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Co-creating change: gender integration in research and institutional innovation at the University of Porto

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Abstract

Integrating gender dimensions into research is critical for enhancing the quality, relevance, and societal impact of scientific inquiry. This paper presents the development and implementation of the Gender Integration Assessment (GIA) tool at the University of Porto, within the scope of the RESET project. The GIA tool was designed to support researchers in systematically embedding gender considerations in research design, methodology, and outcomes, contributing to a more equitable and inclusive academic environment. Grounded in the principles of gender mainstreaming, intersectionality, and co-design, the tool's development followed a participatory, user-centred approach involving researchers, research managers, and top-level decision-makers. The paper outlines three core phases of the process: conceptual foundations, building a Community of Practitioners (CoP), and designing a responsive, practical tool tailored to diverse disciplinary and institutional contexts. The involvement of researchers across fields ensured that the tool would reflect real-world needs and be adaptable across epistemic cultures. Meanwhile, the engagement of top management helped secure institutional alignment, sustainability, and visibility for the tool. The GIA tool also aims to build capacity by fostering reflexivity, offering tailored feedback, and serving as a learning platform. Its digital format includes interactive features and explanatory resources to guide researchers through the integration process. Currently adopted at the University of Porto, the GIA tool contributes to the broader mission of advancing gender equality in research while reinforcing the transformative role of user-centred, inclusive design in institutional change.

Introduction

Incorporating a gender dimension in research is essential for producing knowledge that is inclusive, accurate, and socially relevant. It involves recognizing and addressing how gender roles, identities, and inequalities influence research questions, methods, analysis, and outcomes. By doing so, researchers not only enhance the quality and impact of their work but also contribute to the broader goal of gender equity in society. In this paper, we explore the importance of integrating a gender perspective in research, outlining a practical strategy for doing so that was implemented at the University of Porto. By offering a reflexive approach to work done under the RESET consortium, leading to the development and implementation of a Gender Integration Assessment (GIA) tool, we discuss the challenges and opportunities presented by the approach.

The topic of gender (and diversity) integration into research is not new; in fact, already in 2003, the European Commission encouraged the need to systematically examine whether, and how, sex and gender matter in the goals

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and methods of research projects. Since then, several EU documents reinforce how the inclusion of the gender dimension at all stages of research has the potential to enrich results by making them more relevant to all individuals. Notwithstanding, too few projects really implement a thorough gender and sex analysis or truly develop a gender perspective in research content and project design. As a consequence, in an evaluation report of Horizon 2020 projects (Cheveigné 2017), recommendations for applicants included the need to improve the understanding of the gender dimension in research among both applicants and evaluators and the need for developing simple, practical guidelines for applicants on integrating and evaluating gender in research proposals. Those guidelines were expected to build on existing resources but also encompass the need for tailored tools. This paper accounts for the implementation of such a tool.

The paper is organised into three sections. In section 1, we share the foundational principles and major approaches that sustained the development of the GIA tool. We then move to section 2, where we revise the initial steps taken to develop the GIA tool, with an emphasis on early involvement of the community of practitioners as well as the top decision-makers within the ecosystem of the university. Section 3 proceeds to the process of development of the items that constitute the tool and discusses the importance of placing users at the centre. The paper finishes with some concluding remarks.

Gender mainstreaming, intersectionality, and co-design: foundations of the development of the GIA tool

Advancing gender equality in research and higher education institutions (HEIs) requires more than isolated efforts; it demands a systemic, inclusive, and reflexive approach that rethinks how knowledge is produced, shared, and institutionalized. This section explores three interlinked concepts - gender mainstreaming, intersectionality, and co-design - that together provide a comprehensive framework for fostering equity and inclusivity in research practices. These concepts offer practical tools and perspectives for embedding gender considerations into the heart of research processes and institutional cultures. Together, they form the foundational pillars of an inclusive, responsive, and transformative research ecosystem. The following subsections examine each in detail, outlining their theoretical underpinnings, practical implications, and significance in fostering more equitable research environments.

Gender equality in research and HEIs

Despite decades of policy initiatives, gender inequalities in research and higher education institutions remain persistent and deeply embedded in organizational structures and practices. Although women now represent an increasing proportion of academic staff, gender disparities continue to characterize academic careers, particularly at more senior levels. Evidence consistently shows that women and other underrepresented groups face higher rates of attrition throughout the academic career trajectory, resulting in their continued underrepresentation in leadership and decision-making positions (Fox 2020; O'Connor 2018). Despite significant gains in educational attainment and doctoral graduation rates, women are still underrepresented in senior academic positions. Women remain less likely to attain tenured positions, progress to full professorships, or occupy senior management roles within universities. These patterns have been studied across European and international contexts, pointing to persistent structural barriers in academic career progression (Iaria 2024; European Commission 2025).

These patterns reflect broader structural inequalities reproduced through organizational cultures, institutional procedures, and implicit norms that shape access to opportunities, resources, recognition, and career progression. Higher education institutions may therefore contribute, often unintentionally, to the maintenance of gendered power relations and unequal participation in academic life (O'Connor 2018).

