

# **ARTICLE**

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# **Gender Equality Plans and Inclusiveness in the European Research Area**

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# **Abstract**

Gender equality is a key objective of the European Research Area. The arsenal of gender equality concepts has expanded considerably over the past decades—from gender mainstreaming in the 1990s to the current inclusion, diversity, and intersectionality approaches. Gender equality plans (GEPs) are key to increasing gender equality. With the launch of Horizon Europe, the European Union's research and innovation program 2021–2027, the European Commission introduced a new eligibility criterion: To be eligible, any research-performing organization (RPO) applying for funding, except private companies, must have a GEP in place. There is little evidence on the prevalence of GEPs at RPOs, and if they incorporate concepts about inclusiveness, which is increasingly intended. To address this knowledge gap, we present the first results of a unique mixed-method study that combines online survey data (N = 270) and web-scraping data (N = 6,475). Almost half of the studied organizations (41%) have a GEP. Our results show differences for organization types, i.e., private companies are less likely to have one (6%). Moreover, the intersectionality approach (14%) is less frequently used in GEPs than inclusion (76%) and diversity (80%). Diversity as an approach is significantly more widespread in Northwestern Europe compared to Central Eastern and Southern European countries. Based on our study, we recommend that policymakers develop measures for private companies as well and call for further support to develop intersectional and inclusive approaches of GEPs in RPOs.

## **Keywords**

diversity; European Research Area; gender equality plans; Horizon Europe; inclusion; intersectionality



#### 1. Introduction

Gender equality is a core value of the European Union (EU), and it is enshrined in the EU treaties (European Commission, 2021c, p. 6). The EU is committed to advancing gender equality in all areas, including research and innovation. Not only should education and science be accessible regardless of gender, but everyone should have an opportunity to acquire and contribute to scholarship and scientific knowledge. The prevailing narrative is one of "inclusive excellence," which holds that diversity in science and research will increase innovation and excellence (Zippel et al., 2016).

Measured by the proportion of women in research (as one possible numerical indicator for gender equality), progress toward greater gender equality is far too slow: The *She Figures 2024* report (European Commission, 2025b), which provides comparable pan-European data on developments toward gender equality in research and innovation, shows that women accounted for around one third of the total population of researchers in the European research landscape (p. 11).

The European Commission's arsenal of concepts of "gender equality" has expanded considerably over the past decades. A boost to equality policies has been "gender mainstreaming" in the 1990s (Rees, 1998). This approach enabled more far-reaching change towards gender equality in Europe, because it "mainstreams" the systematic analysis of all organizational procedures with respect to gender equality. In recent years, the focus has been broadened to include the concepts of "inclusion" and "intersectionality" (Crenshaw, 1989) into the framework of the European Commission (2020, 2022). Both approaches call for gender equality approaches that include various geographic and sectoral levels and acknowledge the intersection of inequalities.

GEPs are key to achieving institutional change in research and innovation organizations (European Commission, 2012, 2021c). A GEP is defined by the Horizon Europe program as "a set of commitments and actions that aim to promote gender equality in an organization through a process of structural change" (European Commission, 2021b, p. 11). The eligibility criteria require that a GEP include the following: (a) be publicly available; (b) include dedicated resources; (c) establish mechanisms for data collection and monitoring; and (d) implement activities aimed at raising awareness and providing training on gender equality (European Commission, 2021b, p. 9). This study adopts the Horizon Europe definition of GEP due to its practical applicability to both data collection methods (online survey and web scraping) and its alignment with current EU policy frameworks. Furthermore, this standardized definition allows for the comparability of results across the sampled countries. Under Horizon Europe (2021-2027), the European Commission's research and innovation program, all higher education institutions and research organizations applying for research funding (except private companies) must have a GEP in place (European Commission, 2021a, 2021b). However, knowledge about the prevalence, characteristics, and implementation of GEPs in the European Research Area (ERA) is scarce, and even less is known about the extent to which GEPs adopt an inclusive or intersectional perspective (ERAC Standing Group on Gender in Research and Innovation, 2021; European Commission, 2015, 2025a; European Institute for Gender Equality, 2016; Research Council of Norway, 2016). This contribution addresses this research gap.

The research questions are:

1. How prevalent are GEPs in research-performing organizations (RPOs) across the ERA?



- 2. What underlying concepts of gender equality, equality, and inequalities are mentioned in the GEPs, and how do they differ by organizational and regional context?
- 3. What understanding of gender is expressed in the GEPs, and how do organizational characteristics or regional contexts favor gender inclusiveness?

Insights from this study will inform policymakers about reliable data to shape gender equality approaches more precisely and will give input for social scientists about the distribution of gender equality approaches in European research organizations on a large scale. Our main aim is to describe the phenomenon on a broad scale, instead of an in-depth analysis of case studies.

The data collected comprises online survey data and web-scraping data. Using this mixed-method approach, we investigated organizations in 27 EU member states and five associated countries. The data has been gathered in the context of the EU-funded project INSPIRE, which deals with methods for monitoring of GEPs in Europe. This contribution addresses another research gap concerning how these two methodologies make it possible to relate to each other different results and to compare the methodologies for monitoring processes.

The article is structured as follows: Section 2 presents hypotheses based on the literature review and provides an overview of the changes in equality concepts in the European research landscape and the policy background of the European Commission. Section 3 outlines the methods and data of the current study, while Section 4 presents the results. Finally, Section 5 summarizes the findings and provides recommendations.

# 2. Changes in Equality Policies: From Gender Mainstreaming Toward Inclusive GEPs in the ERA

A first survey study by the European Commission (2015, p. 115) found that 36% of the 200 responding RPOs in the EU-28 had adopted a GEP. However, surveys have the disadvantage of relying on the response rate, which is, on average, very low. On the other side, they provide more in-depth information. Another study by the European Commission used web-scraping techniques to measure the prevalence of gender equality measures in the ERA "by capturing the proportion of research organizations whose websites report that they have taken actions and measures towards gender equality" (European Commission, 2021c, p. 168). The web-scraping data showed that in the majority of ERA countries, "more than 50% of higher education institutions mentioned actions and measures towards gender equality on their websites" (European Commission, 2021c, p. 169). This method has the advantage that it is independent of responsiveness. Its disadvantage is that it requires publicly available information about gender equality activities on the websites. This is the reason why we use a mixed-method approach, which combines the advantages of both approaches and reduces the disadvantages.

