



INSPIRE

D2.1 Literature Review Data Monitoring

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Executive Summary

The **aim** of the report is to give an overview of the literature on monitoring Gender Equality Plans (GEPs) in Research Performing Organisations (RPOs). The report displays information about monitoring GEPs and how GEPs can include an understanding of inclusive gender equality.

As a **method**, we conducted a systematic literature scoping review on documents which were in three languages: English, Spanish, and German. We selected only publications that have a focus on monitoring gender equality plans and/or are considering intersectional approaches. We reviewed a total of 129 publications, which have been published since 2010. Among the examined publications, fifty-seven were scientific journal articles, thirty-four were derived from grey literature, twenty-four were articles in collective monographs, seven were monographs, and another seven were unspecified publication types. The scope of papers considered for this review exhibits a close focus on monitoring gender equality plans and/or considers intersectional/inclusive perspectives. For monitoring inclusive GEPs we define three areas for setting **indicators**: a) prevalence of GEP, b) implementation process of GEP and c) impact of GEP. We understand intersectionality and inclusion as analytical perspectives that have to be included in GEPs, but most studies have not yet reached to transfer them into monitoring approaches.

Conceptual, an important distinction has to be made between monitoring and evaluation as methodological approaches. For the INSPIRE project, we first need to find out how data is collected across countries and different institutions (monitoring), then in a second step, we can find out how and whether an evaluation is possible in addition to monitoring. The evaluation depends on the success of data collection and data quality.

Key findings of the literature review are: First, there is a research gap in monitoring the **implementation** process of GEPs in RPOs on a supra-organisational level. Only a few studies concern how GEPs are implemented at RPO, and those existing studies are concentrated in a few countries. Second, it is difficult to monitor the impact of GEP with an inclusive/intersectional understanding of GEP. Monitoring the **impact** of GEPs is complex, requiring careful examination of diverse factors influencing gender equality dynamics. There can be distinguished two approaches to monitor and/or evaluate the impact: the contribution vs. attribution approach. Given the challenges of attributing GE gains to GEPs rather than to broader contextual trends and drivers, INSPIRE's approach for monitoring the impact relies on a contribution approach. Third, although **intersectionality** is an often-stated claim for GEP, only a few studies attempt to translate the analytical perspective into a monitoring approach. The few existing studies are mainly from the UK, where Athena SWAN has already been requesting monitoring of different inequality dimensions in recent years. However, the entanglements of inequalities are rarely studied. Inclusion seems to be a fuzzy concept, which seems to be more a political strategy than an analytical perspective. To facilitate the monitoring of GEPs, an important **policy recommendation** would be to introduce standards across Europe: how and where GEPs are stored and made available and what content should be edited and listed in them.





Table of Contents

- 1. Introduction.....11
- 2. Methodology.....13
- 3. Quantitative analysis.....18
- 4. Critical analysis.....23
 - 4.1. Data collection for gender equality plans, approaches, and gender monitoring concepts24
 - 4.2. Prevalence27
 - 4.3. Implementation.....29
 - 4.4. Impact32
 - 4.5. Intersectionality perspective and intersectional approaches in GEPs36
- 5. Conclusion.....41
- 6. References.....42



List of Acronyms

EC	European Commission
EU	European Union
ERA	European Research Area
GEP	Gender Equality Plan
RPO	Research Performing Organisation
RFO	Research Funding Organisation
HEI	Higher Education Institution
EIGE	European Institute of Gender Equality
AC	Associated Countries
MS	Member States



List of Figures

Figure 1 Documentation of the search and the inclusion/exclusion of documents.....17

Figure 2 Number of publications per year18

List of Tables

Table 1 Search Terms14

Table 2 Selection criteria15

Table 3 European study location19

Table 4 Non-European study location.....20

Table 5 Publications by document type20

Table 6 Publications by type of study21

Table 7 Publications (only empirical studies) by methodological approach21

Table 8 Publications by level (intra-organisational and supra-organisational)22

Table 9 Topics discussed in the publications (multiple selections).....22



1. Introduction

European Union (EU) initiatives on gender equality in science and research date back to the 1990s (European Commission 1999, 2000). Since 2012, gender equality has become a priority in the European Research Area (ERA) (European Commission 2012) and a cross-cutting issue in Horizon 2020 (2014-2020) and Horizon Europe (2021-2027). The European Commission and the European Council called especially for cultural and institutional change, including gender equality plans (GEPs). They encouraged research-performing (RPOs) and funding organisations (RFOs) to implement gender equality plans (Council of the European Union 2015; European Research Area and Innovation Committee 2015; Cheveigné et al. 2017; European Commission 2020). Through dedicated funding in the research programs (FP7 and Horizon 2020), the European Commission (EC) has supported the implementation of GEPs in thirty structural change projects with over 200 research performing and funding organisations with over 72 million euros (European Commission 2021b, 168). Horizon Europe introduced GEPs as an eligibility criterion for calls with deadlines in 2022 and onwards: Participating organisations, such as public bodies, research organisations, or private higher education institutions (HEIs), are required to establish a GEP that meets a set of minimal standards (European Commission 2021a). In the last years, the EC has expanded the concept of gender equality "by opening policy to intersections with other social categories" (European Commission 2020, 16) and calls for approaches to inclusive gender equality and inclusive gender action plans (European Commission 2022).

Several European countries require the adoption of gender equality plans in research organisations. Thirteen countries (nine Member States (MS) and four Associated Countries (AC)) require a GEP at least in public higher education institutions at the national or regional level, and some of them also in public research institutions, private higher education institutions, or private companies (Standing Working Group on Gender in Research and Innovation 2021). The UK does not require gender equality plans for research organisations. However, the Athena SWAN charter has been established in the UK higher education system. HEIs in the UK can apply to participate in this charter and are evaluated in three categories. Several studies state that this has fostered the advancement of gender equality in higher education and research organisations (Barnard 2017).

A GEP is defined as a set of actions aimed at identifying gender inequalities and bias, designing and implementing measures to correct these, and setting targets and monitoring progress via indicators (EIGE 2016). In a broader definition, it refers to a planned institutional change approach. In the context of Horizon Europe, the EC defines a gender equality plan as "a set of commitments and actions that aim to promote gender equality in an organisation through a process of structural change" (European Commission 2021a, 11). Minimum requirements for GEPs as eligibility criteria in Horizon Europe are being a public document, dedicated resources, data collection, monitoring and awareness raising/training on gender equality (European Commission 2021a, 9). This definition shows that monitoring is a crucial part of gender equality policies. Statistics analysing gender inequalities in academia and research on institutional, national, or European levels stand at the beginning of gender equality policies (for instance, the She Figures since 2003). Developing a GEP starts with an audit or an initial diagnostic, which helps to understand the reasons for gender inequalities and indicates the need for action. Having adopted GEPs, monitoring deals with implementing



D2.1 Literature Review Data Monitoring

the plans and their impact, both on the level of individual research organisations and the national and/or international comparison of organisations and/or countries. Thus, monitoring is closely linked to the development, implementation, and impact assessment of GEPs. There is a considerable need to develop a systematic approach for monitoring gender equality measures and plans overall in the European research landscape.

This report reviews the existing literature on monitoring inclusive GEPs in research and innovation. The review will provide the methodological foundation for the EU project INSPIRE to develop indicators for monitoring the prevalence, implementation and impact of GEPs at a supra-organisational level and whether intersectional approaches of GEPs are applied. It also informs about the state of the art of monitoring inclusive GEPs at the intra-organisational level of RPOs, as there is more research on this. ***Intra-organisational level*** refers to studies that provide results for an individual organisation (universities, public research institutions, or private companies), whereas ***supra-organisational level*** refers to studies monitoring GEPs in several organisations on a regional, national, or European-wide, and international level.

Our primary research question is: What is known from the existing literature about monitoring gender equality plans in research and innovation?

This research question has been subdivided into the following questions to guide our study:

- What concepts, data sources, methods/instruments and indicators are used to monitor the prevalence, implementation, and impact of gender equality plans across organisations?
- What is known about the prevalence, implementation, and impact of gender equality plans?
- In which way are intersectional perspectives and other inequality categories/dimensions integrated into the monitoring of gender equality plans?
- Which levels does the literature address: micro level (individual institution), meso level (countries) and macro level (international comparison)? What is known about the supra-organisational monitoring of GEPs?
- Which knowledge gaps can be identified in the literature on gender monitoring and monitoring gender equality plans in R&I?

Following the trend towards more inclusive gender equality plans, we specifically search for intersectional perspectives on gender monitoring and monitoring GEPs. Nevertheless, gender inequalities are the starting point of our review, and our research focus excludes diversity monitoring that investigates other social inequalities which are not linked to gender inequalities.

The literature review focuses on monitoring gender equality plans, but it is not easy to separate this from monitoring gender inequalities in academia and research. As an example the amount of female professors is often an indicator for certain gender equality measures. Above all, an initial audit or impact assessment is closely linked to gender monitoring issues. Furthermore, the monitoring of the implementation and the impact assessment are connected to the evaluation of gender equality policies. However, there is a methodological distinction in depth and scope between monitoring and evaluation studies. ***Monitoring*** is described as a “continuing function that uses systematic collection of data on specified indicators to provide [...] indications of the extent of progress and achievement of objectives



and progress in the use of allocated funds” (OECD 2007; Espinosa, María Bustelo, and Velasco 2016). In contrast, **evaluation** is defined "a systematic process to determine merit, worth, value or significance." (American Evaluation Association 2014, 1). Evaluations take place at specific points of an intervention, typically at the beginning and end of a process and try to link observed changes to the intervention in a causal way. In this literature review, we will focus on research about monitoring because we are interested in approaches to assess GEPs in a continuing process and on a supra-organisational level, which is only possible with a monitoring approach.

2. Methodology

Monitoring gender equality plans in R&I is discussed in scientific publications, project reports, reports of the European Commission or tools, web manuals, and publications that address practitioners. Thus, we included grey literature in the review. We aimed to open up the data basis on different world regions. For this purpose, we integrated publications in English and Spanish, two world languages, and German.

We compiled the sample of publications to be examined based on search terms in English and German in the following databases:

- Web of Science
- Google Scholar
- Discovery database of the GESIS library (hosted by EBSCO, combining 349 international and German databases and library catalogues with a focus on social sciences, including APA PsycINFO)
- Literature database lit@cews¹ (specialised database on gender in science and research)

Spanish publications have been included via systematic searches with Spanish search terms in the following databases:

- Scopus
- Google Scholar
- Dialnet² (exclusive search database for Spanish literature)

We manually integrated some additional publications that came to our attention during screening, fit the scope perfectly and did not occur in the database searches.

We arranged our search terms by fields (see Table 1) and performed the searches in the previously stated databases by combining terms of different fields.

¹ For accessing online: <https://www.gesis.org/cews/portfolio/digitale-angebote/literatur>

² For accessing online <https://dialnet.unirioja.es>.



Table 1 Search Terms

Field	Key terms + synonyms (British and American English)	German	Spanish
Topic	Gender equality plan Gender action plan Equality and diversity plan	Gleichstellungsplan Gleichstellungskonzept Frauenförderplan	Plan de igualdad de género Plan de acción de género Plan de igualdad y diversidad
	Broader scope: <ul style="list-style-type: none"> Gender equality policy Gender equality policies Gender equality measures 	Gleichstellungspolitik Gleichstellungsmaßnahmen	Políticas de igualdad de género
	Specific terms Athena SWAN		
	Outside the scope (too broad) <ul style="list-style-type: none"> Gender equality Gender mainstreaming Equality (and Diversity) inequalities Affirmative action 		Igualdad de género Desigualdad
Approach	(Gender) Monitoring Equality data monitoring	(Gender) Monitoring	
	Specific terms <ul style="list-style-type: none"> Implementation Impact Prevalence Equality data 	Umsetzung Wirkung Gleichstellungsdaten	Implementación Impacto Predominio Datos (estadísticas) de igualdad. Often also: "Mujeres en cifras"
	Similar but not the same: <ul style="list-style-type: none"> (Gender) Controlling Evaluation 	Gleichstellungscontrolling (Programm) Evaluation	Gender controlling Evaluación
Population / target group	Research institution Research organisation / organisation Research performing organisation / organisation	Forschungseinrichtung Hochschule Universität Forschungsförderung, forschungsfördernde Organisation	Centro de investigación Universidad / Centro de educación superior Educación superior Investigación e Innovación



	Research financing organisation / organisation Higher education (institution) University, universities Research & Innovation Research Innovation	Forschung und Entwicklung	
	The terms "research" etc. also refer to studies and not only the target group.		
Concepts / Context	Intersectional Inclusive	Intersektional	Interseccional Inclusiva

Due to the focus on gender monitoring and monitoring of gender equality plans, we excluded search terms which only refer to diversity monitoring. We restricted our search to publications which combine gender and intersectional approaches and avoided analysing literature which focuses on other relevant inequalities but not on gender.

The following table (Table 2) lists the criteria for integrating the publications into the review.

