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OBJECTIVES OF THE DELIVERABLE

The aim of this document is to present the ACT conceptual framework in order to clarify key concepts and identify the relevant literature to construct the evidence base for subsequent project development. This document includes a state of the art on how communities of practice can promote gender equality issues in HE and R&I and GEP implementation whilst including an overview of current measurement scales and instruments for gender equality monitoring.

CONSORTIUM

The ACT consortium consists of 17 partners: [Fundació per a la Universitat Oberta de Catalunya](#) (project coordinator, Spain), [Portia](#) (UK), [NOTUS](#) (Spain), [Joanneum Research Forschungsgesellschaft MBH](#) (Austria), [Advance HE](#) (formerly [Equality Challenge Unit](#)) (UK), [Loughborough University](#) (UK), [Facultad Latinoamericana de Ciencias Sociales](#) (Costa Rica¹), [Technische Universität Berlin](#) (Germany), [Karolinska Institutet](#) (Sweden), [Science Foundation Ireland](#) (Ireland), [Umweltbundesamt](#) (Germany), [Stiftung Deutsches Elektronen-Synchrotron](#) (Germany), [Centre National de la Recherche Scientifique](#) (France), [Fundació Centre de Regulació Genòmica](#) (Spain), [Uniwersytet Jagiellonski](#) (Poland), [Znanstvenoraziskovalni Center Slovenske Akademije Znanosti in Umetnosti - ZRC SAZU](#) (Slovenia), and [Haskoli Islands](#) (Iceland).

TERMS OF USE

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ACRONYMS

ACRONYM	MEANING
BES	Business Enterprise Sector
DOI	Digital Object Identifier
CoP	Community of Practice
EC	European Commission
EARTO	European Association of Research and Technology Associations
EIGE	European Institute for Gender Equality
ERA	European Research Area
EU	European Union
EUA	European University Association
EUDAT	European Collaborative Data Infrastructure
GE	Gender Equality

GEAR	Gender Equality in Academia and Research
GEP	Gender Equality Plans
GOV	Government Sector
HE	Higher Education
HR	Human Resources
LERU	League of European Research Universities
R&I	Research and Innovation
RRI	Responsible Research and Innovation
RPO	Research Performing Organisation
RFO	Research Funding Organisation

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1. INTRODUCTION

A conceptual framework is understood as “a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena” (Jabareen, 2009:51). The ACT conceptual framework’s main function is to **clarify those concepts needed in order to construct the evidence base for subsequent project development.**²

The conceptual framework is based on a review of peer reviewed publications as well as accumulated knowledge of practical implementation of gender equality in higher education, research and innovation (HE and R&I) with a focus on gender equality plans (GEP) in research organisations and the role played by communities of practice (CoPs).

Draft 1 of this document was circulated to WP and Task leaders in order to better understand the input they need from all partners in order to carry out the WP / tasks they are responsible for. Draft 1 was intended to:

- Clarify key research questions
- Identify the key concepts and definitions that needed further clarification for subsequent project work
- Specify the procedures for the literature search, share articles, reports and key resources
- Provide a tool to enable the consortium to provide knowledge and experience in an efficient way to subsequently build the conceptual framework

Draft 2 of this document incorporated the suggestions and needs of WP/ Task Leaders. It was intended to:

- Discuss the contents of the 'conceptual framework' deliverable
- Present work in progress
- Enable further discussion on key concepts and related operational issues (criteria for selecting CoP); informed bibliography and literature gaps
- Agree on how the consortium may further provide knowledge and experience to enrich the conceptual framework

² Conducting a systematic review of the literature in the field of communities of practice for institutional change in higher education, research and innovation across Europe is beyond the scope of the conceptual framework envisaged in the project.

Following discussion in the second ACT project meeting held on 29-30th October 2018, partners have contributed to this conceptual framework by revising the key concepts and suggesting further references for the informed bibliography, including non-English literature (German, Swedish, Slovenian, Serbo-Croatian, Polish, Spanish).

Draft 3 of this document incorporates these suggestions and presents a state-of-the-art which summarizes the main findings for discussion with ACT partners. The state-of-the-art is a first attempt to highlight the synergies between the body of knowledge examining gender equality in R&I and HE in the ERA, practical tools for GEP implementation and the CoP literature. All relevant literature for subsequent project development has been uploaded to the ACT conceptual framework shared library on Zotero which will be updated throughout the course of the project. This document should be read alongside Müller, Jörg, Amanda Aldercotte, and Rachel Palmen. 2019. ACT Modular Questionnaire Framework (Zenodo. doi:10.5281/zenodo.2553078) which details the possible measurement scales for the audit tool.

The structure of this document is as follows:

- State-of-the-art
- Operational mindmap
- Key concepts
- Informed bibliography

2. STATE OF THE ART

The main aim of this review is to identify how a Community of Practice (CoP) approach can advance gender equality through institutional change in the European Research Area by removing gender-related institutional barriers to research careers, tackling gender imbalances and gender bias in decision-making and integrating the gender dimension in education, research and innovation content (see Annex 1 for literature search key terms). The first section looks at how a CoP can be developed *within* an institution to promote organisational change for a greater gender equality in these three gender equality priority areas. The second section considers how an *inter-organisational* CoP can promote institutional change, primarily through the sharing of best-practices and institutions working together in these three gender equality priority areas. The third section identifies how ACT can improve the competence and agency of CoPs by providing targeted support. The fourth section considers the scaling up of CoPs and how this could lead to GEP innovation. The fifth section considers the evaluation and critical success factors of CoPs identified in the literature.

2.1 COMMUNITY OF PRACTICE APPROACH TO INSTITUTIONAL CHANGE AND GEP IMPLEMENTATION

Communities of practice refer to “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger et al., 2002:2). The concept of the CoP was originally developed by Lave and Wenger who stated that learning happened in social relationships rather than through simple acquisition of knowledge (Lave and Wenger, 1991). Three key dimensions define a CoP: shared interest on a domain of practice (domain), mutual engagement (community) and development of a shared repertoire of resources (practice).

Element	Explanation	Application in ACT
Domain	A domain of knowledge which defines a set of issues. A well-defined domain affirms the purpose and value to members and stakeholders (Barnard et al, 2017).	The implementation of GEPs and gender equality measures in R&I and HE in the ERA.

Community	In pursuing their interest in their domain, members engage in joint activities and discussions, help each other and share information. They build relationships that enable them to learn from each other (Wenger-Trayner, 2015:2).	CoP members of the ACT supported CoPs– include both practitioners and researchers– working together (communicating, and meeting regularly) to promote gender equality in the ERA.
Practice	A set of frameworks, ideas, tools, information, styles, language, stories and documents that community members’ share, which develops specific knowledge on the domain.	Shared knowledge, and ‘know how’ leading to increased competence in the design, implementation, monitoring and evaluation of GEPs and other gender equality measures for institutional change.

Table adapted from Barnard et al (2017)

Domain: Implementing gender equality plans and measures in R&I and HE in the ERA

The domain is the negotiated, shared interest which is informed by the topics and issues that CoP members identify with, and care about. They are a set of defined issues or problems and they form the core of the groups’ activities. ACT CoP member’s mutual domain of interest and engagement, which defines their shared identity, is advancing gender equality, promoting institutional change and in particular in implementing GEPs in HE and R&I across Europe. A domain has to be well-defined in order to affirm the purpose and value to members and stakeholders (Barnard et al. 2017). The domain is also important as it is the basis of the group’s shared identity, which in turn is essential for the CoP success. Indeed, a “lack of identification with the CoP” is one of the five reasons identified by Probst and Borzillo (2008:339) for the failure of CoPs.

Within ACT, advancement of gender equality in higher education, research and innovation is defined in accordance with the three gender equality ERA priorities³ as a

³ In 2012, the ERA Communication "A Reinforced European Research Area Partnership for Excellence and Growth" established gender equality as one of five priorities for achieving the objective of a common research area in Europe.

three-dimensional construct: removing gender-related institutional barriers to research careers; tackling gender imbalances and gender bias in decision-making; integrating the gender dimension in education, research and innovation content. The GENERA project has developed fields of action which operationalize these three ERA priorities and assigns specific actions to be taken at institutional level – (i.e. possible actions to be included in GEPs) to each field (Oetke et al, 2016). This is in effect the ‘domain’ of the ACT project.

A priority area of intervention within the **first ERA priority (careers)** is promoting an **inclusive organisational culture**: raising awareness on gender issues, tackling denial and resistance to change and building competence among top-management and different actors to recognize and eliminate sources of gender inequality, in particular unconscious gender bias. It also encompasses the development of non-discrimination policies, including sexual harassment policies as well as more general diversity issues.

A second field of action concerns **presence**: addressing the chronic under-representation of women as researchers and scientific staff (relative to men as well as relative to the number of women graduates) which is magnified the higher up the career ladder they progress. The aim is to foster a work environment where all researchers can achieve their potential. This requires a critical assessment of RPOs' recruitment and evaluation practices (see Rivera and Tilcsik's (2019) paper for an in-depth examination of how gender inequalities in evaluations can be shaped by the design of the tools used to judge merit). This also entails analysing women's attrition causes and developing strategies for retention and advancement. RFOs' funding criteria and grant management practices also have to be critically assessed in order to promote retention and advancement. Positive action measures such as targeted recruitment or targets for grant awards have proven to be effective.

Oetke et al (2016: 4) highlight that when designing measures in all these fields it is imperative to define these carefully to not victimize female scientists or reinforce gender stereotypes. Academia is well known for long-working hours combined with high pressures and work-life imbalances which can have a counterproductive effect on performance and worker satisfaction (Kinman and Jones, 2008). Furthermore, explicit and implicit academia regulations usually require high levels of competence and research productivity in the early years of the academic career which coincides with the time of starting families or raising young children - a fact that hits women researchers particularly hard (O'Laughling, Bischoff 2005). Measures should make career thresholds

and procedures more transparent and gender aware: this entails counteracting the rigid scientific career trajectory based on an out-dated male norm of full availability and early achievement.

This connects with the third field of action which refers to **flexibility, time and work life**. RPOs policies designed to address the needs of staff with caring responsibilities and work-life balance can help to increase both productivity and satisfaction. In fact, RPOs in Europe have the highest tendency to implement work-life balance measures, including provisions to enable the adoption of a flexible career trajectory (e.g. enabling career interruptions, returning schemes after career breaks) (EC, 2015:121). RFOs may also play an influential role in supporting the reconciliation of work and family life - grant management practices are increasingly including measures to mitigate conflicts between career and family demands (Science Europe, 2016). As highlighted by Oetke et al. (2016) policies and measures designed in this area must challenge the traditional view of women as fulfilling a caring role and must help to foster co-responsibility for care with men. Measures in this area must therefore be formulated to be gender inclusive and not only consider career/family conflict, but also the mutual benefits of work-life balance for both institutions and researchers. Reasonable working hours and limited overtime reduce stress and increase performance.

Concerning the **second ERA priority (decision making)**, experience shows that balancing the gender composition is strategic to effectively counteract unconscious gender bias, improve the quality of committee work through diversity and symbolically change institutional culture (Veronesi et al. 2016). As highlighted by Oetke et al. (2016) addressing gender bias in decision-making not only refers to equal presence of women and men in all relevant boards and committees, but also the ability of their members to address their own biases and make informed decisions. This implies developing **gender awareness** measures to ensure that all bodies are gender-sensitive and aware. Finally, sharing practice on the **effectiveness of different strategies to foster gender balance** is of high relevance. This can be achieved by different means - such as the use of quotas, specific election rules or other 'softer' strategies to bring about gender balance. The role of **RFO steering mechanisms** to foster gender balance in decision-making processes in RPOs is another aspect to be further explored.

