plotting about techniques and technologies* (Barbosa et al., 2024)12, which highlights the experience of the National Coordinator of Peasant and Indigenous Women (CONAMURI). This case invites us to reflect on the relationship between technique and technology in a specific territorial context such as Paraguay:

> "Particularly, women and gender-diverse people have played a central role in mobilizing and coordinating strategies for the re-existence of their worlds, through the development of innovative technical practices. Such is the case of CONAMURI, the organization of Indigenous and peasant women in Paraguay. Within it, women leaders from numerous Indigenous communities are at the forefront of resistance against the violent displacement from their territories caused by the expansion of soy cultivation. They organize agroecology training workshops that promote a dialogue between Western agricultural techniques and their peoples' traditional practices. They create worker cooperatives and local fair trade circuits that challenge capitalist logics. They also recognize both human and non-human actors, such as the 'river-brother', as having political and social agency." (CONAMURI, 2018).

Finally, these studies delve into the concept of body-territory13. Developed by Latin American feminists, the concept invites us to rethink the relationship between the human and the non-human. That is, to think of humans and nature together with techniques and technologies, and to analyze them from a Latin American perspective. This opens the way for a "cyborg Pachamama" (Barbosa et al., 2024), a perspective that sees technologies as inseparable from the bodies and territories they inhabit. In this regard, the term Technocene refers to the physical impact of human behavior on the planet, with an emphasis on human technical capabilities (Costa, 2021).

Another approach to the concept of "bodyterritory" involves examining sociotechnical assemblages in relation to resistance. This means considering the various interrelated layers of the Internet. While there are other ways to approach this analysis, Ricaurte Quijano (2023) proposes three layers: (1) the physical layer, which relates to infrastructure; (2) the logical layer, which pertains to code, software, and similar elements; and (3) the content layer, which concerns the data that circulates. The idea is to think of these layers as the sites where resistance operates between the earth-territory (the ecosphere) and the body-territory (the biosocial).

---

8 Carmen Colazo was one of the driving forces behind the creation of the Paraguayan Network on Gender, Science and Technology (Repagcyt). In 2014, the Network organized the 10th Ibero-American Congress on Science, Technology and Gender in Asunción.

9 TEDIC emerged from a campaign aimed at challenging the digital canon, understood as the concentration of copyright in private hands. While its origins focused on this struggle, the organization has since expanded its scope to address various issues in the fields of technology, education and social development (Musumeci, 2014).

10 Civilab is a civil society organization that aims to contribute to collective transformation by promoting citizen participation and social development through technology (Civilab, n.d.).

11 Google's Women Techmakers program provides visibility, community, and resources for women working in technology

12 Ceragon Networks Ltd. is a network equipment provider, focused on point-to-point wireless connectivity, primarily used for wireless backhaul by mobile operators and wireless service providers, as well as by private companies.

13 The Maká are one of the 18 Indigenous peoples that have existed since before the creation of the Paraguayan state. They are originally from the Boreal Chaco, which includes the western region of Paraguay, the southern part of Bolivia's eastern plains and part of southwestern Brazil.

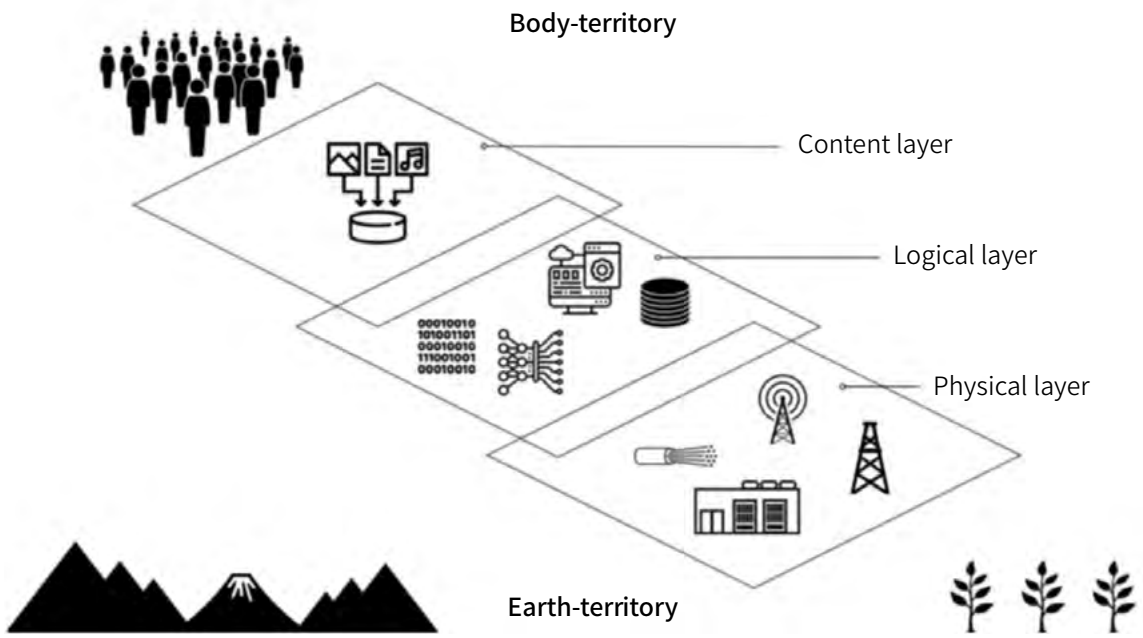
The earth-territory, as the first layer, is understood within traditional epistemologies, especially Indigenous ones, as a sacred space from which materiality flows. According to these epistemologies, the territory is not merely a resource: it is home, the foundation of existence and a spiritual domain (Ricaurte Quijano, 2023). In the case of Indigenous communities in the Amazon, as the same author notes, the earth-territory is not only a geographically rich space in terms of biodiversity, but also a sacred site inhabited by gods and ancestors. These communities' resistance to deforestation and mining exploitation exemplifies the defense of the earth-territory as a vital and spiritual space.

The body is the primary site where power relations involving domination, gender, ethnicity and class are experienced. The concept of body-territory links the materiality of the body with the social structures that cut across it. In the context of domestic workers in Latin America, for example, the feminized body has historically functioned as a territory exploited and disciplined by the logics of a capitalist and patriarchal economy. Work overload, lack of labor rights and physical or sexual abuse exemplify how the body-territory becomes a site of struggle and resistance.

Finally, the author addresses the notion of individual–collective bodies, increasingly mediated by sociotechnical assemblages, defined as networks of technological devices, infrastructures and digital systems that reconfigure social, economic and political relationships (Ricaurte Quijano, 2023). The expansion of digital platforms such as Uber, Rappi and iFood in Latin America illustrates how workers' bodies are mediated by applications and algorithms that control their schedules, routes and payments. This sociotechnical assemblage redefines both the body-territory (the physical labor of the worker) and collective relations, giving rise to new forms of labor precarity.

These three dimensions are not independent; they interconnect in complex ways. For example, the dispossession of the earth-territory (through extractive mining) directly affects the body-territory (due to pollution that sickens local communities) and is mediated by sociotechnical assemblages (such as drones, sensors, and surveillance systems used to protect extractive zones). The logics of global power (extractivism, patriarchy, digital capitalism) simultaneously impact physical space, the human body, and the sociotechnical networks that organize our lives.

This can be graphically represented as:



From Resistance as Re-existence: The Defense of the Body-Territory in Algorithmic Society (Ricaurte Quijano, 2023, p. 23).

Digital technologies are increasingly entangled with the world, prompting us to rethink the body-territory in light of its current complexities. Part of Latin American literature thus seeks to become body-territories entangled with technology. This challenges the prejudice that positions the struggles of Indigenous women and gender-diverse people as technophobic (Barbosa et al., 2024). The goal is to sustain the life of the many existing body-territories. In a world where Indigenous peoples make up around 5% of the global population while guarding 80% of the Earth's biodiversity, protecting their interests becomes fundamental (Ricaurte Quijano, 2023). It is crucial to understand that digital technologies are not separate from the body-territory, which is why there is a call for technologies that do not destroy it.

3.2.1. Gender and the digital divide in Latin America

Research on technology and feminisms in the Global South has focused on a range of issues, among them the digital access gap, which is generally approached from a binary perspective that contrasts the situations of women and men. The sexual division of labor in professional settings has also been analyzed, as women are often relegated to less technical areas, while scientific and technological disciplines continue to be perceived as predominantly masculine spaces.

In a region like Latin America, marked by deep structural inequalities—economic, social, educational and geographical—it is unsurprising that these issues hold a central place in academic and philosophical debates. Gaps in access to technology and the barriers faced by women and other gender identities in the tech sector reflect not only the unequal distribution of income and basic services but also the persistence of gender stereotypes that sustain an androcentric and sexist worldview and knowledge structure.

The central role that debates in South America give to gaps in technology access and inequalities in its use stems from a combination of historical, structural and epistemological factors that shape the region's technological priorities. One of these has to do with the urgent challenges related to poverty, inequality and social exclusion. In this context, technology is primarily seen as a tool to reduce disparities, facilitate access to basic services (education, healthcare, banking), and generate economic opportunities.

This approach reflects global power dynamics, urgent local socioeconomic needs and the technological dependence that characterizes countries in the Global South, in other words, Latin America's peripheral position in the global economy. Historically oriented towards exporting raw materials within an extractivist economic model, the region has been relegated in terms of technological innovation and lacks a focus on promoting the development and consolidation of its own technologies.

In this context, technologies often arrive in the region as finished products, imported from countries in the Global North, accompanied by instructions for use and consumption that leave little room for adaptation or reinterpretation. This limits regional debate, which tends to focus on access to and use of technologies designed elsewhere, rather than questioning the dynamics of their development or exploring alternatives better suited to local realities.

The gender digital divide is a clear manifestation of these inequalities. According to the global report by the World Wide Web Foundation (2020), "Around the world, fewer women than men use the internet. Web Foundation analysis has found men are 21% more likely to be online than women — rising to 52% in the world's least developed countries " (Chair et al., 2020, p. 3).

3.2.2. Science, gender and technology

Since the mid-1990s, Latin America has begun critically examining the role of women and TLGBIQ+14 individuals in the field of Science and Technology (S&T). This analysis has revealed existing gender gaps, inequalities in task distribution, difficulties in accessing and retaining key positions, as well as conflicts arising from the challenge of reconciling professional life with family responsibilities. Additionally, initiatives have been developed to document, promote and value the contributions of women in this field, as well as to implement measures that protect them from various forms of discrimination, violence and abuse based on their gender or sexual identity (Fischetti & Torrano, 2024a).

Studies on science, technology, and feminisms in Latin America cover a wide range of topics. These include debates around critical, decolonial and situated approaches that respond to local struggles and realities; critical readings of scientific and technological models; and, of course, the low participation of women and people of diverse sexual and gender identities in STEM fields.15 These perspectives examine the intersection of gender and technology through a social justice lens, questioning dominant models and proposing alternatives that promote equity.

Argentine feminist thinker Diana Maffía has deeply reflected on these relationships. Among the many issues she addresses, she points out that the historical exclusion of women from scientific communities has led to an androcentric view of knowledge and has deprived science of valuable perspectives and research strategies.

14 This would be the case in Paraguay if the mandatory use of biometric data for border crossings were fully implemented, which, so far, it is not.

15 Copaco is a paraguayan company that provides telecommunications services.

Science and technology, understood as cultural constructs, have been dominated by men, relegating women to the role of objects of study and denying other subjects' ability to produce knowledge and develop technologies. "The exclusion of women from science has a dual effect: it prevents our participation in the epistemic communities that construct and legitimize knowledge, and it expels qualities considered 'feminine' from that construction and legitimization, even considering them obstacles" (Maffía, 2021, p. 25).

The language of science is not neutral, as values are embedded within it and, as the same author points out, this is not merely a descriptive fact. Similarly, the language of artificial intelligence and other technological developments is also far from neutral. The language used in science and technology is one of the core issues analyzed in this field. It also explores the various strands of feminist epistemology and their strategies to uncover sexist bias in science, including the history of women in science and the critique of androcentric theories from both feminist and postcolonial perspectives.

From these critical perspectives on science, Maffía examines the relevance of postcolonialism to feminist critiques of science. She argues that it is not enough to simply include subaltern voices; instead, she emphasizes the need to decolonize the mind as a necessary step for women and other subaltern groups, such as the TLGBIQ+ population, to produce meaningful knowledge and contribute to the advancement of science from a gender perspective. For this reason, the author reaffirms the importance of the concept of "gender" as an analytical category for understanding how cultural norms and social expectations shape the construction of scientific and technological knowledge.

3.2.3. Ethical issues surrounding AI

Ethical debates about the use of AI are increasingly relevant in today's world. The modern project of mechanizing human reason has, in the 21st century, evolved into a regime of knowledge extraction and epistemic colonialism. This raises the ethical imperative to consider the extent to which the development and deployment of these technologies perpetuate and renew the conditions of colonial dispossession.

The *Nooscope Manifested* by Pasquinelli and Joler (2020) offers an introductory framework for understanding how artificial intelligence technologies work. The text serves as a fundamental tool for exploring the relationship between knowledge, automation and the algorithmic infrastructures that shape decision-making today. From a critical standpoint, the authors argue that AI does not operate autonomously but is inherently tied to large-scale data capture and processing, which in turn consolidates new forms of control and governance over knowledge.

The Nooscope was an instrument envisioned by Leibniz in 1677, which he described as follows: "[Humanity] will then possess a new instrument which will enhance the capabilities of the mind to a far greater extent than optical instruments strengthen the eyes, and will supersede the microscope and telescope to the same extent that reason is superior to eyesight" (Leibniz, 1677, in Pasquinelli & Joler, 2020). The Nooscope is then used by Pasquinelli and Joler (2020) to draw an analogy with contemporary artificial intelligence systems. They argue that machine learning consists of three components: an object to be observed (training dataset), an instrument of observation (learning algorithm) and a final representation (statistical model). The combination of these three elements is what the authors present as the Nooscope (Pasquinelli & Joler, 2020).

This approach helps demystify common conceptions of Artificial Intelligence (AI), distancing it from technodeterminist narratives that portray it as an autonomous and neutral entity. Instead, the manifesto highlights how these technologies rely on networks of human labor and computational infrastructures shaped by specific logics of power and information exploitation. It also introduces the concept of the Nooscope, understood as a metaphor for the vision and data-processing systems that underpin

contemporary artificial intelligence. This perspective enables a critical reading of the epistemological and political implications of AI. In this sense, the work serves as a key starting point for those seeking to understand the foundations of current technological development while remaining attentive to the historical and sociopolitical forces that shape it.

One of the most important points raised is that instruments of measurement and perception inherently contain distortions. When discussing AI and machine learning, there is often an attempt to overlook that, in the case of their mathematical models, no statistical system is perfect (O'Neil, 2018).