Table 2 Selection criteria

	Inclusion	Exclusion
Type of documents	Scientific publications Grey literature (reports, policies) for the topic levels Monitoring GEP in R&I, Inclusive GEP in R&I, Gender monitoring in R&I	Grey literature on Gender Monitoring (general) Master and PhD theses, policy texts
Type of studies	Empirical studies Conceptual studies Handouts/tools Literature reviews	Case studies / empirical studies on Gender Monitoring (general)
Regional area	Monitoring GEP in R&I: no restriction	GEP in R&I / Gender Monitoring in R&I: ERA
Discipline	Social Sciences	
Target group	R&I	Outside R&I, exception: Monitoring GEP (supra- organisational level)
Period	since 2010	
Language	English, German, Spanish	
Citations	Gender monitoring (general): the most cited / highly influential	



	Other publications: not a criterion	
Topics		Evaluations on gender equality (exception: explicit link to GEPs) Gender equality policies in R&I (Gender) inequalities in R&I (without connection to monitoring)

The first sample of publications comprised a high number of texts. As a consequence, we decided to differentiate between the quantitative analysis of the whole sample from the in-depth critical analysis. We selected the publications for the critical analysis according to the following criteria:

- Close focus on monitoring gender equality plans
- Broad range concerning level (organisational and supra-organisational monitoring), type of publication (empirical studies, conceptual studies, handout/tools, policy documents), study locations, policy contexts, and methodology (quantitative and qualitative)
- In the case of several articles of the same author and argumentation being selected, we chose only one paper

We performed the search and selection process in the following steps:

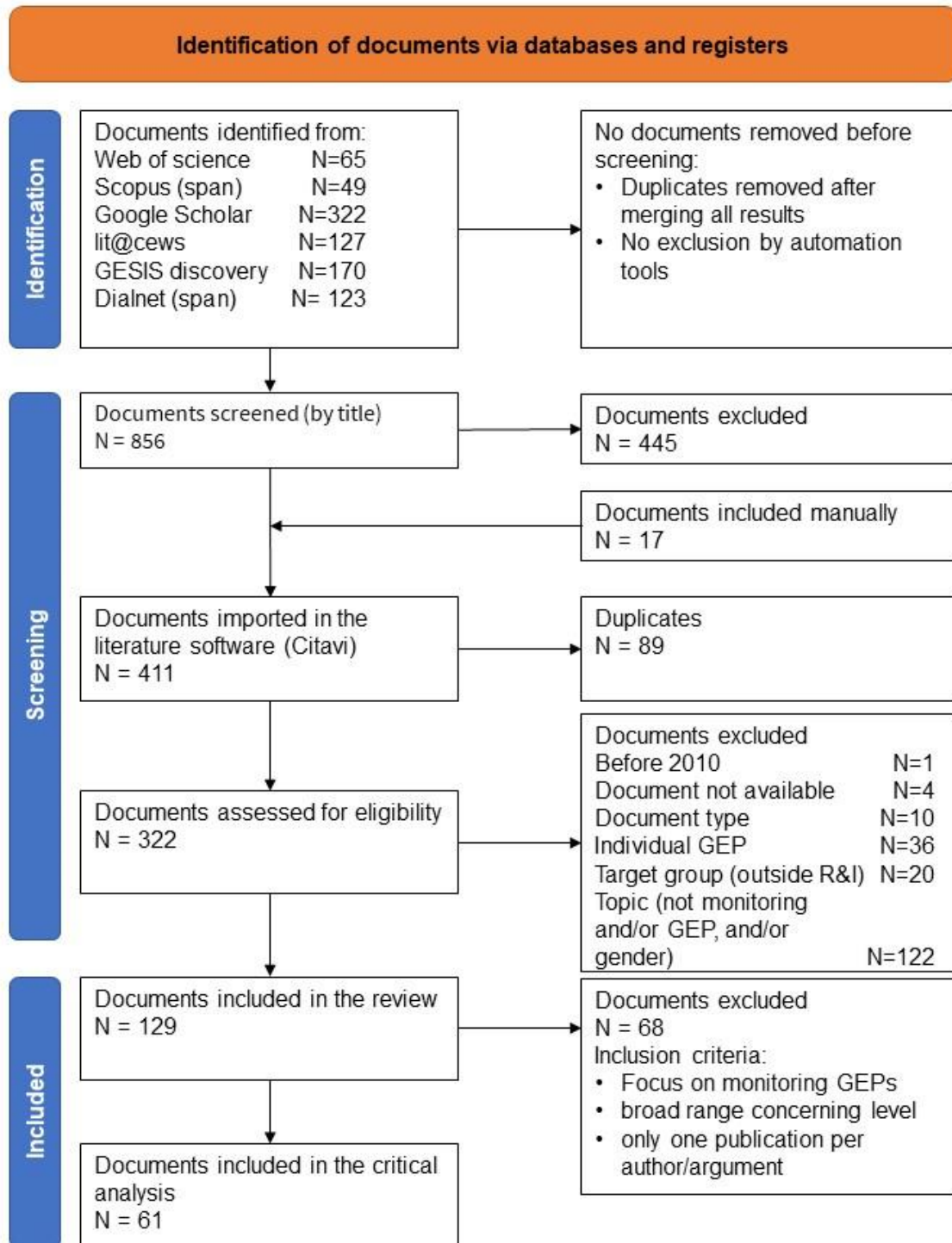
1. Database searches (30.11.2022 - 24.1.2023)
2. Screening by title
3. Assessment for including in the review (abstract, table of contents)
4. Assessment for including in the critical analysis

Searches conducted with English and German search terms in Google Scholar yielded over 1,000 results for numerous term combinations. To manage this amount of hits in a database that is not well structured, we screened only the first 30 hits sorted by relevance and the first 30 hits sorted by time. Similarly, our searches in the "GESIS Discover" database resulted in some term combinations in more than 1000 hits. Consequently, we limited the screening to the first 50 results. We set the limits by practicability, sorting by time and by relevance should ensure to get the most essential publications.

The following chart (Figure 1) documents the search and the process of inclusion/exclusion.



Figure 1 Documentation of the search and the inclusion/exclusion of documents



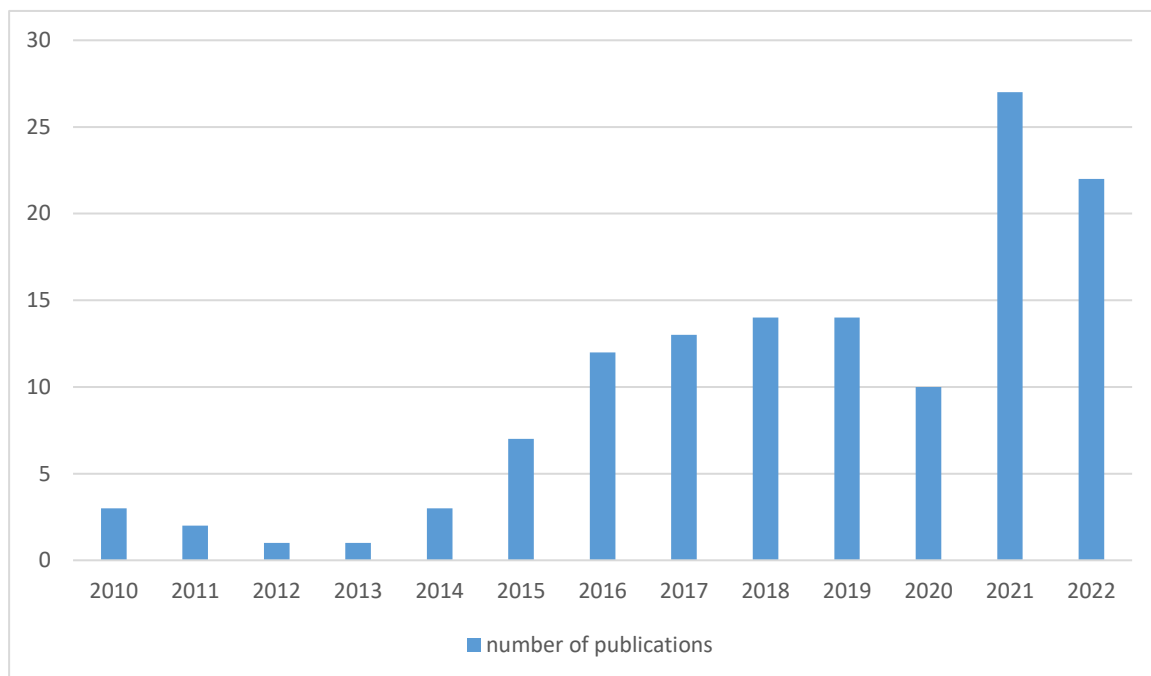


3. Quantitative analysis

In the first step, we performed a quantitative analysis of critical issues to get an overview of the publications on gender monitoring and monitoring gender equality plans in R&I. The data basis for this analysis includes 129 documents.

Political initiatives and requirements at the national and European levels pushed the development and implementation of GEPs, especially the call for institutional change through gender equality plans and financial support for structural change since 2012. The publications on monitoring gender equality plans reflect these political drivers, as the **time course** of the publication demonstrates. Three-quarters of the publications have been published since 2017, whereas only 10 % date before 2015 (see Figure 2).

Figure 2 Number of publications per year



Political initiatives on the national and the EU level influence the literature on monitoring gender equality plans indirectly, but many studies also connect directly to these initiatives. 26% of the publications (N=33) derive from EU-financed structural change projects. Furthermore, 14% (N=18) relate to national policies and 6% (N=8) to the Athena SWAN charter; one publication is linked to both national policies and Athena SWAN. Thus, half of the publications connect to national or European political initiatives.

Searching in a broader database range, we endeavoured to include **non-English publications** in the sample. Due to this search strategy, the sample contains 17% Spanish and 6% German publications (N=22 and N=8, respectively). Nevertheless, English publications dominate the sample (77%).

Most studies have been conducted in the European landscape, which reflects political decisions in the last decades in that region. Above all, the papers from structural change projects analyse several countries simultaneously (up to eight countries). Twenty-four



D2.1 Literature Review Data Monitoring

publications refer to the whole European Research Area. Further, ten publications do not specify their study location. The most frequent countries are Spain and the UK (26 and 20 publications). Germany, Austria, and Ireland are other countries that have been frequently studied. These five countries have national requirements for GEPs or national initiatives and are involved in nearly 60% of the publications.³ Some publications focus on specific regions (“Bundesländer” and “provincial”) of the federally structured countries Germany and Spain (each three publications). Thirteen publications cover Eastern European countries, mostly in combination with other countries; six publications refer exclusively to Eastern European countries.

Table 3 European study location

Countries	Number	Share of locations	Share of publications
Spain	26	16%	20,2%
EU	24	15%	18,6%
UK	20	13%	15,5%
Germany	13	8%	10,1%
Austria	8	5%	6,2%
Ireland	7	4%	5,4%
Sweden	5	3%	3,9%
Italy	4	3%	3,1%
Slovakia	4	3%	3,1%
France	3	2%	2,3%
Greece	3	2%	2,3%
Hungary	3	2%	2,3%
Norway	3	2%	2,3%
Portugal	3	2%	2,3%
Belgium	2	1%	1,6%
Bulgaria	2	1%	1,6%
Denmark	2	1%	1,6%
Finland	2	1%	1,6%
Lithuania	2	1%	1,6%
Serbia	2	1%	1,6%
Slovenia	2	1%	1,6%
Liechtenstein	1	1%	0,8%
Netherlands	1	1%	0,8%
Poland	1	1%	0,8%
Romania	1	1%	0,8%
Ukraine	1	1%	0,8%

Our search strategy sought to find publications that target non-European countries and thus integrate these perspectives. With this strategy, we found 16 publications covering countries outside of Europe, including four covering non-European countries and EU or individual European countries. Table 4 shows the number of publications that refer to non-European countries. The fact that most publications deal with European countries and the distribution of countries confirms that national or European political initiatives primarily affect the literature on monitoring GEPs.

³ The search in Spanish databases also explains the high number of publications for Spain.



Table 4 Non-European study location

Countries	Number
Australia	2
USA	3
Zimbabwe	1
South Africa	1
Morocco	2
Korea	2
Israel	1
Chile	1
Mexico	2
Uruguay	1

Including publications with several countries

Concerning the **target population**, an overwhelming majority of publications (85%) concern HEI. Nearly half (47.3%) work solely on higher education, and 38% target higher education in combination with other study populations. No paper relates exclusively to public research institutions and only one of them to private companies, and these sectors are primarily targeted together with higher education. About 3% of the papers mention private companies, yet nearly 40% provide data on research institutions.

Concerning our search strategy, we assumed that scientific papers and other **document types** discuss monitoring GEPs. We thus integrated databases that also give access to non-scientific papers in the search. One-quarter of the publications are grey literature, and more than 40% are in scientific journals (see Table 5). In addition, a significant amount (19%) are anthological articles. The distribution of document types confirms that our search strategy worked. The aim was to find both scientific papers and grey literature to get a comprehensive field view.

Table 5 Publications by document type

Document Type	Number	Share in%
Paper in scientific journals	57	44.2%
Grey literature	34	26.4%
Article in collective monographs	24	18.6%
Monograph	7	5.4%
Other	7	5.4%
Sum	129	100%

The reflection of gender monitoring and monitoring GEPs includes conceptual studies, handouts/tools, empirical studies, and publications classified as data reports. Eleven publications combine two **types of studies**, like a conceptual study and a handout/tool. More than half of the publications include an empirical study or are partly about empirical data (see Table 6). For instance, authors study the implementation and the impact of the Athena SWAN Charter (Barnard 2017), the implementation of a gender equality plan in an individual university (Gaftandzhieva, Doneva, and Sivakova 2020) or compare different universities



(Kortendiek et al. 2022) and the effectiveness of transformational interventions (Stepan-Norris and Kerrissey 2016). Data reports like the She Figures (European Commission 2021b) collect data for descriptive analysis. Apart from these empirical and data-driven analyses, a substantial part of the publication deals with the conceptual and theoretical foundation of gender monitoring and provides handouts and tools for practitioners. More than 40% of the publications belong to this type of study, including six publications that combine an empirical and a conceptual approach.

Table 6 Publications by type of study

Type of study	Number	Share in%
Empirical study	72	56.3%
Handout/tool	30	23.4%
Conceptional study	27	21.1%
Data report	17	13.2%
Other	5	3.9%
Sum (including multiple selections)	153	119%

Including multiple selections

We analysed the **methodological approach** only for empirical studies. The analysis did not reveal any mainly used or favoured methodological approach. Equally one-third of the empirical studies use quantitative, qualitative, or both methods/mixed methods (see Table 7). We only classified "mixed methods" to those studies that explicitly named this approach. As examples of qualitative methods, the publications provide case studies, comparative analysis, interviews, practice theory approaches, and grounded theory.

Table 7 Publications (only empirical studies) by methodological approach

Methodological approach	Number	Share in%
Quantitative methods	23	32.9%
Qualitative methods	23	32.9%
Mixed methods	15	21.4%
Quantitative + qualitative methods	9	12.9%
Sum (empirical studies)	70	100.0%

The implementation and impact of GEPs are monitored on the **level** of the individual organisation (universities, public research institutions, or private companies) and the supra-organisational level, comparing different organisations on a regional, national, or European-wide, and international level. When classifying publications by levels, we mapped papers as "supra-organisational", which compare gender equality plans and gender equality policies of several universities, for instance, as part of a joint project. Thus, the category supra-organisational includes publications assessing the implementation and impact of gender equality plans of all or a sample of research organisations (regularly restricted to universities), comparing several individual universities and setting monitoring frameworks for supra-organisational monitoring. In this broad sense, more than half of the publications deal with supra-organisational monitoring (see Table 8). Nearly 40% deal with the intra-organisational level, which means GEP monitoring inside a research organisation. Finally, ten publications include both levels.



Table 8 *Publications by level (intra-organisational and supra-organisational)*

Level	Number	Share in%
Intra-organisational	49	38.0%
Supra-organisational	70	54.3%
Intra-organisational + supra-organisational	10	7.8%
Sum	129	100.0%

We classified the **topics** discussed in the publications primarily based on the abstracts and, if necessary, by screening the text. We deductively created four categories according to our research questions (concepts of gender monitoring, GEP prevalence, GEP implementation and GEP impact). While classifying, we complemented these categories inductively to fit the material with three more topics, namely “collecting data”, “monitoring gender inequalities”, and “GEP audit”. Most publications are described through multiple categories, with half of the publications by two topics and 13 per cent by three topics.