In recent decades, the arsenal of "gender equality" approaches has changed considerably in the European context. In the 1990s, the idea of mainstreaming equality (Rees, 1998) boosted the spread of organizational strategies towards gender equality. It declares that every organizational procedure has to be systematically analyzed with regard to gender equality (Danowitz & Bendl, 2010; Rees, 2012; Woodward, 2003). Further, it does not contain a clear set of goals and instruments (Verloo, 2007; Walby, 2005; Woodward, 2003); thus, every organization must spell out its goals for gender equality itself, which makes it time- and cost-intensive. Gender mainstreaming gained attention already in 1994 when the Council of Europe established a Steering



Committee for Equality between Women and Men. Five years later, gender mainstreaming was established as a policy strategy in the EU with the ratification of the Treaty of Amsterdam, and national governments committed to implementing it in public institutions, including universities. Based on this, our first hypothesis is:

H1 (GEP prevalence): "Gender equality plans" are more prevalent than "gender equality and diversity plans" and "diversity, equity, and inclusion plans" in RPOs in the ERA.

In recent decades, "gender mainstreaming" has been joined by three other concepts—"diversity," "intersectionality," and "inclusion"—which have been introduced in the field with the aim of supporting equality and challenging the understanding of gender (Danowitz & Bendl, 2010). Although these approaches differ in their origins and focus, they have in common that they are somewhat abstract and are discussed very controversially in academia, social movements, and practice fields (Riegraf et al., 2010).

Diversity management is a human resource strategy that celebrates difference among the workforce, and by doing so, it tries to decrease discriminatory exclusion. Companies and other organizations, therefore, began to develop anti-discriminatory measures focused on different lifestyles and social backgrounds, not only gender inequalities (Dennissen et al., 2020). Diversity management is seen as an organizational response to the anti-discrimination movements in the USA in the early 1980s (Danowitz & Bendl, 2010). Anti-discrimination laws became established in the US-American context, applying to both the public and private sectors. There is also some evidence that there are regional differences in the distribution of the idea of diversity in Europe. In the UK and Ireland, diversity is stronger than only gender equality approaches (Claeys-Kulik et al., 2019; Grant & Allweiss, 2014; Xiao et al., 2020). The Athena SWAN Charter, which was introduced in the UK in 2005 and has since been expanded to Ireland and Australia, and recently to the USA and Canada, also boosts the diversity, equality, and inclusion approach (Claeys-Kulik et al., 2019; Xiao et al., 2020).

In Europe, the idea of diversity received legal acclamation through the spread of anti-discrimination laws in the EU between 2000 and 2004 (Sauer & Wöhl, 2008; van der Haar & Verloo, 2013). Similar to the USA, European countries have committed to prohibiting by law various grounds of discrimination besides gender and have introduced the diversity approach. However, diversity was only introduced after the gender mainstreaming approach had already become widespread in Europe. In contrast to the US-American path, in the European context, some countries had already established legislation to promote gender equality before this anti-discriminatory legislation came (ERAC Standing Group on Gender in Research and Innovation, 2021). So in many European countries, diversity plays a minor role as an approach in comparison to gender equality, like Germany (Riegraf & Weber, 2017; Zippel et al., 2016), Austria (Wroblewski & Lipinsky, 2018), and Sweden (Husu, 2019).

Based on the literature reviewed above, we propose a second hypothesis:

H2 (regional context): The concept of diversity is more prevalent in countries in Northwestern Europe than in other country clusters.

Our third hypothesis derives from the literature about the fact that anti-discrimination laws apply to both public- and private-sector employers, and that in private companies, diversity and inclusion concepts are more



highlighted instead of intersectionality (Boxenbaum, 2006; Hansen & Seierstad, 2017; McKinsey & Company, 2020; Tandé, 2017):

H3 (organization types): In private companies, diversity- and inclusion-related concepts are more widespread than intersectionality-related ones.

Diversity management is an approach that focuses more on individual differences than structural inequalities (Ely & Thomas, 2001). Accordingly, there has been a great deal of debate as to what differences should be addressed by the concept of diversity and how these differences relate to each other in the scholarly discussion. Overall, there are also some regional specificities in how diversity is used. In the US-American context, diversity in higher education is very much linked to race and ethnicity (Grant & Allweiss, 2014, p. 34). In Spain and the UK, the idea of diversity tends to be related more to support for students and to the notion of disability and learning difficulties (Hardy & Woodcock, 2015; Klein, 2016; Mora et al., 2021), whereas in other European countries it is connected to support for ethnic minorities in academia (Groeneveld & Verbeek, 2012; Weber, 2017). In the UK, it also has a strong emphasis on sexual orientation (Raja et al., 2023).

Our fourth hypothesis addresses the link between the inequality dimensions addressed and the underlying concept of gender equality adopted in GEPs:

H4 (diversity and inclusion approach): If an organization addresses inequalities related to race/ethnicity or disability in its GEP, it is more likely to adopt a diversity or inclusion approach in the GEP.

Intersectionality, the third important concept discussed in the context of gender equality policies, refers to the realization that dimensions of inequality are not simply additive but rather overlap and interact with each other (Crenshaw, 1989). Gallego-Noche et al. (2021) noted that:

The concept of intersectionality has become a springboard for the analysis of power relations that produce inequalities and oppression and has given way for the need for critical inquiry that questions educational practices and political interventions that are incapable of responding to non-hegemonic realities. (p. 83)

In the literature, intersectionality is linked mainly to criticism of the three main systems of oppression: patriarchy, capitalism, and colonialism. In contrast, managing diversity has been criticized for its individualized recognition of differences that could lead to the instrumentalization of differences for organizational performance (Groeneveld & Verbeek, 2012). In this way, it matches neoliberal interests and ignores structural and systematic discrimination (Davis, 2008; McCall, 2005). On the other hand, both diversity and intersectionality are concepts that are not directly linked to specific inequalities—not even gender. However, intersectionality is more connected to criticism of power relations, whereas diversity is seen as less powerful in criticizing systemic disadvantages and is easily linked to economic logics and human resources strategies (Davis, 2008; McCall, 2005).