Importantly, gender inequalities affect not only who produces knowledge, but also the knowledge that is produced (Nielsen 2018). Research priorities, methodological approaches, and the framing of scientific questions are shaped by the perspectives and experiences of those involved in research. Consequently, the underrepresentation of women and

other marginalized groups within academia has implications for whose experiences are investigated, whose needs are addressed, and which forms of knowledge are recognized as legitimate (European Commission 2025).

In response to these challenges, European research policy has progressively strengthened its commitment to gender equality. Within the Horizon Europe framework (2021–2027), gender equality was established as a cross-cutting priority, accompanied by more stringent requirements for research-performing and research-funding organizations. Since 2022, the existence of a Gender Equality Plan (GEP) has become an eligibility criterion for public bodies, research organizations, and higher education institutions applying for Horizon Europe funding. In parallel, the integration of the gender dimension into research and innovation content is expected by default and assessed as part of scientific excellence. These developments have encouraged institutions to systematically monitor gender equality indicators and to strengthen the integration of gender perspectives into research, teaching, and organizational practices. Within this context, tools such as the Gender Impact Assessment (GIA) acquire particular relevance, providing researchers with a practical framework to meaningfully integrate gender considerations into research processes and outcomes.

Gender mainstreaming

Gender mainstreaming concept has faced criticism for being too broad and ambiguously defined (see Walby 2005), but as the United Nations defined Gender mainstreaming is a process rather than a goal: " process of assessing the implication for women and men of any planned action, including legislation, policies, or programs, in all areas and at all levels" (United Nations 1997, p.28). It is a process to promote gender equality by making visible the gendered nature of assumptions, process and outcomes.

In the context of HEIs, gender mainstreaming refers to the systematic incorporation of gender perspectives and the promotion of gender equality across all institutional domains: teaching, research, governance, and administration (EIGE 2019).

Gender mainstreaming encompasses the need for accountability and the transformation of institutional cultures and gender norms to achieve gender equality (Meier 2006). It is therefore a dynamic and ongoing process, rather than a goal, requiring institutional commitment, reflexivity, and sustained engagement from all stakeholders to foster a more inclusive and equitable academic landscape.

Notwithstanding the growing institutionalization of gender equality policies and the widespread adoption of Gender Equality Plans, the implementation of gender mainstreaming remains far from straightforward. Research has consistently identified a range of conceptual, organizational, and political barriers that limit its transformative potential (Kataeva 2024). Among the most frequently reported challenges are the lack of a shared understanding of gender mainstreaming objectives, the tendency to reduce it to a technocratic exercise, insufficient institutional expertise and resources, weak leadership commitment, resistance to addressing deeply embedded gendered power structures and the persistence of meritocratic myths that obscure structural inequalities. As noted by scholars, challenges and resistance to gender mainstreaming persist even when political rhetoric appears supportive (Cavaghan 2016, 2017). Recent analyses confirm and deepen this diagnosis: resistance hinders the potential of gender equality strategies to modify institutional arrangements and challenge the status quo, with implicit institutional resistance and individual opposition from research managers contributing to integrationist, rather than transformative, approaches to gender mainstreaming in university research settings (Tildesley 2023). A key structural paradox underlies these difficulties: gender mainstreaming requires a high level of gender awareness among actors, such as researchers, administrators, and policymakers, who are typically not gender experts, meaning that those least equipped to transform gender discourses are often held responsible for doing so (Roggeband and Verloo 2006). In response to these persistent challenges, the European Union has progressively promoted a structural change approach to gender equality, encouraging the integration of gender mainstreaming across policy domains and institutional practices. This commitment was further reinforced by GEP eligibility requirement.

The incorporation of gender analysis in research design, data collection, interpretation, and dissemination is a particularly demanding dimension of gender mainstreaming in HEI's. While it is crucial that the development of tools

to support gender integration in research is guided by the principles of gender mainstreaming, such tools should not be conceived as rigid or prescriptive methodologies, but rather as flexible, context-sensitive frameworks that can be adapted across disciplinary and institutional settings. The Gender Integration Assessment (GIA) is positioned not as a fixed protocol, but as a co-designed approach aimed at improving access, inclusion, and equity in the knowledge production process. Grounded in the logic of structural change, these tools help researchers identify where and how gender may be relevant to their scientific inquiry, thereby enhancing the epistemic quality and societal value of research outputs. In doing so, they contribute to the broader mission-oriented agenda of European research policy, which seeks transformative solutions to complex societal challenges, all of which are deeply gendered in nature.

In addition to being co-designed, gender equality and mainstreaming efforts in research should also adopt an intersectional approach. Scholars have emphasized that inequalities rarely stem from a single factor; rather, they emerge from the complex interplay of multiple social locations, power dynamics, and lived experiences (Heikkinen 2020). Therefore, applying an intersectional lens is essential when setting research priorities, developing hypotheses, and designing studies to ensure that diverse perspectives and forms of marginalization are adequately addressed.

Intersectionality

Intersectionality is a conceptual and methodological framework that examines how various forms of social stratification, such as gender, race, class, sexuality, ability, age, and others, intersect and interact to produce unique experiences of privilege and oppression (Crenshaw 1989). An intersectional perspective acknowledges that gender does not operate in isolation from other social categories and systems of inequality. Individuals simultaneously occupy multiple social positions, and the interaction between these positions shapes their experiences, opportunities, and constraints across different contexts (Collins 2015; Hancock 2007).