Only in recent years gender equality debates have paid increasing attention to overcoming gender bias in science knowledge production, and mainstreaming sex and gender analysis into basic and applied research (Schiebinger 2008) - the third ERA

priority (content as well as teaching and innovation). At stake is a better quality of research process and outcomes. Incorporating gender and sex in university teaching and the research process, in science knowledge making, and in the science value system is considered a key challenge to improve the quality and excellence of scientific endeavours. As highlighted by LERU (2015:17), the European Commission Directorate-General for Research and Innovation has emphasised the need for sex and gender analysis in its funded projects for years. These policies have been reformulated and strengthened in the current funding framework H2020. In the proposal template applicants are asked to describe, when relevant, 'how sex and gender analysis is taken into account in the project's content'." Whilst some RFOs are adopting similar approaches, namely in the field of health and life sciences, only a scarce number of RPOs are implementing measures to integrate the gender dimension in higher education curricula and researchers training. Different measures for including the gender dimension in education include: Mainstreaming gender awareness in all curricular (LERU); Including methods of sex and gender analysis and related knowledge in all curricula (GENERA; LERU); Developing new knowledge and training methods for students and researchers in fields where sex and gender analysis is of special relevance (e.g. Karolinska Institute in health and biomedical research). Different measures for including the gender dimension in research content include: asking research applications to address 'how sex and gender analysis is taken into account in the project's content' (H2020; Science Foundation Ireland); raising gender awareness and competence for applicants, reviewers or evaluation panels, providing specific guidance and training (LERU, Science Foundation Ireland); Providing tools for researchers to understand and apply gender in research content methods in their research fields, for instance through training workshops, seminars or showcasing good examples (GENERA, LERU).

Community: Embedding Gender Equality through Institutional Processes

In addition to requirements for change to happen in the above substantive areas, institutional change also means that gender equality is widely discussed and explicitly embraced in organisational processes and practices. Using a CoP approach to embed a GEP within an institution is a potentially successful strategy to ensure that institutional change – does not depend on one person, is sustainable, effective and may combat resistance.

The European Commission has highlighted key elements for effective institutional change as⁴

- knowing the institution: collecting base-line data at the institutional level in order to inform an institutionally tailored, evidence-based strategy of change;
- securing top-level support: without commitment by leadership, institutional change lacks strategic importance, and implementation may just not happen, be circumvented, or resisted;
- effective management practices: raising awareness and building gender competence of key decision-makers, human resource managers and other relevant stakeholders

Linked to the top-level support, EIGE (2016) highlights the availability of adequate resources as a prerequisite for institutional change.

Today, in Europe, the preferred approach promoted by the European Commission to advance institutional change for gender equality in higher education, research and innovation is to require institutions to develop and implement gender equality plans (GEPs). Beyond formal adoption of a GEP, achieving actual change requires increased institutional willingness and capacity to identify, reflect on, and address common gender problems in a systematic way. However, experience shows, that, in general, GEP implementation with sustainable outcomes is difficult to achieve. Common problems are⁵:

- overt or subtle resistance, including lip service and pro forma action (in spite of formal adoption, GEP implementation usually encounters deep resistance at different levels and from different actors in the institution)
- difficulties for coordination between different actors in complex organisations (GEP expects actions to be taken in a coordinated way across different organisational functions which are not used to cooperating)
- lack of gender competence and expertise (from gender audit to design, implementation and monitoring of actions) and appropriate tools for each phase of GEP implementation
- weak or unclear consensus on the priority for action in a given timeframe, even when long-term objectives are firmly shared (in many cases, GEP lack a realistic

⁴ http://ec.europa.eu/research/science-society/document_library/pdf_06/structural-changes-final-report_en.pdf

⁵ Based on EIGE (2016) and documentation of main EU funded projects

approach of what is feasible and most effective for advancing gender equality in the short and mid-term)

- lack of adequate budget, human resources and structures (in many cases, the institution does not have a gender equality structure and the GEP does not envisage enough material and human resources for successful implementation)

Adopting a CoP approach to implementing institutional change can improve the effectiveness and sustainability of GEPs. The CoP literature identifies how a CoP approach can help to foster an environment in which knowledge can be created and shared to improve the effectiveness of existing practices used within organisations (Lesser and Everest, 2001, cited in Probst and Borzillo, 2008:336). As a first step for GEP implementation the GEAR Tool states it is necessary to: “embed commitment to both gender equality and the work related to the gender equality plan into multiple organisational structures. This means that support, buy in and commitment for the plan will need to be sought from multiple stakeholders and not only allocated to a specific school or department” (EIGE, 2016:3). A CoP approach could prevent that the GEP implementation depends solely on a few individuals in the organisation. CoPs engage different functional roles in the institution (gender equality practitioners, researchers, human resources, managers, designers of information systems) and therefore transcend institutional hierarchies as well as functional boundaries, providing an arena where a diversity of actors and agendas can come together on a continued basis. In this way, CoPs provide a new approach for GEP implementation which takes into account the complex reality of academic organisations, with their variety and often competing agendas. An important element in this process is embedding gender equality within the institution. This means incorporating a gender equality perspective and aims to integrate it into the institutions’ steering documents including long-standing development strategy, linking gender equality issues with other current internal or external strategies, policies or projects (Swedish Secretariat for Gender Research, 2016). This supports the acceptance of gender equality goals or initiatives in the organisation as well as the engagement of top management.

Secondly, CoPs may be a driver for increased institutional willingness and capacity to think and work together on gender issues by providing a forum for mutual learning and capacity building. It is an iterative process that goes hand in hand with the GEP policy cycle: audit, design, implementation and monitoring. For instance, a critical aspect for consensus building is prioritising action according to time-span. Callerstig (2014:140) in her thesis on ‘Making Equality Work: Ambiguities, conflicts and change agents in the

implementation of equality policies in the public sector' notes the relevance of time as a prerequisite of change. Institutional change requires a constructive tension between long-term objectives and appropriate step-by-step prioritising of short-term actions. For example, actions that are considered as 'easy to implement' with a 'high impact' in the short term could be implemented at the start of the GEP process. This would imply achieving concrete, visible results early on in the process - an aspect that could be key for taking the whole process forward.

Taking a CoP approach to gender equality and institutional change in R&I may also be an effective strategy to tackle resistance -primarily through its emphasis on community engagement and participation. Resistance has been identified in the literature as one of the "serious challenges regarding organizational behavior and change" (FESTA:201?). The FESTA handbook resistance highlights five ways that institutions can tackle resistance:

- 1) Institutionalisation, Diversity, Inclusivity
- 2) Networking and Collaboration
- 3) Communication and Dissemination
- 4) Creating the Capacity for Change
- 5) Teamwork and Methodology

The above dimensions are congruent with a CoP approach. For example, they recommend that involving more men and women into gender equality work of the organization as a way to counteract resistance. If staff are engaged with and participate in gender equality work – they are more likely to understand and recognize it's worth. Kalpazidou Schmidt & Cacace describe the strategy used in the STAGES project for structural change, "A strategy of successfully widening the circles of actors, enlarging the team, has been pursued in order to achieve structural change. Thus, beside the core team, i.e. the group of people directly in charge of designing and implementing the action plan, the process involved the so-called extended team, i.e. institutional bodies, key institutional players, networks, individuals or groups of people who, in cooperation with the core team, promoted the activities working towards sustainability." Extending the community beyond the core team – was seen as a key factor to achieve structural change.

Callerstig's (2014:140) findings show the effectiveness of 'tempered radicalism' and 'small wins strategies' for tackling resistance and supporting actual change. Tempered

radicals are described as: “employees who acknowledge unfair or unjust practices or conditions in their organisations and who want to change them, but who are at the same time loyal and support the overall objectives of the organisation. Tempered radicals use small wins strategies, i.e. they seek out opportunities to make changes in a small fashion, building alliances and securing support as they go along, and they work to create change from the inside” (Callerstig, 2014:140). The small wins strategy has been identified as an effective way to achieve gender equality objectives (Charlesworth & Baird, 2007). Small steps towards organisational change can be effective as it lowers resistance to change. Meyerson and Fletcher (2001) suggest that the small wins strategy is “a powerful way of chipping away at the barriers that hold women back without sparking the kind of sound and fury that scares people into resistance” (p. 126) (cited in Callerstig, 2014:141).

Finally, CoPs are self-sustained communities and for this reason support GEP sustainability. Whilst organisations can sponsor CoPs and facilitators can initiate the formalisation and planning of CoP activities to foster their growth and sustainability, ultimately it is the members of the community who will define and sustain it over time (Cambridge and Suter 2005: 1). In CoPs, people collaborate not because they are obliged to do so, but because they share a concern, passion or interest, which propels them to interact on an on-going basis that leads to deepening their knowledge and expertise. The nurturing of the community produces a strong, shared identity-effect among its members, anchored precisely in the relevance of its concerns for immediate professional and organizational reality, which makes it more self-sustaining, as well as realistic. Regarding the sustainability of the GEP, results from the STAGES project demonstrated how the quest for sustainability starts at the very beginning of the GEP process – through institutional arrangements that are set up for implementation, which are continually assessed so that viable solutions are found to secure their continuity (Cacace et al, 2015:xi) (Sekula & Pustulka, 2016:14). The emphasis of the CoP is built on this premise. Cacace et al (2015:xi) highlight how different actions may have different degrees of sustainability, some may be sustainable from the start, yet others will need to be redesigned, modified or integrated with others to ensure their sustainability. An approach that factors in sustainability from the beginning of the GEP must contemplate a transition phase - “where the teams still continue to cooperate in the delivery of the action by gradually reducing their efforts as new institutional actors take over” (Cacace et al, 2015:ix). EIGE through their GEAR tool also recommends working in this way and highlights how this approach of distributed responsibilities (and not too much

dependence on one or two actors) can prevent changes of leadership, budget cutbacks or apathy thwarting the progress made towards gender equality through plans.

Practice: Increased gender competence

Gender competence is defined by EIGE as those “Skills, attributes and behaviours that people need in order to mainstream gender concerns effectively into policies and plans and help build gender equality”. Gender competence has been identified as a key element in any institutional change project and a lack of gender competence has been identified as hindering gender equality interventions in R&I (Palmén et al, 2018). Building gender competence for each phase of GEP development through audit, design, implementation, monitoring and evaluation is necessary for effective institutional change.

Institutional change projects in academia routinely involve at least two types of actors, researchers (scientists) and practitioners (gender equality officers) and the difficulties of reconciling different types of knowledge have been recognized: “Knowledge creation and use in interventions aiming at GE in research organisations have been highlighted as a key – and potentially controversial issue. Zippel and Ferree (2018) show that not only the knowledge needed for implementation, but also knowledge deriving from it can create internal tensions between academics and administrators and be difficult to manage and communicate.” (Kalpazidou Schmidt and Cacace, 2018). In the context of the ADVANCE institutional transformation programme Zippel and Ferree recognize how “programme directors and ADVANCE leadership teams generate experiential knowledge, they are also pooling information about what what works and doesn’t. These networks of knowledge are not being validated by the arbiters of social scientific impact, but their sharing of insights offers reflexive, actionable contributions to the feminist knowledge project” (Zippel and Ferree, 2018:14). They go on to comment how “an unintended consequence of NSF ADVANCE has been the creation of crucial dynamic national and local networks of actors with gender expertise. These networks include administrators and faculty who have had or acquired some form of gender expertise during the course of their involvement in ADVANCE, as well as social science researchers who work on gender, STEM and universities” (ibid). They go on to identify how “future research should illuminate how these networks disseminate and bridge both applied and scientific forms of knowledge production, creating the foundation for further self-reflexive processes of institutional transformation both within and across disciplines and systems” (ibid).