When analyzing AI, it is crucial to recognize that its technical limitations are intertwined with human biases. Historical biases present in societies long before the emergence of these technologies are often reproduced within them. As mentioned earlier, the coloniality of power and the coloniality of gender manifest in AI. Regarding data biases, it is important to acknowledge that training data for machines is often structured based on hierarchical and binary categories.

The semiotic process of assigning a name or category to an image is never impartial. It is important not to lose sight of the fact that, as María Lugones (2008) points out, there is a way of naming and classifying that is rooted in coloniality (Quijano, 2000, cited in Lugones, 2008). Within these very categories, certain subjects are more visible than others, as highlighted by the intersectional approach. The economic nature of corporate algorithms, which compress information in pursuit of profit maximization, carries the risk of reproducing categories of race, gender and class with colonial origins. At the same time, the black-box nature of these algorithms hinders scrutiny and facilitates their naturalization.

When we talk about AI, we are referring to algorithms that perform pattern recognition. An algorithm is the name given to the process by which a machine carries out a calculation. As the authors point out, the result of these processes is an algorithmic statistical model.

According to Pasquinelli and Joler (2020), most current machine learning applications can be described through two main modalities: first, classification (pattern recognition), and second, prediction (the generation of patterns projected from past trends and behaviors). These modalities contribute to shaping a society of control and statistical governance. As the authors note, this has led to the resurgence of practices that could be described as Lombrosian16, further reinforcing concerns about how such systems perpetuate the coloniality of power and gender.

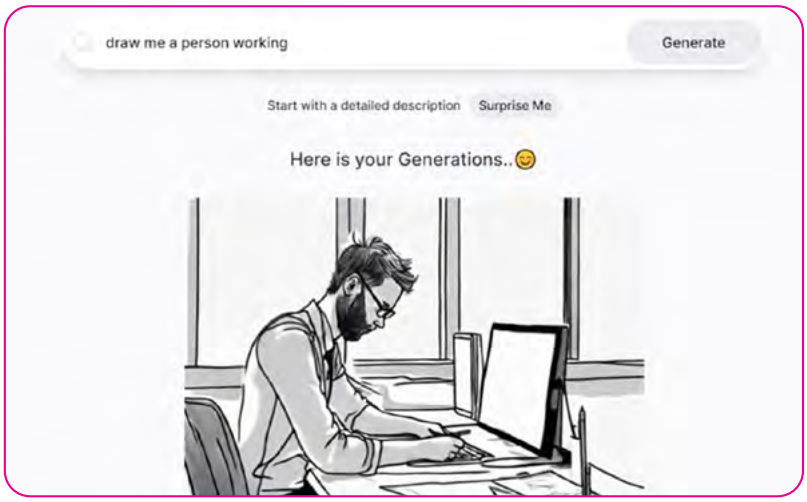
Another important issue the authors mention is the normative power of AI. As Ricaurte Quijano has noted, colonial superiority was legitimized based on an epistemic, ontological and sociotechnical order that supported the dispossession of colonies (Ricaurte Quijano, 2023). In the case of AI, it extends the normalizing power of modern institutions to corporations. In this regard, we cannot ignore that statistics were already used in early modern France to measure social norms and discriminate between what was considered normal and abnormal (Foucault, 2004, in Pasquinelli & Joler, 2020).

In addition to amplifying existing forms of discrimination within a matrix of oppression, AI presents both a logical and political limitation: its difficulty in recognizing and anticipating novel events. Due to the way it learns, machine learning is unable to detect singular anomalies that appear for the first time. This is because it projects past taxonomies and behavioral patterns onto the present. Pasquinelli and Joler (2020) refer to this as the problem of the regeneration of the old, where a homogeneous view of

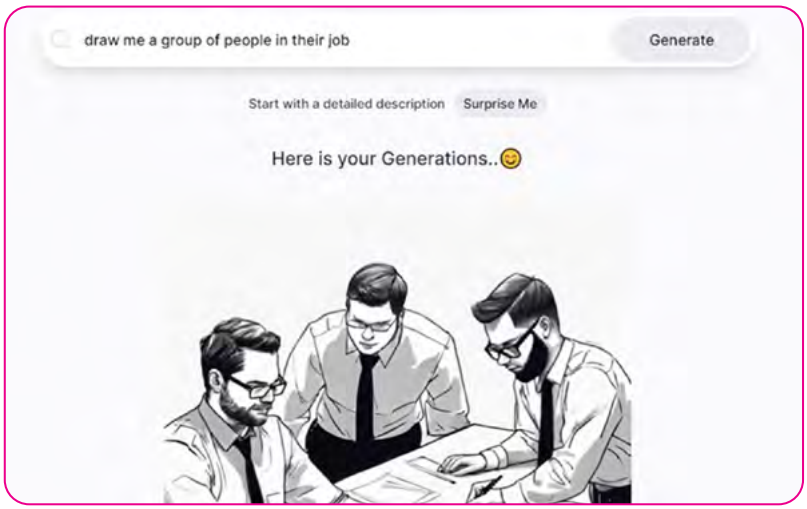
16 The Latin American Coordination of Rural Organizations (CLOC–Vía Campesina) is an organization with over 30 years of commitment to the struggle for the human, economic, cultural, social, and political rights of peoples, in defense of peasant production and ways of life. It is firmly committed to representing peasant, worker, Indigenous, and Afro-descendant movements across Latin America

space and time is imposed, narrowing the possibilities for new historical events. Along these lines, María Lugones (2008) notes that colonized people have become subjects shaped by their colonial condition. A constant regeneration of the old risks obscuring the fact that we are also more than what hegemonic power intends us to be.

The points discussed above are illustrated below with three reference images generated using the artificial image reproduction system Dall-E17:

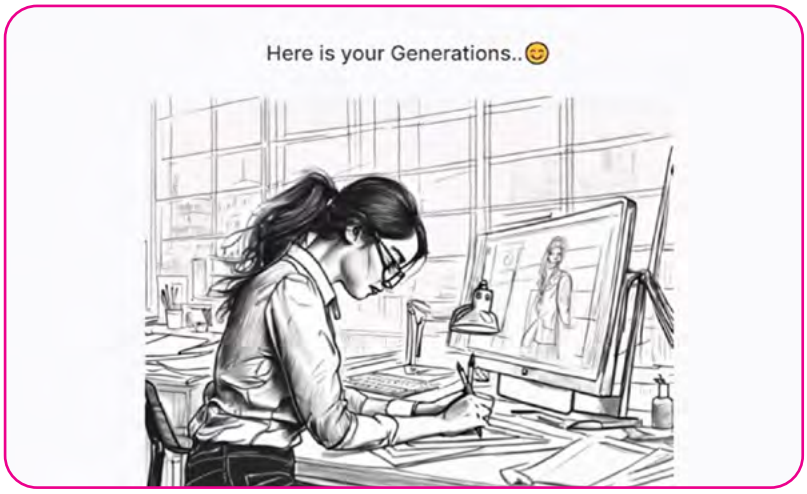


In the first request, the prompt was to generate an image of a person working without further details. As can be observed, it consists of a seemingly white man doing office work in front of a computer.



17 Semilla Róga is a Guaraní expression meaning "the house of the seed." The initiative emerged in the city of Repatriación and is promoted by the National Coordinator of Peasant and Indigenous Women (CONAMURI). Its mission is to recover, reproduce and protect native and creole seeds, recognized as an essential heritage of the peoples in service of humanity. The project seeks to establish a system for the protection and exchange of organic and agroecological seeds, aimed at strengthening the production and commercialization of green manure. It is grounded in the promotion of sustainable environmental education, regarded as a cornerstone for safeguarding our ancestral legacy and ensuring a more equitable future.

The second request was to generate an image of a group of people in their job. As can be seen, it once again depicted a group of apparently white men in an office.



The third and final image requested was that of a woman working. As can be seen, the result was not much different from the previous ones, aside from the fact that it included a gender specification.

Nevertheless, we should not adopt a fatalistic view of these technologies. For instance, alongside the concerns presented above, there is also a growing global mobilization from civil society advocating for the development of ethical AI. There are even initiatives that use AI to expand civic space, such as the Machine Learning for Peace project at the Dev Lab of the University of Pennsylvania, which processes large volumes of data to monitor civic space (Forus, 2023).

Ethical debates surrounding digital technologies are increasingly relevant and will likely continue to grow as our everyday lives become more and more mediated by them.

In the case of Paraguay, Rafael Barrett (1876–1910) is identified by Raúl Acevedo (2023) as one of the first to problematize social technification. This took place during a period of expanding industrialization and liberal rationality in the country. Barrett viewed machines and industrialization as forces that transformed the social and economic relations of his time. According to Acevedo, Barrett held an ambivalent position towards them: while he proposed that machine labor could eventually liberate people from the most inhumane tasks, he also held techno-pessimistic views. Among these, he warned of the danger of humans being turned into machines, or of machines ultimately rebelling against their creators. Nevertheless, one of Barrett's key contributions is the importance of critically reflecting on social technification in our time. In other words, thinking of technology and human subjectivity together, as Barrett did in his own era. In the case of feminists, this struggle must include a dispute over subjectivity that incorporates the question of gender.

Below are discussions that connect ethics and digital technologies within the current context of debates around labor. The selection was based on the potential interest of studying these issues in Paraguay.

3.2.4. Technologies, work and gender

As previously mentioned, one of the topics drawing attention in discussions about digital technologies is their relationship with work. There is an ongoing debate about what kind and how much work AI performs without the contribution of human labor. This and other recent digital technologies have contributed to reshaping the meaning of work in the 21st century. This also implies that there is no single, consensual position on the matter.

Pasquinelli and Joler (2020) emphasize that the information source (data) used for training artificial intelligences always consists of representations of human skills, activities and behaviors. In other words, the training dataset is implicitly a diagram of the division of human labor, which artificial intelligences must analyze in order to automate. According to the authors, "the enterprise of computation has been a combination of surveillance and disciplining of labour, of optimal calculation of surplus-value, and planning of collective behaviours" (Pasquinelli & Joler, 2020, para. 47). Thus, the very concept of automation is called into question, since artificial intelligences rely on human labor in order to function. For this reason, some authors have proposed replacing the term with heteromation (Ekbia & Nardi, 2019).

Another perspective on digital labor highlights that in contemporary society, "work processes have shifted from the factory to society, thereby setting in motion a truly complex machine" (Terranova, 2022, p. 119). According to the author, work in the digital economy is both cultural and technical, and is at once voluntary, unpaid, and pleasure-generating. This "free labor," as she calls it, resolves the contradictions of industrial societies. Whereas in the industrial era workers sought satisfaction through leisure, in the digital era, satisfaction can be found in work itself. While the industrial worker was seen as alienated by the means of production, in the digital era individuals discover their own non-alienated means of production within their own minds.

Terranova (2022) notes that in early internet communities, this free labor was not compensated with substantial financial rewards; rather, it was offered voluntarily in exchange for the pleasure derived from communication and exchange. This free labor was not the result of processes developed outside of capital and later appropriated by it. Instead, it was the result of a complex history of the capital-labor relationship Free labor is a defining feature of late capitalism. It is not merely appropriated by capitalism, it is created, exploited and ultimately exhausted within it.

In relation to Terranova's concept of free labor, it is worth highlighting how Latin American feminisms have long emphasized the significance of elements considered non-economic (Gago, 2019). For instance, feminist theory has underscored the role of affect in the performance of reproductive labor by women. What Terranova refers to as free labor is yet another example that reveals how, in this century, the idea of work—traditionally tied to the hegemonic image of formal, salaried, male employment—has imploded (Gago, 2019). From a feminist standpoint, this should be taken into account in debates about labor and digital technologies, since traditional forms of work have never been the universal norm for all of humanity.

For Verónica Gago, the management of data and information through digital platforms operates within a logic of *expanded extractivism*, in which the extractive frontier is no longer limited to the exploitation of natural resources, but extends into broader social, political and economic dynamics (Gago & Mezzadra, 2017, in Gago, 2019). From this perspective, extractivism is no longer seen merely as a technical process linked to raw materials, but as a core principle of capital valorization.

Within this framework of expanded extractivism, the dimensions of the *coloniality of power* and the *coloniality of gender* become visible, revealing the structural inequalities embedded in the platform economy. One example is the invisible workforce that keeps these platforms running by carrying out essential tasks along the digital assembly line, often under conditions of exploitation and value extraction, primarily in the Global South (Pasquinelli & Joler, 2020). This is partly because many of the functions attributed to artificial intelligence actually require the intervention of human workers to function properly, a labor that frequently falls on precarious sectors in the Global South. Moreover, the rules of international trade, largely shaped by the World Trade Organization (WTO), help reinforce these asymmetries and sustain global inequalities (Scasserra, 2021).

In their book *After Work: A History of The Home and the Fight for Free Time*, Hester and Srnicek (2023b) explore the complex relationship between work and digital technologies. Drawing on a critical analysis of contemporary capitalism, they ask why, despite technological advancements and automation, access to free time remains so elusive. Their research suggests that today's economic structures have not only failed to reduce workloads, but have also expanded and redefined the demands of labor, perpetuating dynamics of exploitation and precarity rather than redistributing the benefits of technological progress. The authors note that with the rise of new technologies, as previously mentioned in connection with Rafael Barrett's thinking, a promise emerged: that it would be possible to maintain the same standard of living while working less. Yet this promise remains unfulfilled.

In the case of reproductive labor, this happens because, firstly, technology alone is not sufficient to reduce the workload without considering the context and the sociotechnical system in which it is used. Secondly, due to the lack of innovation in a sector where, if someone is wealthy enough to acquire technologies that perform these tasks, they are also wealthy enough to hire low-wage workers to do the job. Moreover, many domestic reproductive tasks are, in practice, difficult to mechanize. Finally, this type of labor has increasingly been outsourced through digital platforms. Yet this shift has not reduced the workload, it has merely transferred it from the household to the market. In other words, instead of decreasing, domestic work has been transferred to workers, often precarious ones. As a result, the potential for technology to liberate us from labor remains largely unrealized (Hester & Srnicek, 2023b).

Globally, the mid-20th century witnessed what came to be known as an industrial revolution within the home. During the 1940s and 1950s, various technologies designed for domestic tasks became standardized in Western households, promising to reduce the burden of domestic labor. However, rather than decreasing, household responsibilities persisted and were often reorganized in new ways. Researcher Ruth Schwartz Cowan identified this paradox and coined the term Cowan's paradox to describe how the introduction of household appliances did not alleviate domestic labor but, in many cases, restructured it without challenging the gender inequalities that sustained it. This phenomenon illustrates that the mere introduction of technology is insufficient to reduce labor burdens if the social, economic, and cultural context in which it operates is not taken into account (Hester & Srnicek, 2023b).