Overall, the literature prompts us to propose the following hypothesis:

H5 (intersectionality): If an organization addresses inequalities based on race/ethnicity or class in its GEP, it is more likely to adopt an intersectionality approach in the GEP.

Inclusion refers to the social right to participate in all areas of society, including education and science. Inclusion is often mentioned together with diversity and equity (Booysen et al., 2018). It primarily refers to measures in the context of diversity policies that aim to increase and improve the participation of socially marginalized groups. In our article, we focus on gender inclusiveness, which we define as the overcoming of the binary understanding of gender that excludes, for example, LGBTQ+ people. In some national contexts, for example in Germany, legislation has been introduced that acknowledges a third gender identity besides female and male. However, communities also point to the fact that some people prefer to identify as "non-binary" or "trans\*" rather than as a third gender. The social acceptance and the legal situation of non-binary, trans, and queer people vary widely across Europe (Strube et al., 2021). This makes it difficult to establish standards for data collection.

Our final hypothesis addresses the question of whether the region in which an organization is located impact the gender inclusiveness of its GEP:

H6 (gender inclusiveness—region): The region in which an organization is located impacts the gender inclusiveness of its GEP.

#### 3. Data and Methods

In this article, we present the findings of a study conducted within the framework of the INSPIRE project. The INSPIRE project investigates the feasibility of monitoring GEPs in RPOs in the ERA. To this end, we devised a set of indicators pertaining to the prevalence, characteristics, implementation, and assessment of the impact of GEPs (Löther et al., 2024a). In this article, we will limit the evaluation to data that provide information about the characteristics of GEPs, and the equality concepts mentioned (gender equality, diversity, intersectionality, and gender inclusiveness).

We used two methods of data collection: an online survey and web scraping. The sample for both methodological approaches was extracted from the CORDIS database of research projects funded under Horizon 2020 (European Union, 2022). The CORDIS Horizon 2020 database is particularly valuable for this study as it: (a) includes a wide range of organizations, such as higher education institutions, research organizations, and private companies; (b) covers organizations from over 30 European countries; (c) allows the assessment of the voluntary adoption of GEPs, as it predates the introduction of the GEP eligibility criterion under Horizon Europe; and (d) represents a closed program, ensuring that the sample remains fixed and unaffected by subsequent changes. While the CORDIS Horizon 2020 database provides high-quality data on research-active institutions, it may not fully represent the broader population of European RPOs. Its focus on organizations involved in EU-funded projects may introduce a potential bias towards more internationally engaged and policy-oriented institutions; accordingly, the findings primarily generalize to these institutions.



Both data collection methods were employed during the same time span to determine the most reliable approach to monitor GEPs (for details, see Löther et al., 2024b). Throughout the article, we analyze the online survey and web scraping data separately, selecting the appropriate source based on the hypothesis being tested (see Table S3 in the Supplementary File).

Our study covers 27 EU member states and five associated countries (Bosnia-Herzegovina, Norway, Switzerland, Serbia, and the UK). The countries are clustered in the four European regions in our analysis: Northwestern, Central Western, Central Eastern, and Southern (see Table S4 in the Supplementary File) (for details on the sampling methodology, see Löther et al., 2024a).

# 3.1. Online Survey

The aim of the survey is to monitor the prevalence, characteristics, implementation, and impact of GEPs across Europe. For the online survey, a pilot study was conducted from February 28 to March 27, 2024, in which the questionnaire was tested in 83 organizations in Germany, Estonia, Greece, and Ireland. The full survey was conducted from July 4 to August 19, 2024, with a sample of 4,571 organizations. The reduction in the survey sample size compared to the initial sample size was due to challenges encountered during the automated email extraction process (for details, see Löther et al., 2024b). The survey is designed at the supra-institutional level and targets a responsible person(s) from each organization. A hierarchical ranking system is implemented to extract the responsible person's email. This system prioritizes roles, giving preference to gender equality officers, followed by rectors, presidents, and CEOs; then, heads of administration and HR departments; and finally, heads of communication departments. In order to mitigate the low response rate, we translated the online survey—originally in English—into German, Polish, French, and Spanish, and sent two reminders in these languages for both the pilot and full-sample surveys. However, our efforts resulted in only 281 valid responses. Because we do not analyze research funding organizations in this contribution, the final number of responses analyzed is 270.

#### 3.2. Web Scraping

The term "web scraping" refers to the automated process of collecting data from websites, typically using web-scraping software (Luscombe et al., 2022; Maares & Weltefrede, 2012). Our web-scraping approach comprised four steps: (a) selection of a web-scraping tool; (b) selection of appropriate search terms; (c) development of a methodology to reveal the indicator "prevalence"; and (d) development of a methodology to download GEPs (Löther et al., 2024a).

# 3.2.1. Tool Selection

We also conducted a pilot study for web scraping tools using the same 83 organizations surveyed in the pilot survey. After running a benchmark test on the domains of the pilot sample and carefully assessing the most advantageous tool, we opted to use SerpAPI. This tool met all selection requirements, including scalability, ease of use, no IP blocking, and reliable data extraction (for a comparison of the three web scraping tools tested, SerpAPI, OpenSearchServer, and Scrapy, see Löther et al., 2024a).



#### 3.2.2. Selection of Appropriate Search Terms

We began by developing search terms in English, which we then translated into the 25 languages of the sample countries and validated with experts. Our method of developing search terms focused on terms explicitly associated with GEPs and was tailored to all sample countries by experts. In specific multilingual countries, the language used depended on the location of the targeted organization: in Switzerland, French, Italian, and German are used; in Belgium, French and Dutch; in Luxembourg, German; and in Malta and Ireland, English.