Table 9 *Topics discussed in the publications (multiple selections)*

Topics	Number	Share of publications in%
Collecting data	14	10.9%
Concepts of gender monitoring	17	13.2%
Monitoring gender inequalities	8	6.2%
GEP audit	9	7.0%
GEP prevalence	13	10.1%
GEP implementation	66	51.2%
GEP impact	85	65.9%
Sum	212	164.3%

Nearly a quarter of the publications discuss methodological and conceptual issues regarding collecting data and gender monitoring (see Table 9). Examples of these topics are tools and handbooks on gender statistics and indicators (European Institute for Gender Equality 2019; Makkonen 2016; European Commission 2021c), conceptual studies on gender monitoring (Wroblewski and Leitner 2022), as well as guidelines and tools on how to set up a monitoring system, often outcomes from structural change projects (Lipinsky and M. Schäfer 2016; Peterson and Dahmen 2018).

About 6 % of the publications analyse gender inequalities primarily. Most of them are data reports at the European or regional level, along with some empirical studies (Bae 2022). The category "GEP audit" (7% of the publications) refers to documents that conduct an initial audit of a GEP and thus analyse gender inequalities inside an organisation.

10% of the publications investigate the prevalence of GEPs. This topic includes literature on the assessment of whether legal requirements to adopt a GEP are fulfilled (Becker et al. 2010), the European-wide analysis of how many research organisations have a GEP (European Commission 2015, 2021b) and the comparison of GEP prevalence in Nordic countries (Dietrichson 2022). Half of the publications analyse the implementation of GEPs, that is, their realisation and putting them into practice. The implementation monitoring of



GEPs and measures is often linked with the discussion of enabling and disabling factors (Ní Laoire et al. 2021; Alonso and Onandia 2021).

Two-thirds of the publications deal with the impact of gender equality plans (or gender equality policies). This high number demonstrates the importance of analysing and assessing the impact but also relates to different understandings of impact and approaches to impact monitoring. We will investigate these different approaches in the second part of this review.

Nearly one-quarter of the publications (N=29) include intersectional perspectives. Except for one publication (Iniesta Pérez de Gracia, Elisa and Julián Edo 2011), all papers were published from 2016 onwards, and nearly 70% were published as of 2019. Ten publications integrating intersectional perspectives refer to the UK, and four to non-European countries. For instance, the Equality Challenge Unit (UK) issued guidelines which explicitly foster intersectional approaches to equality research and data (Equality Challenge Unit 2017). A handout for designing and implementing GEPs in Latin American universities explains its intersectional approach by pointing to the diverse needs along different inequalities (Villegas et al. 2018). Especially gender policies, which open up to diversity policies and anti-discrimination integrate intersectionality (Mour 2022; Tsouroufli 2019).

The quantitative analysis of publications on monitoring GEPs shows a wide range of document types and types of study, study locations, methods, levels (intra- and supra-organisational) and topics investigated and discussed. Despite this broad range, the literature review identifies specific patterns and gaps. The conceptual discussion and empirical studies on monitoring GEPs reflect political initiatives and requirements at the national and the European levels, shown in the time course, the publication context (studies issued from EU projects or closely related to national legal requirements or initiatives) and the study locations. Most of the literature deals with the implementation and impact of gender equality plans. The critical analysis will discuss findings and knowledge gaps in this regard. The literature deals similarly with monitoring GEPs inside an individual organisation and comparing RPOs on a supra-organisational level without setting a priority. A large gap concerns the study population: An overwhelming majority of publications relate to (public) HEI, and publications on research institutions (public sector) and private companies are almost entirely missing. Since 2016, more publications have integrated intersectional perspectives, but there is a need for more comprehensive inclusion. The findings and gaps of the intersectional approaches – and gender diversity – in monitoring GEPs will also be discussed in the critical analysis.

4. Critical analysis

For the critical analysis, we conducted an in-depth review of a selected literature corpus to shed light on what is known from the existing literature about monitoring gender equality plans in research-performing organisations (RPO) (see p.16 for the selection criteria). Gender inequality in RPOs is a complex issue that can be explained through various levels of analysis (O'Connor and Irvine 2020; Tzanakou, Clayton-Hathway, and Humbert 2021), e.g. on the macro level, which considers national and international factors on the meso level



which focuses on organisational dynamics within RPOs; and on the micro level which takes situational influences into account. These different levels interact with one another to perpetuate gender inequalities within RPOs. This literature review focuses on cross-country and cross-sector monitoring of gender equality plans, thus on studies considering such a cross-cutting perspective. As explained above, we distinguish between monitoring GEPs on an intra-organisational level compared to a supra-organisational level. The analysis summarized the existing literature about GEP monitoring at intra- and supra-organisational levels. These two levels offer diverse theoretical frameworks and methodologies for examining GEP monitoring practices. Therefore, the critical analysis is structured into subchapters that explore the literature related to each specific level of analysis – intra- and supra-organisational.

We identified four major topics related to monitoring GEPs revealed from the quantitative scoping literature review, which also serve as a framework for the critical analysis: prevalence and characteristics (4.2), implementation procedures (4.3), impact (4.4), and intersectional approaches (4.5). Before resuming the results for these issues, we describe the data sources used and the gender monitoring concept being considered (4.1).

4.1. Data collection for gender equality plans, approaches, and gender monitoring concepts

Monitoring GEPs is a continuous task that requires regular data collection (Wroblewski and Leitner 2022). Furthermore, we rely on the definition of *Gender statistics*, which is “*statistics that adequately reflect differences and inequalities in the situation of women and men in all areas of life*” (World's Women, 2005: Progress in Statistics 2006). Gender statistics serve as the basis for monitoring advancements made towards gender equality (United Nations Statistics Division 2015). However, to prevent the creation of a “data graveyard” (Wroblewski and Leitner 2013), gender monitoring must be connected to specific gender equality goals. As an illustration, Austrian universities have gender equality goals that are built into their mission statements codified in the university law (“Wissensbilanz”) (Wroblewski and Leitner 2013).

Primarily, it is crucial to establish an efficient monitoring mechanism. These mechanisms include the accessibility and availability of data, incorporation of appropriate indicators, active participation of stakeholders in the development process, and adherence to the programme theory or the logic model when it comes to policy implementation. For effective reporting and progress tracking, a monitoring process should also be conducted at regular intervals, i.e., monthly or yearly (Wroblewski and Leitner 2022). To avoid just “sex-counting”, experts and researchers call to link indicators to a broader concept of gender equality (Eckstein 2016). An indicator is a measurable variable representing an associated factor or quantity (e.g., number, percentage, ratio). Scholars recommend that indicators are specific, measurable, achievable, realistic, and time-bound (SMART) (Wroblewski and Eckstein 2018). Nevertheless, qualitative indicators are also important to monitor gender equality, such as expressions of gender sensitivity.

The literature lists a variety of indicators. The most common ones cover – but are not limited to – the gender pay gap (Wroblewski and Leitner 2013, 3–27; O'Connor and Irvine 2020;



Stadler and Wroblewski 2021), changes in women's participation (Löther 2019; O'Connor and Irvine 2020; Timmers, Willemsen, and Tijdens 2010), and changes in the representation of women (and/or under-represented groups) among students and graduates, at different career levels, in decision-making bodies, recruitment and promotion (Sánchez Nimo 2021; Doneva, Gaftandzhieva, and Boykova 2022; Gregory - Smith 2018; Kalpazidou Schmidt et al. 2017; O' Connor and Irvine 2020, 8-11; Stepan-Norris and Kerrissey 2016; Timmers, Willemsen, and Tijdens 2010; Zabaniotou, Boukamel, and Tsirogianni 2021). Literature also shows how gender equality is a complex construct, hence often represented by multiple indicators (Wroblewski et al. 2015; Gairín Sallán and Palmeros y Àvila 2018). Another way to reflect different aspects of this complex construct during a monitoring process could be an index (Wroblewski and Eckstein 2018). For example, vertical segregation⁴ is indicated by the glass ceiling index, while the dissimilarity index represents horizontal gender segregation⁵ (Wroblewski et al. 2015). The dissimilarity index offers a theoretical measure to determine the proportion of women and men needing to transition into different scientific fields to achieve gender balance across various domains (European Commission 2015, 2021b). The glass ceiling index assesses the probability that women will hold senior positions compared to positions on a lower qualification level (Timmers, Willemsen, and Tijdens 2010; European Commission 2021c; Stadler and Wroblewski 2021). It can compare the representation of women in senior positions regardless of the organisations' disciplinary profiles and thus compare organisations with and without GEP and changes in time (before and after the implementation of GEP). However, the index neglects that academics often have to move between institutions due to mobility requirements. In Germany, PhDs cannot be appointed as professors at the same university unless they have been employed at another location for at least two years in between. Even though the research revealed a variety of indicators to monitor gender inequities, indicators that address GEP monitoring on a supra-organisational level to compare RPOs across national and worldwide levels are sparse.

There are two main ways in which data can be collected for an effective monitoring system: quantitative and qualitative. Additionally, mixed methods are also utilized, combining quantitative and qualitative approaches. Quantitative data aims to turn information into numbers or percentages and depends on the reliability and validity of the results obtained. (Aldercotte 2018; Douglas Oloyede 2014). Sources for quantitative data on gender equality are a) surveys (including online surveys; Bühner and Wroblewski 2019; Corejova et al. 2021; European Commission 2015; Henderson et al. 2020; Kortendiek et al. 2022; European Commission 2016), and b) administrative data (Gregory - Smith 2018; Stepan-Norris and Kerrissey 2016; Xiao et al. 2020; European Commission 2021b; Löther 2019).

Qualitative methods collect non-numerical data, such as an individual's opinions and attitudes (Douglas Oloyede 2014; Chitsamatanga 2016; Kalpazidou Schmidt et al. 2020). Ways to gather qualitative data are mainly a) focus groups (Chitsamatanga 2016), b) semi-structured interviews (Henderson et al. 2022), c) document analysis (Henderson et al. 2022;

⁴ EIGE, Glossary and Thesaurus, 'Vertical Segregation', available at: <https://eige.europa.eu/publications-resources/thesaurus/terms/1243>

⁵ EIGE, Glossary and Thesaurus, 'Horizontal Segregation', available at: <https://eige.europa.eu/publications-resources/thesaurus/terms/1225>



Kalpazidou Schmidt et al. 2020; Chitsamatanga 2016), and d) open-ended comments in surveys (Henderson et al. 2022). On the other hand, mixed methods are utilized to compensate for both qualitative and quantitative methodologies' limitations inherent within each respective method (Gaftandzhieva, Doneva, and Sivakova 2020; Langle Gómez 2016; Ovseiko et al. 2019; Peña et al. 2021; Timmers, Willemsen, and Tijdens 2010; Tzanakou and Pearce 2019; University of Vilnius 2021; Striebing et al. 2020; Zabaniotou, Boukamel, and Tsirogianni 2021; Kalpazidou Schmidt et al. 2020; Addabbo et al. 2018; Heidler and Reichwein 2018; Wroblewski and Leitner 2022; Claeys-Kulik, Jørgensen, and Stöber 2019). Many researchers favour this approach to transcend the inherent limits of each method: quantitative evidence on data monitoring of GEPs creates a solid foundation, and qualitative evidence provides a richer picture of the impact on people's experiences, which are more personal and engaging (Douglas Oloyede 2014; European Institute for Gender Equality 2019).

To sum up, Monitoring GEPs involves the ongoing tracking and assessment of changes, utilizing data, indicators, and information to inform decision-making and improve the implementation of initiatives. By identifying gaps and challenges, this process ensures the adoption of effective measures to advance gender equality.

4.1.1. Data collection and methods at the intra-organisational level

Combining both data collection methods (i.e., quantitative and qualitative) is the most widely used approach to monitoring GEPs at the intra-organisational level (University of Vilnius 2021; Peña et al. 2021; Ovseiko et al. 2019; Langle Gómez 2016; Gaftandzhieva, Doneva, and Sivakova 2020). Using only quantitative data collection is the second most widely used approach (Henderson et al. 2020; Corejova et al. 2021; Stepan-Norris and Kerrissey 2016), with a focus on surveys (Henderson et al. 2020; Corejova et al. 2021) due to its ability to collect comprehensive information from a large sample size. Only one publication (Henderson et al. 2022) applied a qualitative approach by combining survey respondents' free-text comments and semi-structured interviews. Another study combines interviews with 41 teachers with a self-assessment questionnaire and students' perception questionnaire with students acquiring information on monitoring (Peña et al. 2021). Another approach is to employ a survey consisting of a questionnaire, which includes open-ended questions, to report the differences in perception of culture, including gender equality, along with other variables (Ovseiko et al. 2019).

4.1.2. Data collection and methods at the supra organisational level

The publications on the supra-organisational level concentrate more on quantitative data (Bührer and Wroblewski 2019; European Commission 2015, 2021b; Gregory - Smith 2018; Xiao et al. 2020; Löther 2019; Kortendiek et al. 2022; European Commission 2016, 2021c; Wroblewski and Leitner 2013). The most commonly used data types are primarily administrative (Xiao et al. 2020; Gregory - Smith 2018; Kortendiek et al. 2022; Löther 2019; Wroblewski and Leitner 2013) and survey data (Bührer and Wroblewski 2019; European Commission 2015, 2016; Kortendiek et al. 2022). Publications with these approaches emphasize the relevance of statistical analysis to measure relationships between variables and draw conclusions from large data sets. Additionally, using causal design in quantitative



research allows for a deeper analysis of how one variable affects another and can lead to showing cause-and-effect relationships. Recent advancements in information technology have identified a novel data collection method, namely, web scraping. In an explorative study, the She Figures report used web scraping to determine whether RPO has taken any action toward gender equality (European Commission 2021b, 2021c).

Furthermore, the combination of quantitative and qualitative sources is another approach widely used (Tzanakou and Pearce 2019; Timmers, Willemsen, and Tijdens 2010; Addabbo et al. 2018; Striebing et al. 2020; Zabaniotou, Boukamel, and Tsirogianni 2021; Heidler and Reichwein 2018; Claeys-Kulik, Jørgensen, and Stöber 2019; Peterson and Dahmen 2018). While qualitative approaches are the least prevalent method of data collection at the supra-organisational level, there exists solely one single research that employs qualitative data derived via semi-structured interviews, focus groups, and document analysis at the supra-organisational level (Chitsamatanga 2016). This study exclusively focuses on gender equality policies in two Zimbabwean state universities.

4.2. Prevalence

Monitoring the prevalence means measuring whether RPOs have established and permanently implemented GEPs for a particular period. However, implementing gender equality policies does not imply the presence of a GEP, nor does the existence of a GEP automatically mean the establishment of effective measures toward achieving gender equality (European Commission 2015). Thus, the presence/absence of GE actions, regardless of GEPs, should be independent. Monitoring the prevalence of GEP is only reported at the supra-organisational level due to the definition of prevalence.