Beyond a framework for understanding diversity, intersectionality has increasingly been recognized as a critical epistemology, challenging assumptions on knowledge production. As argued by Moradi and Grzanka (2017), intersectionality should not be reduced to the inclusion of multiple demographic categories in research. Instead, it calls for a critical examination of who produces knowledge, how research questions are formulated, whose experiences are represented, which forms of knowledge are considered legitimate, and how broader systems of power shape both research processes and outcomes. From this perspective, intersectionality is concerned not only with identities but also with the institutional and structural conditions that produce and reproduce inequalities.

In the context of research design, intersectionality requires researchers to consider how overlapping social positions and systems of inequality shape people's experiences in unique ways that must be considered throughout the research process, from problem formulation to dissemination of findings (Hankivsky 2012). As an example, rather than asking how a phenomenon affects "women" in general, researchers are encouraged to examine how it affects, for example, Black older women or low-income migrant women, acknowledging that these identities shape different experiences (Hankivsky 2012). These interactions are not additive but interdependent; as such, an intersectionality analysis offers a deeper understanding of how sex and gender interact with various forms of inequality, especially within social contexts.

While operationalizing an intersectional methodology is quite challenging, there are some examples that can be useful, as detailed by Hankivsky et al. (2010): (i) *Who is being studied? Who is being compared to whom? Why?* (ii) *How do researchers make sure that they are not seeing what they want to see in their research?;* (iii) *In order to affect social change, does the research include representation from all key stakeholder groups such as policy makers, grassroots activists, and community groups, including multiply oppressed communities?* Similarly, Moradi and Grzanka (2017) emphasize the importance of reflexivity, encouraging researchers to critically evaluate how methodological choices, analytical frameworks, and institutional contexts may reinforce or challenge existing power relations.

These considerations are closely aligned with the objectives of gender mainstreaming, which seeks to systematically incorporate gender perspectives into all stages of policy and decision-making processes. Within research contexts, Gender Impact Assessment (GIA) can be understood as an operational tool that supports the implementation

of gender mainstreaming by encouraging researchers to systematically consider the relevance of sex, gender, and intersecting inequalities throughout the research cycle. In this sense, GIA moves beyond a narrow focus on the representation of women and men, promoting a more reflexive and intersectional approach to research design, implementation, and knowledge production.

In sum, the GIA tool is devised to support the integration of gender and intersectional perspectives in research proposals, thereby contributing to the implementation of gender mainstreaming in research and innovation.

Codesign

To embrace the goal of increasing the ownership of the tool by the researcher community, the process of tool development has to be context-responsive, i.e., considering institutional and disciplinary specificities. This can only be achieved by using participatory methods of design. As argued by Iivari et al. (2023) participatory design for gender equality cannot be understood as a universally applicable approach. Rather, its implementation and outcomes are shaped by local institutional cultures, national policy environments, power relations, and competing understandings of gender equality, highlighting the need for context-sensitive and adaptive approaches. Rather than relying on top-down interventions, co-design fosters ownership, legitimacy, and commitment among participants, thereby increasing the likelihood of long-term institutional change. In the context of gender equality interventions, participatory approaches have been shown to facilitate the integration of diverse experiences and perspectives, enhance the relevance of proposed measures, and contribute to the sustainability of Gender Equality Plans and other structural change initiatives.

EU-funded gender equality initiatives show a clear integration of co-design and participatory design approaches. One of the earliest examples is PLOTINA (https://www.plotina.eu/), which applied participatory processes to the development of GEPs involving institutional stakeholders in co-creation activities. This approach was further formalised with RESET (https://wereset.eu/), which explicitly used co-design and collective intelligence methods to redesign and implement GEPs across European universities, and more recently projects such as INSPIRE (https://www.inspirequality.eu/) and EU-CIEMBLY (https://www.eu-ciembly.eu/en/project), which are further expanding co-design into intersectional and democratic innovation contexts, using participatory methods to design inclusive governance and gender equality systems.

These projects illustrate a clear shift from institutional participatory reform toward broader, intersectional co-design ecosystems in EU gender equality policy.

In this context, the use of co-design as a form of participatory research with a commitment to democratic and emancipatory values (Greenbaum and Loi 2012) is unambiguous as co-design, as a participatory design, conceptualises users as active participants in the design process, engaging them across multiple stages of development and decision-making rather than treating them solely as end-users of predefined solutions (Wacnik 2025).

In the context of designing a tool for gender integration in research, co-design offers a powerful framework for engaging diverse stakeholders, not just as users, but as co-designers. It supports the creation of environments and instruments that are responsive to lived experiences and attuned to systemic inequalities. This means the tool is not only functional but also a means of transformation, helping to reconfigure research practices, address power dynamics, and support structural change within scientific institutions (Iivari 2023).