# 3.2.3. Development of a Methodology to Reveal the Indicator "Prevalence"

In this study, the prevalence of GEPs refers to the presence or absence of a GEP for a given organization. In the web-scraping method, prevalence is determined by the relevant search terms in the organization's webpages. In contrast, the online survey captures not only the existence of a GEP but also additional details such as the type of plan (Löther et al., 2024a). Therefore, detecting search terms in webpages was essential to estimate the prevalence of GEPs through web scraping. We eliminated duplicated and invalid URLs from the original sample (N = 6.947). For the analysis in this article, we excluded research funding organizations from the sample, bringing the total sample size for web scraping to 6.475. We developed a streamlined and comprehensive four-step technique to build a scraper to determine the prevalence of GEPs. This four-step process began with an initial search using English keywords (e.g., "gender equality plan"), followed by a search using local language keywords (e.g., *Gleichstellungsplan* in Germany), an extended search with additional English terms, and finally an extended search with additional local language terms. Our search strategy was iterative, with each step searching for a maximum of 10 results; if none were found, it moved on to the next step. The search process ended when 10 results were found, or all steps were completed. Based on the pilot study of 83 organizations, our web scraping approach for identifying the prevalence of GEPs achieved an accuracy rate of 92%.

#### 3.2.4. Development of a Methodology to Download GEPs

For analyzing the characteristics of the GEPs, it was necessary to detect the correct file and download it; for this, we designed a second script. For reasons of efficiency and resource constraints, we only used English search terms when downloading GEPs via web scraping. The web scraper indicated more documents (7,006 PDFs) than we had organizations in the sample (6,475). In the next step a classification was needed to detect the correct ones. We developed an intermediate classification process called metadata analysis to determine the correct PDFs (i.e., GEPs). The metadata analysis relied on identifying relevant keywords within the file name, initial page, and document metadata (e.g., document title, meta-keywords). We obtained 1,552 PDFs after conducting the metadata analysis. We successfully converted 1,518 PDFs to plain text format (.txt) for text analysis, while 34 corrupted PDFs could not be processed. After further cleaning steps, we had 816 correct files of GEPs.

For the text analysis, we operationalized our indicators by looking for specific search terms within the GEPs and employing standalone and normal string-matching approaches using the regular expression library in Python (i.e., Regex). We extracted information for the indicators, including diversity, gender diversity, intersectionality, and inequality dimensions such as race, nationality, religion, class, age, sexual orientation, and disability. Because GEPs, by definition, address gender issues, we did not treat gender as a distinct or separate dimension in our analysis.



#### 3.3. Limitations

The present study has several limitations that should be acknowledged. First, our text analysis relies on publicly available GEPs obtained through web scraping, which may be outdated in some cases. Second, anti-bot measures implemented by websites can pose challenges to downloading GEPs via web scraping, potentially limiting the dataset. Third, due to methodological constraints, our text analysis of the scraped GEPs was restricted to those published in English. As a result, the downloaded GEPs are in English only, omitting those available only in local languages. In fact, many GEPs were available in English, as we noted during the pilot phase: 31 out of 44 GEPs were in English (see Löther et al., 2024a). While this allowed us to examine GEPs across Europe, it excluded GEPs available only in local languages, which may lead to an underrepresentation of diversity, inclusion, and intersectionality issues in non-Anglophone countries. Additionally, text analysis inherently depends on specific search terms and their capacity to capture relevant content, which may not encompass all relevant aspects.

Although the survey is subject to nonresponse bias, this primarily affects the prevalence estimates of GEPs; the content-related questions remain valid and comparable, as they focus on the substance of the GEPs. However, it is important to note that survey participation depends on the willingness of invitees, and in our case, the response rate was quite low at 6%. The low response rate can be attributed to the low quality of the email addresses (the majority were impersonal) and the field period (summer break season). Due to the project design, we were unable to determine further efforts for email extraction and timing. A further contributing factor was nonresponse bias: The vast majority (95%) of survey respondent organizations reported that they had a GEP or equivalent. This means that organizations that were not engaged with gender equality policies were less likely to respond to the survey. This non-response bias is further supported by the web scraping results, which indicate a much lower GEP prevalence of 41%. This highlights the importance of combining multiple methodological approaches to strengthen the robustness of data and findings.

#### 4. Empirical Results

#### 4.1. Prevalence of GEPs in Europe

In this section, we address our first research question about the prevalence of GEP at organizations in the ERA (Section 3.2.3) and present only our web-scraping data, because the survey data is not reliable for this, as explained in Section 3.3.

Web-scraping data allowed us to assess the prevalence of GEPs across different organization types (see Table 1) and country clusters (see Table 2) in the ERA. The results of the web scraping showed that the prevalence rate of GEPs was 41% (N = 6,475).

**Table 1.** GEP prevalence by organization type based on web-scraping data.

| Organization type       | N     | GEP prevalence by organization type |  |  |
|-------------------------|-------|-------------------------------------|--|--|
| Higher education sector | 1,389 | 83.15%                              |  |  |
| Research organizations  | 2,641 | 49.67%                              |  |  |
| Private companies       | 2,445 | 6.42%                               |  |  |
| Total                   | 6,475 | 40.52%                              |  |  |



**Table 2.** GEP prevalence by country clusters based on web-scraping data.

| Country clusters | N     | GEP prevalence by country clusters |  |  |
|------------------|-------|------------------------------------|--|--|
| Central Eastern  | 1,042 | 51.91%                             |  |  |
| Northwestern     | 1,076 | 40.42%                             |  |  |
| Southern         | 1,719 | 39.67%                             |  |  |
| Central Western  | 2,638 | 36.61%                             |  |  |
| Total            | 6,475 | 40.52%                             |  |  |

The web-scraping data show substantial differences between organizational types (Table 1). GEP prevalence ranged from 6% for private companies (n = 2,445) to 83% for higher education institutions (n = 1,389). There are also regional differences: Central Eastern countries show a higher prevalence of GEPs (52%) than Central Western (37%). However, this may be due to a sample effect, as the Central Western sample includes a larger number of private companies, which used to have a lower prevalence of GEPs.

The discrepancy between the web scraping data and the survey data on prevalence we attribute to nonresponse bias in the survey, driven by (a) greater willingness to participate among organizations that already have GEPs, (b) capacity constraints in under-resourced organizations, (c) lower response rates among those unfamiliar with gender-equality terminology, and (d) limited engagement from private companies. A 95% prevalence rate was observed in the online survey, coupled with the exceptionally low participation of private companies (only 7 out of 270), which supports this hypothesis.