4.2.1. Prevalence at the supra-organisational level

Despite the European Commission's continuous efforts to promote gender equality, starting from 1999 with the Communication on “Women and Science” (Ferguson 2021), the existence of GEPs at RPOs is not uniformly distributed across European countries. Some countries are better positioned regarding the number of organisations with gender equality plans (EIGE 2016). These differences across countries can be mainly attributed to national laws and national research policies (EIGE 2016; ERAC SWG GRI 2021; Winsnes Rødland et al. 2015).

The preferred methods to monitor the prevalence of GEPs at the supra-organisational level are through surveys (European Commission 2015; Kortendiek et al. 2022; ERAC SWG GRI 2021; European Commission 2016) and web scraping (European Commission 2021b, 2021c). Surveys provide data to monitor the prevalence of GEPs across countries, universities at the national level, and RPOs. In 2021, the Standing Working Group on Gender in Research and Innovation (ERAC SWG GRI 2021) initiated an online survey aimed at mapping out the adoption of GEPs across EU MS (23 of 27) and AC (6) for different sectors such as public and private HEIs, RFOs, the public sector, and private companies on a national level. According to their survey, Germany, Denmark, Finland, and Sweden among MS; Iceland and Norway among AC are the only countries that require the adoption of GEP in **all sectors** considered, including public and private HEIs, RFOs, and companies. On the



D2.1 Literature Review Data Monitoring

other hand, Austria, Germany, Denmark, Spain, Finland, France, Ireland, Portugal, and Sweden are among MC; Israel, Iceland, Norway, and Switzerland are among AC that impose a GEP requirement **for HEIs** at the regional or national level. A monitoring study in the state of North Rhine-Westphalia of Germany revealed that thirty universities had valid GEPs, five universities' GEPs were partially valid and in the process of being updated, and only one university did not have a GEP at all (Kortendiek et al. 2022). The report “She Figures” utilising surveys across RPOs in Europe (European Commission 2015, 115–17) displayed that GEPs were in place in 36% of RPOs' survey-responding countries⁶. This number exceeded in Denmark, Malta, the Netherlands, Finland, Sweden, the UK, Iceland, and Norway by 50%.

Although surveys are widely used, this method causes some challenges for data monitoring. First, surveys are cost-intensive. Second, sample selection bias may arise as a methodological problem due to a lack of non-randomized sample selection in survey methods, e.g. the sample in the ERA survey is not randomly selected, and the survey results have not been weighted (European Commission 2016). In such cases, neither inferential statistics nor generalization of the results is possible (European Commission 2016). For instance, in some countries like Ireland, Malta, and Iceland, the outcome is influenced by a limited sample size, which may lead to a high percentage (European Commission 2015). In other words, survey respondents do not represent the actual population. Therefore, the results can only provide a snapshot of the current situation regarding RPOs (European Commission 2016).

Recently, the European Commission employed web scraping as an alternative and less time-consuming approach to traditional methods to monitor the prevalence of GE actions (European Commission 2021b). Web scraping may assess whether HEIs and RPOs name gender equality actions and measures on their websites. One of the limitations of this method reported by EC is that it was not possible to use a strict description of GEPs. Instead, the researchers collected information only on GE actions and measures reported on the webpages of HEIs and RPOs (European Commission 2021b, 2021c). According to the web scraping estimation, over 50% of HEIs in most EU-27 Member States (19 of 27) and Associated Countries mentioned initiatives and actions encouraging GE on their websites (European Commission 2021b). The number increases to over 80% for Germany, Ireland, Spain, Malta, Sweden, Iceland, Norway, Switzerland, and Turkey (European Commission 2021b). Investigating only the countries where more than 30 RPOs exist, the share of RPOs mentioning gender equality actions and measures is lower than that of HEIs, except for Italy, Slovenia, and Finland (European Commission 2021b).

The statistical results obtained through web scraping are similar to those of the survey used for the 2015 edition of *She Figures*, which measured the "**share of RPOs that had GEPs in place**" (European Commission 2021a). Web scraping reached an 86% accuracy rate in the trial phase. Nevertheless, this accuracy rate decreased when GEPs' PDFs associated with the webpage were also included in the analysis (European Commission 2021a, 2021b). Web scraping exhibits an advantage regarding implementation costs relative to the survey

⁶ ERA survey carried out in 28 Member States of the EU, plus Albania, Bosnia and Herzegovina, the Faroe Islands, Iceland, Israel, Montenegro, Norway, Serbia, Switzerland and Turkey.



method. However, the non-randomized sample issue persists: The authors reported that a low share of scraped RPOs may lead to increased results in countries such as Ireland, Malta, and Iceland (European Commission 2021a).

The Horizon Europe eligibility criteria (enforced by the EC), which state that GEPs must be a public document and made available on the organisations' website, may facilitate the spread of web scraping as a promising method for data collection.

4.3. Implementation

Effectively implemented GEPs' measures can lead to a change in gendered practices and, as a result, to structural change (Wroblewski and Palmén 2022). The notion of structural change refers to the transformation in the gender policy approaches from "fixing the women" to "fixing institutions" (Winsnes Rødland et al. 2015). Implementing a GEP entails, among others, organising regular meetings with relevant staff, motivating the staff involved, maximising the effectiveness of the plan, encouraging the whole community to participate by outlining ways that others can contribute, and reporting about the progress towards gender equality in the institutions regularly (ERAC SWG GRI 2021). Monitoring the implementation process focuses on guaranteeing that the GEP is effectively carried out and ensures the execution of GEPs (Lipinsky and M. Schäfer 2016, 2–3). Putting a GEP into action requires having the necessary financial (budget), human resources, leadership commitment, and gender equality units, officers, and networks at both the national and organisational levels (Winsnes Rødland et al. 2015). Monitoring can detect challenges and obstacles in the execution of GEPs at a very early stage (Wroblewski and Leitner 2022), e.g., budgetary deviations from the plan. When monitoring is lacking, such issues go undetected, leading to an *implementation gap* described in the literature as the failure or lack of impact of gender equality programs/plans (Mour 2022).

Horizon Europe (2021a) suggests five thematic areas for implementing measures: a) Work-life balance and organisational culture, b) Gender balance in leadership and decision-making, c) Gender equality in recruitment and career progression, d) Integration of the gender dimension into research, and teaching content and e) Measures against gender-based violence, including sexual harassment. In research organisations, GEPs are the current approach for initiating and striking a structural change toward gender equality. Although the EU suggest these measures, the implementation of gender equality measures varies among EU Member States (Ferguson 2021).

Our findings reveal no gold standard for monitoring GEP implementation. Experts call for more information and data to be collected and evaluated to monitor the implementation processes (Engeli and Mazur 2018). The implementation data in the studied publications focus more on the implementation measures than the implementation process. This review has found a limited amount of research on monitoring the GEP implementation processes, which is consistent with Wroblewski and Lipinsky (2018) arguing that monitoring the implementation can be difficult due to challenges in obtaining data on the implementation phase.



4.3.1. Implementation at the intra-organisational level

Our review reveals a lack of research on implementation monitoring at the intra-organisational level. Most papers on implementation concentrate on the preliminary diagnostics than on monitoring the whole process (Gaftandzhieva, Doneva, and Sivakova 2020; Langle Gómez 2016; Subdirección General para el Emprendimiento, la Igualdad en la Empresa y la Negociación Colectiva de Mujeres 2021; University of Vilnius 2021; Pastor Gosalbez and Acosta Sarmiento 2016). However, monitoring requires a regular and continuous approach to understand whether the organisation executes the GEP as planned. Moreover, most of the research regarding the implementation of GEP concerns how the ideal implementation monitoring should be rather than monitoring the execution of GEP (Doneva, Gaftandzhieva, and Boykova 2022; Subdirección General para el Emprendimiento, la Igualdad en la Empresa y la Negociación Colectiva de Mujeres 2021; Gutiérrez et al. 2017).

Structural change projects are prominent in the literature about implementing GEPs, particularly in Europe, due to the EC's initiatives to support organisational change for gender equality in academia and research institutions (EIGE 2016). To carry out the necessary structural changes, the EC asked research institutions to submit a credible self-tailored action plan based on their problems (EIGE 2016). These plans included measures about a) recruitment, promotion, and retention policies, b) management and research assessment standards, c) course content development, d) leadership development, e) supporting policies for dual career couples, and f) returning schemes after career breaks. EU-funded projects developed tools and guidelines to monitor GEP implementation systematically due to the requirement of these structural change projects. For instance, the TARGET⁷ project created a Gender equality monitoring tool and guidelines for self-assessment which focuses on data monitoring on different dimensions of implementation, such as women in decision-making, removing gender-related organisational barriers, and gender dimension in teaching and research content (Wroblewski and Eckstein 2018). At the same time, the INTEGER⁸ project provides a guideline for Gender Action Plans' self-assessments, which covers various areas, from the preparatory phases to quality assurance. (Lipinsky and M. Schäfer 2016). The EFFORTI project points out that the availability of resources for the implementation is critical for creating an effective and long-term impact through different case studies. The reasons for a suboptimal implementation mainly lay, among other factors, in a lack of gender competence and experience (Palmén et al. 2019). With an emphasis on the implementation process, GenderTime⁹ (Peterson and Dahmen 2018), another structural change project, delivers a monitoring handbook that offers guidance and recommendations, including process monitoring. They highlighted that knowledge exchange and sharing experiences among the engaged agents are crucial for process monitoring but are the most neglected aspects of cross-cultural projects. Leadership commitment is the most pronounced aspect of achieving structural change, and several studies identified it as one of the most critical

⁷ The TARGET project fosters a reflexive gender equality policy in seven gender equality innovating institutions (GEII) in the Mediterranean basin with the goal of advancing gender equality in research and innovation: <http://www.gendertarget.eu/>.

⁸ INTEGER project aims to implement sustainable and transformational changes for improving the career advancement of female scientific researchers : <https://cordis.europa.eu/project/id/266638>.

⁹ GenderTime project aims to identify and implement the best systemic approach to increase the participation and career advancement of women researchers in selected institutions where self-tailored action plans are implemented: <https://gendertime.org/>.



D2.1 Literature Review Data Monitoring

components at the intra-organisational level for implementing GEPs (Henderson et al. 2020; O'Connor 2020; Winsnes Rødland et al. 2015).

In addition to the insights on progress towards reaching the objectives, monitoring GEPs should provide insights into the implementation process's strengths, weaknesses and difficulties (Holzinger and Beranek 2020). The SWG GRI notes that in some countries, the GEP requirement does contain a robust quality assurance feature (ERAC SWG GRI 2021), while our research shows that others may not. For instance, a study conducted in two universities in Zimbabwe addressed some of the challenges in monitoring the implementation processes, such as lack of adequate funding and workforce, lack of gender knowledge, insufficient training programs, lack of consultation of policy implementers in some of the gender programs in place, and scarce budgets (Chitsamatanga 2016). Few studies addressed the obstacles to monitoring the implementation; Palmén et al. (2019) pointed out the linkage of malpractices in the implementation due to a lack of gender competence and experience. Another study reported the importance of proper indicators in monitoring the implementation, and the authors highlighted the importance of qualitative indicators (Mergaert, Cacace, and Linková 2022).

The literature review shows an increasing focus on processes over outcomes in structural change projects (Peterson and Dahmen 2018; Wroblewski and Eckstein 2018; Lipinsky and M. Schäfer 2016). This focus may ensure the effectiveness of gender equality plans, which could stimulate the sustainability of structural change in the long run (Ferguson 2021).

4.3.2. Implementation at the supra-organisational level

Considering the number of action plans involved, monitoring the GEP implementation at the supra-organisational level can be challenging. National regulations, the political environment, and national initiatives have an essential influence on implementing GEPs. Generally, formal responsibilities are more likely to be assigned when GEPs derive from legal obligations (EIGE 2016). On this basis, the lack of responsible parties and funding for GEP monitoring affects the data quality of GEP. Data from the Athena SWAN's action plans revealed that it is essential to invest in recruiting and training highly skilled local implementation personnel (Kalpazidou Schmidt et al. 2020). Valencia Gutiérrez (2017) proposes to counteract missing expertise by networking gender equality actors. Thus, appointing GE units/experts who realise gender equality activities is one of the requirements for an effective GEP implementation that results in structural change. In some countries, tasks were not consistently allocated to responsible persons or departments and timetables were not assigned for action planning (ERAC SWG GRI 2021). For instance, reports show that GEPs in the Czech Republic do not specify the responsible party, deadlines, or indicators. Similar circumstances apply to equal opportunity policies enacted in Hungary and part of those in Italy. In Germany, the federal states (Bundesländer) are the authority to implement GEP for HEIs (European Research Area and Innovation Committee 2015).

According to the ERA survey (2014), actions aimed at promoting gender equality encompass a variety of measures, including career flexibility, recruitment and inclusive advancement policies, assistance in leadership development, quotas for gender balance in recruitment committees, and efforts towards balancing work-life commitments. Since 2013, more than



half of the participating RPOs (European Commission 2015) have included measures relating to work-life balance, including parental leave schemes and flexible working arrangements. A survey conducted in the North Rhine-Westphalia region focused on various implementation aspects, such as gender equality officers and actors, targets for female professors, and family-friendly measures. The survey results yielded that adopted family-friendly measures apply a broad and inclusive understanding of family (Kortendiek et al. 2022). The Monitoring of the Research-Oriented Standards on Gender Equality¹⁰ by the German funding body DFG (Heidler and Reichwein 2018) revealed that among the implemented measures, roughly one-third focused on staff, mainly early-career researchers. Family commitments and actions to support achieving a balance between work and personal life are the second leading dimensions, accounting for 29% of responses.

Monitoring gender inequality plans at a supra-organisational level faces challenges like the absence of standardised measures, hindering consistent progress assessment. Legal responsibilities regarding GEPs vary among countries, and there is often a lack of clear guidance on their implementation and evaluation. Gender equality units/officers are crucial for managing the process and ensuring success in gender equality plans implementation.

4.4. Impact

Monitoring is a continual process throughout implementing the GEP. Monitoring provides information about the impact of the measures in the GEP. It is the underlying assumption of GEPs that the monitoring of it will contribute to improving gender equality in a certain organisation. However, linking a GEP with changes in gender equality is complicated and challenging (Doneva et al. 2022) as it requires making causal links between measures and changes in gender equality. Monitoring the GEP's impact requires a clear distinction between evaluation and monitoring, even if they complement each other (Wroblewski and Leitner 2022). Monitoring is a systematic way of data collection on an outcome to determine whether the implemented initiative runs as planned (Aldercotte 2018; Wroblewski and Eckstein 2018). Impact evaluations, however, aim to determine, among other goals, the initiative's effectiveness and efficiency, assess the initiative's effects and sustainability and link observed changes to the intervention (e.g., GEPs) in a causal way. To this end, evaluations make use of the data gathered through monitoring. Monitoring ensures that “the right thing is done”, and evaluations assess that “the right outcomes are reached”, to put it simply.