In this context, designing a gender integration tool through co-design involves fostering *active, effective, and meaningful stakeholder participation*, where all participants - researchers, practitioners, administrators, and potentially affected groups - are engaged as co-creators. This approach is rooted in *mutual, reciprocal learning and competence building*, where everyone's expertise is valued, and *contextual, situational, and cultural sensitivity* is prioritized (Greenbaum and Loi 2012; Iivari 2023). Central to this is the commitment to *equalising power relations*, particularly by *finding ways to give voice to those who may be invisible or weaker in organisational or community power structures* (Greenbaum and Loi 2012; Iivari 2023). The work is to be done within *situation-based actions*—working directly with people in their everyday settings to understand practices and technologies in context, rather than through detached abstractions.

Ultimately, this approach seeks to enact *democratic practices*: embedding reflexivity, ethics, responsibility, and accountability in the role of the designer-researcher, while actively striving to redistribute power and amplify marginalised voices. In doing so, it opens up space for the co-creation of research environments and processes that are not only functional but also transformative (Greenbaum and Loi 2012).

Although we see co-design as a powerful and positive approach, associated with benefits such as stakeholder engagement, legitimacy, and contextual relevance, we acknowledge that recent literature highlights several challenges such as difficulties in sustaining meaningful participation, uneven power relations among stakeholders, limited innovation outcomes, ethical concerns regarding representation and inclusion, and substantial dependence on contextual and facilitation factors (Sendra 2024; Dubois 2024; Masterson 2024).

In our case, an assertive approach was followed to mitigate these possible foreseen conditions.

The first step was to identify all relevant stakeholders who will use or be affected by the tool to be developed and invite them to contribute to the design process. Participation should be meaningful and relevant to stakeholders' lives, addressing their needs and interests. It should also be effective, with participants feeling that their involvement genuinely impacts the outcome. Another key principle was fostering mutual, reciprocal learning among all participants. Co-design should be grounded in a respect for each group's unique expertise, acknowledging that everyone has valuable knowledge to contribute. The process should encourage all participants to learn from one another, recognizing that combining diverse perspectives leads to creative and innovative solutions. As such, co-design approaches focus on equalizing power relations and promoting democratic practices by actively including those who might otherwise be marginalized. This requires careful reflection on which groups have been excluded or have had limited voice in the discussions. Using a co-design approach requires contextual, situational, and cultural sensitivity. Each co-design process is embedded in a unique cultural, organizational, social, political, and historical context, so there is no one-size-fits-all solution. The co-design approach must be adapted to fit the specific context of each institution. This involves considering the unique dynamics and needs of the institution in advance and modifying the co-design methods accordingly to ensure they are appropriate and effective for the particular setting.

Hence, co-design emphasizes the importance of understanding the local conditions in which the design solutions will be used, in this case, the GIA tool: who will be the main users and/or affected by the design solutions? What are their skills, characteristics, needs, desires, goals, and tasks? In what kind of context will they use the design solutions?

Building a community of practitioners: the first step to a collaborative design of the GIA tool

The starting point for the work that would lead to the development of the GIA tool benefited from exploratory work, under different work packages of the RESET project and involving processes of consultation with stakeholders with diverse roles in the ecosystem of the University of Porto. To operationalize the GIA tool, the co-design process was structured into four sequential stages: stakeholder mapping and CoP constitution, iterative testing, group discussion, and final reporting and institutionalisation (Heikkinen 2022). Initially, a stakeholder mapping process was conducted to identify key actors across various scientific fields, leading to the formation of a Community of Practitioners (CoP). It was clear from the onset that many researchers often would dismiss concerns about including a gender dimension in their research proposals, and this happened for a variety of reasons, ranging from lack of awareness to perceived irrelevance. While gender is increasingly recognised as a critical factor in scientific studies, there were clearly numerous barriers that prevented researchers from integrating gender analysis into their work. These challenges involved both researchers in general and the decision-makers at the university level. We address them separately.

Ensuring effectiveness, sustainability, and institutionalisation: the case for involving top decision-makers

A key factor that was considered critical in addressing the challenges of a successful implementation of the GIA tool was the involvement of top decision-makers, that is essential to overcome institutional resistance, legitimize new

practices, and shift embedded gender norms across academic structures (Cavaghan 2017). Top decision-makers hold significant influence over the priorities and directions of research funding, policy, and institutional support. Their involvement in the development of the tool to assess gender integration would ensure that this tool is aligned with broader institutional agendas. Decision-makers, by virtue of their positions, can shape the framework within which gender analysis is viewed and acted upon within academic and research settings. When they are engaged in the development process, they can ensure that these tools are not just theoretical or idealistic but are practical and realistic, reflecting the strategic goals of the institution. Their authority can help make gender integration a central and mandatory component of research proposals, which, in turn, can lead to more effective implementation of gender-sensitive research methodologies.

Moreover, their involvement was considered fundamental to help institutionalise gender analysis as a key factor in research, ensuring that gender considerations are not treated as peripheral or optional but as central to the research process, thus contributing to the gender mainstreaming process. This sends a powerful message to the entire research community that gender integration is a priority and must be taken seriously. Without the active support of decision-makers, the tools created to assist researchers may lack the necessary weight to influence change at the institutional or systemic level.