## 4.2. Characteristics of the GEPs

Our survey results provided information about the characteristics of GEPs. Among the respondent organizations that have a GEP or equivalent, the majority of them (60%) reported that they had a GEP (focusing primarily on gender equality) and no other equivalent plan, while 22% stated having a "gender equality and diversity plan (including several inequalities but focusing on gender)" and no other equivalent plan, 5% indicated having a "diversity, equity and inclusion plan (dealing with several inequalities without highlighting one)" and no other equivalent plan. Twelve percent of the respondent organizations indicated that they had at least two kinds of these plans. To test whether the distribution of responses varied significantly across the three main types of plans reported, we conducted a chi-square test, the results of which yielded a value of 197.03 with 2 degrees of freedom, which was statistically significant (p = 0.000). A chi-square test is appropriate here because it compares the observed and expected frequencies across multiple categorical groups (the three plan types) under the null hypothesis of a uniform distribution. The result indicates that the three types of plans are not distributed uniformly across the dataset. Thus, our survey results suggest that GEPs are more prevalent in Europe compared to "gender equality and diversity plans" and "diversity, equity, and inclusion plans."

This confirms H1: Plans named GEPs are the most common across the ERA.

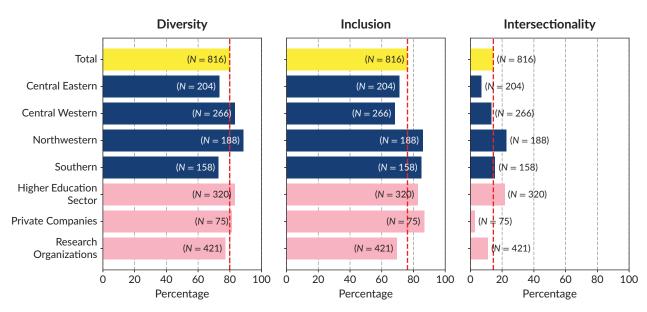


## 4.3. Equality Concepts Mentioned in GEPs

In this section, we analyze which explicit equality concept is mentioned in the GEP: First, the text analysis of the downloaded GEPs (N=816) reveals that "diversity" was the most frequently mentioned equality concept (80%), followed by "inclusion" (76%), and "intersectionality" (14%; see Figure 1). Second, the results of the online survey confirm the dominance of the concept of "diversity," which was used by the majority of respondent organizations (62%) in their GEPs. By contrast, 34% of respondent organizations claim to use the term "intersectionality."

Additionally, we investigated potential regional differences to determine whether the diversity concept was more prevalent in the Northwestern country cluster than in other country clusters (H2). As Figure 1 shows, the term "diversity" was more prevalent in the GEPs in the Northwestern country cluster (88%) than in the Central Western (83%), Central Eastern (73%), and Southern (73%) clusters. We used a t-test for unequal variances (also known as Welch's t-test) to test the significance. We used Welch's t-test on our 0/1 "diversity" indicator because the mean of a binary variable is its prevalence, so testing for differences in means directly tests for differences in proportions. Welch's version also handles unequal variances between clusters. The diversity concept was more prevalent in the Northwestern cluster compared with both the Central Eastern clusters and the Southern cluster, with statistically significant differences (p = 0.0002 and p = 0.0003). However, diversity was not mentioned statistically significantly more often in the Northwestern cluster compared with the Central Western cluster due to insufficient evidence (p = 0.1137). Among the country clusters, the Northwestern cluster also had the highest percentage of intersectionality (23%). This suggests that initiatives like Athena SWAN have more strongly spread the "diversity" approach in this region (Xiao et al., 2020).

H2 is partly confirmed by the fact that diversity is more widespread in the Northwestern countries in comparison to Central Eastern and Southern Europe, but not in comparison to Central Western Europe.



**Figure 1.** Frequency of mentions of diversity, inclusion, and intersectionality in the GEPs captured via web scraping, by country clusters and organization type.



It is apparent from Figure 1 that the organization type is also a factor for a certain type of equality concept. The concepts of diversity and intersectionality were more prevalent in GEPs of organizations in the higher education sector than in GEPs of other types of organizations. Furthermore, the differences between higher education institutions and other types of organizations were greater for "intersectionality" than for "diversity," indicating that "intersectionality" is a more academic approach.

This finding supports H3, that private companies were considerably more likely to adopt the concepts of diversity or inclusion than intersectionality. Among organizational types, private companies ranked highest for the concept of inclusion (87%), second highest for diversity (81%), and lowest for intersectionality (3%), indicating that the diversity and inclusion approaches are more pronounced in companies. We conducted McNemar's non-parametric test to analyze paired nominal data—specifically, to evaluate whether there was a significant difference in proportions between two related groups (McNemar, 1947; Pembury Smith & Ruxton, 2020). The McNemar test is particularly appropriate for this analysis because it is well-suited to examining related data such as information from the same organizations. We examined the following two hypotheses. The first null hypothesis was that the proportion of private companies adopting the diversity approach was equal to the proportion of private companies adopting the intersectionality approach. The second null hypothesis was that the proportion of private companies adopting the inclusion approach was equal to the proportion of private companies adopting the intersectionality approach. We strongly rejected both null hypotheses, as the exact p-values for both tests were 0.0000. These results indicate that private companies were much more likely to adopt diversity or inclusion than an intersectionality approach, highlighting a significant difference in adoption rates. This finding is consistent with studies observing that private sector companies emphasize diversity and inclusion over intersectionality (Boxenbaum, 2006; Hansen & Seierstad, 2017; McKinsey & Company, 2020; Tandé, 2017).

The concepts of diversity and inclusion are significantly more prevalent in private companies than the concept of intersectionality—confirming H3.