CoPs break away from the idea of knowledge as a static object and their functioning is based on the idea of tacit knowledge of practitioners which is an “accumulation of experience—a kind of “residue” of their actions, thinking, and conversations” (Wenger et al, 2002:6). This type of knowledge is dynamic, it grows with everyday practice, and it requires social participation which in turn is “the vehicle for learning itself” (Hugues et al, 2007:2)”. A continuous wheel of knowledge production, learning and practice development is therefore created in CoPs. It is argued by Hearn and White that “what defines a group as a CoP is..what it does, with the emphasis on practice” (2009:1). Thus, it is the **practice**, enacted by the interaction of the members of the **community** who share a common **domain** or purpose, that shape CoPs.

The practice is the element that results from the long-term activities of CoPs and it can be seen as both the process and the products of knowledge. The shared practice is comprised of a shared repertoire of resources, experiences, stories, learning activities, methods used, ideas or toolkits among others, that are accepted among members and used as communication tools. These elements of the shared practice can be explicit ‘know how’ but also tacit ways of ‘doing things’, that members of the community share in interactions.

The practice of a CoP, (WHO, 2015) is developed through a variety of activities, which can also be seen as the objectives (Wenger-Trayner, 2015). In the context of ACT, these are as follows:

- Collective problem solving
- Exchanges of information
- Sharing experiences
- Reusing and reviewing already available information assets
- Coordination and strategic approaches to improving competence
- Building solid arguments for institutional change
- Growing expertise and confidence of members
- Assessing successes and failures in adopting particular practices
- Documenting progress in joint exchanges and learning
- Visits and remote meetings
- Mapping available knowledge and identifying gaps in understanding

In ACT CoPs there is a mix of practitioners, such as gender equality practitioners, HR practitioners, diversity managers, and researchers and academics. Members of ACT CoPs do not necessarily work together on a daily basis, or be part of the same institution. Rather, depending on need and opportunity, they deploy any suitable communication channels to exchange ideas, seek feedback, and reach consensus.

2.2 COPS, EFFECTIVE PRACTICE AND SYSTEMIC IMPACT ON ERA PRIORITIES

Effective and sustainable GEP implementation is conditioned by marked diversity of national and institutional contexts where inter-institutional (regional, national and transnational) CoPs could act as a catalyst for institutional change. A salient aspect is the persistence of different approaches and rates of progress among Member States in terms of the implementation of gender equality measures in the ERA. Effective coordination between governments, RFOs, and RPOs is required to foster long-term institutional change for gender equality in HE and R&I. However, only 8 National Action Plans include targets and measures for institutional change (GENDERACTION, 2018). In Member States with the legal obligation, GEPs are found in greater numbers and in the greatest proportion of research and higher education institutions (namely Germany, Spain, Italy, Austria, Finland, Sweden and, finally the United Kingdom through the Athena Swan Initiative). According to EIGE (2016), there are over 1100 research and higher education institutions in the EU currently implementing a GEP. National contexts furthermore contain different organisational cultures, with more or less autonomy at the university level, collegial or personal authority decision-making. While it is generally expected that a favorable legislative and policy framework will foster GEP implementation, there is also strong consensus that an effective sharing of practice and mutual learning about the very process of institutional change for gender equality is also needed. Furthermore, supporting GEP implementation and institutional change across Europe entails the adoption of a complex approach - able to support the linguistic and cultural diversity as well as diverging policy agendas, administrative environments, and historical gender equality trajectories within Europe.

Specifically, regarding the gender dimension in research content, a review of gender equality policies in European Research Area (ERA) countries shows that some countries have introduced gender criteria in research funding or have supported the consideration of gender in research content through specific programmes. Fifteen NAPs address the objective to strengthen the gender dimension in research content, although only three contain measures (GENDERACTION, 2018). Yet although policies are in place, there is

hardly any evidence on the effects of the integration of the gender dimension in research content. The Austrian Ministry for Transport, Innovation and Technology commissioned an analysis of the inclusion of gender criteria within the research projects funded by the programme FEMtech. The analysis (Wroblewski, 2016) was based on research proposals, self-description of projects (e.g. webpages) and qualitative interviews with project leaders and gender experts involved in the projects. The empirical findings were contrasted with an ideal scenario of the integration of the gender dimension in research projects. The comparison depicted that most research designs did not support the ideal scenario. There are several reasons for this deviation – e.g. firstly, because gender concepts used are not explicated secondly, because gender expertise is restricted to specific partners, and thirdly, because of a lack of reflection of results or research process. **Good practice** relied on the strong position of the gender expert and a clear definition of her/his tasks in the project team. On this basis, the study formulated recommendations for further development of the programme with a focus on strengthening the gender dimension in research content and the reflexive approach of the research process as regards gender issues. However, policy action in the field of gender dimension in teaching appears to be more limited. Only ten NAPs mention the objective of integrating the gender dimension in higher education curricula and only one contains measures (GENDERACTION, 2018). It is clearly an issue that deserves further attention at either national and European level.

Supporting inter-institutional CoPs is a good way to foster best practice sharing for the effective practice take-up. CoPs offers an approach that is flexible and able to adapt to complexity and in particular differing contexts and needs. Indeed, CoPs have been described as “a contested concept in flux” (Hugues et al., 2007: 1), that is a concept that is in a continuous process of being defined, re-defined and adapted to suit different needs and aims. The concept of CoP is therefore infused with ‘interpretative viability’, which means that it “can be deployed to achieve different purposes and can simultaneously appeal to different constituencies since each can interpret the concept in their own way” (Murillo, 2011: 2). Concepts that are left with loose ends are often more adaptable to various contexts. It means that the more appealing or suitable elements of the concept can be adopted and adapted, leaving out those that are not relevant or suitable. Thus, this ‘interpretative viability’ of the concept of CoP and its inferred malleability make it a useful approach for dealing with complexity. From this perspective, it is also worth stressing that the CoP approach, with its focus on learning as a process of social participation (Lave and Wenger 1991; Wenger 1998) seems also pertinent to fostering sustainable sharing of practice and mutual learning as a process that

overcomes national and institutional boundaries and enlarges its scope, with a view to contribute to the effectiveness of GEP implementation and advancement of gender equality in HE and R&I at the European level. Wenger (1998) speaks about re-thinking learning and explains that if the focus is placed on participation, this has certain implications for what is required to understand and support learning, both for individuals and for communities: “for individuals it means that learning is an issue of engaging in and contributing to the practices of their communities. For communities, it means that learning is an issue of refining their practice and ensuring new generations of members” (Wenger, 1998:7). In CoPs, members are committed to learn and share with each other based on the passion they feel for the topic (Mercieca, 2017:10). Using CoP as an approach means that CoPs can contribute to the much-needed sustainability of 'thinking together' about effective GEP implementation and ensuring this so-called 'new generation of members' through the sharing of practice.

There is rich knowledge and experiences available about different gender equality measures developed by institutional change process. In particular, good practices have been identified by EIGE and projects funded by the European Commission in the three ERA priorities. However, literature review suggests that GEP implementation needs further knowledge on **practical conditions for effective practice and systemic impact on ERA priorities** taking into account different institutional realities. In particular, differences between higher education institutions, research institutes and research funding organisations are relevant. In this regard, the contribution of networks of research organisations which are working on gender issues is of high relevance. The basis for developing inter-institutional CoPs could be the GENDERACTION definition of good practices:

- are based on an empirical baseline assessment
- explicitly aim to contribute to at least one of the three main gender equality objectives
- formulate concrete targets and target groups
- are based on the theory of change/ programme theory (a formulated set of assumptions why and how the policy should reach its targets and target groups),
- involve relevant stakeholders in the development of the policy/ measure
- are provided with sufficient and sustainable funding
- produce results which are sustainable and significant (in terms of coverage, resources, timeframes, etc.)

- develop a dissemination/ communication strategy (what has been done, what has been achieved, what worked, what didn't work), and
- are monitored or evaluated on a regular basis with regard to their implementation status and impact.

Finally, GEP implementation in general needs to improve **data collection and monitoring - related to the formulation of a theory of change**. As stressed by EIGE (2016) many GEPS do not rely on a proper gender audit and do not have adequate systems for collecting gender-relevant data in place. A pertinent field of action for GEPs is to improve existing procedures, processes and information systems by addressing the data gaps that have been identified as relevant (Target guidelines, 2018). Additionally, it is important to stress that monitoring indicators should be clearly related to the formulation of a theory of change to ensure the consistency of actions. Improving the quality of data implies identifying the indicators that should be used for monitoring output, outcome and impact of the actions included in the GEP. In general, monitoring should include a variety of tools, measures and benchmark progress indicators against other institutions and focus not only on the successes of specific policy measures, but also on shortfalls and unintended effects (McGregro and Bazi, 2007; Lee, Faulkner & Alemany 2010, European Commission, 2012, Lipinsky 2014; Wharton 2015; Sekula and Pustulka, 2016).

Beyond the specificities of institutions and tailored-made GEPs, an important aspect in need of action is the development of **reliable and standardized instruments for GEP monitoring and information sharing**. In general, GEP implementation by institutions is conducted in isolation from others, and with processes that differ widely in terms of their scope and effectiveness, and in majority of cases without a proper assessment of gender equality needs and priorities, or the necessary monitoring and evaluation mechanisms. Results usually do not transcend the immediate project context while quality assessment of the reliability and validity of the generated data has not been conducted. Mutual learning, however is conditioned on the possibility to compare related gender equality measures with their resulting impacts in a meaningful and systematic way. ACT intends to address this gap by providing a modular questionnaire framework, based upon and incorporating elements from the ASSET survey in order to provide an instrument for standardized, high quality GEP monitoring, mutual benchmarking, and a source of evidence for policy decisions and collective progress towards coordinated institutional change. The modular questionnaire framework is intended to cover different aspects: perceptions of gender equality, job and career, caring responsibilities, recruitment and

retention, training and learning, sexual harassment, socio-demographic elements, and promotion and development. (For more information please see Müller, J., Aldercotte, A., and Palmen, R. (2019). ACT Modular Questionnaire Framework. Zenodo. doi:10.5281/zenodo.2553078).

2.3 IMPROVING COMPETENCE, AGENCY AND SCOPE OF COPS

It is the aim of the ACT project to support the creation, development and consolidation of locally/thematic anchored CoPs for supporting practice sharing, mutual learning and knowledge production with regard to institutional change and GEP implementation in RPOs and RFOs. Given the importance of context in CoPs, it is believed that members can more easily negotiate a shared interest that is meaningful to their local organization and cultural context if the CoP is situated at the local level and/or has a clear thematic focus: CoPs may differ in terms of the gender equality domains they address (e.g. institutional excellence and accountability), the R&I fields they operate in (physics, life science, engineering), or specific research organisations they pertain to. The aim of ACT is to support diverse CoPs to make progress and scale up in size as well as geographically.