Furthermore, top decision-makers control the allocation of resources. Their involvement could help ensure that adequate resources—whether financial, technical, or educational—would be dedicated to the development and implementation of the GIA tool. Training programs or workshops that support researchers in improving their gender integration practices were planned from the early stages as a fundamental element of the process, and the involvement of top decision-makers was crucial to secure the necessary resources to do so. By being involved in the tool development process, decision-makers can also ensure that resources are distributed in a way that supports long-term sustainability. This could include investing in the development of software, providing incentives for researchers who integrate gender effectively, or funding further research into the intersectionality of gender with other social factors, among others. Such resource allocation is essential for ensuring that gender integration does not become a fleeting or tokenistic effort but is embedded within the research culture as a priority.

In addition to resource allocation, top decision-makers are responsible for creating the institutional policies and frameworks that govern research practices. Their participation in the development of gender integration tools ensures that these tools are in alignment with institutional policies and research priorities. If gender integration is to be effectively assessed, it must be incorporated into the institutional policy landscape. Decision-makers can help create or modify policies to require the inclusion of gender assessments in research proposals, making gender integration a standardized and institutionalized practice rather than a discretionary or optional aspect of research design. Moreover, their involvement ensures that tools are developed in a way that complements existing institutional strategies, making it easier for researchers to adopt and implement them.

To ensure alignment with institutional policies and facilitate effective dissemination, the initial checklist and its validation plan were presented to the Research and Innovation Vice-rector, who was responsible for the protocol and its implementation at the University of Porto. This presentation was crucial for securing high-level institutional buy-in and ensuring that the GIA tool would be integrated into the university's research framework. The top leadership endorsement demonstrated the university's commitment to promoting gender-sensitive research practices and provided a strong foundation for the tool's subsequent implementation and dissemination, starting with the actual implementation of a collaborative participatory approach that would engage researchers themselves in the tool's development.

Resistance and distance among researchers: the case for a collaborative participatory approach

Following the engagement of the top leadership, a Community of Practitioners (CoP) was established to provide further input and expertise in the validation process. This working group consisted of 17 researchers (8 females and 9 males) strategically selected to represent diverse disciplines, including principal investigators with significant experience in mega-funding projects (Heikkinen 2022).

While the importance of including a gender dimension in research has gained significant global recognition in recent years—driven largely by European Commission mandates and evidence showing that gender analysis improves scientific excellence (European Commission 2025; Tannenbaum 2019)—researchers have often dismissed these concerns in practice. For instance, global analyses reveal that less than 2% of research publications explicitly address sex and gender in their key fields (European Commission 2025).

Furthermore, the participatory co-design approach was not without limitations and institutional challenges. A primary constraint during the initial testing and iteration phases was sample bias; the activities primarily attracted researchers who were already sensitive to gender topics, making it difficult to reach the less committed academic population (Heikkinen 2024). Additionally, significant disciplinary resistance was observed. Researchers from STEM fields and hard sciences (e.g., physics and engineering) often perceived the checklist as unbalanced or irrelevant, arguing that their research did not directly involve human participants (Heikkinen 2024).

Addressing these challenges required the CoP to critically re-evaluate the tool. To prevent the GIA from being perceived as a bureaucratic 'tick-in-the-box' exercise, the CoP iterated the design to function as a pedagogical and capacity-building instrument. The checklist was reorganized into fundamental and advanced levels of gender integration, incorporating a 'not applicable' option that requires justification, and structuring questions progressively to prevent respondent alienation (Heikkinen 2022; Heikkinen 2024).

Additionally, researchers would dismiss gender concerns due to assumptions that their research is "objective" and free from social influences. Many viewed science as a neutral pursuit of truth, free from the biases that characterize everyday life. Gender, therefore, is often seen as an extraneous factor that does not fit into the "pure" research methodology. This belief can lead to the idea that including gender analysis would undermine the scientific rigor of their study, even though ignoring it may result in incomplete or biased findings. After some reflexive work during CoP meetings, this view was generally acknowledged.

Time constraints and the pressure to meet funding requirements can also contribute to dismissing gender dimensions in research proposals. With limited resources and strict deadlines, researchers often prioritize the core aspects of their study over what might seem like supplementary or peripheral concerns. Gender analysis is sometimes viewed as an additional layer of complexity that could delay progress or complicate the proposal. This became a concern from the early stages and something CoP members agreed should be considered while developing the tool.

Furthermore, institutional biases and a lack of support for gender-sensitive research can discourage researchers from exploring gender issues. In many cases, there is insufficient training or mentorship on how to integrate gender into research, and researchers may feel that pursuing this avenue will not be valued by their peers or funding agencies. When gender is not explicitly required in funding calls, researchers may view it as an unnecessary addition.

It was clear to the RESET team that overcoming all these challenges would require not only raising awareness about the importance of gender in research but also creating an environment where researchers are supported and encouraged to explore how gender can shape their findings. This was, to a certain degree, the ultimate goal of developing a GIA tool. GIA was planned from the beginning to operate as an *ex ante* evaluation of the sex and gender dimensions in research activities and products. The aim was to determine the degree of sex and gender responsibility of a research proposal. By focusing on the very early stage of the research, GIA wanted not only to contribute to the success of individual researchers' research projects, research teams' proposals, and organizations, but also help change how researchers approach science and research problems and protocols, offering them a supportive tool that aids on reflexiveness while raising awareness.