### 4.4. How Inequalities Addressed in GEPs Are Related to Equality Concepts

We examined whether mentioning specific dimensions of inequality in the GEPs influenced the likelihood that those plans also mention diversity, inclusion, and intersectionality to answer our second research question and H4 (diversity and inclusion approach) and H5 (intersectionality). We derived both inequality dimensions and equality concepts from GEPs obtained via web scraping, then used text analysis to determine whether each specific inequality and concept was mentioned. To determine how inequality dimensions mentioned in the GEPs affect equality concepts mentioned in the GEP (i.e., diversity, inclusion, and intersectionality), we constructed a logistic regression model, as indicated below by Equation 1, in which the dependent variables are binary measures of whether an organization mentioned a diversity, inclusion, or intersectionality concept in its GEP. In other words, if an organization mentions the diversity concept, then the first dependent variable will be equal to one; otherwise, it will be zero. If an organization mentioned an inclusion approach, the second dependent variable will be equal to one; otherwise, it will be zero. The third dependent variable is equal to one if the organization mentioned the concept of intersectionality; otherwise, it will be zero. Logistic regression is particularly useful because it models the probability of a binary outcome—the presence or absence of each concept mentioned in a GEP—as a function of mentioned inequalities in the GEP, providing easily interpretable odds ratios that quantify the strength of each predictor. Our constructed model is demonstrated by Equation 1.



$$\log \operatorname{it} (P(Y = 1 \mid \chi_{i})) =$$

$$= \beta_{0} + \beta_{1} \cdot \operatorname{Race}_{i} + \beta_{2} \cdot \operatorname{Nationality}_{i} + \beta_{3} \cdot \operatorname{Religion}_{i} + \beta_{4} \cdot \operatorname{Class}_{i} + \beta_{5} \cdot \operatorname{Age}_{i}$$

$$+ \beta_{6} \cdot \operatorname{Sexual Orientation}_{i} + \beta_{7} \cdot \operatorname{Disability}_{i} + \gamma \cdot \operatorname{Country Fixed Effects}_{i} +$$

$$+ \delta \cdot \operatorname{Activity Type Fixed Effects}_{i}$$
(1)

The independent variables are the inequality dimensions extracted from the captured GEPs: race, nationality, religion, class, age, sexual orientation, and disability. All independent variables are binary and constructed in the same way: If the inequality dimension was mentioned in the GEP, then it takes a value of 1; otherwise, it is zero. To reduce potential omitted variable bias, we inserted two fixed effects into the equation. The first fixed effect is  $\gamma$ ; it represents the country fixed effect and captures any particular time-invariant effect that belongs to countries, such as cultural factors, national policies, and legislation. The second fixed effect is  $\delta$ , which represents an organization-type fixed effect and captures any organization-specific characteristics. In addition, we addressed potential heteroskedasticity in our estimation by employing robust standard errors.

**Table 3.** Results of the logistic regression to determine how the inequality dimensions affect equality concepts mentioned in the GEPs captured via web scraping and text analysis.

| Independent variables | Dependent variables |           |                   |  |
|-----------------------|---------------------|-----------|-------------------|--|
|                       | (1)                 | (2)       | (3)               |  |
|                       | Diversity           | Inclusion | Intersectionality |  |
| Race/ethnicity        | 0.823***            | 0.580**   | 1.123***          |  |
|                       | (0.288)             | (0.265)   | (0.302)           |  |
| Nationality           | -0.146              | -0.284    | 0.554*            |  |
|                       | (0.297)             | (0.281)   | (0.314)           |  |
| Religion              | -0.449              | -0.554*   | -0.726**          |  |
|                       | (0.323)             | (0.292)   | (0.353)           |  |
| Class                 | 0.930*              | 0.986***  | 1.105***          |  |
|                       | (0.478)             | (0.372)   | (0.305)           |  |
| Age                   | 0.598**             | 0.956***  | 0.0925            |  |
|                       | (0.245)             | (0.230)   | (0.312)           |  |
| Sexual orientation    | 0.254               | 0.253     | 0.516*            |  |
|                       | (0.320)             | (0.275)   | (0.305)           |  |
| Disability            | 0.353               | -0.0757   | -0.0847           |  |
|                       | (0.314)             | (0.267)   | (0.287)           |  |
| _cons                 | 1.595***            | 0.224     | -1.820***         |  |
|                       | (0.530)             | (0.416)   | (0.489)           |  |
| N                     | 798                 | 811       | 734               |  |
| Pseudo R-squared      | 0.163               | 0.183     | 0.207             |  |

Notes: Standard errors in parentheses; the constant coefficient in the model is represented by \_cons; \* p < 0.10; \*\*\* p < 0.05; \*\*\* p < 0.01.

Table 3 examines how various inequalities relate to the concept of diversity, inclusion (H4), and intersectionality (H5). Race/ethnicity (p < 0.01), class (p < 0.10), and age (p < 0.05) were positively associated with the concept of diversity. This means that organizations that mentioned race/ethnicity, class, or age in their GEPs had a higher probability of also mentioning "diversity." Age (p < 0.01), class (p < 0.01),



and race/ethnicity (p < 0.05) were significantly and positively associated with the concept of "inclusion," whereas religion was significantly (p < 0.10) negatively associated.

Race (p < 0.01), class (p < 0.01), nationality (p < 0.10), and sexual orientation (p < 0.10) were all positively related to the probability of mentioning intersectionality. In contrast, religion was significantly negatively linked (p < 0.05).

As all of the model's independent variables are binary, the logistic regression coefficient represents the log-odds difference between the two categories (e.g., race/ethnicity = 1 vs. race/ethnicity = 0). Using odds ratios, we could quantify the strength of the effect of these inequalities on the likelihood of addressing the concepts. If an organization mentioned race/ethnicity in its GEP, the odds of mentioning diversity were  $e^{0.823} \approx 2.27$  times higher compared with organizations that did not mention race/ethnicity, ceteris paribus. In other words, addressing race/ethnicity in the GEP raised the odds of addressing diversity by 2.40 compared with organizations that did not mention race/ethnicity. Addressing the dimensions of inequality, class, or race/ethnicity increases the likelihood of adopting a diversity and inclusion approach in the GEP. However, this effect was stronger for diversity than for inclusion. Furthermore, race/ethnicity and class are positively associated with the intersectionality concept, indicating that if an organization addresses race/ethnicity or class in its GEP, it is more likely to adopt an intersectionality approach in the GEP.

These results suggest that explicitly addressing inequality dimensions such as race/ethnicity or class in GEPs increases the likelihood of mentioning diversity, inclusion, and intersectionality. The observed positive association for race/ethnicity is in line with Crenshaw's (1989) intersectionality framework, which argues that paying attention to racial categories can shed light on and help address overlapping forms of disadvantage. The results suggest, further, that addressing age-related inequality in GEPs increases the likelihood of adopting a diversity or inclusion approach, and that the recognition of inequalities related to nationality or sexual orientation contributes to the advancement of the concept of intersectionality. Conversely, the negative relationship with religion suggests that organizations that stress religion in their GEPs may be less likely to explicitly incorporate or mention the notion of intersectionality.