The definition of impact and its features varied across the publications studied (see also Aldercotte 2018; Kalpazidou Schmidt et al. 2017). To analyse the effects of interventions like GEPs or programs, program theory and logic chart models differentiate between output, outcomes and impact. Aldercotte (2018, 3–4) states that impact is often very broadly defined, which makes evaluation difficult. She also links impact to evaluation, and this relies on the comparison of results. According to the I-O-O-I model in the EFFORTI project (Kalpazidou Schmidt et al. 2017). **Output** means “Short term (measurable results) of funded projects/programmes”¹¹, whereas **outcomes** are “Mid-term effects on the participants/beneficiaries of the programme”, and the **Impacts** is defined as “Mid- or long-

¹⁰ In 2008, DFG (German research Fund) introduced the Research-Oriented Standards on Gender Equality program to enhance sustainable equality policy in the university community and research.

¹¹ [Effortti Toolbox v2.0 | Effortti](#)



D2.1 Literature Review Data Monitoring

term indirect effects that occur beyond the participants of a programme/spill-overs”. In our view, these are definitions which make it easier to deal with the difficulties of understanding the concept of monitoring the impact of GEPs.

In structural change projects, the impact is monitored through either program evaluation (Palmén et al. 2019) or self-assessment (Lipinsky and M. Schäfer 2016; Wroblewski and Eckstein 2018) that the projects itself propose, e.g., EFFORTI, TARGET, INTEGER. In these frameworks, the evaluation of the “impact of an intervention thus relies on some form of comparison, either before and after an intervention or with another group of individuals who were not exposed to an intervention (i.e. a control group)(Aldercotte 2018, 4).

Developing indicators and monitoring the impact of GEP is complex and demanding (Wroblewski et al. 2015) because long-term changes are hard to identify during the plan's implementation or even once it is finished (Douglas Oloyede 2014; Lopez Padilla 2015). It is often difficult to link which impacts are directly related to the intervention and how the impact has occurred (Kalpazidou Schmidt et al. 2017). Because changes toward gender equality are not linear (Higher Education Authority 2018), analysing the impact of gender equality needs multi-dimensional approaches (Kalpazidou Schmidt and Cacace 2017).

The literature presents approaches to evaluate the impact, the attribution and the contribution model (Kalpazidou Schmidt et al. 2017). The **attribution method** relies on calculating the contrafactual (asking "what if") and strongly emphasizes establishing a cause-effect relationship between the intervention and its impact (Engeli and Mazur 2018). To accurately assess the impact, it is necessary to consider other external factors that may have influenced the changes in addition to the evaluated measures. Long-term quantitative data collection is essential for the attribution (causality) approach. Some authors describe this difficulty as a time problem, e.g., the publication of Kalpazidou Schmidt et al. (2017). Yet, some evaluation studies (Gregory - Smith 2018; Löther 2019) evaluated the impact by utilizing datasets on GEPs covering periods of nine years and eight years in difference-in-difference settings that account for causality.

In contrast, the **contribution approach** has a broader meaning of “change”. This approach "attempts to provide rigorous accounts of how and why an intervention contributed to producing the observed effects” (Kalpazidou Schmidt et al. 2017, 27; Kalpazidou Schmidt et al. 2020; Palmén et al. 2019). Instead of trying to attribute effects to the intervention by calculating causality, the contribution approach relies on a theory of change to detect factors contributing to the effects. A related approach is the impact drivers model (Mergaert, Cacace, and Linková 2022) is also based on a theory of change. The impact driver model describes drivers like change agents, leadership commitment, availability of resources, and data collection, which contribute to institutional change toward gender equality. The authors elaborated some indicators for each driver and provided an assessment tool.

A large number of the publications don't rely on theoretically informed approaches but state any observed effect as impact, such as changes in the representation of women (and/or under-represented groups) among students, graduates and researchers at various career levels among decision-making bodies, in recruitment, and in promotion (Doneva, Gaftandzhieva, and Boykova 2022; Kalpazidou Schmidt et al. 2017; O'Connor and Irvine



D2.1 Literature Review Data Monitoring

2020, 8–11; Sánchez Nimo 2021; Zabaniotou, Boukamel, and Tsirogianni 2021). This is why the quantitative analysis identified so many publications about the impact of GEPs.

To sum up, Monitoring the impact of GEPs is complex, requiring careful examination of social, cultural, economic, and institutional factors influencing gender equality dynamics. Employing attribution vs. contribution approaches, along with rigorous empirical research, enables a deeper understanding of the barriers, drivers, and consequences of gender equality. This involves gathering quantitative and qualitative data and assessing the impact of GEPs on the measures. Although monitoring and evaluation complement each other, investigating the impact of GEPs highlights a crucial distinction. Monitoring GEPs entails keeping track of the plan's effects to ensure its implementation as planned. However, impact evaluation not only assesses or outlines changes but also attempts to measure the part of a particular intervention (GEPs) in causing them ('causal inference') (Gillian Fletcher 2015, 9). Impact evaluation must be conducted after a certain period since it relies heavily on the quantitative data collected during the monitoring process. In addition, it is exceedingly difficult to directly link increases in gender equality to GEPs rather than more general contextual trends and variables (Kalpazidou Schmidt et al. 2017).

4.4.1. Impact at the intra-organisational level

Evaluating the efficacy of GEPs requires a considerable period since its first implementation (Douglas Oloyede 2014; Lopez Padilla 2015). There is a shortage of research on the quantitative impact of GEPs at the intra-organisational level, and the long-term impact is not widely discussed. Monitoring the impact of GEPs on individual organisations is mainly based on surveys, administrative data among staff (Henderson et al. 2020; Ovseiko et al. 2019) and annual reports (Corejova et al. 2021).

Most findings on the long-term impact of GEPs arose from studies about Athena SWAN charters in single organisations or departments (RPO; single universities). Due to its early introduction to the UK science environment (in 2005), it is possible to monitor the impact of the charter on changes in individual organisations, e.g., the University of Oxford (Kalpazidou Schmidt et al. 2020; Ovseiko et al. 2019). In addition, another study conducted by Stepan-Norris and Kerrissey (2016) extensively examined the effectiveness of the ADVANCE¹² programme, comparing data on women's representation in faculty positions before and during the GE programme for the time 1993–2009 at the university of California. The study found a positive causal effect by calculating Random effects models (REM). Self-assessment studies are another strategy for assessing institutional changes' sustainability and impact on gender equality. Apart from the self-assessment guidelines mentioned previously (e.g., INTEGER, TARGET), Peña et al. (2021) developed a teacher's self-assessment tool to incorporate the gender dimension in teaching. The study's guidelines recommend improvements for the implementation of changes that will enable successful incorporation in STEM.

Our review shows that GEPs do not always have proper evaluation mechanisms because of the absence of measurable targets and/or precise timelines (EIGE 2016; Guyan et al. 2022). Despite this general lack of evaluation mechanism, impact monitoring is present to a greater

¹² ADVANCE Institutional Transformation initiative, implemented at the University of California, Irvine (UCI), in 2001.



extent in GEPs supported by EU-funded projects, usually consisting of a set of quantitative and qualitative indicators aimed at measuring the impact of actions taken to increase women's access to certain positions, to enhance work-life balance and women's career management, to train staff in gender equality issues or to integrate gender in curricula (Claeys-Kulik, Jørgensen, and Stöber 2019; Wroblewski and Eckstein 2018; Kalpazidou Schmidt et al. 2017; EIGE 2016; Peterson and Dahmen 2018).

4.4.2. Impact at supra-organisational level

When planning monitoring activities, it is crucial to make well-informed decisions related to the type of data to collect. These decisions should be based on considerations of which type of data can serve as relevant and reliable indicators of achievements, performance, and progress (Peterson and Dahmen 2018). Main references that study the impact of GEPs on a supra-organisational level applied quantitative data for monitoring to make the study feasible and comparable (Kortendiek et al. 2022; Gregory - Smith 2018; Xiao et al. 2020; Löther 2019).

A survey conducted by Kortendiek et al. (2022) in a region (North Rhine-Westphalia) of Germany investigated the impact of GEPs by determining whether each university is above or below the national average in terms of the representation of women at the 36 universities in the region. Women remain significantly underrepresented among professors, and disciplinary profiles are crucial in women's careers. Nevertheless, GEPs benefit women's involvement in board positions (Kortendiek et al. 2022).

To isolate the causal effect of the programs, Löther (2019) and Gregory-Smith (2018) applied the econometric method "difference in difference" to examine the GEP impact at the supra-organisational level. While Gregory-Smith did not find any causal impact of Athena SWAN on female careers in UK medical schools, Löther (2019) demonstrated the positive causal impact of the German Women Professorship program on the proportion of women professors in Germany between 2007 and 2015. In another evaluation study, Xiao et al. (2020) explored the associations between Athena SWAN awards and university performance as measured by overall scores in the global ranking system (The Quacquarelli Symonds World University Rankings). Using quantitative employment data on female-to-male ratios provided by 148 UK HEIs to evaluate the impact, this study showed that Athena SWAN enhanced the representation of women and that HEIs with silver awards outperformed those with bronze awards in the worldwide university rankings.

Although these methodologies provide a strong understanding of the GEPs' long-term impact through routinely gathered data, many publications on GEP monitoring highlight the obstacles to determining causal impact for such a complex societal environment. As a result, less demanding and practical data monitoring strategies on impacts have piqued the interest of researchers. Addabbo et al. (2018) created the gender equality fuzzy expert system to evaluate gender equality achievement in the employment structure by gender and level of student enrolment by gender. They describe this instrument as a less demanding approach to evaluating expert opinions and conducting a comparative examination of administrative data.



The EFFORTI¹³ project proposed an evaluation framework based on the contribution approach and theory of change to assist program evaluators in performing a thorough examination of the outputs, outcomes, and impacts of gender equality policies in R&I. This framework may simplify the challenging GEP evaluation process (Palmén et al. 2019). Mergaert et al. (2022) also noted the emerging need for a self-assessment tool for certifications or third-party checks, referring to the Horizon Europe GEP requirement on monitoring. They developed the impact driver model as an awareness-raising and capacity-building instrument and connected this model to the self-assessment tool. Seven research organisations reviewed the tool, enabling comparative analysis and providing insightful information about those factors influencing the transformation process. Moreover, Moreira and Sales Oliveira (2022) proposed the GEHEI framework, constructed of indexes that can assess gender inequality disparities in HEIs. This tool claimed to be able to highlight the situations where inequality is more pronounced for both sexes in HEIs. The framework was also tested in two universities in Portugal and Brazil (one with GEP and the other without), demonstrating its efficiency and simplicity in detecting gender inequality in both universities.

These assessment frameworks and tools help to improve the evaluation and monitoring of GEPs, address the intricacies of evaluating GEPs, and support the advancement of gender equality in a variety of contexts. The EFFORTI framework is promising in revealing the relationship underlying "how" and "why" policy intervention works in R&I by establishing a non-linear concept and relying on the contribution approach - instead of attribution - to monitor and evaluate the impact (Kalpazidou Schmidt and Krogh Graversen 2020). EFFORTI offers valuable insights into the data monitoring-related aspects of the INSPIRE framework, including contextual factors¹⁴, the theory of change approach, and a blend of quantitative and qualitative indicators.

4.5. Intersectionality perspective and intersectional approaches in GEPs

The intersectionality perspective considers that social inequalities are interrelated to each other. Researchers generally agree about three main oppression and power systems in society, namely gender, race and class. Individuals face different discrimination experiences along these interrelated axes of inequality. Adopting an intersectional perspective necessitates recognizing that, for example, Black and Minority Ethnic women academics encounter distinct challenges in career advancement compared to their white female and their Black and Minority Ethnic male counterparts (Equality Challenge Unit 2017). In other words, intersectionality describes a specific form of discrimination where various social inequalities, such as gender, race, disability and other inequalities, are interconnected. According to EIGE's¹⁵ description, "intersectionality is an analytical tool for studying, understanding, and responding to the ways in which sex and gender intersect with other

¹³ Evaluation Framework for Promoting Gender Equality in Research and Innovation is an EU project funded by the EC.

¹⁴ Contextual elements may pertain to country, type of research system, sector type (i.e. public or private), type and position of organisation in the R&I system, type of gender equality intervention, and previous experiences with policy interventions.

¹⁵ EIGE, Glossary and Thesaurus, 'Intersectionality', available at: <https://eige.europa.eu/thesaurus/terms/1263>.



D2.1 Literature Review Data Monitoring

personal characteristics/identities, and how these intersections contribute to unique experiences of discrimination”.

The European Commission underlines the importance of an intersectional approach in designing and implementing GEPs. In the last years, the EC has expanded the concept of gender equality "by opening policy to intersections with other social categories" (European Commission 2020, 16) and calls for approaches to inclusive gender equality and inclusive gender action plans (European Commission 2022). Alongside sex-segregated data, an intersectional perspective argues that data on surrounding conditions and differences within gender groups are also substantial (Eckstein 2016). Regarding European legislation about antidiscrimination, there is an emphasis on six inequalities: gender, race/ethnicity, age, disability, sexual orientation, and religion. This list of inequalities is not exhaustive. Depending on the context under study, they may or may not be relevant to investigate. Thus, fixed criteria for cross-national and cross-sectoral analysis do not exist. An intersectional approach is not yet mandatory for GEP in the European funding program “Horizon Europe”. However, the European Commission recommends an approach involving disaggregated sex and/or gender data together with other aspects of individual or group inequality, such as ethnic minority background, disability status, migration history, socioeconomic standing, and affiliation with the LGBTIQ community (European Commission 2021a). So far, intersectionality as an approach has not been prioritised or standardised. As a consequence, systematic monitoring is not yet in place.

Intersectionality is also part of the broader concept of inclusion in the ERA. There are three axes addressed in the new ERA’s **inclusive** conceptualization of GEPs: a) intersectional inequalities, b) inclusivity of geographical region, and c) inclusivity across private and public sectors (ERAC SWG GRI 2021). Additionally, the SWG GRI proposes the incorporation of intersectionality into GEPs through a layered strategy. The significance of each intersecting aspect may vary depending on the country’s context (ERAC SWG GRI 2021).