It was also clear from the beginning that the process of integrating gender considerations into research would be complex and would require a deep understanding of how gender intersects with other factors and influences the outcomes of research across different fields and among different groups of researchers. One of the most effective ways to support this process would be by involving researchers directly in the development of the tool that was supposed to be designed to assist them in this task.

On the one hand, we wanted the tool to be grounded in the practical realities of research. Researchers have firsthand experience of the challenges they face when conducting studies, and their insights into how gender dynamics can affect their specific fields of study are invaluable. Without input from those who are actively engaged in research, tools may fail to address the nuances and specificities of different academic disciplines, leading to solutions

that are too generic or disconnected from real-world applications. By involving researchers in the development process, the resulting tools are more likely to be relevant to their needs, allowing for a more seamless and effective integration of gender dimensions into research proposals. This fully aligns with one of the first principles of co-design: active, effective, meaningful stakeholder participation (Iivari 2023)

On the other hand, researchers are the end users of the tools, so it is essential that they are intuitive and easy to navigate. Tools designed to assist with the integration of gender analysis into research proposals must be accessible to researchers with varying levels of expertise in gender studies. Some researchers may be experts in their field but have limited knowledge of gender theory, while others may already be familiar with gender-sensitive research methodologies. By involving researchers with and without gender expertise in the development process, the goal was to ensure that the tool would be tailored to a diverse audience, with user-friendly interfaces and customizable features that meet the needs of different researchers. This input helps make gender analysis more accessible and less intimidating, encouraging more researchers to engage with and adopt these tools.

With an eye on the dissemination of the tool, it was also considered that researchers are more likely to use tools that they helped create or shape. Involving them in the development process fosters a sense of ownership and investment in the tools. When researchers feel that their perspectives and needs have been taken into account, they are more likely to see the tool as a useful resource rather than as an imposed obligation. This concrete application of the co-design principle of mutual reciprocal learning by valuing each other's expertise and collaborative design can lead to higher levels of engagement, ensuring that gender dimensions are consistently incorporated into research proposals. Additionally, when researchers are part of the development process, they can help identify potential barriers to the adoption of gender-sensitive research practices and contribute ideas for overcoming them. This collaborative approach increases the likelihood that the tools will be both effective and widely used.

Tools that are developed with input from researchers are more likely to be sustainable over time. Researchers can provide feedback on how the tools function in real-world settings, enabling them to refine and improve them based on actual usage. This iterative process ensures that the tool evolves to meet the changing needs of the research community and remains relevant as new challenges and opportunities emerge, making it contextual, situational, and culturally sensitive (Iivaria 2023). Furthermore, when researchers are involved in the development process, they are more likely to advocate for the continued use and improvement of the tool within their institutions and networks. This advocacy can lead to a broader and more sustained integration of gender analysis into research across different disciplines.

Last but not least, involving researchers in the development of a gender analysis tool was seen as a rare opportunity to promote a culture of inclusivity within the scientific community while building bridges across different research groups that too often do not interact. By sending a message that gender is an important consideration in research and that the perspectives of diverse researchers—particularly those from underrepresented or marginalized groups—are valued, this participatory approach could help challenge existing biases and assumptions about gender in research, encouraging researchers to rethink how gender intersects with their work and broadening their understanding of what inclusive, high-quality research looks like.

After the initial version refinement, a group of researchers from the GIA CoP was invited to test and comment on the GIA Checklist (test version). To gather structured feedback on the checklist's clarity, relevance, usability, and overall effectiveness, an evaluation questionnaire was integrated into the test version. A sample of 9 researchers from our CoP were able to test this GIA Checklist for Research Proposals version and provide feedback in a systematic manner, via an evaluation questionnaire. These researchers covered the scientific fields of: i) Arts and Humanities; ii) Business, Administration and Law; iii) Education; iv) Health and Welfare; v) Information and Communication Technologies; and vi) Social Sciences, Journalism and Information. Following the filling in of the questionnaire, a group discussion was held to gather further qualitative feedback and insights, which were then used to refine the GIA checklist for practicality and effectiveness.

Towards a responsive, user-centred gender assessment tool that builds capacity

The goal of developing a gender assessment tool for researchers was to ensure that gender considerations are effectively integrated into research practices. To maximize its effectiveness, the tool must be both responsive and user-centered. These were guiding principles in the process that would lead to the final design of the GIA tool.

A responsive gender assessment tool takes into account the diverse needs and contexts of different research groups and disciplines, but also of the different communities, places, and objects that are central in the different research fields. Gender roles, norms, and issues vary significantly across settings. By being attuned to these specific dynamics, the tool can provide researchers with relevant insights and data that help them understand and address specific gender-related challenges in their study area.

User-centered design prioritizes the needs, experiences, and feedback of the end-users—the researchers themselves. Involving researchers in the development of the tool ensures that it is practical, relevant, and easy to use. When researchers feel that a tool has been designed with their input, they are more likely to engage with it actively, leading to more thorough and mindful gender assessments. Involvement of researchers in the iterative process of designing the tool became a building block of the tool itself.