In Paraguay, the last 20 years have seen significant transformations, with the population moving away from the poverty line and a decrease in overall vulnerability. At the same time, many people who had performed unpaid domestic work (primarily women and children) entered the labor market and/or educational institutions. These changes were accompanied by shifts in consumption habits, and over the past decade, Paraguay reached an average of 5 to 7 household appliances per person. However, these new patterns of consumption led to rising levels of personal debt, which, according to economist Manuel Ferreira, had a severe economic impact when the pandemic hit (Terere Cómplice, 2024).

For all these reasons, it is necessary to continue theorizing about changes in the world of work from a local perspective. What are the boundaries between work and everyday life in Paraguay? How do digital technologies mediate this relationship? What does "work" mean in the new digital context, particularly from a gender perspective? The country's new consumption habits involve an increased use of household appliances, but does that actually translate into less work? And how much of what is earned through labor ultimately goes towards accessing these technologies? These are just some of the questions that remain to be answered, but there are many more.

3.3. FEMINIST PERSPECTIVES IN SCIENCE AND TECHNOLOGY STUDIES

The intersection between Science, Technology, and Society (STS) studies and feminism has given rise to a rich and complex field of research that aims to dismantle the idea of technological neutrality and examine how science and technology perpetuate gender inequalities. Leading authors in this field, such as Sandra Harding (2016) and Evelyn Fox Keller (1985), challenge dominant narratives about science and technology, emphasizing that these are neither objective spheres nor free of values (Fischetti & Torrano, 2024b).

Similarly, Langdon Winner (1983) argued that technologies are political artifacts, meaning they embody and reproduce power relations. This idea rests on the premise that technology is not neutral; rather, it is designed and used in ways that reflect the interests and values of those who control it. In this sense, the author asserts that technology can be political in two main ways:

1. **By its intrinsic design:** Some technological artifacts are created to favor certain social groups or interests over others.
2. **By its social implications:** Even technologies that seem neutral in their design can have political consequences by influencing social organization, the distribution of power, and relationships between people.

4. DEBATES ON TECHNOLOGIES AND FEMINISMS IN PARAGUAY

This section could begin by noting the limited production of knowledge on technologies and feminisms in Paraguay, reflecting the existing gap in research production in this field. However, rather than focusing on this shortcoming, the decision is to highlight the works that have been identified and brought to light. At this point, it is worth highlighting that, without a doubt, knowledge production in Paraguay, across all areas, is grounded in the firm conviction that development must include the construction and strengthening of science and technology from local perspectives, in dialogue with shared approaches. This becomes particularly relevant in a context marked by low investment in research and development (R&D) in the country. According to data from the National Council of Science and Technology (CONACYT), in 2021 Paraguay allocated just 0.15% of its Gross Domestic Product (GDP) to R&D, a figure that slightly declined to 0.12% in 2022 (Paraguay Innovation Observatory, n.d.). These figures are significantly lower than the Latin American and Caribbean average, which stands at around 0.62% (CONACYT, 2021).

In this context, in addition to recognizing individual and collective efforts to reflect on technologies from the Southern Cone, and particularly from Paraguay, it is essential to emphasize that the majority of these studies and reflections have been driven by women. Likewise, many—if not most—of the advocacy initiatives in the technological field in the country have been led by women, highlighting their significant leadership in the construction of critical and transformative thinking around technology.

For the purposes of this research, the literature is organized into four main thematic areas, which are outlined below.

4.1. GENDER GAPS AND INEQUALITIES IN SCIENCE AND TECHNOLOGY

Marta González García's (2017) work "Science, Technology and Gender" analyzes the historical and persistent underrepresentation of women in these fields, exploring its social, cultural and structural causes, as well as the consequences of this inequality. Within this framework, she highlights that in Paraguay, the first woman to graduate from university was Serafina Dávalos, who earned a law degree from the National University of Asunción in 1907. She also notes that the Paraguayan Scientific Society, founded in 1921, was led by a woman for the first time in its history only in 2016, by the renowned biologist Antonieta Rojas. The author addresses gender biases in the construction of scientific knowledge and in technological design, including the language and methodologies used. She also underscores the importance of science and technology education with a gender perspective as a means to promote epistemic justice and to foster a more equitable and inclusive technoscience (González García, 2017, p. 17).

For her part, Zunilda Pereira Ayala, in her research "Determinants of Women's Dropout in Engineering Programs at UNA's Faculty of Engineering" (Pereira Ayala, 2013), explores the reasons behind women's dropout rates. She focuses on personal trajectories, analyzing motivations such as academic difficulties, conflicts with paid work, family responsibilities, discrimination and sexual harassment. Among the study's recommendations are measures such as the creation of daycare centers and academic support programs aimed at reducing dropout rates among women in engineering (Pereira Ayala, 2013).

Carmen Colazo18 and María Victoria Cano Colazo, in their article titled "Aproximação à análise da situação da mulher na ciência e tecnologia na Argentina e no Paraguai a partir de uma perspectiva feminista" (2021), examine the historical exclusion of women from the scientific and technological fields in both countries. Using both qualitative and quantitative methodologies, they argue that this exclusion is rooted in an androcentric epistemological tradition that relegates women to caregiving roles within the private sphere, thereby distancing them from access to scientific knowledge. The article underscores that, although women have made significant progress in terms of numerical representation, gender gaps persist in positions of power and scientific productivity. These disparities are attributed to stereotypes, gender bias and the need to reconcile professional with personal life (Colazo & Cano Colazo, 2021). The authors also point out that in Argentina, despite women outnumbering men within the National Council for Scientific and Technical Research (CONICET), they remain underrepresented at the highest hierarchical levels. In the case of Paraguay, the analysis highlights the structural limitations of the higher education system, which reflect the country's historical conditions, including its delayed university development and the absence of specific higher education regulations. While female enrollment has increased since 2000, structural and cultural challenges, such as patriarchal hegemony and the legacy of the dictatorship, continue to hinder gender equality in education and science.

4.2. ICTS

In the context of the COVID-19 pandemic, María Molinas et al. (2021) carried out the study "Technology and Women in a Pandemic Context: Digital Strategies for Violence Prevention, Economic Empowerment, and COVID-19 Spread Reduction". In it, they examine how the health crisis exacerbated both gender-based violence and the digital divide. The study proposes digital strategies to promote women's economic empowerment and prevent violence, highlighting the importance of a comprehensive response to inequalities in access to and use of technology.

The research is based on the premise that in emergency situations, such as the pandemic, gender-based violence, the overload of caregiving tasks, loss of income sources and the digital divide pose heightened risks for women in poor and vulnerable sectors. María Molinas et al. (2021) developed a digital training strategy using four selected tools to address the need to strengthen the capacities of women from these sectors. The study focused its actions on women participating in the state program Abrazo and developed a digital training strategy using four tools and various application formats, taking into account their safe use and health protocols within the pandemic context. This strategy was centered on women's economic empowerment and the prevention of gender-based violence. The research concludes with six recommendations aimed at defining a national strategy involving transmedia narratives and assessing the reach and limitations of different communication channels.

One of the most recent studies was conducted by María Victoria Heikel (2024) and is titled "Challenges Faced by Women to Enter the Technological Sector." In this work, she identifies the sociocultural barriers that Paraguayan women must overcome to access and participate in the Information and Communication Technology (ICT) sector, analyzing how gender stereotypes and unequal access limit their participation. The report argues that gender gaps in ICT access and use stem from existing inequalities between men and women, which are reinforced by cultural factors that assign gender-specific

18 GeoChicas is a feminist collective founded by a group of Mexican geographers. Associated with OpenStreetMap, they provide cartographic information to identify dangerous areas for women across Latin America. In 2016, a group of women attended the second Latin American State of the Map conference in São Paulo, Brazil, to discuss mapping. The goal was to explore the community-driven development of this digital tool. The event was organized by OpenStreetMap (OSM), a collaborative project that seeks global participation to expand the data and geographic information gathered on its platform. The OSM aimes to create an ongoing space for dialogue on the causes and consequences of women's underrepresentation in the creation of collaborative maps.

roles. It offers public policy recommendations aimed at expanding women's participation in the sector, emphasizing the importance of addressing not only the lack of access but also persistent gender stereotypes.To this end, the study includes a review of national and international statistical data on ICT access and use, an analysis of focus groups conducted with Paraguayan women and a survey analysis involving executive directors of private companies and public officials from the ICT sector.

4.3. PHILOSOPHY OF TECHNIQUE

In "Rafael Barrett, Ontologist of the Present: Meditations on Ecology, Plant Subjectivity and Social Technification," Raúl Acevedo (2023) reflects on the relationship between ecology, subjectivity, and social technification, drawing on the thought of Rafael Barrett and the Foucauldian notion of the ontology of the present, a critical stance towards mechanisms of power and social dynamics. Barrett addresses the tensions between nature and society, criticizing the exploitation of natural resources, as illustrated in his 1909 essay "What Yerbales are" He introduces the idea of a subjectivity shaped by plant life, underscoring the relationship between humans and nature. According to Acevedo (2023), this perspective anticipates contemporary debates on the social impact of technification, stressing the need for a critical view of machine power and its influence on human relationships.

4.4. DIGITAL RIGHTS, DIGITAL SECURITY AND GENDER-BASED VIOLENCE

The organization TEDIC (Technology, Education, Development, Research, and Communication) has made significant contributions to the analysis of the intersection between technology and human rights, with a particular focus on gender issues. Among its notable research outputs are: "Gender violence on the Internet in Paraguay" (2018), "Non-Consensual Image Dissemination in Paraguay" (2021), "Digital gender-based violence against journalists in Paraguay" (2023), "Technology-facilitated gender-based violence against women politicians in Paraguay" (2024), "Trafficking in persons and sexual exploitation in its intersection with ICTs in Paraguay" (2024), "From theory to practice – building and testing a framework for definitions of online gender-based violence and other terms" (2024) y "Perpetrators of gender-based violence online – Roadmap for investigations" (Carrillo, Bogado, et al., 2024).

The list of works also includes titles on topics such as data protection, digital security, technology and elections, technology and the environment, the digital economy, freedom of expression and privacy. In doing so, TEDIC has laid an important foundation for understanding and addressing these issues, providing both a shared framework of key definitions and empirical evidence for their analysis. Its work not only exposes these dynamics, but also promotes the development of knowledge, tools and strategies to strengthen a critical perspective on technology from a gendered, intersectional and rights-based approach.

From a critical perspective, Paraguayan research on technology and science demonstrates a significant effort to build knowledge through an interdisciplinary approach. A comparative analysis of these studies reveals that the most explored topics focus on the gender gap in science and technology-facilitated gender-based violence. However, areas such as the critical philosophy of technique and the development of theoretical frameworks that analyze the impact of technology from a local perspective have received less attention. This asymmetry underscores the need for a more comprehensive approach, one that not only documents and analyzes existing inequalities but also fosters deeper reflection on the nature of technology itself. Nonetheless, the persistent lack of state investment in science and technology remains a significant challenge, as it limits the country's ability to develop a robust scientific infrastructure capable of generating transformations in how technological developments are understood.

5. THE EXPLORATION KITCHEN: METHODOLOGICAL NOTES

This chapter outlines the main findings from the analysis of interviews with activists, academics and professionals involved in Paraguay's technology sector. The interviews included seven individuals working in one of the following areas: technological development, academic research or activism.

First, an informal survey was carried out to identify potential interviewees, helping define key profiles that would ensure a diversity of voices capable of enriching the analysis of the intersections between technology and feminisms in the Paraguayan context. Subsequently, a double-entry table was created, listing individuals and organizations whose work related to one of the aforementioned sectors.

In this exploratory phase, priority was given to including individuals from diverse fields related to technology, feminism and gender perspectives, in order to gather their views on technology and its interrelation with feminisms. This approach aimed to capture a range of perspectives and experiences regarding the development, use and appropriation of technologies from a feminist standpoint. Three main interviewee profiles were defined: academics, activists and professionals in the technological field. Their characteristics are described below.

5.1. INTERVIEWEE PROFILES

5.1.1. Academics

This group includes women and non-binary individuals linked to higher education institutions, research centers, and other knowledge production spaces. These researchers focus on the critical study of technologies from feminist perspectives, gender studies or the relationship between technology and society. However, due to the research needs and the limited academic training on this subject in Paraguay, the scope of the interviews was broadened to include regional researchers and men whose work relates more generally to science and technology.

Through this group, the aim is to access a theoretical and reflective understanding of how technologies generate certain effects and are, in turn, shaped by gender inequalities. The interviews also explore the construction of technological knowledge from intersectional perspectives, debates on cyberfeminism, unequal access to technology in Paraguay and the production of knowledge from the Global South.

5.1.2. Activists

This group includes women and non-binary individuals involved in feminist collectives or organizations that promote technology from a gender perspective. Their work includes advocating for digital rights, ensuring equal access to technological development, and denouncing gender-based violence online.

From a political and social standpoint, this group provides insight into the challenges and opportunities for integrating a feminist perspective into technology. Their experiences help to highlight how technologies can function both as tools of oppression and emancipation, strengthening feminist networks and promoting a more inclusive and equitable use of digital resources.

5.1.3. Technology professionals

This group consists of women and non-binary individuals working in fields such as software development, engineering, technology design, and information and communication technologies (ICTs). By including individuals who work within these sectors, the goal is to shed light on their reflections on technology and gender. Additionally, the section explores their technical and experiential perspectives on how technologies are designed, developed and used in their professional contexts.

Combining these three profiles enables a rich triangulation of data by integrating theoretical, political and technical approaches. In this way, the research not only maps current conceptions of technology and feminisms in Paraguay but also identifies points of convergence and tension among these sectors.

Once potential individuals from each sector were identified and contacted, interviews were scheduled and specific questionnaires were administered for each profile.

5.2. INTERVIEW QUESTIONNAIRES

The development of the interview questionnaires took place in several stages, ensuring their coherence with the research objectives and their ability to generate meaningful data. The process began with the previously defined research questions, linked to ideas about technology and feminisms, the existence or absence of cyberfeminism in Paraguay and the ways in which technologies contribute to autonomy or perpetuate inequalities. These thematic axes guided the initial selection and drafting of the questions.

Three specific versions of the questionnaire were developed, one for each identified profile (academics, activists and technology professionals). This allowed us to tailor the language and focus according to the context and experience of each group, ensuring the questions were relevant.

In an initial phase, open-ended questions were drafted, designed to encourage detailed and reflective responses. These questions sought to explore both personal experiences and conceptual understandings, such as: “How is the relationship between feminisms and technology perceived in your field of practice?”

The questionnaires were reviewed to identify potential biases in language or approach, ensuring that the questions were relevant and sensitive to the particularities of the Paraguayan context. The final versions incorporated adjustments made during the review, prioritizing open-ended questions that encouraged a natural, flowing conversation.

This design and review process ensured that the interviews served as effective tools for capturing participants’ conceptions and experiences, while respecting the diversity of their backgrounds and perspectives.

The analysis conducted allowed us to address questions about the social and political manifestations associated with cyberfeminism, as well as assess whether these indicate a consolidated or emerging movement. Furthermore, it examined how technologies are currently conceived and constructed, providing deeper insights into the role the Global South plays in the pursuit of technological autonomy and emancipation.