There are three main approaches of how to apply the intersectional perspective, and we differ them to qualify their characteristics: *Inter-categorical*: to analyse different but separate categories and focus on overlapping inequalities; *intra-categorical*: to set one major inequality, for example, gender and differentiate more in detail based on this (we will name it inclusive/Intersectional gender equality approach later) or *anti-categorical*: to extract the inequalities only out of the material (McCall 2005). Each one of the approaches entails different methodological procedures. For instance, the anti-categorical approach is primarily conducted in a more qualitative method.

Monitoring intersectional inequalities use quantitative and qualitative methods (Equality Challenge Unit 2017). Regression analysis could be one quantitative method to address intersectionality, but intersectionality does not simply mean to analyse ‘additive’ data, e.g., by adding gender to race. Instead, different inequalities interact with each other. Together, they generate a distinct impact that differs from what either would individually cause. In practice, the term "interaction" refers to the multiplication of two intersecting inequalities in regression analysis (e.g., being women and being black) (Equality Challenge Unit 2017). Moreover, the Equality Challenge Unit (2017) broke down degree attainment data by gender and ethnicity and demonstrated the different levels of degree attainment between white and BME students. Further, it argues how ethnicity influences gender disparities in degree attainment.



D2.1 Literature Review Data Monitoring

Although the quantitative analysis (see p. 22) proves an increasing number of studies on intersectionality (since 2016), there are still few empirical studies on intersectionality and monitoring on an organisational or supra-organisational level. One study recommends using an intersectionality approach when listing different indicators during the diagnostic. Villegas et al. (2018) suggest collecting disaggregated data on sex, age, ethnicity, and other inequalities. Unfortunately, the paper is a practical/conceptual guide without collecting intersectional data itself (Villegas et al. 2018). Another study collected intersectional data by breaking down data by gender and age without referring to the concept of intersectionality (University of Vilnius 2021). The lack of publications that take intersectionality into account may be caused partially by the difficulties in gathering data because the statistics of different inequalities vary due to cultural, political, and legal contexts. For instance, some countries like Spain, France and Germany consider data on “race” or “ethnicity” sensitive due to historical reasons after de/colonisation and the Second World War. For example, in France, collecting data on ethnicity is prohibited. However, such data collection is already part of national statistics in the UK and Ireland (Claeys-Kulik, Jørgensen, and Stöber 2019). For Ireland O’Connor and Irvine (2020) report that no intersectional data was released despite the commitment of the country to publish these data. To get information about the collection of inequality data and intersectionality in individual institutions, the INVITED¹⁶ project employed a survey in 159 HEIs from 36 European countries. The results indicate that most HEIs (83%) gather basic gender information from academic staff. Still, only a few HEIs collect data on sexual orientation and socio-economic background, at rates of 9% and 7%, respectively (Claeys-Kulik, Jørgensen, and Stöber 2019).

Within this European landscape, the Athena SWAN initiative stands as an exception, having a stronger emphasis on different inequality data analysis. The term ‘intersectionality’ appears in articles on the Athena SWAN charter (Henderson et al. 2022; Kalpazidou Schmidt et al. 2020; Ovseiko et al. 2019). Studies on the Athena SWAN mention increasing attention to the intersectionality perspective. The UK context, which allows to ask for different social inequalities, favours this approach. Established in 2005, Athena SWAN has included an intersectionality approach since 2015 and states, “All individuals have identities shaped by several different factors. We commit to considering the intersection of gender and other factors wherever possible” (Ovseiko et al. 2019). However, each institution can operationalise intersectionality according to its preferences and needs. Only studies on Athena SWAN in the UK examine intersectionality (Henderson et al. 2022; Kalpazidou Schmidt et al. 2020; Ovseiko et al. 2019), albeit Athena SWAN recently extended to Ireland, Canada, Australia and the US (Ovseiko et al. 2019).

The findings on Athena SWAN's intersectionality perspective are contradictory. Some studies argue for a positive effect of Athena Swan (Henderson et al. 2022; Ovseiko et al. 2019), whereas another study scathes the implementation of Athena SWAN due to its inability to operationalise the intersectional gender concept and neglecting experiences of intersecting inequities (Tzanakou and Pearce 2019). In their evaluation of the potential impact of Athena SWAN at the intra-organisational level, Kalpazidou Schmidt et al. (2020) and Ovseiko et al.

¹⁶ The INVITED project is jointly conducted by EUA and the European Universities Continuing Education Network (EUCEN) with support from the European Students’ Union (ESU): <https://eua.eu/101-projects/737-invited.html>.



D2.1 Literature Review Data Monitoring

(2019) report that the research institutions analyse inequalities such as gender, sexuality, race, disability, age, and religion with self-assessment surveys. Still, they are lacking in investigating racism and classism. The authors state that intersectional analysis exists in the studies without explaining how intersectional analysis is carried out. The approach seems to rely more on analysing each inequality separately than intersecting them. Furthermore, the authors report the use of binary terms as a drawback. Similarly, Henderson et al. (2022) revealed in their study on Biomedical Research Centres (public sector) that survey respondents want investigations with a broader perspective on different inequalities to analyse intersectional inequalities. They argue that the National Institute for Health and Care Research (NIHR) committed that Biomedical Research Centres should have at least Athena SWAN silver awards to apply for funding. Thus, organisations must address intersectional inequalities like gender, race, sexual orientation, and transgender identities.

In recent years, EU-funded structural change projects started to incorporate an intersectional viewpoint. For example, the monitoring tool and survey instrument “The Gender Equality Audit and Monitoring (GEAM) tool¹⁷” might capture data about identity characteristics (including social class, age, and disability) to examine how perceptions and experiences of gender equality intersect with other variables of social discrimination in academic organisations or organisational units¹⁸ (Guyan et al. 2022).

Some publications (Gutiérrez et al. 2017; University of Vilnius 2021) used terms such as *equity*, *equality*, *diversity*, and *inclusion* instead of intersectionality to address different social inequalities. However, these approaches do not face the intersections of inequalities but analyse social inequalities more separately from each other and sometimes do not even focus on gender. Most of their findings are related to individual universities, not RPOs (University of Vilnius 2021; Langle Gómez 2016; Gutiérrez et al. 2017). Two of these universities are located in Mexico (Langle Gómez 2016; Gutiérrez et al. 2017). More specifically, the University of Vilnius (2021) and La Universidad de Campeche (2017) foster equality of opportunities driven by the concept of “equity”. For instance, the University of Vilnius monitors various inequality areas, including gender, age, disability, citizenship, sexual orientation, religion and faith, belief and convictions, social status, and family status, but each separately and not in an intersectional one. Nevertheless, they break down administrative data on students and academic and non-academic personnel by age and gender (University of Vilnius 2021). On the other hand, the University Campeche suggests several variables on students: grades for accessing the university, admission test grades, interviews, English language level assessment, and assessment of their socio-economic background (Gutiérrez et al. 2017).

This review could not identify any framework or set of indicators generally accepted for tracking intersectionality at the supra-organisational level. The lack of a unique definition for intersectionality and different perceptions regarding the priority of intersectionality among countries and organisations, for instance, differences among MS and AC (Claeys-Kulik, Jørgensen, and Stöber 2019; ERAC SWG GRI 2021) represent challenges for the integration of intersectional perspectives in the GEP monitoring at the supra-organisational level.

¹⁷ GEAM survey tool and platform is published openly via the webpage of the project: <https://geam.act-on-gender.eu/content/access-act-limesurvey-platform>.

¹⁸ This survey tool is available in different European languages which helps to reduce language barrier (English, Spanish, German, Polish, Portuguese, Lithuanian, Italian, Greek, Slovenian, Ukrainian).



D2.1 Literature Review Data Monitoring

Concerning the gender concept, most European countries and institutions collect "gender statistics" based on biological sex, i.e., female and male (European Commission 2021a). The third category, non-binary (or gender-diverse), has been adopted by a growing number of countries and organisations, and the concept for collecting data shows a trend away from "biological sex at birth" toward "gender identity", which still entails conceptual and methodological debates within the feminist movement (European Commission 2021a).

Data on how many GEPs of RPOs integrate intersectional perspectives do not exist. Nevertheless, She figures (European Commission 2021b) investigates, through creating a proxy indicator, whether structural change projects that received funding mentioned the intersectionality approach. They composed a two-step procedure to get data. Firstly, the authors detected Horizon 2020 projects that integrated the gender dimension of research content. Then, they apply a bibliometric analysis of texts, searching projects' titles or abstracts for the terms "women" and "men" or explicitly "gender differences". Their result yielded that 1.7% of all Horizon 2020 projects across Europe included a gender dimension (European Commission 2021b). In the second step, they re-queried the projects which integrated the gender dimension and added further search terms like "intersectional*", "disabilit*", "ethnic", "LGBT", "race" OR "racis*", "religion", "belief", "class", "social origin", "sexual orientation", "vulnerable group" OR "vulnerable population" and "socio-economic" which serve as proxy for the intersectional approach of research content. This analysis revealed that only 58 out of 30,084 Horizon 2020 projects (or 0.19%) integrated an intersectional approach to research content (European Commission 2021b). At the country level, the highest percentage of projects integrating an intersectional approach was observed in Turkey (0.47%), followed by Ireland (0.29%).

Our findings are consistent with a recent review by Mour¹⁹ (2022), who reports that intersectionality is rarely applied as an analytical tool and framework. Regarding intersectionality perspectives, few empirical studies integrate social inequalities other than gender, like racial/ethnicity, disability, sexual orientation, and socioeconomic position. Even if some organisations state that tackling intersectionality²⁰ is the next step in their agenda, they often fail to engage intersectionality in their strategies/practice (Claeys-Kulik, Jørgensen, and Stöber 2019). Studies mentioned above demonstrate that even though institutions do not mention intersectionality in their monitoring approach, they nevertheless monitor intersectionality or other inequality categories using distinct plans or strategies. Our analysis also indicates a concentration of intersectionality-focused publications in the UK. Monitoring intersectionality at the supra-organisational level is hindered by data collection complexities, lack of standardised frameworks, and limited awareness. Overcoming these challenges necessitates commitment, awareness-raising, and a focus on inclusive practices to recognize and value diverse identities and experiences.

¹⁹ Scoping review investigates interdisciplinary overview of peer-review articles and grey literature reports, assessing anti-discrimination policies in HEI and research institutions across the world.

²⁰ Authors illustrated the concept of intersectionality as persons who identify with various dimensions of diversity ("e.g., female researcher in engineering who has a migration background or first-generation student coming in through an alternative pathway and having caring responsibilities").



5. Conclusion

This review aims to map what is known from the existing literature about monitoring gender equality plans in RPOs. Even though GEPs have been in force for several years, gender inequalities persist in research and innovation organisations. The publications on monitoring GEPs – both conceptual and empirical studies – reflect political initiatives and requirements at the national and European levels. Yet, the review reveals that despite increasing initiatives, programs, and attempts made at the supra-organisational and intra-organisational levels, monitoring of GEPs is not standardised. The lack of standardisation is also due to the broad variability in GEPs' scope and characteristics, stemming from the country's context with different legal requirements and gender equality initiatives. Thus, the lack of monitoring and evaluation processes in GEPs is one big challenge for their implementation. The literature deals similarly with monitoring GEPs inside an individual organisation and comparing RPOs on a supra-organisational level without setting a priority.

Theoretical reflection on concepts related to monitoring gender equality and GEPs argues the need to link gender monitoring to gender equality goals and to reflect the understanding of gender equality. The most common approach for monitoring data at the intra-organisational level entails combining quantitative and qualitative data sources. Some authors point out that presenting only quantitative data cannot provide an in-depth understanding. However, quantitative methods, especially surveys, are more widespread in monitoring GEPs at the supra-organisational level.

Monitoring the prevalence of GEPs relies on survey data and, more recently, on web scraping. Surveys face problems like sample selection and non-response, while applying an exact definition of GEPs limits web-scraping. Survey and web-scraping data show that over one-third of RPOs adopted GEPs, and half of the HEIs implemented gender equality measures, with significant differences between countries.

This review highlights several areas of research that have not been adequately addressed in the current body of literature. The majority of published studies have focused on the European landscape, leaving a gap in knowledge regarding other countries. A large gap concerns the study population: An overwhelming majority of publications relate to (public) HEI, and publications on research institutions (public sector) and private companies are almost entirely missing. This review also found a limited amount of research on monitoring the GEP implementation processes. Monitoring the implementation can be difficult due to challenges in obtaining data on the implementation phase. Regarding monitoring the Impact, most publications discuss the difficulties of monitoring the impact of GEPs, and impact monitoring is a challenge and gap in the literature. The review additionally reveals a lack in the literature on monitoring intersectionality, which is rarely used as an analytical tool or framework.

Much of the literature deals with the implementation by presenting measures, but there is limited information about monitoring the processes. Concerning monitoring the impact of GEP, this review points to a clear distinction between evaluation and monitoring. Monitoring is a systematic way of data collection to control whether the implemented initiatives run as planned. Evaluations, in contrast, assess their effectiveness and efficiency and determine causal links between measures and observed changes. Monitoring is an essential



requirement for conducting a comprehensive evaluation. The absence of proper monitoring prohibits the effective execution of evaluations. Establishing a proper European-wide monitoring of GEP is, therefore, the first and necessary step that is taken in the INSPIRE project.

Many publications are concerned with impact monitoring but rely mainly on changes in the representation of women and a contribution approach. Few publications try to attribute causal changes to the implementation of GEPs. The studies are contradictory about the effects of GEP: Some prove the positive effect of GEPs on the representation of women in leading positions and even on the performance of universities in rankings. In contrast, others don't detect any positive effect. The "contribution approach" emerges as the preferred strategy for monitoring the impact of INSPIRE projects due to the complexity of gender equality and the interaction of various contextual factors. This is because it acknowledges the difficulty of attributing direct causal effects to gender equality initiatives while still recognizing their valuable contributions to advancing gender equality.

The review found an increase in the number of publications after 2016 that take intersectionality into account. Moreover, one of the axes of inclusive GEPs requires the inclusion of intersectionality perspectives, yet the intersectionality perspective is not frequently addressed in publications. There are methodological issues on the one hand: first, it is not standardised what kind of interrelating inequalities should be considered in the GEP. Second, in some countries, there is data collection on certain inequalities prohibited. As a result, most of the literature is emphasizing the importance of having intersectionality as an approach for GEP but does not apply it. However, in the UK, RPOs feature a higher concentration of intersectionality approaches because of the strong influence of Athena SWAN. The difficulties of gathering data and the lack of a common understanding of the term "intersectionality" contribute to making it challenging to monitor intersectionality.