For the purpose of the ACT project, it is important to clarify the difference between CoPs and networks. Both CoPs and networks are types of social structures, albeit very different ones. CoPs are always networks, as they involve connections among members but not all networks qualify as CoPs. This is because networks lack one of the defining aspects of CoPs: a shared domain that becomes a source of identification. This identity is what creates a sense of commitment to the community as a whole, not just connections to a few linking nodes, as it happens in networks. ACT CoPs, therefore, transcend networks, precisely because of the community aspect, which requires a developed shared identity on the topic of gender (in)equality. This identity represents a collective intention, however tacit and distributed, to steward this domain of knowledge and to sustain learning about it ⁶.

CoPs are also different to Networks of Practice, which are groups of individuals that engage in the same or very similar practice. The key point of differentiation is that unlike CoPs, people who belong to networks do not necessarily work together. Although members of a network share a great deal of common practice, insight and implicit

⁶ Adapted from: <http://wenger-trayner.com/resources/communities-versus-networks/>).

understanding that in turn foster the circulation of new ideas, these ideas do not circulate as in a CoP, through collaborative, coordinated practice and direct communication. Instead, they circulate on the back of similar practice (people doing similar things but independently) and indirect communications (professional newsletters, listservs, journals and conferences, for example). Thus, one of the defining aspects of ACT CoPs is the **mutual engagement**, understood as the relationships that bind the CoP members together into a social entity and represent the building blocks in the functioning of the CoP itself.

CoPs take different forms: they vary in size, in levels of member engagement, in geographical scope (from local to global), some meet face-to-face and others just virtually and their members can be located within the same organisation or from across organisations (Wenger-Trayner, 2015:1). They can be informally set up groups with no management (Murillo, 2011) which emerge spontaneously (Swan, 2002; Pyrko et al. 2017) or they can be formally arranged, funded and supported by management (Wenger-Trayner, 2015; Murillo, 2011). Moreover, the characteristics of CoPs also vary in relation to the “culture, structure, types of business and scale of organisation” (Hong, 2017:576). In short, the literature on CoPs present them as either naturally occurring social structures or as communities or groups created, assembled and managed with the aim of fulfilling an objective, all with differing forms and sizes.

Also, in relation to the domain and the practice, Hearn and White (2009:2) explain how CoPs, “can bring together a range of perspectives on a problem, and ensure that relevant knowledge is accessible to those who need it. This is far more than the exchange of knowledge”. This practice of learning and knowledge sharing, inherent to CoPs, fulfills one of the main requirements for greater gender equality advancement. Successful long-term institutional change for gender equality is dependent upon an effective sharing of experiences, learning and knowledge creation. Thus, by their very nature, CoPs help foster the environment in which knowledge can be co-created and shared to improve the effectiveness of existing practices (Probst et al, 2008:336).

The evolution of CoPs is marked by lifecycles: they emerge, they grow, and they have life spans. Each lifecycle phase requires specific design, facilitation, and support strategies to help achieve the goals of the CoP and advance into its next stage of development. The following six-dimensional model outlines the lifecycle phases of communities: inquire, design, prototype, launch, grow, sustain (McDermott 2002 as cited in Cambridge et al. 2005:2). The lifecycle phases are defined as follows:

- Inquire: Exploration and inquiry, identification of the audience, purpose, goals, and vision for the community.
- Design: Defining the activities, technologies, group processes, and roles that will support the community's goals.
- Prototype: Piloting the community with a select group of key stakeholders to gain commitment, test assumptions, refine the strategy, and establish a success story.
- Launch: Rolling out the community to a broader audience over a period of time in ways that engage newcomers and deliver immediate benefits.
- Grow: Engaging members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organizational goals while creating an increasing cycle of participation and contribution.
- Sustain: Cultivating and assessing the knowledge and "products" created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future.

ACT CoPs will be targeted at different developmental stages and while the majority of CoPs will be at the *design*, *prototype* or *launch* stage, it is deemed important that there is at least one CoP that each represents the *inquire*, *grow* and *sustain* stages. The purpose of this inclusive selection criteria is to ensure that the ACT CoP toolkit is useful to CoPs at different stages. The value of having a *sustain* stage member would be to help them embed their actions into their structure, so their work continues beyond the lifespan of the ACT project.

In the context of ACT, each **selected** CoP will receive targeted support:

- Direct and continuous targeted support coordinated by Seed partners:
 - tailored-guidance provided by the CoP facilitator. economic support for, training sessions, visits, conferences, workshops, travel expenses etc.
 - online presence and resources in the Knowledge Sharing Hub.

In addition, ACT envisages to provide support to **other** CoPs through diverse means:

- Sporadic, ad-hoc support facilitated by Seed partners:
 - participation in events, conferences, workshops
 - sporadic economic support for visits, trainings sessions, conferences, etc.
- Online, continuous, free self-managed support.

- o online presence and self-managed workspace and resources in the Knowledge Sharing Hub
- o exchange/sharing between online CoPs

2.4 NETWORK OF COPS AND GEP INNOVATION

The diversity of national contexts, together with the rich knowledge pool of past institutional change initiatives as well as ongoing gender equality and RRI actions fundamentally question the feasibility of creating, one EU-level CoP from the beginning. Rather, in order to reflect the status quo in the area of gender equality in HE and R&I, ACT intends to nurture a variety of CoPs across different language, cultural and political environments, each firmly operative in their local/thematic context. However, taking these CoPs as a point of departure, it is the aim of ACT to explore the innovation and mutual learning potential of the **network of CoPs at the EU level**.

The rationale of such approach relies on the evidence that tackling gender inequality in R&I would benefit from all relevant institutions acting in concert, e.g. as promoted by DFG in Germany through their Research Oriented Standards for Gender Equality⁷; the Equality Challenge Unit's in the UK Athena Swan Charter⁸, and the NSF's in the USA Diversity Fuelling Excellence in Research and Innovation Roadmap for Action for North America⁹. In addition, GEP implementation issues would benefit also from better articulated linkages with relevant European level initiatives and developments advancing gender equality through European Research Area (ERA) mechanisms, such as the 351 institutions that have received the excellence award from the EU's EURAXESS Human Resources Strategy for Researchers (HRS4R); or projects such as GENDER-NET and GENDERACTION, directly focused on supporting the achievement of the ERA gender dimension. This also includes initiatives developing OPEN Innovation and Responsible Research and Innovation (RRI) approaches, e.g. Fraunhofer CeRRI, www.lce.com, and www.prosci.com. The same holds true as regards the consensus-based development of ERA policy through the European Commission's Stakeholder Platform, which involves EARTO, LERU, EUA, CESAER and EU-Life, and has produced valuable insights as regards gender equality and institutional change implementation through working groups, position papers and guidelines.

⁷

http://www.dfg.de/en/dfg_profile/facts_figures/evaluation_studies_monitoring/studies/study_research_standards/

⁸ <http://www.ecu.ac.uk/equality-charters/athena-swan/>

⁹ <http://www.gender-summit.com/images/GS3-Roadmap-july30-2014.pdf>

Addressing the EU dimension and the potential for innovation in GEP implementation is therefore an opportunity for action. The literature on social network analysis has advanced general understanding of the relationships between diversity and innovation. The evidence suggests that network size and network strength exhibit a positive, significant relation with innovation as do brokerage across structural holes and network diversity (Baer et al., 2015). More recent research shows that pure access to diverse resources is not enough, a combination of “bridging” and “bonding” has to emerge to create “structural folding” (Stark, 2009; Vaan et al., 2015; Vedres and Stark, 2010). Actors at the structural fold are insiders to more than one community. As a first step, ACT aims to conduct a survey for community mapping in the field of gender in HE and R&I and analyse its network structure using Social Network Analysis. The aim is to identify central and more marginal actors and their core knowledge in order to foster their targeted engagement (matching stakeholders through innovation events). Instead of striving for collaboration between all members of different CoPs, a “structural fold” approach is pursued where only selected individual across different CoPs will interact more closely. This provides on the one hand a less taxing approach to CoP members (not everybody is involved in interaction across CoP borders) while also being more realistic about the language and cultural barriers of many CoP stakeholders, on the other.

On the basis of the experience supporting CoPs and the results of this analysis, it will be the aim of ACT to develop the instruments and support schemes to facilitate not just the consolidation of strong locally/thematically anchored CoPs (horizontal integration) but also to generate insights that transcend these differing implementation realities across Europe and tie back into a synchronized effort across institutions, main stakeholder and agendas (vertical integration). The establishment of three coordination groups (one per ERA priority) is a first step in this direction.

2.5 CRITICAL SUCCESS FACTORS OF COPS AND EVALUATION

Critical success factors have been identified in the CoP literature, from studies evaluating knowledge sharing activities in CoP (Hong, 2017) to identifying key governance mechanisms (Probst & Borzillo, 2008). Probst & Borzillo's (2008) research on CoPs aims to bridge part of the literature gap on guiding these intra-organizational networks. It also identifies the main reasons for their failure – defined as a lack of ongoing development and sharing of knowledge and best practices (McDermott, 2004). Their research question is: through which specific governance mechanisms are CoPs successfully guided? Their findings highlight 10 commandments of COP governance:

- 1) Stick to strategic objectives
- 2) Divide objectives into sub-topics
- 3) Form governance committees with sponsors and CoP leaders
- 4) Have a sponsor and a CoP leader who are “best practice control agents”
- 5) Regularly feed the COP with external expertise
- 6) Promote access to other intra- and interorganizational networks
- 7) The CoP leader must have a driver and promoter role
- 8) Overcome hierarchy pressures
- 9) Provide the sponsor with measurable performance
- 10) Illustrate results for CoP members.

Hong (2017) highlights how despite an increasing interest in COP performance evaluation, there have been few attempts to identify critical strategies based on evaluation to foster knowledge sharing activities in CoPs. Whilst some assessment frameworks for CoPs have been developed – Hong is adamant that these “do not provide strategic directions for overcoming weaknesses and creating successful CoPs after an evaluation.” (Hong, 2017:573). Hong (2017) develops a method for identifying the critical success factors of CoP based on performance evaluation. In one CoP example critical success factors are grouped together according to: Knowledge Creation; Knowledge Sharing; CoP process and Organisational culture. Performance measures are then developed for each critical success factor – these performance measures attempt to ‘yield information about the status of CoP’ – to enable learning about what works (and what does not work) (See annex 2 for Hong’s Table of Perspectives, Critical Success Factors and Performance Measures).

Jagasia et al (2015) carried out research to examine the critical factors for successful implementation of CoPs. They conducted a survey with 223 respondents who have “participated in successful organizational initiatives related to knowledge management and CoPs” and they use a regression model to analyse the findings. They conclude that there are four essential factors which lead to effective CoP implementation, - providing proper community support; people factors; alignment of the KM initiative with business strategy and key KM processes. They build on the Critical success factors for CoPs identified by McDermott (2000) which they claim are the most cited in the literature. According to him, the 10 critical success factors of CoP fall into four main categories—management, community, technical, and personal challenges, as shown in Figure 1.

Challenges	Success Factors
Management Challenges	Important Topics Well respected leader and facilitator
	Time an encouragement to participate Build on organization’s core values and strategy
Community Challenges	Key thought-leader involvement Build personal relationships Passionate core group Thinking and sharing opportunities and forums
Technical Challenge	Stable and easy to use technology enablers
Personal Challenge	Trust

Critical Success Factors for CoP Identified by McDermott (2000) cited in Jagasia et al 2015: 4.