In summary, the findings of this research made it possible to identify the predominant conceptions and emerging practices around technological development from a feminist perspective, as well as the possibilities it offers for social and political transformation in Paraguay.

6. CARTOGRAPHY OF VOICES: VISIONS ON TECHNOLOGIES AND FEMINISMS IN PARAGUAY

Feminist theories have examined the role of technology both as an extension of patriarchal power structures and as a potential space for resistance and transformation. In this section, we bring together the ideas currently circulating around the intersection of technologies and feminisms in Paraguay, based on an inquiry that considers three profiles: academics, activists and professionals from the technology sector.

In this way, we connect the perspectives and approaches of the interviewees from each of these fields with the theoretical contributions of authors from both the Global North and South, which were briefly revisited at the beginning of this document. To carry out this analysis, we used the analytical categories developed for the interviews.

6.1. FEMINISMS AND DIGITAL SPACES. CYBERFEMINISM / CYBORG FEMINISM

Mirtha Rodríguez is a communicator by profession. In 2001, she joined the Documentation and Studies Center (CDE), a prominent feminist think tank in Paraguay. Separated from her partner, with four children and unable to write her thesis at the time, she began forging her path from the "fabulous library" of the CDE, as she aptly describes it. Twenty years later, she decided to return to her studies and started a computer science program. Although she was unable to continue due to the challenges of balancing paid work with unpaid household and caregiving duties, this experience allowed her to "reconcile with mathematics" and led to an invitation to join the Paraguayan Society of Artificial Intelligence. She describes it as a diverse and heterogeneous network of friends and professionals, ranging from computer scientists to philosophers, though it is not explicitly a feminist organization. Nevertheless, she emphasizes that several women from different disciplines are members, some even serving on the board: "[...] The positive aspect is that those of us who are part of it, including the men, of course, have a strong gender awareness. It's not a foreign topic to them."

Within the framework of this research, one of the main goals was to identify how familiar the interviewees were with the concept of cyberfeminism or being a cyberfeminist. More specifically, the aim was to determine whether the theoretical debates associated with this current had significantly permeated each of the sectors studied, and to what extent they had been incorporated into the practices of activists, professionals and academics.

"I know that cyberfeminism exists, and I know there are also different currents. I once read a critique of cyberfeminism because, well, feminism in general goes through what any political movement goes through. We know there isn't just one feminism but many feminisms. There's a feminism that's more liberal, and there's a feminism that's more left-wing feminism that offers a sharper critique of the economic system that generates much of the violence we suffer, which is the capitalist system, an exploitative system that generates not only gender violence but also violence and oppression against the entire working class. I suppose there must be a cyborg feminism that's more anarchist, anti-system, and another form of feminism that seeks equality between men and women but without questioning the system at its roots." (Interview with Marta Rodríguez, SOPAIA, 2024)

She acknowledges the existence of different currents, such as cyberfeminism, which seeks to expose gender oppression as it manifests through technology, and cyborg feminism, which addresses the intersection of feminism and technology, exploring how identities are shaped by it. Regarding feminisms and digital spaces, she believes the latter play a crucial role in feminist activism, allowing relevant issues to gain visibility, facilitating networking and providing access to information. She highlights the importance of using digital platforms for campaigns and collective actions, although she notes that these experiences have been marked by learning curves and obstacles, such as self-censorship in response to online gender-based violence.

In the case of activist Maricarmen Sequera, co-founder and executive director of TEDIC19, there is a clear distancing from the techno-optimist vision that characterized early cyberfeminists. These pioneers argued that emerging technologies would enable liberation from the limitations imposed by gendered bodies, an outlook that, from a critical perspective, is considered reductionist. Sequera contends that such terms, imbued with a technocentric connotation, need to be revisited and contextualized to better reflect local realities, an argument that resonates with contemporary studies in the sociology of technology and cultural criticism. Among professionals and activist-professionals, some say they have never heard of cyborg feminism or cyberfeminist theory in general, as their approach tends to be more practice-oriented. Even so, there are those who have expressed interest in learning more about the subject, suggesting the value of creating spaces for exchange between academics and professionals.

Researcher Eduardo Carrillo, a member of the TEDIC team, emphasizes that while there are theoretical foundations for cyberfeminism and cyborg feminism, from his perspective he sees these concepts first and foremost as a call to action to reflect on the intersection between feminism and technology.

For her part, Angela Olmedo, activist and director of Civilab20, selected as one of the activist interviewees, notes that digital spaces help bring visibility to issues that are not addressed elsewhere. They also facilitate the creation of support and collaboration networks among women and feminist organizations. Finally, they provide access to information and resources that can be very useful for women seeking knowledge about their rights or about gender-based violence. Regarding cyberfeminism and cyborg feminism, she stated that, from what she can tell, both concepts are based on the idea that feminism must integrate technology and the digital sphere as tools for social change.

María Goñi, an academic and researcher at the Universidad de la República (Uruguay), specializing in science, technology and society from a gender and feminist perspective, stated in the interview that she does not confine herself to the cyberfeminist category. Rather, she advocates for a flexible approach that encompasses the diversity of feminist identities within the technological realm. Goñi's stance aligns with the theories of authors such as Donna Haraway (1995) and Sadie Plant (1997), who have critically examined how digital technologies interact with bodies and identities. In her *Cyborg Manifesto*, Haraway specifically calls for the rethinking of fixed categories and the promotion of inclusive perspectives in technological analysis.

19 GenderIT is an international project of the Association for Progressive Communications. It serves as a space for analysis and reflection for activists, academics, journalists and defenders of women's rights, sexual rights and digital rights. One of its main activities is mapping the intersections of these three rights, with a particular focus on conditions in countries of the Global South (GenderIT, 2024).

20 The Ibero-American Network of Science, Technology and Gender (RICTYG) focuses on the critical analysis of science, technology and innovation systems from a gender perspective. Its aim is to improve the governance and quality of these systems.

6.2. FEMINIST MOVEMENTS AND THEIR RELATIONSHIP WITH TECHNOLOGY. LOCAL EXPERIENCES

Anonymous has worked as a software developer since 2013 for the same private company based in the United States, where she has been a third-party contractor from the start. She describes her team as multicultural: "I have colleagues from India, Pakistan, the United States, and Canada." To this day, she is the only female developer on her team.

Her interest in technology dates back to her high school years, where she attended a technical accounting program but felt it didn't challenge her much: "Everything seemed too mechanical; I was looking for something complex and challenging". She vividly remembers that in 2007, computer science was said to be the career of the future, but she didn't know what it was about until a computer science teacher specializing in programming encouraged her to pursue it.

Anonymous is a member of the Kuña++ and Programando Paraguay collectives, both based in Encarnación, Itapúa, as well as Google's Women Techmakers21 initiative. She believes that gender-focused and feminist organizations in Paraguay and throughout Latin America must make women in the technology sector visible and work to demystify roles, showing that these jobs are suitable for both men and women.

> "I believe that the more women we have in the sector, the more we will grow as a country. So it acts as an agent of change, both economically and socially. The more women are involved in creating products, the more there will be a female perspective too. Because if we leave all the responsibility to the other gender, they will always focus on their own needs, and ours will not be sufficiently represented. Organizations focused on fighting gender gaps play a very important, essential role in our development as a country in all aspects." (Interview with Anonymous, Kuña++, 2024).

Carolina Urquhart, a software developer with over 20 years of industry experience and currently working as a Senior Software Engineer at a multinational company, agrees that the underrepresentation of women in the sector is a growing issue. Although she does not actively participate in women's organizations, her professional experience allows her to recognize this gap. In this context, she recalls being the only woman among more than 100 attendees at the CONTEK 2003 technology event. The event was held in a shopping mall in Asunción, where participants had the opportunity to compete in network games and learn about programming (ABC Color, 2003).

She feels that the ideas and demands of feminist movements are not unfamiliar to her. However, she views herself as less disruptive in practical and political terms, attributing a more confrontational stance to feminist praxis. To illustrate her point, she stated:

> "My feminist examples in technology, the ones that have impacted me the most. are far removed from street activism, but they do have a practical side, like Ada Lovelace or the women engineers at IBM in the 1980s. Or Amelia Earhart, who said, 'I'm going to fly the plane.' That has an explosive, totally life-changing impact, just seeing someone do something so remarkable. Lovelace, Marie Curie, and all the women who,from a practical standpoint, had an impact not only on women's lives but on men's lives too. That is how we see equality reflected in practice

21 Currently, in various countries around the world (including Paraguay), it has become possible for both women in a lesbian couple to participate in a pregnancy: one provides the eggs, which are fertilized with sperm from an anonymous donor, while the other receives the embryos, carries the pregnancy and gives birth. This Assisted Reproductive Technology (ART) is known as in vitro fertilization (IVF) with reception of oocytes from the partner (ROPA), or co-IVF (Saus-Ortega, 2018).

> and how we can inspire women, showing them what we are capable of achieving." (Interview with Carolina Urquhart, 2024).

Without falling into skepticism towards feminist or women's organizations, she understands that role models are very important. In this sense, there is a stronger emphasis on recognizing certain figures or success stories that can inspire other women. The women interviewed, especially professionals and those active in women-in-tech organizations, feel compelled by what they experience firsthand: "The organizations we work in do not have anything theoretically studied and applied. It is mostly based on the reality we live, because we experience inequality and discrimination firsthand; it is quite empirical." (Interview with Carolina Urquhart, 2024).

Before joining Kuña Tech, Sonia Cardozo was part of the Paraguayan collective Girls Code for about two years, from around 2016 to 2018, where she worked as a coordinator and organized programming workshops for girls. Like other professional-activists, her interest in telecommunications and her critical perspective emerged from her experience as a woman in a field that, as she puts it, we were persistently taught was not meant for us. She observes that the gender perspective and feminism in Paraguay are not as integrated into discussions about technology as they are in countries like the United Kingdom. In Latin America, there is talk of the need to advance inclusion, but many barriers remain, such as a lack of institutional support and a lack of support for diversity. If it is already difficult to find role models in this field to inspire women to take an interest in technology in general, it is even more challenging in areas outside the country's capital, notes another interviewee, Katya Vázquez, a professional programmer.

> "In my community, there aren't many events because it's 'the interior of the country.' There aren't many investments here, and unfortunately the public sector doesn't help much either. So I never felt motivated; I was very frustrated and at a point in my life where I practically didn't know what to do. But then the Programando Paraguay initiative arrived, and I started meeting women who were in the field and succeeding, that's when I began to feel motivated." (Interview with Katya Vázquez, Mujeres Programando, 2024).

She adds that in Encarnación, Paraguay, the women-in-tech community is primarily made up of engineers, and she felt that her two years of experience, which she considered limited, did not qualify her to join those spaces due to the requirements demanded for participation. Katya did not finish her university studies because neither she nor her family could afford the costs, and in Encarnación there "haven't been technology companies, just one, and it's specifically for people with a higher education background, with an engineering degree, etc." The Mujeres Programando initiative emerged precisely from this reality, which she describes as "a community of girls who are still in training." All its members are young women, both students and professionals. Ninety percent are programmers, that is, computer engineering students or participants in the same program Katya herself attended. The goal they set for themselves is to provide support and "motivate girls to stay on this path and not face the same obstacles I faced when I left school and thought, I have nothing, I won't continue with computer science because I don't know, I don't feel motivated, I went through bad experiences with sexism, etc.'" (Interview with Katya Vázquez, Mujeres Programando, 2024). That is how they began working on offering talks and workshops.

For this reason, Mirtha Rodríguez emphasizes the need for feminist agendas related to technology in Paraguay , and in Latin America and the Caribbean more broadly, to prioritize gender awareness in the technological sphere. While not disregarding more established regional debates on equitable access to technology or the inclusion of women's voices in technology-related decision-making, she argues that in a world where technologies pervasively shape all aspects of social, economic and cultural life, dialogue between feminist movements and collectives of technology professionals is indispensable. Feminist perspectives provide critical tools for identifying and questioning the biases and discrimination

embedded in algorithms, interfaces and digital systems, while technology professionals possess the technical knowledge needed to redesign these systems from an inclusive standpoint. This exchange not only enables the creation of fairer technologies but also strengthens the capacity of feminist movements to harness the transformative potential of digital tools, opening new horizons for gender equity and social justice in an increasingly interconnected world.

While Maricarmen Sequera agrees with the above points, she offers a counterpoint, arguing that surveillance and data commercialization on digital platforms limit the authenticity of feminist activism and its relationship with the public. Therefore, feminist campaigns must aim to have a real impact that transcends digital spaces (Interview with Maricarmen Sequera, 2024).

To conclude, Angela Olmedo, drawing on her experience, emphasizes that several issues must be addressed by feminist movements in their relationship with technology in the local context: 1) Education on rights, digital literacy and the responsible use of technology; 2) Raising awareness of gender-based violence in cyberspace; 3) Ensuring equal opportunities for women to access and use technology; 4) Designing technology from a gender perspective, with special attention to women's needs; and 5) Intersectoral collaboration among civil society, universities, businesses and the State to promote equal rights (Interview with Ángela Olmeda, 2024).

6.3. INTERSECTIONALITY IN CYBERACTIVISM: WOMEN AND GENDER-DIVERSE PEOPLE IN PARAGUAY

In the interviews conducted, the question of intersectionality was included because this approach helps us understand how an individual's position impacts the opportunities and challenges women face in their relationship with technology.

6.3.1. Machismo culture and gender gaps

According to Anonymous, Paraguay's deeply rooted machismo culture hinders the full development of women in the technology sector. While much is said about the transformative potential of technology, the absence of adequate public policies, combined with companies' tendency to favor men and overlook the additional burdens women face, such as caregiving responsibilities, perpetuates and worsens gender gaps in the workplace (Interview with Anonymous, 2024).

> "Companies still do not implement policies that guarantee women can work and grow in the tech sector, ignoring essential factors like the need to balance work life and motherhood. Although there is talk about closing the gender gap, men are still preferred in hiring, despite women being equally qualified. Saying that you plan to have children is like marking yourself for rejection." (Interview with Anonymous, 2024).

Eduardo Carrillo, for his part, also agrees that machismo culture continues to exclude women as technology professionals, as he points out:

> "Women do not feel called to pursue these careers, either because of the toxic, very masculine environment or due to discrimination. When they decide to have children, caregiving responsibilities fall on them, complicating their careers in technology. Truly, technology fields remain predominantly masculine." (Interview with Eduardo Carrillo, 2024).

This relates to the existing need for institutional frameworks and public policies that not only promote technological inclusion but also thoroughly address the patriarchal dynamics limiting women's access to and participation in the workplace.