6. References

Addabbo, Tindara, Claudia Canali, Gisella Facchinetti, Alessandro Grandi, and Tommaso Pirotti. 2018. "Gender Equality in Tertiary Education and Research Institutions: An Evaluation Proposal." In *Proceedings of the International Conference on Gender Research: ICGR 2018 : Hosted by ISCAP, P. Porto, Porto, Portugal, 12-13 April 2018*, edited by Ana Azevedo and Anabela Sarmento, 1–9. Reading, UK: Academic Conferences and Publishing International Limited (ACPI).

Aldercotte, Amanda. 2018. "Monitoring and Evaluating Impact." Unpublished manuscript, last modified February 01, 2023. <https://www.advance-he.ac.uk/knowledge-hub/monitoring-and-evaluating-impact>.

Alonso, Maria Elisa, and Beatriz Onandia. 2021. "Difficulties in Implementing an Action Plan for Gender Equality in French Higher Education: The Equality Missions." *Investigaciones Feministas* 12 (2): 309–17. <https://doi.org/10.5209/infe.74194>.

American Evaluation Association. 2014. "What Is Evaluation." <https://www.eval.org/Portals/0/What%20is%20evaluation%20Document.pdf>.



- Bae, Yookyung. 2022. "A Study on Institutional Conditions to Promote Gender Equality in Higher Education: 대학의 성평등 증진을 위한 제도적 조건 연구." *Journal of Korean Women's Studies* 38 (3): 109–42. <https://doi.org/10.30719/JKWS.2022.09.38.3.109>.
- Barnard, Sarah. 2017. "The Athena SWAN Charter: Promoting Commitment to Gender Equality in Higher Education Institutions in the UK." In *Gendered Success in Higher Education: Global Perspectives*, edited by Kate White and Pat O'Connor, 155–74. London: Palgrave Macmillan.
- Becker, Ruth, Anne Casprig, Beate Kortendiek, Agnes Senganata Münt, and Sabine Schäfer. 2010. *Gender-Report 2010: Geschlechter(un)gerechtigkeit an nordrhein-westfälischen Hochschulen*. Studien Netzwerk Frauen- und Geschlechterforschung NRW 9. Edited by Netzwerk Frauenforschung NRW. Essen: Netzwerk Frauen- und Geschlechterforschung NRW. Fakten, Analysen, Profile. Accessed July 02, 2015. <http://www.genderreport-hochschulen.nrw.de/fileadmin/media/media-genderreport/download/report-2010/gender-report-2010.pdf>.
- Bührer, Susanne, and Angela Wroblewski. 2019. "The Practice and Perceptions of RRI: A Gender Perspective." *Evaluation and program planning* 77. <https://doi.org/10.1016/j.evalprogplan.2019.101717>.
- Cheveigné, Suzanne de, Bente Knoll, Maria Bustelo, Eivind Engebretsen, and Ulf Sandström. 2017. "Interim Evaluation: Gender Equality as a Crosscutting Issue in Horizon 2020." Unpublished manuscript, last modified March 21, 2023. <https://hal.science/hal-02948895/document>.
- Chitsamatanga, Bellita Banda. 2016. "Implementation of Gender Equality Policies to Enhance Female Leadership in Zimbabwean Universities: Towards a Comprehensive Framework." Doctoral or postdoctoral thesis, University of Fort Hare; Faculty of Education. Accessed February 01, 2023. https://vital.seals.ac.za/vital/access/manager/Repository/vital:39680?site_name=GlobalView&query=&f0=sm_mimeType%3A%22application%2Fpdf%22&collection=vital%3A16155&sort=sort_ss_sm_creator+asc.
- Claeys-Kulik, Anna-Lena, Thomas Ekman Jørgensen, and Henriette Stöber. 2019. "Diversity, Equity and Inclusion in European Higher Education Institutions: Results from the INVITED Project." https://eua.eu/downloads/publications/web_diversity%20equity%20and%20inclusion%20in%20european%20higher%20education%20institutions.pdf.
- Corejova, Tatiana, Maria Rostasova, Veronika Mešková, and Alexandra Valicova. 2021. "On the Possibilities Monitoring and Improving the Status of Gender Equality at the University." In *14th Annual International Conference of Education, Research and Innovation: Proceedings*, edited by Luis G. Chova, Agustín L. Martínez, and Ignacio C. Torres, 6196–6201. Valencia: IATED.
- Council of the European Union. 2015. "Advancing Gender Equality in the European Research Area: Council Conclusions (Adopted on 01.12.2015)." 14846/15. Accessed February 15, 2016. <http://data.consilium.europa.eu/doc/document/ST-14846-2015-INIT/en/pdf>.



D2.1 Literature Review Data Monitoring

- Dietrichson, Susanne. 2022. "Fewer Gender Equality Measures in Academia in Finland Than in Norway and Sweden." *Kilden genderresearch.no*, February 11, 2022. <https://kjonnsforskning.no/en/2021/02/fewer-gender-equality-measures-academia-finland-norway-and-sweden>.
- Doneva, Rositsa, Silvia Gaftandzhieva, and Kirina Boykova. 2022. "An Approach to Monitoring Gender Equality Plans Implementation." In *EDULEARN22 Proceedings: 14th International Conference on Education and New Learning Technologies*, edited by Louis Gómez Chova, Agustín López Martínez, and Joanna Lees, 3383–91. EDULEARN proceedings (Internet). Valencia: IATED Academy. <https://library.iated.org/publications/EDULEARN22>.
- Douglas Oloyede, Freya. 2014. "Measuring Progress on Equality: Qualitative Evidence." Unpublished manuscript, last modified February 06, 2023. http://www.ecu.ac.uk/publications/files/measuring-progress-on-equality-qualitative-evidence.pdf/at_download/file.
- Eckstein, Kirstin. 2016. "Gleichstellungsindikatoren an Universitäten - von der Berichterstattung zur Steuerung." In *Gleichstellung messbar machen: Grundlagen und Anwendungen von Gender- und Gleichstellungsindikatoren*, edited by Angela Wroblewski, Udo Kelle, and Florian Reith, 149–69. Wiesbaden: Springer VS.
- EIGE. 2016. "Integrating Gender Equality into Academia and Research Organisations: Analytical Paper." Unpublished manuscript, last modified December 16, 2016.
- Engeli, Isabelle, and Amy Mazur. 2018. "Taking Implementation Seriously in Assessing Success: The Politics of Gender Equality Policy." *European Journal of Politics and Gender* 1 (1-2): 111–29.
- Equality Challenge Unit. 2017. "Intersectional Approaches to Equality Research and Data." Unpublished manuscript, last modified December 09, 2022. https://s3.eu-west-2.amazonaws.com/assets.creode.advancehe-document-manager/documents/ecu/Research_and_data_briefing_2_Intersectional_approaches_to_equality_research_and_data_1579105654.pdf.
- ERAC SWG GRI. 2021. "Gender Equality Plans as a Catalyst for Change: ERAC 1202/21." Unpublished manuscript, last modified December 09, 2022. <https://data.consilium.europa.eu/doc/document/ST-1202-2021-INIT/en/pdf>.
- Espinosa, Julia, María Bustelo, and María Velasco. 2016. *Evaluating Gender Structural Change. Guidelines for Evaluating Gender Equality Action Plans*.
- European Commission. 1999. "Women and Science: Mobilising Women to Enrich European Research." Unpublished manuscript, last modified April 13, 2016. COM (1999) 76.
- European Commission, ed. 2000. *Science Policies in the European Union: Promoting Excellence Through Mainstreaming Gender Equality; a Report from the ETAN Expert Working Group on Women and Science (ETAN-Bericht)*. Luxembourg: Office for Official Publications of the European Communities. Accessed March 21, 2023. <https://op.europa.eu/en/publication-detail/-/publication/4d456ad0-abb8-41a2-9d21-dbd5381f1f4c/language-en>.
- European Commission. 2012. "A Reinforced European Research Area Partnership for Excellence and Growth." Unpublished manuscript, last modified March 21, 2023.



D2.1 Literature Review Data Monitoring

- <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:52012DC0392>. COM(2012)392 final.
- European Commission. 2015. *She Figures 2015: Gender in Research and Innovation*. Luxembourg. (not online anymore).
- European Commission. 2016. "She Figures Handbook 2015." (not online anymore).
- European Commission. 2020. "A New ERA for Research and Innovation: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions." Unpublished manuscript, last modified March 22, 2023. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0628>. Com(2020) 628 final.
- European Commission. 2021a. *Horizon Europe Guidance on Gender Equality Plans*. Luxembourg: Publications Office of the European Union. Accessed March 17, 2023. <https://op.europa.eu/en/publication-detail/-/publication/ffc06c3-200a-11ec-bd8e-01aa75ed71a1/language-en/format-PDF/source-232129669>.
- European Commission. 2021b. "She Figures 2021: Gender in Research and Innovation - Statistics and Indicators." Unpublished manuscript, last modified December 02, 2021. <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/67d5a207-4da1-11ec-91ac-01aa75ed71a1>.
- European Commission. 2021c. "She Figures Handbook 2021." Unpublished manuscript, last modified December 02, 2021. <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/058103b5-4da0-11ec-91ac-01aa75ed71a1>.
- European Commission. 2022. "Towards Inclusive Gender Equality in Research and Innovation." https://research-and-innovation.ec.europa.eu/document/download/e5a7cdf-5b24-40af-9f82-2870285da0aa_en. Factsheet.
- European Institute for Gender Equality. 2019. "Gender Statistics and Indicators." Unpublished manuscript, last modified November 21, 2022. <https://eige.europa.eu/sites/default/files/indicators.pdf>.
- European Research Area and Innovation Committee. 2015. "European Research Area (ERA) Roadmap 2015-2020: ERAC 1208/15." Unpublished manuscript, last modified March 22, 2023. <https://era.gv.at/era/era-2000-2021/era-roadmap/european-era-roadmap-2015-2020/>.
- Ferguson, Lucy. 2021. "Analytical Review: Structural Change for Gender Equality in Research and Innovation." Unpublished manuscript, last modified December 09, 2022. https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/162958/OKM_2021_4.pdf?sequence=1&isAllowed=y.
- Gaftandzhieva, Silvia, Rositsa Doneva, and Vanya Sivakova. 2020. "Towards Gender Equality Plan in the University of Plovdiv: Analysing and Assessing the State-of-Play." In *ICERI2020 Proceedings*, 3486–94. IATED.
- Gairín Sallán, Joaquín, and Guadalupe Palmeros y Àvila, eds. 2018. *Políticas y prácticas para la EQUIDAD en la EDUCACIÓN SUPERIOR*. Las Rozas (Madrid): Wolters Kluwer. <https://permalink.obvsg.at/AC16458411>.



- Gillian Fletcher. 2015. *Addressing Gender in Impact Evaluation. What Should Be Considered?* London.
- Gregory-Smith, Ian. 2018. "Positive Action Towards Gender Equality: Evidence from the Athena SWAN Charter in UK Medical Schools." *British journal of industrial relations* 56 (3): 463–83. <https://doi.org/10.1111/bjir.12252>.
- Gutiérrez, Marvel Carmen Valencia, Alonzo Rivera Diana Lizbeth, Vargas Contreras Jorge Albino, Zavala Centeno Brillante, and Sansores Ambrosio Fátima Elena. 2017. "Equidad En Educación Superior. Un Indicador de Calidad." *Revista Boletín Redipe* 6 (6): 90–96.
- Guyan, Kevin, Amanda Aldercotte, Jörg Müller, Maria Caprile, and Sergi Yanes Torrado. 2022. "The Development of the Gender Equality Audit and Monitoring Survey." In *Community of Practice Approach to Improving Gender Equality in Research*, edited by Rachel Palmén and Jörg Müller. First edition, 44–63. Routledge research in gender and society. London: Taylor & Francis (Unlimited). <https://www.taylorfrancis.com/chapters/oa-edit/10.4324/9781003225546-3/development-gender-equality-audit-monitoring-survey-kevin-guyan-amanda-aldercotte-j%C3%B6rg-m%C3%BCller-maria-caprile-sergi-yanes-torrado>. Accessed February 01, 2023.
- Heidler, Julia, and Eva Reichwein. 2018. "The DFG Research-Oriented Standards on Gender Equality: Selected Findings from a Study on Implementation and Impact." DFG infobrief 1.18. Unpublished manuscript, last modified February 15, 2019. http://www.dfg.de/download/pdf/dfg_im_profil/geschaeftsstelle/publikationen/infobriefe/ib01_2018_en.pdf.
- Henderson, Lorna, Rinita Dam, Syed Ghulam Sarwar Shah, Pavel Ovseiko, and Vasiliki Kiparoglou. 2022. "Perceptions of Gender Equity and Markers of Achievement in a National Institute for Health Research Biomedical Research Centre: A Qualitative Study." *Health Research Policy & Systems* 20 (1): 102. <https://doi.org/10.1186/s12961-022-00904-4>.
- Henderson, Lorna, Syed Ghulam Sarwar Shah, Pavel Ovseiko, Rinita Dam, Alastair Buchan, Helen McShane, and Vasiliki Kiparoglou. 2020. "Markers of Achievement for Assessing and Monitoring Gender Equity in a UK National Institute for Health Research Biomedical Research Centre: A Two-Factor Model." *PLOS ONE* 15 (10). <https://doi.org/10.1371/journal.pone.0239589>.
- Higher Education Authority. 2018. "Gender Action Plan 2018 - 2020: Report of the Gender Equality Taskforce." Unpublished manuscript, last modified January 19, 2023. <https://www.gov.ie/en/publication/3c3c6f-gender-action-plan-2018-2020/>. Accelerating gender equality in Irish higher education institutions.
- Holzinger, Florian, and Sarah Beranek. 2020. "MONITORING of GEP IMPLEMENTATION - WHY IS IT IMPORTANT?" Accessed September 20, 2023. <https://gender-spear.eu/blog/post/37/monitoring-of-gep-implementation-why-is-it-important>.
- Iniesta Pérez de Gracia, Elisa, and Ana María Julián Edo. 2011. "Herramienta práctica para auditorías de igualdad: Logros y retos: Actas del III congreso universitario nacional "Investigación y género." In *Logros y retos: Actas del III congreso universitario nacional "Investigación y género"*, edited by Isabel V. Bermúdez, 904–28.