Lastly, Wenger, Treyner and de Laat (2011) identify 5 cycles of value creation in communities of practice:

Cycle 1: Immediate value: Activities and interactions

Cycle 2: Potential value: Knowledge capital

Cycle 3: Applied value: Changes in practice

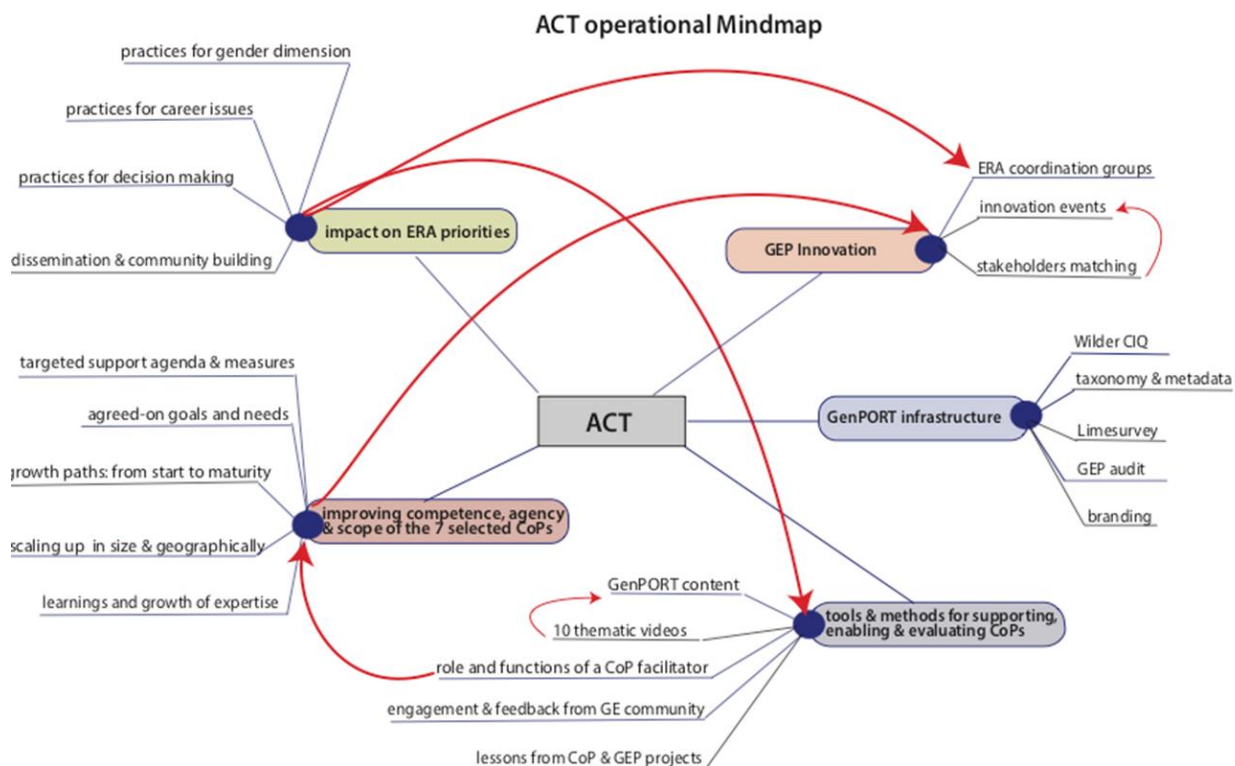
Cycle 4: Realized value: Performance improvement

Cycle 5: Reframing value: Redefining success

For each of these cycles they define typical indicators and potential sources of data (See annex 2 for examples of indicators of activity/ interactions for each cycle of value creation).

3. CONCEPTUAL MINDMAP

The conceptual mindmap provided a useful tool to classify the literature to make sure that it could be readily retrieved according to its utility for the project. Each heading was used as a 'tag' to classify the literature in the Zotero library.



4. KEY CONCEPTS

The project's key concepts have been pooled into the following four domains: GE and institutional change in HE and R&I, Community of Practice, Methodology and Background. The table below provides all definitions related to the project at a quick glance. Each concept will be defined in turn.

Gender equality and institutional change in HE and R&I	Community of practice	Methodology	Background: HE and R&I terms
Gender Equality in HE and R&I	Roles and responsibilities of ACT CoP members	Participatory methods	HE and R&I
Gender equality in research careers	CoP institutional scope	Toolkit	Disciplines
Gender equality in decision-making	CoP geographical scope	Measuring progress towards gender equality and GEP implementation (Adaptation of ASSET survey)	Responsible Research and Innovation (RRI)
Gender dimension in research and education content	CoP disciplinary scope	Community mapping	Research organisations
Institutional change	CoP domain scope	Social Network Analysis (SNA)	Network of research organisations
Gender Equality Plan (GEP)	Targeted support to CoPs	Monitoring vs evaluation	Sub-organisation level
Gender audit	CoP consolidation	CoP monitoring	Research sectors
GEP implementation	Scaling up CoPs in size/geographically	CoP evaluation	
GEP monitoring	Network of CoPs/Meta CoP	Measuring mutual engagement	
GEP evaluation		Synergy	
Stakeholders' engagement		Matching events/stakeholders	
Type of stakeholders			
Gender equality practitioners			
GEP sustainability			

4.1 GENDER EQUALITY AND INSTITUTIONAL CHANGE IN HE AND R&I

Gender Equality in HE and R&I

Gender equality in HE and R&I is a three-dimensional construct which encompasses the three priority areas of intervention defined by the European Research Area: 1) careers, 2) decision-making and, 3) education, research and innovation content. The table below explains the recommended interventions according to TARGET guidelines, and the long-term vision for each area:

Area	Intervention	Vision
Careers	Removing gender-related institutional barriers to careers	There are no gender-related institutional barriers for careers: Implicit gender bias and structural obstacles are abolished
Decision-making	Tackling gender imbalances and gender bias in decision-making	Decision-making is gender-fair: Women and men are equally represented in decision-making bodies; decision-making bodies are gender aware and gender competent
Education, research and innovation content	Integrating the gender dimension in education, research and innovation content	Education, research and innovation include the gender dimension: gender is mainstreamed in Higher Education curricula, which also includes gender-specific subjects; Research and innovation consider the gender dimension in all stages

TARGET Guidelines to Design a Customised Gender Equality Plan (GEP) – (D3.3)

Gender equality in research careers

Gender equality in research careers refers to removing implicit gender bias and other gender-related institutional barriers to equality. It does not only refer to equal presence of women and men in all stages of the research career, but also fostering a gender-inclusive organisational culture and gender-sensitive policies for recruitment, retention and advancement.

TARGET guidelines

Gender equality in decision-making

Gender equality in decision making refers to tackling gender imbalances and gender bias in decision-making processes. It does not only refer to equal presence of women and men in all relevant boards and committees, but also the ability of their members to address their own biases and make informed decisions that are gender aware and gender-sensitive. This implies to combine measures addressed to ensure gender balance with gender awareness and training measures.

TARGET Guidelines to Design a Customised Gender Equality Plan (GEP) – (D3.3)

Gender dimension in research and education content

Gender dimension in research refers to mainstreaming sex and gender analysis in all phases of the research process. It means to consider sex and gender issues with respect to the way research itself is designed, implemented, reported and applied. This includes setting research priorities, making funding decisions, establishing project objectives, developing methodologies, gathering and analysing data, evaluating results, developing patents, and transferring ideas to market and drafting policies. Gender dimension in education refers to integrating the outcomes of gender-sensitive research in higher education curricula. It means to mainstream sex and gender issues into the teaching curriculum and support gender-specific subjects. Integrating sex and gender in higher education, knowledge making, and in the science value system is considered a key challenge to improve quality and excellence of research and innovation.

LERU

<https://www.leru.org/files/Gendered-Research-and-Innovation-Full-paper.pdf>

Institutional change

Institutional change refers to the promotion of an institutional environment (values, norms, structures and procedures) in which gender equality is widely discussed and explicitly embraced in institutional and individuals' practices. In the field of STI, institutional change targets three areas of intervention 1) careers; 2) decision making; 3) education, research and innovation content

Adapted from definition in the ACT grant agreement

Gender Equality Plan (GEP)

GEP is a means to foster gender equality within an institution. It refers to a set of actions aiming at: 1) conducting impact assessment/audits of procedures and practices to identify gender bias; 2) identifying and implementing strategies to correct any bias; 3) setting targets and monitoring progress via indicators.

eige.europa.eu/gender-mainstreaming/toolkits/gear/what-gender-equality-plan-gep

GEP policy cycle

The GEP policy cycle refers to the different stages of GEP: initial gender audit, design and implementation, monitoring and evaluation. The results of self-assessment and external evaluation are the point of departure for setting new objectives and actions for the new cycle.

Gender audit

A gender audit of an institution assesses the extent to which gender equality is effectively institutionalised in the policies, programmes, structures, procedures and in the corresponding budgets. It also documents good practices towards the achievement of gender equality.

eige.europa.eu/gender-mainstreaming/methods-tools/gender-audit

GEP implementation

GEP implementation refers to setting measures in motion according to a defined timeline, institutionalising such measures, engaging stakeholders on an on-going basis, raising awareness of the need for adaptations and strengthening the institutional capacity to understand and act upon obstacles or resistances.

eige.europa.eu/sites/default/files/gear_roadmap_01_shortguide.pdf

GEP monitoring

GEP monitoring is defined as a continuing function that uses the systematic collection of data on specified indicators to provide management and key stakeholders of an ongoing intervention with indications both of the level of progress and achievement of the objectives as well as the use of any allocated funds. The selection of appropriate monitoring indicators relies on a theory of change which indicates objectives and expected outputs, outcomes and impacts for each action.

TARGET Gender equality monitoring tool and guidelines for self-assessment) – (D4.1.)

GEP evaluation

Evaluation is the systematic and objective assessment of an ongoing or completed GEP including its design, implementation and results. The aim is to determine the relevance and fulfillment of the objectives as well as the development efficiency, effectiveness, impact and sustainability. An evaluation should provide credible and useful information

that allows the lessons learned to flow into the decision-making process. Evaluation also refers to the process of determining a GEP's value or significance.

Adapted from TARGET Gender equality monitoring tool and guidelines for self-assessment) – (D4.1.)

Stakeholders' engagement

It refers to the mobilisation of stakeholders of an institution for developing and implementing a GEP. Their involvement can be direct or more indirect but relies on a commitment to gender equality which will create a sense of belonging that will help overcoming obstacles and resistances throughout the process at all levels.

eige.europa.eu/gender-mainstreaming/toolkits/gear/involved-gender-equality-plan

Type of stakeholders:

- **Science Stakeholders**, including scientists and researchers, science managers & HR managers in science, science academies, research laboratories, research councils and funding bodies, rectors' organizations, publishers, editors and journals, opinion formers and media, trade unions of scientists, lobby organizations and campaigners, teachers, educators and learners
- **Gender Equality Stakeholders**, including gender in science offices and committees, women scientist organizations, gender equality practitioners, gender equality NGOs and lobbies and gender networks (women, sexuality).
- **Policy Stakeholders** including STI policy makers, education & training policy makers, science & education ministries, gender equality policy makers, gender equality / women's ministries, employment policy makers, statistical offices and legislators and legal apparatus

GenPort User Needs Assessment, D 2.3

GEP sustainability

GEP sustainability refers to a long-term impact of implemented changes that go beyond the duration of a specific gender equality plan. To ensure the sustainability of gender equality actions, it is important to embed practices in the normal routines and procedures of the organisation. It is also important to anchor gender equality provisions into existing structures and practices to ensure institutionalisation and strengthen the sustainability of planned measures.

eige.europa.eu/gender-mainstreaming/toolkits/gear/involved-gender-equality-plan

4.2 COMMUNITY OF PRACTICE

Community of practice (CoP)

Communities of practice refer to “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger et al., 2002:2). What gives life to CoPs is “thinking together about real-life problems that people genuinely care about” (Pyrko et al., 2016: 403). Three key dimensions define a CoP: shared interest on a domain of practice (domain), mutual engagement (community) and development of a shared repertoire of resources (practice).