A well-designed tool that caters to researchers' practical needs can also serve as a platform for capacity building. Researchers can learn about gender issues and effective assessment strategies through the use of the tool, ultimately empowering them to conduct better-informed studies. This educational aspect can lead to a broader understanding of gender dynamics within their research teams and communities. This was, from the onset, one of the goals of the GIA tool.

In view of achieving these goals, the RESET team designed a protocol that involved a collaborative process of co-designing the GIA tool that evolved along three phases.

Responsiveness in a diverse research ecosystem

To understand the responsiveness of the tool, it is crucial to clearly define what it is and how it functions compared to pre-existing frameworks. The Gender Impact Assessment (GIA) developed under RESET is an ex ante evaluation tool aimed at determining the degree of sex, gender, and intersectional responsibility in a research proposal. While pre-existing tools, such as the Stanford Gendered Innovations or the SAGER guidelines,offer valuable but mostly static self-study materials and reading guidelines, the RESET GIA distinguishes itself by being a dynamic, interactive, and pedagogical checklist.

The initial GIA checklist was co-designed with the RESET team, and it was compiled together by using various already existing checklists and guidelines (Heikkinen 2022). The first draft included crucial points on inclusion of gender perspective in research as well as issues such as gender composition of the research team; division of tasks, when relevant; gender in relation to data collection and its representation in the data, and gender as an analysis category or as a tool of data analysis. The co-designed GIA checklist was systematised to include three parts corresponding to the Horizon grant application, namely Excellence, Implementation, and Impact. To ensure practical relevance, it prompts researchers with specific, actionable questions. For instance, in the Excellence phase, it asks if sex and gender were included as keywords in the literature review; in the Implementation phase, it assesses if the research team is balanced in terms of sex and diversity; and in the Impact phase, it questions whether the research results might have different effects depending on people's social characteristics, such as gender. By providing specific prompts rather than broad theoretical guidelines, the tool responds directly to the practical needs of researchers.

One aspect that stood out during the codesign was the lack of relatability of some researchers to some items in the scale. A simple "yes/no, don't know scale" was insufficient, given that many researchers were firm in their belief that some issues covered by the tool did not apply to their field. Although it was also clear to RESET researchers that many of those manifestations were actually mirroring the low awareness of some researchers towards gender dimensions in research, in practice, the need to have a "does not apply" category became evident. Its inclusion would

further create room for questioning researchers about why a specific item does not apply to their research and would signal additional needs for capacity building.

User-centredness in a diverse community

Given the diversity of the research community, with varying disciplinary backgrounds, institutional contexts, cultural norms, and levels of familiarity with gender concepts, it was essential that the development of the tool would follow a user-centred perspective. A one-size-fits-all approach risks alienating or excluding user groups. Instead, a user-centred design ensures that the tool is accessible, adaptable, and meaningful to its wide array of users. In order to engage researchers throughout the development process, so that the tool would become more responsive to real-world needs and challenges, ultimately increasing its relevance, uptake, and impact in advancing gender integration across disciplines, RESET researchers have conducted several presentations in meetings with groups of researchers across different research fields and centres. Moreover, the research team has also engaged in training sessions, tailored to the specifics of each group of researchers. In doing so, not only have we initiated the dissemination of the tool before it was finalised, but we have also created ample opportunities to test it in a diversity of research scenarios, increasing its goodness-of-fit by systematically looking at it from different perspectives.

Building capacity for gender integration in research

Following what was said above, it became important that the checklist would be informative, but also operate as a learning tool for researchers and actually operate as a transformative element itself.

Not all research can be gender-transformative – it depends on the objectives, context, and scope of the research. But this cannot be used as an excuse to be gender-blind. The checklist should help researchers to strengthen their level of gender integration. It was consensual that it was important to be open to engaging in a critical analysis and discussion around how well gender can be integrated in research, and what the challenges and opportunities are for that to take place. The checklist should be treated as a starting point, and researchers should not limit themselves to the issues it raises.

Gender integration in research is not something that takes place at a specific point in time during the life cycle of the project. Researchers must adopt a reflexive approach to questioning how well gender is being integrated at different stages of the research cycle. It should not be an issue raised once the research is finished and just to prepare for dissemination and publication. Researchers must be reflexive and be aware of their own gender assumptions, biases, and power as researchers. Research and researchers are never neutral.

These notions translate into a format for the tool that involves the production of additional content to enrich the experience of navigating the tool itself. On the one hand, navigation is accompanied by elements that give access to explanatory materials covering key concepts and dimensions of gender integration in research. Hovering over the items in the checklist offers links to such materials. On the other hand, once the checklist is fully completed, users get feedback. Feedback is tailored to the user based on an algorithm that offers feedback based on combinations of answers ticked by users across the items of the checklist. If fundamental gender integration items are not met, the system automatically provides immediate explanatory content, practical examples from successful research cases, and direct links to scientific literature, enabling researchers to actively bridge their knowledge gaps in real-time. Final recommendations are organised along fundamental and complementary items to offer users an overview of how far their research approaches are from what a positive gender integration in research looks like. This interactive tailored feedback ensures that the tool is not just an evaluation protocol, but a continuous and personalized learning platform.[1]

The GIA tool has been fully developed and is in use by the researchers at the University of Porto[2]. Formal endorsement from the top management, with investment in ample dissemination across all faculties and research

[1] according to the International Standard Classification of Education (ISCED-F 2013), available at https://doi.org/10.15220/978-92-9189-179-5-en.