6.3.2. Diversity and women's experiences

The contributions of Angela Olmedo and Mirtha Rodríguez highlight that women's experiences in the digital sphere are not homogeneous. Factors such as race, social class and sexual orientation shape how women interact with technology. For example, in relation to access to information and their rights, Olmedo recounts an experience:

> "We were giving a talk with a group of friends at the República de Uruguay school, which offers adults over 18 the opportunity to complete secondary school in two years.There were about 80 people, ranging in age from 19 to 70. They asked all kinds of questions because they had already lived through so many situations […] So it was much more experiential. One young woman came up to me and told me she was experiencing physical violence from the father of her three daughters. She couldn't believe everything she was learning just from the ten articles of the Constitution I shared with them. She asked me, 'Where can I find out more?' I told her to message me on WhatsApp, and I sent her the Comprehensive Protection Law for Women as well as information about Ciudad Mujer." (Interview with Angela Olmedo, 2024).

For her part, Rodríguez expresses her concern about the development of artificial intelligence and the reproduction of gaps and biases:

> "Artificial intelligence indeed reproduces biases, and we know that, from a South American, Paraguayan perspective, we must take into account that all cutting-edge knowledge is concentrated in the North. Not only is it in the North, it's in English. So right there we already see a gap. Secondly, it's in the hands of corporations and powerful people, and we know that these corporations and powerful people reproduce a system dominated by the white, bourgeois, privileged man who is conservative, who denies climate change because it benefits him to do so. And this social and cultural logic is inevitably reproduced in AI too, because its training is in their hands." (Interview with Mirtha Rodríguez, 2024).

A feminist approach, especially in the digital sphere, can promote greater inclusion and take into account the diverse realities that women experience. However, as Rodríguez also points out, other factors, such as the economic costs involved, should be considered. The interviewees highlighted the prevalence of a machismo culture intertwined with gender gaps, illustrating the complexity of women's experiences in this context. They also emphasized the emergence of communities and organizations based on transformative ideas and principles rooted in cyberfeminism.

6.4. EMERGING COMMUNITIES, ORGANIZATIONS AND CYBERFEMINIST ACTIVISM

Carrillo points out the existence of an emerging community in Paraguay dedicated to exploring the relationship between technology and gender. Although there are not yet many groups focused specifically on cyberfeminist discussions at the local level, he highlights that an emerging community is trying to understand the intersections between technology and gender in Latin America.

In this way, although the cyberfeminist discussion is still emerging in Paraguay, this community can play a key role in activism by providing a space for the exchange of ideas and the development of strategies that address not only the inclusion of more women in different spaces but also the transformation of technology itself. In this regard, Carrillo explains that:

> "As technology has already truly permeated all aspects of human life, the various organizations that serve different communities are beginning to address this issue. And there, perhaps, they can directly take on a feminist perspective through a more critical analysis of technology. So, I'd say it might be somewhat emergent, but not yet solid; it's still very timid." (Interview with Eduardo Carrillo, 2024)

María Goñi agrees with this statement, noting that Latin America has great potential due to the presence of social organizations that are actively advocating, participating and shaping what feminism means within the field of technology. She also points out the need to recognize that the technological context has changed significantly since 2000; today, we need to talk about data science and artificial intelligence. (Interview with María Goñi, 2024)

The emergence of these groups demonstrates a growing interest in understanding how technologies can be used not only as tools for empowerment but also as means to challenge and transform existing power structures. In this regard, Sonia Cardozo, an electronics engineer who works on communication network systems for private companies and is also an activist with Kuña Tech (and formerly with Girls Code), highlights the importance of integrating gender studies transversally into the actions of these organizations.

> I think that organizations like ours should bring in someone—because I don't know—I should bring in someone who's involved in gender studies and so on, and who also has different emphases, to talk about these things. Because now it really has to be an intersection of subjects, an intersection of knowledge. It's no longer just as technical as what I do. My work is connecting the Internet point to point, the lights come on, it works fine. But this goes much further, because it affects our daily lives and with who we are and what it means to be human. So I think at that point it's no longer just about technology, but about millions of other things. And maybe instead of focusing only on the technology, we should start bringing in other people who can contribute other perspectives on it." (Interview with Sonia Cardozo, 2024).

6.4.1. The context of inequality in Paraguay: Limits for activism

Activism around technology in Paraguay faces the challenge of a context marked by social and gender inequality. Taking an intersectional approach that considers the complexities of identity and diverse experiences can help this activism have a greater impact. This involves not only creating public policies and driving progress in the private sector, but also developing movements that amplify the voices of women and gender-diverse individuals who, because of their multiple identities, may face disadvantages in accessing and participating in the technological sphere.

Regarding this context of inequality in Paraguay, Camilo Caballero, a researcher specializing in the social studies of science and technology with research projects focused on the perception of science, culture and science policy, points out that the situation of science and technology in Paraguay is at a disadvantage, much like other areas such as health, education, and human rights:

> "We face similar barriers, structural barriers, barriers stemming from a lack of opportunity. Of course, there are several isolated initiatives with strong momentum and some very significant, specific advances. But overall, the situation is still deeply unequal. At the national level, we have top-tier science and technology in certain areas, in particular niches, while other sectors are entirely excluded and likely won't have any chance to integrate into broader scientific and technological development. In Paraguay, much like with other issues, we have major inequalities, serious shortcomings, very interesting and promising niches, and rapid, sometimes abrupt shifts: progress and setbacks, going from having a lot… to having nothing. People get excited and involved, and then step away again. It's a dynamic marked by instability." (Interview with Camilo Caballero, 2024).

For Caballero, a broad understanding of a country's scientific and technological development involves not only publishing academic papers but also fostering a scientifically literate citizenry. Today, this is an essential condition for a more equitable integration into the knowledge economy.

Regarding this aspect, María Victoria Heikel, a feminist researcher with extensive experience in gender studies and public policy in Paraguay, reflects on how Paraguay compares to other countries. She also raises additional questions, such as:

> "What are the chances of acting at the same level as is done internationally on these issues? When it comes to spreading feminist perspectives through social media, how many people can actually engage in that practice? In Paraguay, how many people know how to use the tools to put feminist ideas out there in cyberspace? Entering that space isn't always easy, and not just because of cultural stereotypes, but also due to the country's inadequate infrastructure. We lack the material conditions to develop that field and that's a major limitation. It's not so much about women's interest, but rather the structural constraints we're navigating." (Interview with María Victoria Heikel, 2024).

6.5. DIGITAL SPACE AND VIOLENCE[S]

Online violence, understood as an extension of historical structures of patriarchal and discriminatory violence, affects certain bodies with greater severity. Gender, ethnic, and class dimensions often operate as mitigating or aggravating factors of such violence in digital spaces. Anonymous shared a situation that arose on social media to illustrate this point:

> "The other day, the Polytechnic Faculty—I studied at the Polytechnic—posted something on Instagram, about 'no to racism,' 'no to racism!' It was just a flyer, and people went crazy and I got even crazier reading the comments. People were saying, 'Why are you mixing education with this?' That's when I realized people don't want institutions to take an anti-racist stance or one about diversity or whatever. I think what helps is that we keep being in these spaces, keep posting, keep doing things and keep sharing on the internet. So, yes, you'll find hate messages, but you'll also find people who say, 'We still believe in this,' even if we receive messages that disagree with us. And I think that's the most important thing, to keep being there and keep showing that there are people who think like you and believe in the same things." (Interview with Anonymous, 2024)

On the other hand, Sonia Cardozo, a member of the Kuña Tech organization, brought up something that few people tend to acknowledge: racial violence. Cardozo emphasized the importance of including this type of violence in discussions about gender-based violence experienced from teachers and supervisors, as well as hate messages directed at the organization for promoting messages of equality among all people. Online hate messages served as the entry point for discussing violence on the Internet:

> "It's really terrible to accept that there are always violent comments. While they no longer affect me personally, I know very well that this discourages many women from participating in these kinds of activities or joining these spaces. That's why I don't dismiss, much less normalize, hate messages." (Interview with Sonia Cardozo, 2024).

From her organization, she reflects on several of these issues, which she describes as just a few of the many obstacles women face in the telecommunications sector. After working as staff, she became a coordinator until 2022, when she left to pursue a master's degree. Her professional background is in telecommunications:

> ""First, I started at Vox, the telephony branch of the state company Copaco. Then I moved to Copaco itself, joining through a public competition. I worked in the optical network planning area, focusing on long-distance networks. Before moving to the United Kingdom, I switched companies to Ceragon22, which is similar to Huawei, Nokia, Ericsson, but Israeli. My main work is for Claro Argentina, they are our biggest clients, and I design their optical networks, also known as fiber to the home. Among other things, that's what I do." (Interview with Sonia Cardozo, 2024)

Online violence is, precisely, a historical continuation of patriarchal violence, which digital platforms have not always been able to address adequately, according to Maricarmen Sequera. In this sense, Angela Olmedo and Mirtha Rodríguez both agree that online gender-based violence affects women's participation in that sphere, limiting their access to information, their ability to express themselves freely and their personal safety. Rodríguez adds that it leads to self-censorship, restricting the expression of opinions, as Cardozo confirms in her account: "We realize that, sometimes, to avoid that violence,

22 See examples of STEM initiatives for girls (Villavicencio et al., 2022).

because we don't want to get caught up in some kind of spiral of violence, we just self-censor. I mean, we're already self-censoring, because we know that violence is there." (Interview with Mirtha Rodríguez, 2024).

Olmedo, therefore, insists on the urgent need to establish measures to combat online gender-based violence. These include raising awareness about its various forms, creating tools and platforms for reporting it and developing strategies for its prevention. Meanwhile, for Cardozo, the key to addressing these forms of violence is to occupy digital spaces just as the streets are occupied:

> "Let's keep posting, let's keep doing stuff, and let's keep sharing what we think online. Sure, you'll come across hate speech, but you'll also find people who share our values. I think that's what matters most: to keep being present and keep making visible that there are others who think like us and believe in the same things." (Interview with Sonia Cardozo, 2024).

Through the testimonies of professionals like Sonia Cardozo and the reflections of academics and experts, it becomes evident that the presence of hate messages and the resulting self-censorship create a scenario that limits the full and safe participation of women in the online public sphere. This phenomenon, corroborated by studies that have documented the negative impacts of online violence on freedom of expression and the rights of women and gender-diverse people, calls for a critical perspective and the development of institutional and community strategies to counter such practices.

Despite this, the narratives and analyses presented reaffirm that, although hate speech persists in digital spaces, women's resistance and determination to remain visible and active constitute an act of vindication. This not only challenges the unacceptable normalization of online violence but also highlights the need to develop coordinated responses that include awareness-raising, reporting mechanisms and protection measures. Counteracting digital violence is a collective and multidimensional effort in which the consolidation of safe and equitable online spaces is essential, yet still insufficient to transform the culture of exclusion and hostility that has historically marginalized certain groups. This issue warrants particular attention, as it unfolds in an increasingly conservative and reactionary global political context. Shifts in geopolitics and international relations have triggered profound changes in the language and narratives circulating online, as is especially evident on the social media platform X. In this case, algorithms have ceased to reflect users' organic interests and have instead shifted towards a model in which topics and discussions align with the exclusionary and aggressive vision of its owner, Elon Musk. Through specific algorithmic modifications, Musk has gained control over the content users are constantly exposed to, promoting a narrative that reinforces his ideological perspective and restricts informational pluralism. This phenomenon clearly illustrates how technological developments, in this case, the algorithms that govern social media, are being used to consolidate authoritarian and exclusionary power structures, transforming not only how information is consumed but also the very framework of public discourse.

6.6. TECHNOLOGY DEVELOPMENT AND DESIGN

The analysis of technology development and design, as well as the use of artificial intelligence and algorithms, reveals the multiple intersections between gender, culture and technology in Paraguay. This analysis identifies the challenges and limitations faced by women and gender-diverse people in these fields, as well as the proposals to move towards a more inclusive and equitable approach.

6.6.1. Underrepresentation of women

Maricarmen Sequera emphasizes that women are underrepresented in technological development due to cultural and structural barriers. This point underscores the need to implement a multidisciplinary and feminist perspective in the governance of technological projects.

> "For us women, from the moment we grow up in our families and in our society, technology—accessing it or even just touching it—is automatically seen as a male domain, at least for our generations. Maybe among the youngest today this gap is smaller, but generally, for women, connecting with technology is still seen as something exclusively for men. So even as adults, we might see a 16-year-old boy and ask him to help us hook up the TV, which is very different from asking a woman. And that's unconscious, right? It just happens, it's very normalized in our culture. For example, if something goes wrong with our phone, we automatically ask a man, never a woman, even if she works in tech. And that's why the gap is still huge." (Interview with Maricarmen Sequera, 2024).

Anonymous highlights the lack of participation of women in the technology sector, especially in development, as the main challenge. She attributes this issue to a lack of interest, fear, or even the prevailing machista culture:

> "To this day, I'm the only female developer on the team. I had female managers, female testers, who are in charge of quality, but there were no women in development. The same thing happens at university. When I started my degree, there were about four of us women, but throughout the program, it was precisely the women who dropped out. I finished my degree with one other female classmate; the rest were men. Now, as a teacher, I still notice the same trend, even though there have been some improvements." (Interview with Anonymous, 2024).

Carolina Urquhart, a developer, shares this perspective on the increasing inclusion of women in technology fields:

> "Together with Carla Casanello, I gave a very technical talk on technology for Women's Tech Makers at the Universidad Autónoma. Most of the audience was male. That was in 2013, more than ten years ago. Recently, I gave another talk for students who had completed a fairly technical course, and most of them were women. It wasn't an absolute majority, but definitely just over half. So I believe that's going to keep changing." (Interview with Carolina Urquhart, 2024).

The interviewees agreed that women's experiences and perspectives are not sufficiently represented in the development of new technologies. Based on this, they proposed several key considerations for inclusive design:

- Develop specific proposals to ensure technologies are designed from a gender perspective.
- Create incentives for including women in technology development teams.
- Conduct comparative analyses of outcomes between all-male teams and diverse, multidisciplinary teams, and their impact on technology development.

6.7. POLICIES AND TRAINING

According to Eduardo Carrillo, the development and design of technologies are primarily tied to appropriate policies that promote, support and facilitate job placement across various technical and technological fields. He also highlights the importance of interdisciplinary work, noting that technology is not produced solely by technical disciplines. Another key point is identifying which types of technologies are emerging from the region and, based on that, building strategic connections from Paraguay. Mirtha Rodríguez, in turn, points out that for technology to be designed from a gender perspective, actions must be implemented to promote the inclusion of women at every stage of technological development, encouraging both training and gender awareness.

Regarding policies and training, Camilo Caballero states that "the next form of illiteracy will be not understanding programming, not understanding computer logic, artificial intelligence, how algorithms work, how they're programmed" (Interview with Camilo Caballero, 2024). He warns that lacking this knowledge will be like navigating the world today without knowing how to read or never having solved an equation. If we want to meaningfully engage with artificial intelligence, it is essential to understand how that AI is constructing its responses. We need basic knowledge of how a processor and memory work, how data is stored, how algorithms function. A better understanding of these elements will lead to more critical use.