Finally, we investigated potential multicollinearity by examining the correlation coefficients between explanatory variables. The highest score was between sexual orientation and religion (0.57), indicating no evidence of multicollinearity. The *R*-squared coefficients were moderate, which is common for models that predict binary outcomes.

Addressing race/ethnicity, class, and age significantly increases the likelihood of adopting "diversity" or "inclusion" labels—disability does not—providing partial support for H4. Likewise, addressing race/ethnicity, class, nationality, and sexual orientation significantly increases the likelihood of adopting an "intersectionality" approach, which confirms H5.

#### 4.5. Gender Inclusiveness in European GEPs

Our third research question is about the usage of a broad understanding of gender in the GEPs. Establishing "inclusive GEPs" (European Commission, 2022) indicates that organizations acknowledge gender as more than a binary category—though it does not necessarily mean they have fully engaged with its deeper



complexities—for example, by using gender-sensitive language in GEPs or offering several gender identity options when collecting data on gender. We use the term "gender inclusiveness" to capture this usage of a broadened understanding of gender in the GEP. In the first step, we investigated the use of terms such as "non-binary," "trans," "transgender," "gender identity," "all genders," and "other genders" in the GEPs captured via web scraping. In the second step, we tested whether the geographical location of the organization affected the prevalence of gender inclusiveness in GEPs using online survey data.

Our text analysis revealed that 35% of the GEPs (N=816) contained terms indicating a non-binary understanding of gender. These terms were "non-binary," "trans," "transgender," "gender identity," "all genders," and "other genders." We observed that there is not a direct link to a certain equality approach: An expanded understanding of gender (35%) was more prevalent than the use of the concept of intersectionality (14%); however, it was less common than the concepts of diversity (80%) and inclusion (76%).

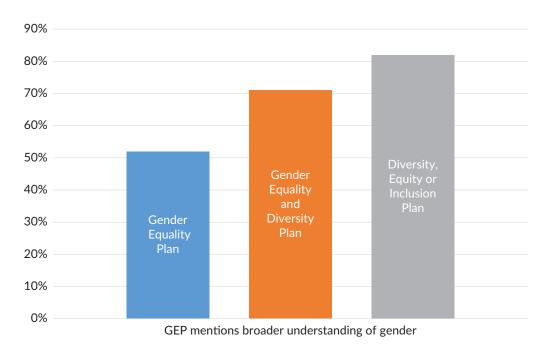
In the online survey, we asked the organizations which terms they used to express diverse options for gender. Among the respondents, 57% reported that they used expressions like "non-binary," "diverse," "trans," etc. This discrepancy between the results of the text analysis and the survey data might be explained by the different methodological approaches, the restriction of the text analysis to English GEPs, and the nonresponse bias introduced by the low survey response rate of 6%. In what follows, we refer more to the survey data, as we assume that the survey respondents provided more accurate and detailed data than the text analysis at this point. Publicly available GEPs contain evolving or context-dependent terminology, and thus proper extraction for text analysis can be challenging. Surveys, on the other hand, provide real-time data and more precise insights because respondents frequently have direct knowledge of their organization's policies that exceed what is publicly available.

The survey data revealed that the type of plan influenced the understanding of gender expressed. As can be seen from Figure 2, organizations that reported having a GEP—a plan designed exclusively to gender equality—were less likely to display a non-binary understanding of gender (52% of those having this kind of plan) than those with a "gender equality and diversity plan" (71% of those having this kind of plan) or a "diversity, equity, or inclusion plan" (82% of those having this kind of plan).

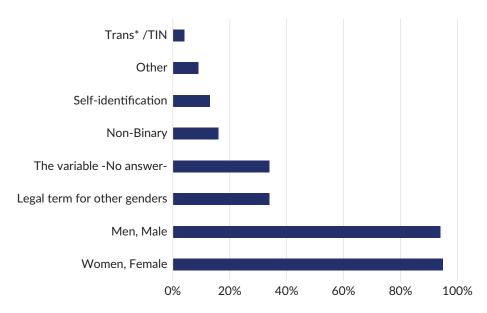
What emerges from the results reported here is that the use of gender-diverse options for gender identity was not very widespread in GEPs of the respondent organizations in our online survey. However, the type of plan did have an impact on the use of more than two gender identity categories: Just over 80% of organizations with a "diversity, equity, or inclusion plan" used gender-diverse options, which is around 10 percentage points higher than the figure for organizations with a "gender equality and diversity plan" and around 30 percentage points higher than the figure for organizations with a GEP. This indicates that gender diversity is more covered by concepts like "diversity" and "inclusion" instead of "gender equality" only.

Most organizations that displayed a non-binary understanding of gender in their GEPs also identified gender identity as an additional category of inequality in their data collection (79% of n = 52). However, data on gender identity were collected less frequently (20% of N = 270), possibly due to methodological challenges for the organizations. In instances where gender was not collected as binary, this was most often accomplished by offering the response option "no answer" (34% of n = 230) or using a third legal term for other genders (34% of n = 230; see Figure 3). The term "non-binary" was predominantly employed in data collection undertaken by organizations within the Southern country cluster (35% of n = 40).





**Figure 2.** Gender-diverse options for gender identity in different types of plans based on data from the online survey (Q3.1 and Q4.8; see Löther et al., 2025, pp. 134–153). Note: Multiple responses were allowed, indicating that organizations could have more than one plan.



**Figure 3.** Response options used when collecting data on gender within the framework of GEPs (Q5.10; see Löther et al., 2025, pp. 134–153). Note:  $TIN = Trans^*$ ; Inter\*, Non-Binary.

Turning now to the results on the regional distribution of gender inclusiveness (see Table 4), it may be reasonably assumed that social and political discourses that are hostile to a non-binary understanding of gender will impact the frequency with which such an understanding is reflected in GEPs. In response to an open-ended question, two organizations from the Northwestern cluster and one organization from the Central Western cluster reported that the use of non-binary terms was not permitted when collecting data on gender, which may suggest the presence of hostile anti-trans discourse or strong data protection legislation.