[2] available at https://giachecklist.up.pt/.

centres, has helped secure the outreach of the tool. Access to the tool generates data that will allow the monitoring of its use by the community of researchers, by disciplinary fields, and by the profile of researchers (early-stage, established, and PhD students). This monitoring will be critical to future revisions of the tool and its constant adaptation to an evolving science.

Concluding remarks

The development of the Gender Integration Assessment (GIA) tool at the University of Porto represents a significant step toward fostering more inclusive, reflexive, and equitable research practices. Grounded in the principles of gender mainstreaming, intersectionality, and co-design, this initiative illustrates the importance of creating tools that are not only theoretically robust but also practically relevant and context-sensitive.

Crucially, the project emphasized a user-centred approach, recognizing the diversity of the research community and the need to engage researchers as co-creators rather than passive recipients. This participatory process not only enriched the tool's design but also contributed to a broader culture shift - one that views gender integration not as a bureaucratic requirement, but as a meaningful and necessary component of research excellence.

While the findings demonstrate the value of co-design in developing the tool, we acknowledge that its transferability cannot occur without a contextual and cultural adaptation phase. As discussed above (Dubois 2024; Masterson 2024), recent research highlights that co-design processes are highly context-dependent, with outcomes shaped by institutional arrangements, stakeholder composition, facilitation practices, available resources, and existing power relations. Consequently, the effectiveness of co-design may vary substantially across settings, limiting straightforward replication or scaling of results. Rather than proposing a universally applicable model, our work aims to be read as offering context-sensitive insights that may inform, but not determine, the design of similar initiatives elsewhere.

The development and implementation of the GIA tool discussed in this paper offers a valuable blueprint for other HEIs navigating the complexities of gender mainstreaming in research. While this study is based on a single-case analysis, the institutional mechanisms, challenges, and design strategies encountered yield highly generalizable lessons for the broader academic ecosystem.

A primary takeaway for other HEIs is that the success of a gender assessment tool cannot rely solely on policy mandates or grassroots enthusiasm; it requires a dual-axis governance model. On the one hand, engaging top decision-makers (such as Vice-Rectors of Research) early in the process is essential to secure necessary funding, resources, and structural legitimacy. This ensures the tool is embedded within the institutional policy landscape rather than treated as a peripheral, optional exercise. On the other hand, and simultaneously, HEIs must establish a diverse, multi-disciplinary CoP to co-design the tool. Involving active researchers—particularly high-profile investigators—creates a sense of ownership, ensures user-friendliness, and bridges the gap between theoretical gender mainstreaming and the practical realities of diverse scientific fields.

Another key takeaway from this experience is that HEIs implementing similar tools must proactively prepare for institutional resistance, particularly from STEM and hard sciences fields. The case analysis reveals two common barriers that other institutions will likely face: the assumption of scientific objectivity (the belief that hard sciences are neutral and free from social influences) and the perceived irrelevance of gender dimensions in research that does not explicitly involve human subjects. To mitigate this, HEIs should avoid a one-size-fits-all framework. Instead, they should adopt a collaborative participatory approach that uses tailored training and presentations to demonstrate how gender and intersectionality intersect with specific scientific disciplines. Furthermore, anticipating sample bias during initial testing - where only already-sensitized researchers participate - is crucial for refining outreach strategies to engage less committed academic populations.

A third critical takeaway concerns preventing a gender assessment tool from becoming a dismissed, bureaucratic tick-in-the-box exercise. To avoid that risk, HEIs should design it as a dynamic pedagogical instrument. Three structural features extrapolated from the case-in-analysis highlight how a tool can shift from bureaucracy to capacity building. On the one hand, by means of progressive questioning and stratification, structuring the tool into fundamental and advanced levels that prevent respondent's alienation and allow researchers with varying levels of gender

expertise to navigate it easily. On the other hand, by incorporating an N/A option, coupled with a mandatory justification, the tool reconciles respecting disciplinary differences while simultaneously prompting researchers to critically reflect on why they believe gender does not apply to their work. Finally, by means of leveraging digitalization to provide real-time, algorithmic feedback, definitions, and direct links to successful case studies or scientific literature the tool transforms from a rigid evaluation protocol into a personalized, continuous learning platform.

As the tool is implemented and further adapted, its success will hinge on ongoing engagement, iterative refinement, and responsiveness to evolving scientific and societal challenges. In this sense, the GIA tool is not an endpoint but a foundation for continued transformation toward a research culture where gender is not peripheral but integral to knowledge production and scientific responsibility.

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Declarations

Competing interests The authors declare no competing interests.

Ethics approval and consent to participate The RESET audit was approved by the University of Porto Ethics Committee (Reference: 112/CEUP/2021). The research was conducted in accordance with the ethical principles and relevant guidelines and regulations applicable to research involving human participants. Informed consent was obtained from all participants prior to their participation in the study.

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