6.8. BIASES IN ARTIFICIAL INTELLIGENCE AND ITS ALGORITHMS

Maricarmen Sequera points out that artificial intelligence (AI) can amplify digital violence by automating biases. For this reason, it becomes necessary to develop tools guided by an inclusive vision. Sequera highlights that AI is shaped by specific cultural contexts, which causes it to reproduce and magnify stereotypes. This creates risks when AI is applied without adaptation to local contexts. Added to this is the issue she describes as the "black box" problem: the impossibility of knowing how algorithms are programmed, since their design is not public, yet they are used in our everyday life.

> "To me, artificial intelligence is like any other technology. It's a space, a technology that will reproduce the same issues, and on a larger scale, because it's a black box that, once created, becomes automated. We're not yet dealing with robots or anything that is going to kill us. The real problem is the excessive trust in technology, which is obviously created by humans, specifically, most often by men who are white, English-speaking, and located in just one geographic part of the world. That means these solutions—especially in this case, more complex

because we're talking about black-box systems—are very difficult to interpret when an error happens. And that, for me, is what's dangerous. The threat isn't some robot coming for us; the real danger of artificial intelligence is not knowing where the error is happening, because it's such a subtle area, very hard to audit. And on top of that, audits can only be carried out by elite groups of people who are specialized enough to interpret them." (Interview with Maricarmen Sequera, TEDIC, 2024)

According to Mirtha Rodríguez, artificial intelligence can perpetuate gender stereotypes and other biases, as it tends to reproduce the prejudices of the cultures that create it. There is concern about how women are underrepresented in the production of content for AI and how this affects access to knowledge. This makes it necessary to develop AI from a gender perspective and promote tools that include alternative narratives:

"And from a feminist perspective, imagine all of this: if we women still haven't fully written our history in books or texts—all that rich history—then the same will be reproduced in artificial intelligence. If we need feminist AI, we need more women and more organizations collecting data, feminist AI that can tell us, for example, about last century's women's struggles, which is an incredibly rich history. It's hard for us in Paraguay to do this alone. We need AI, I don't know, with data from historians or others, to teach us about gender identities, philosophy, and the social constructions around these topics. Feminist epistemology is something very rarely discussed. Generally, all university programs teach epistemology because, logically, knowledge construction must be taught. But I don't know anyone who teaches feminist epistemology. That is, what knowledge production do we women have as cognitive subjects? How do we construct knowledge? From what position do we do science? So just imagine all that we have. I believe AI opens a sea of opportunities for us, but also a series of risks related to these issues." (Interview with Mirtha Rodríguez, SOPAIA, 2024)

Regarding algorithms, María Victoria Heikel expresses concern about the lack of automated, accessible and open information, which can be used to manipulate people, as well as about the low participation of women, given that algorithms tend to reproduce gender stereotypes.

"For example, facial recognition algorithms are built using data from young white men. In this context, it's possible to imagine that a Maká woman23 living in Chaco who wants to travel to another country might face difficulties being recognized by a facial recognition machine, since the algorithm may not adequately account for her profile.24 The issue is how algorithms are built. How is technology constructed in healthcare, in security, in systems or in artistic production? And how much participation do women have in that construction? (sic) Women have very little participation, because algorithms are built on stereotypes, and within stereotypes, there are gender gaps. It's necessary to call out how algorithms are constructed and what stereotypes lie behind them. In everything related to technology, there are stereotypes, and that's a struggle that's far from over. And those stereotypes will always contaminate what you create with technology." (Interview with María Victoria Heikel, 2024)

23 This summary is based on: (Bosch, 2013b); we also adopted the acronym format (FTT) she uses for Feminist Theories of Technology.

24 External physical components of computer systems

However, she also recognizes the potential that comes with understanding how algorithms work, for example, in the field of health. In this area, it is worth mentioning a young researcher in Paraguay, at the Faculty of Exact and Natural Sciences (FACEN) of the National University of Asunción, who is working on a thesis involving algorithms to identify a specific lung disease. The gender gap is also intertwined with infrastructure and access to technology, but additionally with knowledge of human rights, women's rights and TLGBIQ+ people's rights, as Sonia Cardozo highlights:

> "In Paraguay, there's a significant digital divide and the lack of internet access limits our ability to even talk about artificial intelligence and the metaverse. For example, when I worked at Copaco25, I saw the reality: we don't even have internet just 30 km from here and yet we're already trying to talk about AI, the metaverse, and so on. I mean, it's like in Paraguay we're taking steps that are too big without having the foundations in place—because all of this needs to go hand in hand with what we've been discussing: feminism, human rights, LGBTIQ+ rights (sic). It's all so broad, and I feel like we're only focusing on the technology itself and wanting to take those steps without taking into account everything that should be considered in order to develop these very sensitive spaces. After all, artificial intelligence is something we teach to a machine, and if we ignore millions of factors, we'll end up building something that simply replicates what we already have in real life: machismo, violence and millions of other things. So, I think in Paraguay we're not really preparing ourselves—or maybe we are, technologically; intellectually, we have capable people—but sometimes those people in these spaces lack awareness of other perspectives." (Interview with Sonia Cardozo, 2024).

6.9. THE STATE AND POLICIES ON SCIENCE AND TECHNOLOGY IN PARAGUAY: PERSPECTIVES AND SCOPE

The analysis of policies and social transformation in Paraguay in the context of science and technology is related to the lack of inclusive public policies, the need for regulation in the use of technology and the promotion of equal access to it from a gender perspective.

6.9.1. Lack of inclusive policies and new perspectives

Maricarmen Sequera highlights that the "lack of inclusive policies and personal data protection regulations" is a significant challenge in Paraguay (Interview with Maricarmen Sequera, 2024). Despite advancements in other Latin American countries, Paraguayan regulations do not adequately consider a feminist perspective to protect women's rights. This suggests a critical legislative void that could allow the perpetuation of inequalities and rights violations in the digital sphere (Tedic, 2024).

As an example of other countries with inclusive policies, Carrillo mentions Costa Rica and its recent cybersecurity plan with a gender perspective:

> "I know that Costa Rica has a national cybersecurity plan with a gender perspective, which was just published last year, becoming the first to do so. It will surely generate a series of lessons for the rest of the countries in the region on how to implement this type of policy with a gender

25 Non-physical components of computer systems.

perspective, which will subsequently allow it to be replicated in different parts of the world" (Interview with Eduardo Carrillo, 2024).

In addition to inclusion, policies and laws should also protect and regulate personal data. Regarding this issue, Anonymous points out that it is fundamental to develop "laws that regulate data privacy and the use of technology," following examples from countries with stronger regulation, such as the United States. This involves creating a regulatory framework that not only complies with international standards but also integrates local needs with a gender perspective, so that policies benefit all sectors of the population.

6.9.2. Role of the state, equal access and disaggregated data

The State plays a fundamental role in ensuring equal access to technology, which is essential for building a more just and inclusive society, especially since the State bears the responsibility of guaranteeing this access. Access to disaggregated data is also essential for designing effective policies. Additionally, the implementation of digital inclusion and literacy policies, investment in infrastructure, and learning from successful experiences are closely interrelated and form key pillars of sound public policy.

For Maricarmen Sequera, the challenge in Paraguay regarding the State and public policies lies in the absence of inclusive policies and data protection regulations. While some Latin American countries have made progress in this area, many existing regulations still fail to incorporate a feminist perspective that addresses women's needs and safeguards their rights.

Meanwhile, Anonymous argues that to ensure a rights-based approach, it is necessary to develop laws that regulate data privacy and the use of technology, following the model of countries like the United States, where regulation in this area is more robust.

Angela Olmedo highlights the need for states to implement policies that ensure access to technology for everyone, regardless of gender, while also developing digital literacy programs that address the specific needs of women.

In this regard, Mirtha Rodríguez believes that states should play an active role in promoting equal access to technology from a gender perspective, by investing in digital infrastructure and resources, and supporting research in the technological field. She also underscores the need for a clear and robust ethical framework for the use of data and emerging technologies. For Katya Vázquez, however, the main challenge in Paraguay is the lack of investment in projects that promote the inclusion of women in the technology sector.

Camilo Caballero argues that, from a comparative perspective, the governance of science and technology in Paraguay is significantly underdeveloped in relation to current challenges. Countries like Brazil, Argentina, Uruguay and Mexico had already implemented their first public science and technology policies in the 1950s and 1960s. It wasn't until the late 1990s that a UNESCO mission toured countries lagging behind in this area, such as Paraguay, Guatemala, and Honduras, to support the creation of their National Councils for Science and Technology. Since then, the situation has become more complex, as the country still relies on a council that centralizes all decision-making. From an administrative and bureaucratic standpoint, it lacks the capacity to address today's challenges. In a comparative perspective, other countries facing similar challenges have already established a range of decentralized bodies that complement one another, or even dedicated ministries that ensure a cross-cutting approach to the issue, fostering convergence and synergy among the economic, educational and scientific sectors to work together towards scientific development.

María Victoria Heikel believes that, in the case of Paraguay, it is necessary to establish infrastructure and expand broadband access, which Mirtha Rodríguez refers to as technological architecture.

> "In the case of the development of the Paraguayan State, not too much can be asked of it. So, at the very least, it should provide infrastructure and free broadband access for everyone. The State must rethink its re-engagement with the private sector in the technological field, which, until now, has been very stagnant. If the State were open to developing certain processes where the private sector could contribute alongside the State, each from its area of expertise, with a view to building something that the other sector lacks the capacity or resources to do." (Interview with María Victoria Heikel, 2024).

This perspective underscores the imperative need for the State not only to guarantee technological infrastructure and free broadband access but also to take an active role in technological development. The insights brought to this discussion by economist Mariana Mazzucato (2014) illustrate this point. She highlights that, while Apple is globally recognized for its high stock market valuation and pioneering role in the digital revolution, it is also known for the remarkable design of its products, attributed to the talent of Steve Jobs and his team. However, she emphasizes that the average consumer is unaware that the cutting-edge technologies incorporated into these products are the result of decades of state support and funding—including significant investments from the U.S. federal government and the military—that have driven innovation. The State's participation is fundamental to democratizing knowledge and equitably distributing the benefits of technological innovation.

6.10. [IM]POSSIBLE FUTURES

This section presents the visions and expectations regarding the advancement of digital technologies in Paraguay and the region, based on reflections shared in the interviews. The technological future of Paraguay is clearly shaped by a tension between transformative possibilities and persistent structural challenges.

Anonymous envisions a scenario in which policies are implemented to guarantee universal access to technology—regardless of gender—so that everyone can begin learning about it from an early age. In line with this, Camilo Caballero points out that "the main challenge lies in convincing critical sectors of the importance of participating in technological discussions, even when resources are limited" (Interview with Camilo Caballero, 2024). Carolina Urquhart, for her part, argues that although progress is slower than desired, there is growing interest among women and young people in technical fields, which will inevitably foster a broader and more plural debate on technological development in Paraguay.

Mirtha Rodríguez, for her part, goes a step further and emphasizes the need to train artificial intelligence from a feminist perspective. She argues that such an approach must enable access to knowledge for everyone, from the most trivial subjects to those of greatest significance. According to Rodríguez, creating feminist artificial intelligence is a crucial challenge that can only be met through coordinated efforts.

In response to this challenge, Maricarmen Sequera argues that feminism faces a significant task: to influence the design and governance of technologies in order to prevent them from reproducing oppressive dynamics. She envisions an internet that is "free of surveillance, inclusive and safe" (Interview with Maricarmen Sequera, 2024).

In the same vein, María Goñi underscores the role of feminist epistemology in questioning dominant ways of producing knowledge. She proposes that technological research should be geared towards addressing social problems and driving structural change:

> "Feminist epistemology challenges traditional, hegemonic approaches to doing science, and it also keeps ethical questions at the forefront: What are we researching for? This is essential not only for advancing knowledge but also for actively seeking to transform these problems" (Interview with María Goñi, 2024).

This exchange shows that imagining possible futures depends on the ability to coordinate efforts between public policy, feminist activism and technological communities, so that technology becomes a tool for emancipation.The advancement of technology in Paraguay and Latin America opens up a horizon filled with promising opportunities, but also significant challenges. Although digital tools may expand access to justice, education and employment, persistent structural inequality, limited connectivity and inadequate regulatory frameworks continue to pose barriers that risk deepening technological exclusion. This double-edged reality reflects the disruptive nature of innovation and highlights the urgent need for inclusive and participatory policies, ones that can turn what seems unreachable into a viable horizon for all, especially in peripheral contexts.

Drawing from the reflections shared, the ability to envision possible futures rests on coordinating efforts across public policy, feminist activism and technological communities. This collective approach seeks to transform technologies into truly emancipatory tools. Interviewees agree that, while digital progress in Paraguay and Latin America opens up a horizon of possibilities—such as democratized access to justice, education and employment—significant challenges remain. Structural inequality, limited connectivity and weak regulatory frameworks continue to threaten Paraguay's inclusion in both the development of these technologies and the decision-making processes surrounding them.

Ultimately, democratizing knowledge and equitably distributing the benefits of technological innovation are essential imperatives to counter the reactionary trends shaping the global landscape, and to make the future possible.

7. CONCLUSIONS

7.1. MAIN FINDINGS

This exploration began by examining the social and political manifestations associated with cyberfeminism in Paraguay, questioning whether these phenomena can be interpreted as signs of a consolidated or emerging movement. It also looked into how technological tools are being constructed from a feminist perspective and the role of the Global South in the pursuit of technological autonomy and emancipation. While it is not possible to make definitive claims or generalizations, this initial inquiry has brought to light key critical issues, which will be presented below to help enrich the broader conversation

7.1.1. Ambivalent relationship with feminisms

One of the most significant findings of this study is that, among the activists and professionals consulted, there is a degree of openness to feminist ideas, especially those related to the barriers they face in accessing technological fields. However, there is no clear evidence of a consolidated feminist perspective or a fully embraced feminist praxis. While some individuals identify as feminists within their organizations, this identification is not reflected at the organizational level nor does it serve as a guiding framework for their work or activism.

However, those connected to academia are more familiar with these theoretical and political debates and have begun to develop local interpretations of what they understand as cyberfeminism. Below is a brief excerpt from a conversation with one of the interviewees:

> "It's very important to think about definitions of cyberfeminism from an emancipatory perspective. Because when we talk about that, we're talking about the use of technology that's more controlled by the communities who use it, about greater possibilities for protecting oneself online, greater possibility for creating new economic opportunities that respect the rights of women, workers, and so on. I believe it can be, if you will, a philosophy, an interesting movement to explore in terms of how technology is used in Latin America by specific publics, with a particular focus, of course, on women and TLGBIQ+ communities (sic). Finally, if we speak of feminism as an emancipatory movement, then that cyborg feminist movement must also be aimed at the liberation from all forms of oppression." (Interview with Eduardo Carrillo, 2024).