Wenger, Etienne. 2002. Communities of practice. In Encyclopedia of the social sciences. (Vol. 1.5, Article 5). Amsterdam: Elsevier Science.

Domain

The domain of practice is the starting point of any CoP. It refers to a shared concern or interest, what initially motivates people to gather, and forms the knowledge base from which a group chooses to work. The domain comprises of a set of defined issues or problems that forms the purpose of the groups’ activities. A well-defined domain is important as it affirms the purpose and value to members and external stakeholders. The domain keeps the CoP focused and ensure its relevance over time.

McDonald, Jacquie, and Aileen Cater-Steel (Eds.). 2017. Communities of Practice: Facilitating Social Learning in Higher Education. Springer Singapore.
(Barnard et al. 2017).

In relation to ACT, the CoPs domain of practice is advancing gender equality in HE and R&I across Europe and in particular promoting institutional change and implementing GEPs in research organisations. Membership implies a commitment to this Domain and a shared competence and interest that distinguishes members from other people and other collectives. Members value their collective competence and learn from each other, but also people outside the group value and recognise their expertise.

Community

Community refers to the group members and the quality and quantity of interactions in the group which create a sense of belonging, of continuity, of being connected to others and to ideas and values. Community relies on **mutual engagement**: norms and social interactions built by CoP members which lead to the creation of shared meaning on issues or problems. Relationships of mutual engagement bind the CoP members

together into a social entity and represent the building blocks in the functioning of the CoP itself. Unlike other social structures that are related to knowledge and learning, CoPs rely on **direct and sustained interactions** between its members.

Agrifoglio, Rocco. 2015. Knowledge Preservation Through Community of Practice. Theoretical Issues and Empirical Evidence. Springer Briefs in Innovation Practice.

Murillo, Enrique. 2011. Communities of practice in the business and organization studies literature, Information Research, vol. 16 no. 1, March

Barnard, Sarah et al, 2017. Using communities of practice to support the implementation of gender equality plans: lessons from a crossnational action research project. In: Godfroy, A-S. and Pourrat, Y. (eds). Transferring, Implementing, Monitoring Gender Equality in Research Careers, In Press) and Sergiovanni, T. J. Building community in schools. San Francisco: Jossey-Bass, 1994.

In relation to ACT, being member of a CoP involves a sense of trust, belonging and enjoyment from the membership, rather than solely the achievement of the common gender equality goals. Members of ACT CoPs do not necessarily work together on a daily basis, or be part of the same institution. Rather, depending on need and opportunity, they deploy any suitable communication channels to exchange ideas, seek feedback, and reach consensus.

Practice

Practice refers to the results of the CoP in terms of deepened knowledge and expertise and the ways to achieve these results. Deepened knowledge and expertise refer to explicit "know how" and tacit "ways of doing things" that CoP develops in its domain. Over time, CoP members develop a set of shared repertoire of resources that allow them to engage more effectively and strengthen the coherence of CoP activities. Resources may be varied: language, sensibilities, tools, methods, styles, routines, etc. CoPs develop this shared repertoire of resources by sharing practice, mutual learning and thinking together on practice development.

Murillo, Enrique. 2011. Communities of practice in the business and organization studies literature, Information Research, vol. 16 no. 1, March

"thinking together" (Pyrko et al., 2016)

In relation to ACT, practice relates to a set of frameworks, ideas, tools, toolkits, information, styles, languages, methods, stories, experiences, learning activities, and

documents, comprised in explicit “know-how”, but also tacit “ways of doing things” that community members share as a broad repertoire of resources. This shared practice aims to contribute to the advancing of gender equality and institutional change for gender equality in HE and R&I organisations across Europe. This practice manifests itself (not exclusively) by activities, such as problem solving, requests for information, seeking experience, reusing assets, coordination and strategy, building an argument, growing confidence, discussing developments, documenting projects, visits, mapping knowledge and identifying gaps.

Types of CoP

CoPs can be classified into informal, sponsored, or strategic CoPs according to the objectives, membership, sponsorship, development process, and organization support. They can be categorised as follows:

- Informal CoPs: members in an organization participate in CoPs for free with a shared common interest
- Formal CoPs: each member in an organization participates in a specific CoP as assigned. The goal of formal CoPs is connected to the purpose of an organization.
- Sponsored CoPs: constructing knowledge and the ability of core competency in an organization
- Strategic CoPs: solving organization problems by specialist and member of CoP. The employee becomes a member by application of CoP according to rules

Hong, Jongyi. 2017. A method for identifying the critical success factors of CoP based on performance evaluation, Knowledge Management Research & Practice, vol. 15 no.4

Network vs CoP

CoPs and networks are two different types of social structures. While CoPs are always networks, as they involve connections among members, not all networks qualify as CoPs. This is because networks lack one of the defining aspects of CoPs: a **shared domain** that becomes a source of **identification**. This identity is what creates a sense of commitment to the community as a whole, not just connections to a few linking nodes, as it happens in networks. ACT CoPs, therefore, transcend networks, precisely because of the community aspect, which requires a developed shared identity on the topic of gender (in)equality. This identity represents a collective intention, however tacit and distributed, to steward this domain of knowledge and to sustain learning about it.

Adapted from: <http://wenger-trayner.com/resources/communities-versus-networks/>

Network of practice vs CoP

Network of practice refers to a group of individuals that engage in the same or very similar practice, but unlike in a CoP, these people do not necessarily **work together**. They share a great deal of common practice, insight and implicit understanding that in turn foster the circulation of new ideas. These ideas, however, do not circulate as in a CoP, through collaborative, coordinated practice and direct communication. Instead, they circulate on the back of similar practice (people doing similar things but independently) and indirect communications (professional newsletters, listservs, journals and conferences, for example).

Brown, John Seely, and Paul Duguid. 2000b. Mysteries of the region. In W. F. Miller, et al (Eds.), The Silicon Valley edge (pp. 16-39). Palo Alto, CA: Stanford University.

ACT CoP member

ACT CoPs are oriented to achieve institutional change and in this sense its members should be institutional/organisational representatives. Therefore, in the context of ACT, a CoP member refers to an individual from a research organisation or a network of research organisations. A CoP member may be an employee, but also an individual attached to these institutions in other ways, such as board member, advisor, or student amongst others. CoP members include both practitioners who work on promoting gender equality and researchers who work on gender-sensitive projects in their specific field.

However, as members join ACT on a voluntary basis, they should also be committed, and intrinsically motivated in relation to GE and institutional change. Finally, CoP members could have different degrees of power to implement institutional change, e.g., institutional representatives could include GE or diversity managers, practitioners, researchers and students, as they all represent the institutions they belong to but have different degrees of influence.

Thus, ACT CoP representatives: (i) have some sort of specialist knowledge; (ii) have a certain degree of power in their institution indicative in their institutional role; (iii) are competent in a specific skill and able to teach the basics to others; (iv) are motivated and personally committed.

Roles and responsibilities of ACT CoP members

The main roles and responsibilities are:

- **Leader:** provides guide and managerial activities but doesn't need to be directly involved in CoP routine activities. He/she can help promote the CoP and provide orientation and motivation to its members as required.
- **Moderator:** plays a critical role in fostering community activity and participation.
- **Facilitator:** coordinates and supports the CoP's activities using asynchronous and synchronous tools. They also provide the CoP with updates and promote it by sharing its purpose and mission inside and outside the organisation(s) involved in the CoP.
- **Participants:** the members develop a shared repertoire of resources: experiences, stories, tools, lessons learned, best practices etc (what can be called a shared practice). This requires time and sustained interaction.

Marti, Ms Myrna (WDC). 2015. Building Communities of Practice. Panamerican Health Organisation. WHO

CoP institutional scope

The institutional scope of a CoP refers to the institutions covered by the CoP. An intra-institutional CoP is made by members belonging to the same institution. An inter-institutional CoP is made by members coming from different institutions. In the context of ACT, the institutional domain is classified as follows:

- **intra-institutional** - all members belong to the same research organisation;
- **inter-institutional** - members belong to different research organisations; these research organisations are not formally organised in a network;
- **inter-institutional/network** - members belong to different research organisations; these research organisations are formally organised in a network.

CoP geographical scope

CoP geographical scope refers to the geographical area covered by the CoP. It can be local, national, transnational (limited to certain countries) or global amongst others. The geographical scope depends primarily on the geographical location of the individuals who form the CoP but also on the CoP's definition of its geographical coverage (for instance: a CoP composed of individuals from institutions located in different countries may be either transnational or global, depending on how the CoP defines its geographical coverage. The same applies to the distinction between local and national).

In the context of ACT, the geographical scope of CoPs is based on country clusters, which are: Southern Europe; Continental; Nordic; UK/Ireland; Eastern Europe, Global.

CoP disciplinary scope

The disciplinary scope of CoPs refers to the disciplines covered by the CoP. In the context of ACT CoP disciplines are: 1) Natural sciences and mathematics; 2) Engineering and technology; 3) Medical and health-sciences; 4) Agricultural and environmental sciences; 4) Social sciences; 5) Arts and humanities

Adapted from OECD Canberra manual (1995) and 2013 ISCED fields of education and training

CoP domain scope

The domain scope of CoPs refers to the advancing gender quality with a focus on the three main ERA priorities: 1) careers, 2) decision-making and, 3) education, research and innovation content. ACT approaches the domain in an open and flexible manner because its CoPs are not restricted to a particular area. The selection process of the ACT acknowledges and embraces this richness in the variety and specialisation of CoPs.

Targeted support to CoPs

In the context of ACT, each **selected** CoP will receive targeted support:

- Direct and continuous targeted support coordinated by Seed partners:
 - tailored-guidance provided by the CoP facilitator. economic support for, training sessions, visits, conferences, workshops, travel expenses etc.
 - online presence and resources in the Knowledge Sharing Hub.

In addition, ACT envisages to provide support to **other** CoPs through diverse means:

- Sporadic, ad-hoc support facilitated by Seed partners:
 - participation in events, conferences, workshops
 - sporadic economic support for visits, trainings sessions, conferences, etc
- Online, continuous, free self-managed support.
 - online presence and self-managed workspace and resources in the Knowledge Sharing Hub
 - exchange/sharing between online CoPs

CoP consolidation

The consolidation of a CoP refers to the evolution of the community into a sustainable entity and its institutionalization as a core value-added capability of the organization. This

depends on conscious facilitation and understanding of the CoPs lifecycle phases (inquire, design, prototype, launch, grow and sustain).