D2.1 Literature Review Data Monitoring

- https://idus.us.es/bitstream/handle/11441/39493/Pages%20from%20Investigacion_Genero_11-2-4.pdf?sequence=1&isAllowed=y.
- Kalpazidou Schmidt, Evanthia, Susanne Bühner, Martina Schraudner, Sybille Reidl, Jörg Müller, Rachel Palmén, Sigrid Haase et al. 2017. "A Conceptual Evaluation Framework for Promoting Gender Equality in Research and Innovation: Toolbox I - a Synthesis Report." Unpublished manuscript, last modified June 02, 2020. <https://www.efforti.eu/sites/default/files/2018-03/EFFORTI%20D3.3%20FINAL%20report%2027032018.pdf>. EFFORTI - Deliverable 3.3.
- Kalpazidou Schmidt, Evanthia, and Marina Cacace. 2017. "Addressing Gender Inequality in Science: The Multifaceted Challenge of Assessing Impact." *Research Evaluation* 26 (2): 102–14. <https://doi.org/10.1093/reseval/rvx003>.
- Kalpazidou Schmidt, Evanthia, and Ebbe Krogh Graversen. 2020. "Developing a Conceptual Evaluation Framework for Gender Equality Interventions in Research and Innovation." *Evaluation and program planning* 79:101750. <https://doi.org/10.1016/j.evalprogplan.2019.101750>.
- Kalpazidou Schmidt, Evanthia, Pavel V. Ovseiko, Lorna Henderson, and Vasiliki Kiparoglou. 2020. "Understanding the Athena SWAN Award Scheme for Gender Equality as a Complex Social Intervention in a Complex System: Analysis of Silver Award Action Plans in a Comparative European Perspective: Analysis of Silver Award Action Plans in a Comparative European Perspective." *Health Research Policy & Systems* 18 (1): 19. <https://doi.org/10.1186/s12961-020-0527-x>.
- Kortendiek, Beate, Lisa Mense, Sandra Beaufaÿs, Jenny Bünnig, Ulla Hendrix, Jeremia Herrmann, Heike Mauer, and Jennifer Niegel. 2022. "Gender-Report 2022." Unpublished manuscript, last modified August 08, 2022. <https://www.netzwerk-fgf.nrw.de/koordinationsforschungsstelle/projekte/gender-report>.
- Langle Gómez, Luz Elena. 2016. "Diagnósticos, indicadores e igualdad de género en la Universidad Autónoma de Aguascalientes." *Caleidoscopio*, no. 34: 179. <https://doi.org/10.33064/0crscsh126>.
- Lipinsky, Anke, and Maria Schäfer. 2016. "INTEGER Guidelines for the Self-Assessment of Transformational Gender Action Plans Set up in Higher Education and Research Institutions." *Cologne, Germany: GESIS Leibniz Institute for the Social Sciences.[Google Scholar]*.
- Lopez Padilla, Victória. 2015. "Procedimiento de Seguimiento y Evaluación Del "I Plan de Igualdad de Oportunidades Entre Mujeres y Hombres de La Universidad de Alicante (2010-2012." In *Investigació i gènere a la Universitat Jaume I*. Vol. 46, edited by Mercedes Alcañiz, 177–82: Universitat Jaume.
- Löther, Andrea. 2019. "Is It Working? An Impact Evaluation of the German "Women Professors Program"." *Social Sciences* 8 (4): 116. <https://doi.org/10.3390/socsci8040116>.
- Makkonen, Timo. 2016. "European Handbook on Equality Data: 2016 Revision." Unpublished manuscript, last modified December 16, 2022. <https://ec.europa.eu/newsroom/just/redirection/document/43205>.
- McCall, Leslie. 2005. "The Complexity of Intersectionality." *Signs: Journal of Women in Culture and Society* 30 (3): 1771–1800. <https://doi.org/10.1086/426800>.



D2.1 Literature Review Data Monitoring

- Mergaert, Lut, Marina Cacace, and Marcela Linková. 2022. "Gender Equality Impact Drivers Revisited: Assessing Institutional Capacity in Research and Higher Education Institutions." *Social Sciences* 11 (9): 379-N.PAG. <https://doi.org/10.3390/socsci11090379>.
- Moreira, Josilene Aires, and Catarina Sales Oliveira. 2022. "Quantifying for Qualifying: A Framework for Assessing Gender Equality in Higher Education Institutions." *Social Sciences* 11 (10): 478. <https://doi.org/10.3390/socsci11100478>.
- Mour, Chloé. 2022. "Anti-Discrimination Policies in Higher Education Institutions: An Interdisciplinary Scoping Review." LIEPP Working Paper 132 | hal-03625791. <https://hal-sciencespo.archives-ouvertes.fr/hal-03625791/document>.
- Ní Laoire, Caitríona, Carol Linehan, Uduak Archibong, Ilenia Picardi, and Maria Udén. 2021. "Context Matters: Problematizing the Policy-Practice Interface in the Enactment of Gender Equality Action Plans in Universities." *Gender, Work and Organization* 28 (2): 575–93. <https://doi.org/10.1111/gwao.12594>.
- O'Connor, Pat. 2020. "Why Is It so Difficult to Reduce Gender Inequality in Male-Dominated Higher Educational Organizations? A Feminist Institutional Perspective." *Interdisciplinary Science Reviews* 45 (2): 207–28. <https://doi.org/10.1080/03080188.2020.1737903>.
- O'Connor, Pat, and Gemma Irvine. 2020. "Multi-Level State Interventions and Gender Equality in Higher Education Institutions: The Irish Case." *Administrative Sciences* 10 (4): 98. <https://doi.org/10.3390/admsci10040098>.
- OECD. 2007. "Glossary of Key Terms in Evaluation and Results Based Management." <https://www.oecd.org/dac/evaluation/dcdndep/39249691.pdf>.
- Ovseiko, Pavel V., Pololi H. Linda, Edmunds Laurel, Civian Jan, Daly Mary, and Buchan Alastair. 2019. "Creating a More Supportive and Inclusive University Culture: A Mixed-Methods Interdisciplinary Comparative Analysis of Medical and Social Sciences at the University of Oxford." *Interdisciplinary Science Reviews* 44 (2): 166–91.
- Palmén, Rachel, Evanthia Kalpazidou Schmidt, Clemens Striebing, Sybille Reidl, Susanne Bühner, and Dóra Groó. 2019. "Measuring Gender in R&I: Theories, Methods, and Experience." *Interdisciplinary Science Reviews* 44 (2): 154–65. <https://doi.org/10.1080/03080188.2019.1603873>.
- Pastor Gosalbez, Inma, and Ana Acosta Sarmiento. 2016. "La institucionalización de las políticas de igualdad de género en la Universidad española: Avances y retos." *Investigaciones Feministas* 7 (2): 247–71. <https://doi.org/10.5209/INFE.52966>.
- Peña, Marta, Noelia Olmedo-Torre, Mas de les Valls, Elisabet, and Amaia Lusa. 2021. "Introducing and Evaluating the Effective Inclusion of Gender Dimension in STEM Higher Education." *Sustainability* 13 (9): 4994. <https://doi.org/10.3390/su13094994>.
- Peterson, Helen, and Jennifer Dahmen. 2018. "Monitoring Handbook: Methods and Tools for Monitoring Developed in the GenderTime Project." Gothenburg Studies in Work Science 1. Unpublished manuscript, last modified September 19, 2018. <https://gupea.ub.gu.se/handle/2077/56065>.
- Sánchez Nimo, Silvana María. 2021. "The Evaluation of Equality Plans at the University of the Balearic Islands: A Proposal for a Gender-Sensitive Indicator System." *Investigaciones Feministas* 12 (2): 439–48. <https://doi.org/10.5209/infe.72029>.



D2.1 Literature Review Data Monitoring

- Stadler, Bettina, and Angela Wroblewski. 2021. "Wissen in Zahlen: Potenziale von Gender-Monitoring im gleichstellungspolitischen Prozess am Beispiel österreichischer Universitäten." *GENDER* 13 (2): 142–58. <https://doi.org/10.3224/gender.v13i2.10>.
- Standing Working Group on Gender in Research and Innovation. 2021. "Gender Equality Plans as a Catalyst for Change: ERAC 1202/21." Unpublished manuscript, last modified December 09, 2022. <https://data.consilium.europa.eu/doc/document/ST-1202-2021-INIT/en/pdf>.
- Stepan-Norris, Judith, and Jasmine Kerrissey. 2016. "Enhancing Gender Equity in Academia: Lessons from the ADVANCE Program." *Sociological Perspectives* 59 (2): 225–45. <https://doi.org/10.1177/0731121415582103>.
- Striebing, Clemens, Evanthia Kalpazidou Schmidt, Rachel Palmén, Florian Holzinger, and Beata Nagy. 2020. "Women Underrepresentation in R&I: A Sector Program Assessment of the Contribution of Gender Equality Policies to Research and Innovation." *Evaluation and program planning*, no. 79. <https://doi.org/10.1016/j.evalprogplan.2019.101749>.
- Subdirección General para el Emprendimiento, la Igualdad en la Empresa y la Negociación Colectiva de Mujeres. 2021. "Guía Para La Elaboración de Planes de Igualdad En Las Empresas." https://www.igualdadenaempresa.es/asesoramiento/herramientas-igualdad/docs/Guia_pdi.pdf.
- Timmers, Tanya, Tineke Willemsen, and Kea Tijdens. 2010. "Gender Diversity Policies in Universities: A Multi-Perspective Framework of Policy Measures." *Higher Education* 59 (6): 719–35. <https://doi.org/10.1007/s10734-009-9276-z>.
- Tsouroufli, Maria. 2019. "An Examination of the Athena SWAN Initiatives in the UK: Critical Reflections." In *Strategies for Resisting Sexism in the Academy*, 35–54: Springer. https://link.springer.com/chapter/10.1007/978-3-030-04852-5_3. Accessed January 27, 2023.
- Tzanakou, Charikleia, Kate Clayton-Hathway, and Anne Laure Humbert. 2021. "Certifying Gender Equality in Research: Lessons Learnt from Athena SWAN and Total E-Quality Award Schemes." *Frontiers in Sociology* 6 (16): 1–12. <https://doi.org/10.3389/fsoc.2021.784446>.
- Tzanakou, Charikleia, and Ruth Pearce. 2019. "Moderate Feminism Within or Against the Neoliberal University? The Example of Athena SWAN." *Gender, Work & Organization* 26 (8): 1191–1211. <https://onlinelibrary.wiley.com/doi/full/10.1111/gwao.12336>. Accessed January 27, 2023.
- United Nations Statistics Division. 2015. "Gender Statistics Manual: Integrating a Gender Perspective into Statistics." Accessed August 30, 2016. <http://unstats.un.org/unsd/genderstatmanual/>.
- University of Vilnius. 2021. "Monitoring of Diversity and Equal Opportunities Situation in Vilnius University in 2020." Unpublished manuscript, last modified February 23, 2023. https://www.vu.lt/site_files/Apie_VU/MONITORING_OF_DIVERSITY_AND_EQUAL OPPORTUNITIES_SITUATION_IN_VILNIUS_UNIVERSITY_IN_2020.pdf.
- Villegas, Adoración Barrales, Consuelo Arce González, Juana Brito Delgado, Norma Corea, Ligia Franco, Ana J. Garzón Castrillón, Claudia Melgar de Zambrana, and Andrea Tejera. 2018. "Marco Para Un Diagnóstico Por Estamentos En Materia de Equidad En Las IES -



D2.1 Literature Review Data Monitoring

- Políticas y Prácticas Para La Equidad En La Educación Superior.” In *Políticas y prácticas para la EQUIDAD en la EDUCACIÓN SUPERIOR*, edited by Joaquín Gairín Sallán and Guadalupe Palmeros y Àvila, 67–150. Las Rozas (Madrid): Wolters Kluwer. <https://core.ac.uk/download/pdf/195786599.pdf>.
- Winsnes Rødland, Anne, Christensen Lise, Ingeborg W. Ovesen, Slipersæter Stig, and Rustad Linda. 2015. “Synthesis Report on Selected Structural Change Initiatives and Indicators for Monitoring of State-of-Play and Progress.” Unpublished manuscript, last modified November 28, 2016. http://www.gender-net.eu/IMG/pdf/Rapport_Gender-net_2-8-v3.pdf.
- World's Women, 2005: Progress in Statistics*. 2006: United Nations.
- Wroblewski, Angela, Susanne Bühner, Andrea Leitner, and Cheng Fan. 2015. “Monitoring the Evolution and Benefits of Responsible Research and Innovation (MoRRI): Analytical Report on the Gender Equality Dimension.” Unpublished manuscript, last modified March 22, 2018. https://www.isi.fraunhofer.de/content/dam/isi/dokumente/ccp/2015/morri_analytical_report.pdf.
- Wroblewski, Angela, and Kirstin Eckstein. 2018. “TARGET. D 4.1-Gender Equality Monitoring Tool and Guidelines for Self-Assessment.” Unpublished manuscript, last modified January 27, 2023. <https://www.semanticscholar.org/paper/TARGET.-D-4.1-Gender-equality-monitoring-tool-and-Wroblewski-Eckstein/4849f909d497e1ac1c1ae2faf46e530204f4c989>.
- Wroblewski, Angela, and Andrea Leitner. 2013. “Analyse von Gender - Indikatoren: WB - Kennzahl 1.A.5 Gender Pay Gap und Datenbedarfskennzahl 1.3 Geschlechterrepräsentanz im Berufungsverfahren.” Unpublished manuscript, last modified January 27, 2023. http://www.equ.at/dateien/IHS_Bericht_Gender_Indikator.pdf. Endbericht. Studie im Auftrag des BMWF.
- Wroblewski, Angela, and Andrea Leitner. 2022. “Relevance of Monitoring for a Reflexive Gender Equality Policy.” In *Overcoming the Challenge of Structural Change in Research Organisations—A Reflexive Approach to Gender Equality*, edited by Angela Wroblewski and Rachel Palmén, 33–52: Emerald Publishing Limited. <https://irihs.ihs.ac.at/id/eprint/6240/1/wroblewski-leitner-2022-relevance-monitoring-reflexive-gender-equality-policy.pdf>. Accessed January 27, 2023.
- Wroblewski, Angela, and Anke Lipinsky. 2018. “Steering by Evaluation in Times of Impact Orientation and Monitoring?” *fteval. Journal for Research and Technology Policy Evaluation* (45): 22–27.
- Wroblewski, Angela, and Rachel Palmén, eds. 2022. *Overcoming the Challenge of Structural Change in Research Organisations—A Reflexive Approach to Gender Equality*: Emerald Publishing Limited.
- Xiao, Yunyu, Edward Pinkney, Terry Kit Fong Au, and Paul Siu Fai Yip. 2020. “Athena SWAN and Gender Diversity: A UK-Based Retrospective Cohort Study.” *BMJ open* 10 (2): e032915. <https://doi.org/10.1136/bmjopen-2019-032915>.
- Zabaniotou, Anastasia, Oumaima Boukamel, and Aigli Tsirogianni. 2021. “Network Assessment: Design of a Framework and Indicators for Monitoring and Self-Assessment of



D2.1 Literature Review Data Monitoring

a Plan in the Mediterranean Engineering Education Context Customized Gender Equality.”
Evaluation and program planning 87:101932.
<https://doi.org/10.1016/j.evalprogplan.2021.101932>.