The interviewee expands on this characterization by illustrating how some communities choose to use specific technologies, emphasizing the importance of sharing basic digital security practices—whether in the use of messaging apps, social media or through measures like device encryption, password protection and two-factor authentication—as steps towards adopting free or semi-free systems.

This focus on the intersection between technology and digital security represents an initial effort to establish a framework for a movement that not only challenges but also transcends the limits imposed by conventional technological structures. It involves integrating protective practices, such as encryption and secure authentication, that could become key elements of a broader approach aimed at autonomy, freedom and digital justice. This first step is crucial because laying the groundwork for a secure and accessible digital culture strengthens communities' ability to challenge dominant dynamics of exclusion and control. It means building a digital security infrastructure that does not solely serve government surveillance or corporate interests, but is truly inclusive and emancipatory.

7.1.2. Disconnection between women's organizations working in technology and the feminist movement (and vice versa)

Many organizations composed of women professionals in the technology sector, included in this research, tend to approach the challenges in this field from a functional and technical perspective. Their activities largely focus on issues related to narrowing digital divides, improving access to resources, and training women and girls in areas such as programming and robotics. While they acknowledge that women face disadvantages in various domains, the absence of a critical feminist framework weakens the central critique of the system within which, and on a larger scale, regimes of exclusion and discrimination are produced.

This is due to a limited, and in some cases prejudiced, understanding of what it means to adopt feminism as a starting point. In many cases, feminism as a movement is reduced to very specific demands and actions, such as reproductive rights and marches. Consequently, the transformative potential of feminism is underestimated, as its capacity to question and destabilize hegemonic structures in diverse fields such as technology, science, economics and culture is overlooked.

Within the feminist movement, technology is still often perceived as an external, overly specific issue or, in the worst cases, a secondary concern, pushed aside in favor of matters seen as more urgent. This may be due to the limited visibility and representation of women in technological spaces, as well as the technical complexity that tends to surround the field, which can discourage its inclusion as a central issue in feminist struggles. Moreover, dominant narratives around technology are often steeped in technical language that, perceived as neutral, frequently conceals the gender biases and power dynamics embedded in the design and use of digital tools.

This disconnection also reflects the lack of a conceptual and practical bridge that links the demands and struggles of both spaces. Women's organizations in technology and the feminist movement share common concerns—such as equitable access to education, the eradication of gender-based violence, the promotion of women's autonomy and sexual and reproductive rights, among many others. However, the absence of a structured and sustained dialogue prevents these shared concerns from being translated into joint strategies or concrete collaborations. This gap limits the potential for impact on both fronts: feminist movements could strengthen their influence by integrating deeper reflection on the role of technology and its effects on the scope of their struggles, while tech organizations could benefit from the critical and political depth that feminisms offer to enhance their strategies.

From a feminist perspective, technological tools are constructed through a critical lens that views technologies not as neutral elements, but as social and political constructs that reflect and reproduce existing power relations.

A feminist perspective calls for challenging the gender biases embedded in the design and use of technologies, promoting an intersectional approach that integrates diverse identities and experiences. It includes questioning the patriarchal and androcentric structures that have historically dominated technological design, while also fostering the participation of women and gender-diverse people in the creation of technology. Initiatives such as cyberfeminism and technofeminism underscore the importance of incorporating these approaches. Furthermore, building feminist technological tools also involves recognizing traditional and everyday technologies as integral to the analysis. Organizations such as CONAMURI and Mbya Guaraní Indigenous women in Paraguay demonstrate how traditional knowledge and innovative technical practices can be brought together to resist extractivist dynamics and promote sustainable and equitable development.

The Global South, understood as a diverse geopolitical and epistemological territory, is essential for building autonomous technologies with emancipatory horizons. This is an imperative for those who inhabit this part of the world, as a way to challenge and dispute the historical relationship of social, cultural, economic—and also technological—dependence and subordination.

All participants in the research shared a critical view of technology. However, there is less visible reflection on the role the Global South plays in reimagining technological and cultural imaginaries, specifically in creating tools that critically and creatively incorporate local knowledge and the specific contexts of those responsible for developing these technologies. Challenging the dominant scientific-technological paradigm means, among other things, seeing Global South countries not merely as recipients of technology, but as active producers of knowledge.

In Latin America, several experiences embody these critical, situated perspectives on technology. A paradigmatic example in the field of agroecology comes from organizations like the Latin American Coordination of Rural Organizations (CLOC-Vía Campesina).26 They challenge the narrative and technical monopoly over social and ecological technologies promoted by the agro-industrial production model, which depends on technologies patented by transnational corporations. From this political critique of capitalist modes of production, based on resource extraction, environmental destruction and wealth concentration, they advocate for technological practices grounded in ancestral knowledge.

At Semilla Róga27 , located in Repatriación in the department of Caaguazú, peasant and Indigenous women care for a variety of seed species. These women are the guardians of the seeds, the guardians of the future, and a force of resistance against the relentless drive to commodify everything. They exchange seeds with producers from various regions of the country. As they put it: “You give and receive, receive and give. No one buys or sells; we exchange what we have to get what we don’t. We must guard our seeds so we have food”. These technologies strengthen food sovereignty and resilience in the face of climate change. By calling for life to be placed at the center, they recognize how extractive and market-driven logics, across all spheres of life, including technology, increasingly undermine our ways of being and relating. As Silvia Rivera Cusicanqui (2010) points out, we must decolonize technological modernity and make space for other forms of modernity not based on consumption or destruction, but on respect and complementarity (Civilab, 2024).

The development of autonomous technologies from our territories must be grounded in an emancipatory vision that:

- Promotes local technology production and reduces dependence on imported technologies.
- Strengthens technological sovereignty while honoring local knowledge and cultures.
- Prioritizes social and environmental justice over technological extractivism.
- Reinterprets technology from its own contexts to help communities through participatory and horizontal processes in the design and use of technologies for a fairer and more sustainable present and future.

26 A term that refers to the major technology companies currently operating.

27 Refers to the set of technologies developed for storing and transmitting information

The need for a feminist reconstruction of science and technology, as articulated by Diana Maffía (2021), is fundamental to addressing these processes. It calls for a reinterpretation of the scientific-technological field from a gender perspective, one that incorporates the experiences and viewpoints of diverse women and other gender and sexual identities, and that challenges androcentric norms and methods.

7.2. RECOMMENDATIONS

This section offers a set of suggestions to strengthen collaborative networks among feminists, technologists and scientists in order to promote a critical feminist approach to technology rooted in our geographies

7.2.1. Strengthening of collaborative networks between feminist organizations and technologists

- Create spaces for knowledge exchange between feminist organizations and tech collectives.
- Organize annual forums on feminism and technology to reflect on progress, setbacks and challenges. Is important that these spaces include diverse participation from activists, academics and users, so that a broad range of experiences and perspectives can be brought into dialogue.
- Organize workshops on technology and society for social researchers and tech developers, to encourage reflection and the development of technologies that enable theoretical exchange.

Develop digital platforms for sharing experiences, resources, and knowledge.

7.2.2. Articulation of local, regional and international networks

- Link national initiatives with global networks such as Geochicas,28 GenderIT,29 and the Ibero-American Network of Science, Technology and Gender (RICTYG),30 among others.
- Foster exchanges among technologists from the Global South to develop solutions tailored to specific contexts.

7.2.3. Development of community projects and collaborative research against algorithmic biases

- Design participatory technologies through collaboration between feminist organizations, technology collectives and urban, rural, and Indigenous communities, reclaiming scientific, technical, and community knowledge.
- Create a technology and gender observatory to monitor the representation and participation of women and people of diverse gender identities in technological sectors, as well as to identify gaps and situations that exacerbate discrimination.

28 A field of science dedicated to designing technological devices that perform automated tasks.

29 An area of science that studies the capacity of machines to develop patterns for problem-solving and logic.

30 Technologies associated with living organisms and biology; the use of organisms or biological compounds for technological development.

- Promote collaborative spaces for exchange among developers, social researchers and feminist organizations to prevent the development of technological products and services that reproduce gender, ethnic, class and other biases in the design of algorithms and databases.

7.2.4. Institutional policies in the labor sector

- Promote diversity in work teams by encouraging the participation of women and gender-diverse people in technical and leadership roles.

- Incentivize the implementation of gender quotas in technology sector hiring processes through comparative studies and evaluations that demonstrate the impact of diversity on innovation and productivity. It also involves awareness campaigns and dialogue spaces, such as intersectoral roundtables, where company representatives, researchers and activists can meet to define inclusive hiring standards. Mentorship and joint training programs should also be promoted to facilitate the inclusion of women and gender-diverse people in technical areas. At the same time, incentives such as public recognition or tax benefits should be established for companies that adopt and comply with diversity quotas.

- Establish clear policies against harassment and gender discrimination in the technology sector.

- Fund projects that analyze the impact of technologies from a feminist perspective.

7.2.5. Communication and awareness campaigns

- Highlight the stories of women and gender-diverse individuals who have made an impact in technological development.

- Develop communication campaigns that emphasize feminist contributions to the design and use of technologies.

7.2.6. Technological education with a gender perspective

- Implement technology training programs starting in primary education with an intersectional, gender and rights-based approach.

- Incentivize the participation of women and gender-diverse people in STEM careers through scholarships, mentorships and support networks.

- Design training programs that address topics such as feminist theory, the intersection of gender and technology and gaps in access to and use of technology.

- Integrate modules on technological ethics, inclusive design, and diversity into STEM educational programs.

7.2.7. Technofeminist Repository

- Create online or physical reading spaces that promote the exchange of ideas on technology from a feminist perspective.

- Disseminate materials such as Donna Haraway's *Cyborg Manifesto* and Judy Wajcman's *Technofeminism*, alongside regional and local studies on technology and gender.

7.3. FUTURE RESEARCH DIRECTIONS

To deepen the analysis of the intersection between technologies and feminisms in Paraguay from universities and research centers, it is essential to develop collaborative and comparative research from a feminist perspective that fosters dialogue with other regions of the Global South. Through case study analysis, this approach would allow us to explore how different cultural contexts shape the design and use of technologies and their differentiated effects on diverse groups.

- Examine the effects of digital technologies on domestic and care work, questioning their potential to reduce burdens or perpetuate inequalities.

- Investigate the working conditions of people employed on digital platforms, with a focus on the experiences of women and gender-diverse individuals.

- Explore access to and the implications of reproductive technologies for homoparental families and other diverse family structures that differ from heterosexual norms, for example, the ROPA method used by lesbian couples to conceive a pregnancy in which both women participate (one gestational, the other genetic).31

- Analyze the influence and impact of social media on the cultural and identity formation of adolescents and young people from an intersectional perspective. While adolescents in general may be vulnerable to its effects, special attention should be given to Indigenous adolescents and children, adolescent girls and TLGBIQ+ youth, particularly regarding gender-based violence and sexual exploitation, to which they are especially exposed.

- Investigate access to and participation in technical and university-level STEM fields (Science, Technology, Engineering, and Mathematics) from a gender and intersectional perspective, in order to support projects that promote the greater inclusion of women and gender-diverse individuals in these areas.32

- Collaborate with social movements to conceptualize and imagine technologies that foster a more democratic and participatory society.

These recommendations aim to articulate critical reflection and action to transform the technological landscape in Paraguay from a feminist and intersectional perspective.

31 An Argentine collective that emerged from an interest in feminist studies on technique and technology, with a Global South perspective and a non-anthropocentric, materialist approach.

32 "Let me say this upfront for those who wish to understand: being poor and a woman are too heavy sorrows to carry together." —Carmen Soler (1924-1985)

7.4. POLITICAL REFLECTIONS

This research not only expands knowledge on the intersection of gender and technology, but also highlights how feminist theoretical frameworks on technology have undergone significant shifts, from initial techno-optimism to techno-pessimism, while still leaving room for an open-ended outcome.

Since the rise of technological optimism in the 1970s, when movements like radical feminism and liberal feminism explored the liberating potential of technology, through the critiques of the 1980s that questioned its supposed neutrality, to the emergence of postfeminism, with strands like cyberfeminism and technofeminism, which reshape identities in the digital realm, it is clear that technology does not operate in a neutral manner; rather, it reflects and reproduces historical power relations.

However, the study also adopts a critical stance within a political context where technological narratives are increasingly monopolized by conservative and reactionary discourses, led by powerful figures like Elon Musk, Donald Trump and Javier Milei. These figures work actively to shape the collective imagination, as well as expectations about the present and future, where technologies play a central role.

A feminist perspective on technology thus gains unavoidable political relevance, as it offers critical tools to understand hegemonic discourses and propose alternatives to reconfigure the present and open pathways towards a future in which technology is built on diversity, inclusion and respect for human rights.

In the case of Paraguay, although academic production and research on these topics remain limited compared to other contexts, a more diverse and plural discussion is starting to emerge. This debate, which spans from optimistic to pessimistic and ambivalent perspectives, creates a space conducive to articulating proposals that, by integrating the voices of civil society and academia, challenge the hegemony of imported models and the power narratives imposed by global technological and economic elites.

The challenge lies in continuing to generate knowledge and research pathways that bridge humanistic and technical dimensions, recognizing that the social sciences are also essential for understanding and transforming technological development.

Nonetheless, the current context presents additional challenges, as evidenced by the recent cuts to international cooperation promoted by the Trump administration. These cuts have had a critical impact on countries like Paraguay, affecting both civil society and private research centers dedicated to producing rigorous and critical knowledge, especially considering the country's low investment in research and the limited resources available to universities to expand their full-time research faculty. In response to these obstacles, it is important to promote collaborative alternatives, such as the creation of regional and international networks, the strengthening public–private partnerships and the implementation of academic cooperation projects. These initiatives would help optimize resources, share knowledge, and ensure the ongoing production of critical knowledge at the intersection of feminism and technology.