- Inquire: Through a process of exploration and inquiry, identify the audience, purpose, goals and vision for the community.
- Design: Define the activities, technologies, group processes, and roles that will support the community's goals.
- Prototype: Pilot the community with a select group of key stakeholders to gain commitment, test assumptions, refine the strategy, and establish a success story.
- Launch: Roll out the community to a broader audience over a period of time in ways that engage newcomers and deliver immediate benefits.
- Grow: Engage members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organisational goals while creating an increasing cycle of participation and contribution.
- Sustain: Cultivate and assess the knowledge and "products" created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future

Cambridge, D. & Suter, V. (2005) "Community of Practice Design Guide: A Step-by-Step Guide for Designing & Cultivating Communities of Practice in Higher Education", Briefs, Case Studies, Papers, Reports

Scaling up CoPs in size/geographically

Scaling up CoPs refers to enlarging their size (number of members/institutions) and their geographical scope (from local to international). In the context of ACT, CoPs will receive targeted-support to scaling up in size/geographically.

en.oxforddictionaries.com/definition/scalable

Act-grant agreement. WP4- Targeted support scheme for implementing GEPs and scaling up the network of CoPs P. 20

Network of CoPs/Meta CoP

Taking as a point of departure the selected CoPs, ACT aims to support one network of CoPs (or meta-CoP) at the European level. The aim of this network is increasing gender expertise and capacity to synchronise efforts across stakeholders, institutions and policy agendas with regard to gender equality, institutional change and GEP implementation in the European Research Area. This meta-cop will integrate selected key members of all

CoPs. This approach provides first a less demanding approach to CoP members, as not everybody is involved in interaction across CoP borders, and second it is more realistic about the language and cultural barriers of many CoP stakeholders.

Act-grant agreement. Excellence, p. 9

4.3 METHODOLOGY

Participatory methods

In the ACT project participatory methods refer to the use of methods for consensus building, sharing of experiences and mentoring. These methods will be part of the CoP toolkit and will be used for: a) team building (community engagement of CoPs) b) idea generation and consensus building, c) skills and knowledge sharing and d) project planning and implementation.

ACT grant agreement

Good practice

Good practice refers to initiatives or model projects that are successful and that make an outstanding, sustainable, and innovative contribution to an issue or problem at hand. The following criteria applies in defining best practice: 1) they are innovative; 2) have positive effects on the targeted issues; 3) the effects should be sustainable; 4) they have the potential for replication.

Holzinger, Florian, and Helene Schiffbanker. 2012. Good practices –smart practices? Reflections on gender equality initiatives in R&D organizations. POLICIES Working Paper Nr. 68: 1-18

Toolkit

In the ACT project a toolkit refers to the collection of participatory methods for supporting CoPs and tasks such as team-building, knowledge sharing or project implementation amongst others. The tool kit integrates a systematic documentation framework, that provide the foundations for scaling CoP outcomes.

Act-grant agreement. WP2- Practice design and development, p. 13.

Measuring progress towards gender equality and GEP implementation (Adaptation of ASSET survey)

In the context of ACT, one of the tasks aimed at measuring progress towards gender equality and GEP implementation is the development of a new Modular Gender Equality Audit and Monitoring Tool. This tool will build upon the Athena Survey of Science

Engineering and Technology (ASSET) and adapt its questionnaire to the EU reality of HE and R&I, including its translation, provide data quality testing and incorporate new items.

The modular questionnaire framework is intended to cover different aspects: perceptions of gender equality, job and career, caring responsibilities, recruitment and retention, training and learning, sexual harassment, socio-demographic elements, and promotion and development.

Adapted from ACT-grant agreement. WP2- p. 14

Community mapping

In the context of ACT community mapping refers to a survey mapping key actors and experts, their institutional affiliation and current engagement in institutional change or other R&I initiatives. The survey consists of a single questionnaire targeting primarily gender equality practitioners (gender equality officers, equal opportunity officer, diversity manager) but also other stakeholders such as science managers, researchers or HR staff within research and higher education institutions and research funders across Europe.

Social Network Analysis (SNA)

SNA refer to mapping and measuring of relationships and information flows in order to understand the structure of a network and to draw conclusions that can support research on the impact of the relationship on an actor (Grunspan, et al., 2014 in Bralic 2017). In the ACT project, a SNA of the survey will be carried out to identify social capital for central actors and the potential to create further collaborative connections among gender equality practitioners and individual COPs.

Bralić, Antonia. 2017. Social Network Analysis of Country Participation in Horizon 2020 Programme. Presented in 28th Central European Conference on Information and Intelligent System, Varaždin, Croatia

Monitoring vs evaluation

Monitoring of an on-going intervention is the systematic and regular collection of data on specified indicators on the use of any allocated resources, the implementation of activities and the achievement of expected results, with the aim of supporting evidence-based self-assessment. In contrast, evaluation is the external assessment of the design, implementation and results of an on-going or completed intervention, with the aim of determining the relevance of its objectives, achievement of expected results, efficiency,

effectiveness, impact and sustainability. Monitoring and evaluation go hand in hand; neither is more important than the other. In a policy cycle, the evaluation (external assessment) provides further evidence for self-assessment and decision-making.

TARGET Guidelines to Design a Customised Gender Equality Plan (GEP) – (D3.3.)

CoP monitoring

CoP monitoring refers to the activities performed by CoP members to collect data on CoP performance according to the objectives and expected results, so that conclusions, lessons learned, post-action reviews and recommendations can be put forward. Monitoring is a critical step to promote and preserve the exchange of lessons learned and knowledge gained.

Marti, Ms Myrna (WDC). 2015. Building Communities of Practice. Panamerican Health Organisation. WHO

CoP evaluation

In the context of ACT, CoP evaluation refers to the activities performed by an external agent to assess CoP performance, with a focus on its contribution to implementing and sustaining GEPs.

Measuring mutual engagement

Collaboration refers to the mutually beneficial and well-defined relationships entered into by two or more individuals, including individuals representing institutions, to achieve common or shared goals. The relationship includes a commitment to (a) a definition of mutual relationships and goals, (b) a jointly developed structure and shared responsibility, (c) mutual authority and accountability for success, and (d) sharing of resources and rewards. In the context of ACT collaboration within and between CoPs will be measured using the Wilder Collaboration Factors Inventory (Mattessich, Murray-Close, & Monsey, 2001). The Wilders Inventory is a 20-items strong questionnaire to assess the “health” and development success of CoPs. It includes items regarding shared vision, trust and mutual respect among group members, leadership, distribution of roles, or appropriate pacing among others. The Wilders measurement scale is widely used for assessing participants’ engagement in the collaboration (Fraser et al., 2017) creating sound measures by which to compare projects. Small adjustments will be made to adapt the questionnaire to the specific context of ACT CoPs.

Mattessich, Paul W., and Barbara R. Monsey. 1992. Collaboration: What makes it work. St. Paul, MN: Amherst H. Wilder Foundation.

Synergy

Synergy refers to the combined power or profits that can be achieved by two or more organizations or groups working together rather than separately. In the context of ACT synergy refers to how CoPs' knowledge and practice sharing on GEP implementation can be combined with other initiatives that may have an indirect impact on gender equality, i.e. EURAXESS, and HRS4R.

dictionary.cambridge.org/es/diccionario/ingles/synergy

Matching events/stakeholders

The activity of matching events refers to innovation events designed to address 'structural holes' identified by social network analysis (SNA). ACT will match diverse stakeholders and organise 3 EU level "Innovation events" one for each gender equality ERA priority. Stakeholders will be matched and contrasted according to their domains, geographical reach, and European agendas based on SNA analysis.

ACT-grant agreement. WP4- Targeted support scheme for implementing GEPs and scaling up the network of CoPs, p. 20

4.4 BACKGROUND: HE and R&I TERMINOLOGY**HE and R&I**

Different terms are used for encompassing science, technology, research and innovation: **R&I** (research and innovation); **STI** (science, technology and innovation); **R&D** (Research and development); **RTDI** (Research Technology Development and Innovation). STI is the term currently used by the OECD (it replaces R&D since 2016). There is no consistent use of terms in the EU official documents, though R&I seems to be the most common nowadays. In the context of ACT, it is proposed to use HE and R&I for two reasons: 1) it includes innovation; 2) it includes education (Higher Education) and not only research and innovation development.

OECD. 2017. OECD Science, Technology and Industry Scoreboard 2017: The digital transformation, OECD Publishing, Paris.

<http://dx.doi.org/10.1787/9789264268821-en>

Disciplines

Disciplines are: 1) Natural sciences and mathematics; 2) Engineering and technology; 3) Medical and health-sciences; 4) Agricultural and environmental sciences; 5) Social sciences; 6) Arts and humanities

Adapted from OECD Canberra manual (1995) and 2013 ISCED fields of education and training

Responsible Research and Innovation (RRI)

Responsible Research and Innovation refers to an approach for the implementation of STI which entails engaging all actors (from individual researchers and innovators to institutions and governments) through inclusive, participatory methodologies in all stages of STI processes and in all levels of STI governance (from agenda setting, to design, implementation, and evaluation). It aims to produce better science, making research agendas more diverse and taking better account of real-world complexities. In the context of the European Research Area RRI targets six policy objectives, including gender equality.

<https://www.rri-tools.eu>

Research organisations

Research organisations can be divided into research performing organisations (RPOs) and research funding organisations (RFOs). Universities and other Higher Education Institutions are considered as a sub-type of RPO.

Network of research organisations

In the context of ACT a network of research organisations refers to a formal association (or any other legal category) of research organisations. ACT is addressed to both research organisations and networks of research organisations.

Sub-organisation level

The sub-organisation level refers to the faculties, institutes, departments and units that are part of a wider organisation. ACT is addressed to both organisations and sub-organisations.

Research sectors

Research or STI sectors are: Higher education sector (HE), government sector, (GOV), business enterprise sector (BES) and not-for-profit institutions (NPIs).

- **HE**

The higher education sector comprises all universities, colleges of technology and other institutions providing formal tertiary education programmes, whatever their source of finance or legal status, and all research institutes, centres, experimental stations and clinics that have their R&D activities under the direct control of, or are administered by, tertiary education institutions.

- **GOV**

The government sector consists of the following groups of resident institutional units: a) all units of central (federal), regional (state) or local (municipal) government, including social security funds, except those units that provide higher education services or fit the description of higher education institutions provided in this manual; b) all non-market NPIs that are controlled by government units that are not part of the HE sector. The sector does not include public corporations, even when all the equity of such corporations is owned by government units. Public enterprises are included in the BES

- **BES**

The business enterprise sector comprises: a) All resident corporations, including not only legally incorporated enterprises, regardless of the residence of their shareholders. This group includes all other types of quasi-corporations, i.e. units capable of generating a profit or other financial gain for their owners, recognised by law as separate legal entities from their owners, and set up for purposes of engaging in market production at prices that are economically significant; b) The unincorporated branches of non-resident enterprises are deemed to be resident because they are engaged in production on the economic territory on a long-term basis; c) All resident not-for-profit institutions that are market producers of goods or services or serve business. This sector comprises both private and public enterprises.

- **Not-for-profit**

Non-profit institutions are legal or social entities, created for the purpose of producing goods and services, whose status does not permit them to be a source of income, profit or other financial gain for the units that establish, control or finance them. They can be engaged in market or non-market production.