**Table 4.** GEPs mentioning a broader understanding of gender by country cluster, and the time period of the first GEP.

|                 | GEP mentions a broader  | N   | Time p    | Time period of the first GEP |           |  |
|-----------------|-------------------------|-----|-----------|------------------------------|-----------|--|
|                 | understanding of gender |     | 1980-1998 | 1999-2020                    | 2021-2024 |  |
| Northwestern    | 87%                     | 15  | 26%       | 40%                          | 33%       |  |
| Central Western | 65%                     | 107 | 9%        | 48%                          | 42%       |  |
| Southern        | 57.5%                   | 40  | 0%        | 27.5%                        | 72.5%     |  |
| Central Eastern | 34%                     | 38  | 0%        | 3%                           | 97%       |  |
| Total           | 59.5%                   | 200 | 7%        | 35%                          | 58%       |  |

Note: Q4.4 and Q4.8 (see Löther et al., 2025, pp. 134-153, for the questionnaire).

As Table 4 shows, the survey findings corroborate this assertion for Central Eastern European organizations. While more than half of organizations in the Southern, Central Western, and Northwestern country clusters reported that their GEPs included a broader understanding of gender, only 34% of the organizations in the Central Eastern European clusters did so.

We found considerable differences between the regions in Europe with regard to when they introduced their first GEP. In the Northwestern and Central Western country clusters, many organizations already had their first GEPs in the 1980s and 1990s. In the Southern and Eastern European countries, by contrast, most organizations started putting a GEP in place after the announcement in 2021 of the European Commission (see Table 4; Löther et al., 2024b). This shows the impact of funding bodies and how they can contribute to spreading gender equality measures and instruments. Additionally, the regional differences in the outcomes might be explained by other national and regional equality initiatives, especially the Athena SWAN Award in the UK and Ireland (Claeys-Kulik et al., 2019; Xiao et al., 2020), the female leadership program in Ireland (O'Connor & Irvine, 2020), and the German's Research-Oriented Gender Equality (and, since 2022, also Diversity) Standards by the DFG (Deutsche Forschungsgemeinschaft) and female professorship program in Germany (Riegraf & Weber, 2017; Zippel et al., 2016).

Accordingly, to test our final hypothesis (H6)—that there is no association between the country clusters in which organizations are located and their use of gender-inclusive terms (e.g., "non-binary," "transgender") in their GEPs—we used a Pearson chi-squared test of independence. The test result indicates a rejection of the null hypothesis with a *p*-value of 0.001, which implies a statistically significant relationship between country cluster and whether organizations displayed gender inclusiveness in their GEPs.

This supports H6, which states that the region in which an organization is located impacts the gender inclusiveness of its GEP. Organizations in the Central Western and Northwestern clusters were more likely to update their GEPs to reflect gender inclusiveness than those in the Southern and Central Eastern regions.

## 5. Conclusion

This mixed-method study is pathbreaking in two ways: First, it provides robust data about the characteristics of GEPs on a wide scale across Europe. Second, it gives the basis for how survey data could be combined with digital data to improve the results. This article aimed to assess the distribution of GEPs in the ERA and to investigate the underlying concepts of equality and the understanding of gender in these GEPs.



First, our results show considerable differences between public and private organizations. Only 41% (N = 6,475) of the investigated organizations had a GEP in place. Among organizations in the public higher education sector (83%) and research organizations (50%), the prevalence of GEPs was considerably higher than among private companies (6%). One possible explanation is that for public organizations, the legal framework for achieving gender equality is more binding and stronger than for private companies.

The second major finding was that "diversity" and "inclusion" were more widespread than "intersectionality." Our results suggest that all three concepts are more present in GEPs in organizations in Northwestern Europe, which might be explained by the Athena SWAN Award and its requirements in this area (Claeys-Kulik et al., 2019; Xiao et al., 2020). The fact that intersectionality was less prevalent than diversity and inclusion may be due to its greater complexity and sophistication (Acker, 2012; McCall, 2005). This indicates that there is a need for further support for organizations to develop intersectional approaches.

Third, the logistic regression analysis revealed which inequalities addressed in the GEPs are connected to each concept ("diversity," "inclusion," and "intersectionality"). We found that race/ethnicity and class are positively related to diversity, inclusion, and intersectionality. In this regard, all three concepts are connected to the three main oppression systems (Crenshaw, 1989; McCall, 2005). Surprisingly, there is no difference between diversity and intersectionality. This may be explained by the effect that they intercorrelate. Age is positively associated with diversity and inclusion. Here again, it is most likely that this is because of the materials for the Athena SWAN Award that participating organizations have to produce, which suggest age as an inequality dimension and connect diversity with inclusion approaches (Claeyk-Kulik et al., 2019). Nationality and sexual orientation are positively associated with intersectionality. A striking result is that religion is negatively related to both inclusion and intersectionality. This may indicate that religion as an inequality dimension is more emphasized in conservative country contexts where broader inclusion or more critical intersectional approaches are less embraced or socially acceptable. These findings warrant further exploration.

Finally, we investigated how the inclusiveness of the understanding of gender is expressed in GEPs. Overall, we found that the majority of GEPs understood gender as a binary division between women and men. Distinguishing between different types of GEPs, we found that those named only GEPs were more likely to adhere to a binary understanding of gender, whereas those that add "diversity" or "inclusion" in the title were more open to expressing gender inclusiveness. Many respondents of our survey reported that they collect data about gender relations only with binary response options. However, some organizations offered a third option. A small number of organizations reported that they allowed respondents to self-identify their gender. The legal situation for gender inclusiveness in the ERA varies a lot, and this is reflected in our data. As expected (H6), there were considerable differences between the regions. Organizations located in the Central Eastern country cluster were less likely to express gender inclusiveness.

Our findings have several policy implications. First, policymakers should provide targeted support to private companies to facilitate the adoption of GEPs and to promote a broader understanding of gender that explicitly incorporates intersectionality. Second, capacity-building interventions are needed—especially within newcomer organizations in Southern and Central Eastern European countries—to support them in establishing an accepted approach for a broad understanding of gender and intersectional approaches. Another suggestion would be to provide and make accessible materials that help protect against hostile political actions against trans and non-binary people.



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#### **Conflict of Interests**

The authors declare no conflict of interests.

#### **LLMs Disclosure**

We made use of ChatGPT and DeepL for language editing.

# **Supplementary Material**

Supplementary material for this article is available online in the format provided by the authors (unedited).

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