8. BIBLIOGRAPHY

1. Acevedo, R. (2023). Rafael Barrett, ontólogo del presente: Meditaciones sobre ecología, subjetividad plantifica y tecnificación social. *ESTUDIOS PARAGUAYOS, 41*(1), Article 1. https://doi.org/10.47133/respy26002301art06

2. Barbosa, B., Benamo, M. E., Cavalli, A., D'andrea, A. C., Fischetti, N. B., & Torrano, M. A. (2024). *Manifiesto de las simpoiéticas del Sur: Feministas tramando sobre técnicas y tecnologías*. https://ri.conicet.gov.ar/handle/11336/244215

3. Benjamin, R. (2019). *Race After Technology: Abolitionist Tools for the New Jim Code.* Polity.

4. Blanco, J., & Berti, A. (2016). No hay hardware sin software: Crítica del dualismo digital. *Quadranti – Rivista Internazionale di Filosofia ContemporaneaQuadranti – Rivista Internazionale di Filosofia Contemporanea, IV*(1-2). https://www.studocu.com/es-ar/document/universidad-nacional-de-cordoba/psicologia/no-hay-hardware-sin-software-critica-del/79968442

5. Bosch, N. V. (2013a). Teorías Feministas de la Tecnología: Evolución y principales debates. *Repositorio digital Universitat de Barcelona*. https://diposit.ub.edu/dspace/handle/2445/45624

6. Bosch, N. V. (2013b). Teorías Feministas de la Tecnología: Evolución y principales debates. *Grupo COPOLIS. Departamento de Sociología y Análisis de las Organizaciones. Universitat de Barcelona.* https://diposit.ub.edu/dspace/bitstream/2445/45624/1/Teorías%20Feministas%20de%20la%20Tecnología.pdf

7. Butler, J. (1999). *Gender trouble: Feminism and the subversion of identity* (2nd ed.). Routledge. https://selforganizedseminar.wordpress.com/wp-content/uploads/2011/07/butler-gender_trouble.pdf

8. Carrillo, E., Bogado, A., & Kostic, B. (2024). *Perpetrators of gender-based violence online – Roadmap for investigations.* TEDIC; Women´s Rights Online (WRO); Fundación Karisma. https://www.tedic.org/wp-content/uploads/2024/07/Perpetrators-of-gender-based-violence-online.pdf

9. Carrillo, E., Sáenz, R., & Moreno, C. (2024). *From theory to practice – building and testing a framework for definitions of online gender-based violence and other terms.* TEDIC. https://www.tedic.org/wp-content/uploads/2024/07/Framework-definitions-OGBV-2.pdf

10. Carrillo, E., Sánchez, J., Duarte, J., & Durán, M. J. (2024). *Trafficking in persons and sexual exploitation in its intersection with ICTs in Paraguay.* TEDIC. https://www.tedic.org/wp-content/uploads/2024/08/Investigacion-Luna-Nueva-ENG.pdf

11. Chair, C., Brudiyg, I., & Cameron, C. (2020). *Women's Rights Online: Closing the digital gender gap for a more equal world.* World Wide Web Foundation.

12. Civilab. (2024). Quines somos. Civilab. *Civilab*. https://civilab.org.py/quienes-somos/

13. Colazo, C., & Cano, Colazo, M. V. (2021). *Aproximacão a analise da situacão da mulher na ciência e tecnologia na Argentina e no Paraguai a partir de uma perspectiva feminista.* Atena. https://ri.conicet.gov.ar/bitstream/handle/11336/248595/CONICET_Digital_Nro.7ba80dd9-c571-43bc-a358-5acad1832868_B.pdf?sequence=2&isAllowed=y

14. CONACYT. (2021). Indicadores de ciencia y tecnología de Paraguay 2019. *conacyt.gov.py*. https://www.conacyt.gov.py/sites/default/files/upload_editores/u454/Indicadores-CyT_Paraguay-2019-actualizado-7-mayo-2021.pdf

15. CONAMURI. (2018, agosto 8). Ceferina Guerrero, guardiana de las semillas nativas y criollas. *CONAMURI*. https://www.conamuri.org.py/ceferina-guerrero-guardiana-de-las-semillas-nativas-y-criollas/

16. Contra las dicotomias: feminismo y epistemologia crítica. (2016). En *Feminismos populares: Pedagogías y políticas* (pp. 137-151). La Fogata Editorial ; América Libre.

17. Costa, F. (2021). *Tecnoceno: Algoritmos, biohackers y nuevas formas de vida*. TAURUS.

18. Costanza-Chock, S. (2020, February 26). Valores de diseño: ¿Liberación mediante codificación rígida? *Justicia en el diseño.* https://designjustice.mitpress.mit.edu/pub/3h2zq86d/release/1

19. Cuevas, M., & Sequera, M. (2024). *Technology-facilitated gender-based violence against women politicians in Paraguay.* TEDIC. https://www.tedic.org/wp-content/uploads/2024/09/WEB.pdf

20. Ekbia, H. R., & Nardi, B. A. (2019). Los nietos de Keynes y los trabajadores de Marx en las plataformas digitales. Por qué el trabajo humano todavía es importante. *Revista Internacional del Trabajo*, 138(4), 703-728. https://doi.org/10.1111/ilrs.12140

21. Fischetti, N., & Torrano, A. (2024a). *Tecnologías feministas; tramas para la resistencia.* CLACSO; https://biblioteca-repositorio.clacso.edu.ar/bitstream/CLACSO/251469/1/Tecnologias-feministas.pdf. https://biblioteca-repositorio.clacso.edu.ar/bitstream/CLACSO/251469/1/Tecnologias-feministas.pdf

22. Forus (2023). Civil society Manifesto for ethical AI. https://www.forus-international.org/en/pdf-detail/106205-civil-society-manifesto-for-ethical-ai-106205

23. Fox Keller, E. (1985). *Reflections on Gender and Science.* YALE UNIVERSITY PRESS. http://ereserve.library.utah.edu/Annual/ECS/6605/Thompson/world.pdf

24. Gago, V. (2019). *La potencia feminista.* Traficantes de sueños, Tinta Limón. https://traficantes.net/sites/default/files/pdfs/TDS_map55_La%20potencia%20feminista_web.pdf

25. Galloway, A. (1997). Un informe sobre ciberfeminismo. Sadie Plant y VNS Matrix: Análisis comparativo. *Mujeres en Red. El Periódico Feminista.* https://www.mujeresenred.net/spip.php?article1531

26. González García, M. (2017). *Ciencia, tecnología y género.* Consejo Nacional de Ciencia y Tecnología.

27. Haraway, D. (1991). *Simians, Cyborgs, and Women: The Reinvention of Nature*. Routledge. https://monoskop.org/images/f/f3/Haraway_Donna_J_Simians_Cyborgs_and_Women_The_Reinvention_of_Nature.pdf

28. Harding, S. (2016). Del problema de la mujer en la ciencia al problema de la ciencia en el feminismo. En *Ciencia y Feminismo*. Ediciones Morata.

29. Heikel, M. V., Da Re Carreras, R., & Del Puerto, C. (2024, setiembre). Desafíos que enfrentan las mujeres para insertarse en el sector tecnológico. *Revista electrónica mensual. Debates sobre innovación, Volumen 8*(1). https://revistadebates.xoc.uam.mx/index.php/debinnovacion/article/view/63/58

30. Hester, H., & Srnicek, N. (2023b). *After Work. A History of the Home and the Fight for Free Time*. Verso Books. https://traficantes.net/libros/after-work

31. Lluch, E. J., & Valero, L. B. (2021). *Feminismos contemporáneos.*

32. Loucas, R., Sauter, B., Loucas, M., Leitsch, S., Haroon, O., Macek, A., Graul, S., Kobler, A., & Holzbach, T. (2024). Is There An "Ideal Instagram Face" for Caucasian Female Influencers? A Cross-Sectional Observational Study of Facial Proportions in 100 Top Beauty Influencers. *Aesthetic Surgery Journal Open Forum, 6*, ojae085. https://doi.org/10.1093/asjof/ojae085

33. Lugones, M. (2008). Colonialidad y Género 1 Coloniality and Gender Colonialidade e Gênero. *TABULA RASA*.

34. Maffia, D. (2021). Epistemología feminista: La subversión semiótica de las mujeres en la ciencia. *Revista Venezolana de Estudios de la Mujer, 12*(28).

35. Mazzucato, M. (2014). *El Estado emprendedor. Mitos del sector público frente al privado* (Anthem Press). http://www.economia.unam.mx/academia/inae/images/ProgramasyLecturas/lecturas/inae_iv/mazzucato2017.pdf

36. Molinas, M., Britos, Rivas, J., & Ubaldi, Garcete, N. (2021). *Tecnología y mujeres en contexto de pandemia. Estrategias digitales para prevención de la violencia, fortalecimiento del empoderamiento económico y reducción de la propagación del COVID-19*. Fundación Capital.

37. Musumeci, E. (2014). [UAB DIVULGA]. *Hay un cierto determinismo biológico en la neurocriminología*. https://www.uab.cat/web?cid=1096481466568&pagename=UABDivulga%2FPage%2FTemplateDetallArticleInvestigar&param1=1345665937671

38. O'neil, C. (2018). *CATHY O'NEIL: Armas de Destrucción Matemática. Cómo el Big Data aumenta la desigualdad y amenaza la democracia.* Madrid: Capitán Swing, 2017, 269 pp. 199-202. https://www.redalyc.org/journal/2971/297165396011/html/

39. Observatorio de Innovación de Paraguay. (s. f.). Inversión en I+D con respecto al PIB en países seleccionados, 2021. *Observatorio de Innovación de Paraguay*. https://obi.mitic.gov.py/entradas/inversion-en-id-con-respecto-al-pib-en-paises-seleccionados-2021?utm_source=chatgpt.com

40. TEDIC (2024). *Cyborgfeminismo: Tecnología + feminismo para hackear el futuro* [Video recording]. https://www.youtube.com/watch?v=gnBcZygpy8Q

41. Pasquinelli, & Vladan, J. (2020). *The Nooscope Manifested: AI as Instrument of Knowledge Extractivism*. Fritz. https://fritz.ai/nooscope/

42. Pereira Ayala, Z. (2013). *Factores determinantes de la deserción de mujeres en carreras de la Facultad de Ingeniería de la Universidad Nacional de Asunción - FIUNA, 1997-2000.*

43. Pérez Riedel, M. D. (2015). Feminisimos, teoría queer y tecnologías de género. *Ciencias de la Comunicación, UBA*. http://sedici.unlp.edu.ar/bitstream/handle/10915/126755/Documento_completo.pdf-PDFA.pdf?sequence=1&isAllowed=y

44. Rammert, W. (2001). La tecnología: Sus formas y las diferencias de medios. Hacia una teoría social pragmática de la tecnificación. *Scripta Nova. Revista Electrónica de Geografía y Ciencias Sociales, 80.* https://www.ub.edu/geocrit/sn-80.htm

45. Ricaurte Quijano, P. (2023). *Descolonizar y despatriarcalizar las tecnologías.* Centro de Cultura Digital.

46. Rivera Cusicanqui, S. (2010). *Ch'ixinakax utxiwa: Una reflexión sobre prácticas y discursos descolonizadores*. https://sentipensaresfem.wordpress.com/wp-content/uploads/2016/09/rivera-cusicanqui-ch_ixinakax-utxiwa-20101.pdf

47. Saus-Ortega, C. (2018). La maternidad biológica compartida en parejas lesbianas. La técnica de fertilización «in vitro» con el método de recepción de ovocitos de la pareja (ROPA): Una revisión de la literatura. *Matronas profesión, 19*(2). https://roderic.uv.es/rest/api/core/bitstreams/6ec5b06b-4b2d-4fc8-8db2-75cdc5cd3a7b/content

48. Scasserra, S. (2021). *La desigualdad automatizada. Industrialización, exclusión y colonialismo digital. 294*. https://static.nuso.org/media/articles/downloads/3.TC_Scasserra_294.pdf

49. Sequera, M., & Acuña, J. (2023). *Digital gender-based violence against journalists in Paraguay.* TEDIC. https://www.tedic.org/wp-content/uploads/2023/10/Violencia-Genero-Periodistas-TEDIC-2023-ENG-web-1.pdf

50. Sívori, H. F., Parreiras, C., & Peña, P. (2023). Presentación: Por qué perspectivas latinoamericanas sobre feminismo, género y sexualidad en las tecnologías digitales. *Sexualidad, Salud y Sociedad (Rio de Janeiro)*, e22300. https://doi.org/10.1590/1984-6487.sess.2023.39.e22300.a.es

51. Svampa, M. (2019). *Las fronteras del neoextractivismo en América Latina.* Centro Maria Sibylla Merian de Estudios Latinoamericanos Avanzados en Humanidades y Ciencias Sociales. http://calas.lat/sites/default/files/svampa_neoextractivismo.pdf

52. Tedic (2024). *Por una ley integral de protección de datos personales*. TEDIC. https://www.tedic.org/wp-content/uploads/2022/09/Fanzine-Datos-personales-web.pdf

53. Tello, A. M. (2020). *Tecnología, política y algoritmos en América Latina*. Cenaltes Ediciones. Cruces Colectivos. https://ri.conicet.gov.ar/bitstream/handle/11336/147182/CONICET_Digital_Nro.650bbd31-1e28-4fd6-9898-d35e1ab3646a_B.pdf?sequence=5&isAllowed=y

54. Terere Cómplice (Director). (2024, October 7). *TererePOD - Especial 1 Año Santiago Peña | Manuel Ferreira* [Video recording]. https://www.youtube.com/watch?v=MQwym2apWmM

55. Terranova, T. (2022). *Cultura de la red. Información, política y trabajo libre*. Tinta Limón. https://dialnet.unirioja.es/servlet/articulo?codigo=9619700

56. Torrano, A., & Fischetti, N. (2020). Filosofía feminista de la técnica y la tecnología. Notas para una academia latinoamericana activista. *Pensando - Revista de Filosofia, 11*(23), Article 23. https://doi.org/10.26694/pensando.v11i23.11058

57. Torrano, A., & Fischetti, Natalia. (2018). Apuestas del feminismo: Ciencia/Técnica/Latinoamérica. Nuevas urdimbres desde el Sur. *RevIISE-Revista de ciencias sociales y humanas, 11*, 167-279. https://ri.conicet.gov.ar/bitstream/handle/11336/92428/CONICET_Digital_Nro.ef381aab-0b6b-4967-97af-d9d5c73ba35a_A.pdf?sequence=2&isAllowed=y

58. Vergés Bosch, N. (2013). Teorías Feministas de la Tecnología: Evolución y principales debates. *Grupo COPOLIS*.

59. Vergés. Bosch, N., Cruells, López, E., & Hache, A. (2011, marzo 16). El colectivo Donestech: Ciberfeminismo de investigación. *Fundacionbetiko.org*. https://fundacionbetiko.org/wp-content/uploads/2012/11/colectivo-donestech-ciberfeminismo-de-investigacion.pdf

60. Villavicencio, X., Myers, C., & Coflan, C. (2022). *IEd Tech Hub. Clear evidence, better decisions, more learning. STEM Skills Initiatives for Adolescent Girls in the Latin America and the Caribbean Region*. https://www.unicef.org/lac/media/37176/file/STEM-skills-iniciatives-for-adolescent-girls.pdf

61. Wajcman, J. (2004). *Technofeminism*. Polity Press. Cátedra. https://monoskop.org/images/a/ae/Wajcman_Judy_TechnoFeminism_2004.pdf

62. Winner, L. (1983). *¿Tienen política los artefactos?* (Versión Versón castellana de Mario Francisco Villa). http://www.ub.edu/prometheus21/articulos/tienen.pdf

63. World Wide Web Foundation. (2020, October). *Women's Rights Online: closing the digital gender gap for a more equal world.* https://webfoundation.org/research/womens-rights-online-2020/