OECD. 2015. Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development, The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris

ANNEX 1 - METHODOLOGY

Key words for bibliographic search:

Suggested Key words/ Tags /common phrases for bibliographic search:

- “community [communities] of practice”
- “community [communities] of practice” & “gender”
- “community [communities] of practice” & “gender equality”
- “community [communities] of practice” & “gender dimension”
- “community [communities] of practice” & “diversity”
- “community [communities] of practice” & “systematic change”
- “community [communities] of practice” & “transformative change”
- “community [communities] of practice” & “gender expertise”?
- “organizational learning” & “gender equality”
- “Gender Equality Plan” & “research” or “science” or “innovation”
- “measuring” & “institutional change” & “gender equality” or “integrating the gender dimension” or “collaboration”
- “monitoring” & “institutional change” & “gender equality”
- “sustainability” & “institutional change” & “gender equality”
- “evaluation” & “gender equality” or “integrating the gender dimension” or “collaboration”
- “Gender Equality Plan” & evaluation

Databases to search for literature:

- Scopus
- ISI Web of Science
- Google Scholar
- <https://www.jstor.org/>
- CEEOL (Central and eastern European Online Library) www.ceeol.com
- European Institute For Gender Equality (EIGE)
- GENPORT
- FP7 and H2020 projects:
- Institutional Change and related gender equality [Baltic Gender; CHANGE; EFFORTI; FESTA; GARCIA; GECCO; GEDII; Gender Action; GENERA; GENISLAB; GENOVATE; INTEGER; LIBRA; PLOTINA; STAGES; SUPERA; TARGET; TRIGGER]
- Other SWAFS/ H2020 projects outside the gender domain [for example RRI projects].

Fixed tags which form the organising principles as identified in the ACT operational mindmap:

impact on ERA priorities
improving competence, agency & scope of the 7 selected CoPs
GEP Innovation
GenPORT infrastructure
tools & methods for supporting, enabling & evaluating CoPs
practices for gender dimension
practices for career issues
practices for decision making
dissemination & community building
targeted support agenda & measures
agreed-on goals and needs
growth paths: from start to maturity
scaling up in size & geographically
learnings and growth of expertise
ERA coordination groups
innovation events
stakeholders matching
Wilder CIQ
taxonomy & metadata
Limesurvey
GEP audit
branding
GenPORT content
10 thematic videos
role and functions of a CoP facilitator

engagement & feedback from GE community
lessons from CoP & GEP projects

Methodological approach tags provide information on the methodology used in the resource which may be useful for ACT.

This may be:

- Conceptual
 - State-of-the-art
 - Compilation of statistics
 - Building gender indicators
- Empirical research: Quantitative techniques
 - Empirical research: Qualitative techniques

For publications based on empirical research, there are two additional tabs asking for specific information about the research techniques: one for quantitative techniques and other for qualitative techniques. In the case of publications based on both quantitative and qualitative techniques both tabs should be filled in.

Quantitative techniques

Sample: Representative

Sample: Non representative

Data: Micro-data

Data: Aggregated data

Analysis: Cross-sectional

Analysis: Longitudinal/ Cohort

Techniques: Descriptive statistics

Techniques: Bivariate analysis

Techniques: Multivariate analysis

Qualitative techniques

Technique: Biographic Research

Technique: Case Studies

Technique: Content Analysis

Technique: Interviews

Technique: Observations

Software used for analysis: No/Yes

Resources are classified with two 'free' tags and these should not be very general, i.e. 'CoP' or 'gender'.

For those resources related to gender and science the Genport taxonomy might be useful.

ANNEX 2 - COP EVALAUTION & PERFORMANCE MEASUREMENT

Perspectives	Critical Success Factors	Performance Measurement
Knowledge creation	Developing advanced standardised processes	Number of advanced standardized process in KMS per a month
	Creating innovative knowledge	Number of innovative knowledge in knowledge base Satisfaction level about innovative knowledge registered in KMS
	Developing best practices	Number of best practices in knowledge base Satisfaction level of best practice
Knowledge sharing	Exchanging tacit knowledge in offline meeting	Number of offline meeting per a month Satisfaction level of knowledge sharing between beginner and senior manager
	Managing a mentorship programme	Level of knowledge sharing between beginner and senior manager Number of beginner/ number of senior manager in CoP Level of improving individual capacity
	Utilizing systematic communication systems	Average number of login online CoP per week Average hours to online CoP per a week
CoP process	Defining the domain and identifying issues	Clearness level of the primary purpose of CoP Number of members
	Building regular contacting (1-1 or in community events)	Average number of event per a year Amount of money for supporting activities of CoP

	Developing new leadership	Number of members recruited to a CoP
	Utilizing outside expert	Number of outside expert Number of meeting outside experts Cost of systematic support for outside communication
Organisational culture	Strengthening CEO will for cultivating CoP	Amount of money for incentive Engagement level of senior managers
	Constructing learning organization	Satisfaction level of facilitator Trust level about another member in CoP
	Strategic support of IT	Supporting level of online system Satisfaction level about communication tool and KMS
	Performance evaluation	Level of reflecting activities of CoP in performance evaluation

Table 1: Example of Perspectives, CSF and PMs of COP2, Hong (2017: 579).

Cycle 1: Activities/ interactions indicators	
Typical indicators	Some potential sources of data
Level of participation	<ul style="list-style-type: none"> - Attendance at meetings - Number and characteristics of active participants - People who subscribe to a site - Logs and website statistics - Participant lists on teleconference systems
Level of activity	<ul style="list-style-type: none"> - Frequency of meetings - Number of queries - Quantity and timeliness of responses
Level of engagement	<ul style="list-style-type: none"> - Intensity of discussions - Challenges of assumptions - Length of threads
Quality of interactions	<ul style="list-style-type: none"> - Bringing experience of practice into the learning space - Debates on important issues - Feedback on quality of responses to queries
Value of participation	<ul style="list-style-type: none"> - Feedback form - People coming back to community or reengaging with the network - Evidence of fun, such as laughter
Networking	<ul style="list-style-type: none"> - Number of people on one's contact list - New connections made
Value of connections	<ul style="list-style-type: none"> - Self-reports - Frequency of interactions
Collaboration	<ul style="list-style-type: none"> - Joint projects - Co-authorship
Reflection	<ul style="list-style-type: none"> - Meta-conversations about community/network

Cycle 2: Knowledge capital indicators	
Typical indicators	Some potential sources of data
Skills acquired	<ul style="list-style-type: none"> - Self-report and interviews - Tests and surveys - Community reflections
Information received	<ul style="list-style-type: none"> - Self-reports - Threads read
Change in perspective	<ul style="list-style-type: none"> - Self-reports
Inspiration	<ul style="list-style-type: none"> - Self-reports - Retention rates of members
Confidence	<ul style="list-style-type: none"> - Self-reports - Initiatives started and/ or risks taken by members
Types and intensity of social relationships	<ul style="list-style-type: none"> - Social network analysis (SNA) Techniques such as SNA, can help visualise social networks in terms of specific connections – friends, people one turns to for help, blogs one follows, etc. These visualisations provide a good basis for talking about the value the community/ networking has for participants in particular situations.
Structural shape of networks	<ul style="list-style-type: none"> - Certain metrics can be applied to network graphs and there is software to produce different views of a network (for instance by removing certain influential people or certain types of links). This can reveal distinct clusters within a broader network or the existence of people who act as connectors or bottlenecks between clusters.
Level of trust	<ul style="list-style-type: none"> - Bringing up difficult problems and failures from practice - Number of referrals or recommendations

Production of tools and documents to inform practice	<ul style="list-style-type: none"> - Quantity and types of output - Coverage of relevant topics
Quality of output	<ul style="list-style-type: none"> - Evaluation of products - Frequency of downloads
Documentation	<ul style="list-style-type: none"> - Summaries of events and discussions - FAQ - Archives
Reputation of the community	<ul style="list-style-type: none"> - Feedback from stakeholders - Links to community site
New views of learning	<ul style="list-style-type: none"> - Self-reports - Interest in learning and leadership activities

Cycle 3: Change indicators	
Typical indicators	Some potential sources of data
Implementation of advice/ solutions/ insights	<ul style="list-style-type: none"> - Self-reports - Follow-up <p>For instance, it is a good discipline to follow up how a member has adapted or used the advice from a community or network. This was the collective learning continues through application in practice.</p>
Innovation in practice	<ul style="list-style-type: none"> - New ways of doing things - New perspectives - New concepts and language
Use of tools and documents to inform practice	<ul style="list-style-type: none"> - Self-report such as feedback on documents and tools from people who have used them - Indicators of value in application
Reuse of products	<ul style="list-style-type: none"> - Self-report of re-use - Estimation of reuse as a proportion of the frequency of downloads

Use of social connections	<ul style="list-style-type: none"> - Collaborative arrangements - Leveraging connections in the accomplishments of tasks
Innovation in systems	<ul style="list-style-type: none"> - New processes - New policies
Transferring learning practices	<ul style="list-style-type: none"> - Using communities, networks or other peer-to-peer processes and tools for learning in other contexts

Cycle 4: Performance improvement indicators	
Typical indicators	Some potential sources of data
Personal performance	<ul style="list-style-type: none"> - Speed and accuracy - Customer feedback - Student achievements
Organizational performance	<ul style="list-style-type: none"> - Client satisfaction - Business metrics - Scorecard results - Project assessments <p>These metrics will differ a lot depending on the nature of the relevant organisations.</p>
Organizational reputation	<ul style="list-style-type: none"> - Ability to attract projects related to domain - Client feedback
Knowledge products as performance	<ul style="list-style-type: none"> - Clients interested in knowledge itself - Direct delivery of knowledge products to clients

Cycle 5: Reframing Indicators	
Typical indicators	Some potential sources of data
Community aspirations	<ul style="list-style-type: none"> - New learning agenda - New discourse about value - New vision
Assessment	<ul style="list-style-type: none"> - New metrics - New assessment processes
Relationships with stakeholders	<ul style="list-style-type: none"> - Different conversations with stakeholders - Involvement of new stakeholders - New sets of expectations
Institutional changes	<ul style="list-style-type: none"> - New strategic directions that reflect the new understanding
New frameworks	<ul style="list-style-type: none"> - New social, institutional, legal or political systems (emerging or created)

ANNEX 3 - INFORMED BIBLIOGRAPHY: MINDMAP

A literature search was carried out according to the methodology detailed in annex 1. Literature was subsequently assigned fixed tags (from the mindmap), methodological tags and free tags. A Zotero group ([ACT conceptual framework](#)) has been created – which has to date 390 items which are classified by ‘fixed’ and ‘free’ tags and will continue to act as a central hub of key resources (peer reviewed articles, grey literature [for example, European Commission reports] and useful ‘tools’). These will be constantly updated throughout the lifetime of the project and will provide a centralised resource bank for project partners. In the following section we highlight some of the key literature and resources classified in the following structure:

- Impact on ERA priorities, gender mainstreaming and institutional change
 - o Practices for gender equality in careers
 - o Practices for gender equality in decision-making
 - o Practices for gender dimension in education, research and innovation content
 - o Gender Mainstreaming
 - o Institutional Change
 - Lessons from GEP projects and other interventions
 - Monitoring and Evaluation

- Improving competence, agency & scope of the 7 selected CoPs
 - o Engagement
 - o Targeted support agenda and measures
 - o Agreed on goals and needs
 - o Growth paths: from start to maturity
 - o Scaling up in size & geographically
 - o Learnings and growth of expertise

- Tools and methods for supporting, enabling & evaluating CoPs
 - o Role and function of a CoP facilitator
 - o Lessons from CoP
 - o GEP Audit
 - Climate and diversity
 - Gender status beliefs, socio-psychological constructs and sexism
 - Stress
 - Job satisfaction questionnaire
 - Sexual harassment and violence

IMPACT ON ERA PRIORITIES, GENDER MAINSTREAMING AND INSTITUTIONAL CHANGE

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