

An Innovative IT-Supported Approach Facilitating Co-Design of Tailored Gender Equality Plans

The CrowdEquality Idea

Crowdsourcing Platform

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Abstract Only few European research institutions have managed to implement structural changes and modernise their management towards higher gender equality. At the same time, gender equality is recognised to be an essential component towards achieving innovativeness and better performance. The EQUAL-IST project (“Gender Equality Plans for Information Sciences and Technology Research Institutions”) was aimed at addressing this challenge by designing and implementing tailored Gender Equality Plans (GEPs) in the six involved STEM (Science, Technology, Engineering, and Mathematics) research institutions from Finland, Germany, Italy, Lithuania, Portugal, and Ukraine. In order to increase acceptance, minimise potential resistances, and ensure sustainability of the interventions promoting gender equality initiated within the project, it was decided to follow a participatory approach to GEP design. This approach means that internal stakeholders were engaged in the GEP design, including decision-makers, academic and non-academic staff members, and students. In order to support this approach, an innovative online crowdsourcing platform, called CrowdEquality, was developed and applied within the project. Internal stakeholders from the involved research institutions were invited to collectively use the developed platform during the following processes: (i) identification of specific challenges related to gender equality, which exist in the research institution (‘problems’); (ii) generation of promising initiatives (‘solutions’) that could address each of the identified challenges; and (iii) voting on the selected feasible ideas. This article reports on the course and outcomes of using the CrowdEquality platform for the participatory GEP design within the EQUAL-IST project.

Furthermore, it is reflected in the article on the challenges faced and lessons learned during the platform development and operation. The article provides valuable insights to the research institutions willing to apply a participatory approach to GEP design.

Keywords Gender equality. Gender Equality Plan. Crowdsourcing. Co-design. Participatory approach. STEM.

Summary 1 Introduction. – 2 Background. – 3 Approach. – 4 Results. – 5 Discussion and Conclusion.

1 Introduction

Gender equality is recognised by the European Commission as an essential component towards achieving innovativeness and better performance (European Commission 2009, 2014). However, in most European research institutions women continue to be under-represented in senior academic positions (*vertical gender segregation*, e.g., European Commission 2015b) and in the STEM (Science, Technology, Engineering, and Mathematics) disciplines (*horizontal gender segregation*, e.g., Hewlett et al. 2008). As it is widely recognised that research and innovation are the main drivers of a prosperous economy and all potential talent needs to be utilised to its full extent, these challenges need to be addressed.

The European Commission proposed Gender Equality Plans (GEPs) as a tool to promote structural change towards gender equality in research institutions (European Commission 2012, 2015a). GEP is defined as “a set of actions aiming at: (i) conducting impact assessment / audits of procedures and practices to identify gender bias; (ii) identifying and implementing innovative strategies to correct any bias; and (iii) setting targets and monitoring progress via indicators” (EIGE 2016).

The EQUAL-IST project (“Gender Equality Plans for Information Sciences and Technology Research Institutions”) was focused on the design and implementation of tailored GEPs in the six involved STEM research institutions from Finland, Germany, Italy, Lithuania, Portugal, and Ukraine. In order to increase acceptance, minimise potential resistances, and ensure sustainability of the interventions promoting gender equality initiated within the project, it was decided to follow a participatory approach to GEP design (Cargo, Mercer 2008). This approach means that internal stakeholders were engaged in the

* Parts of this article were adopted from the input submitted by the same authors to the EQUAL-IST project website (<https://equal-ist.eu>) and, in particular, to its page about CrowdEquality (<https://equal-ist.eu/crowdequality-page>).

GEP design, including decision-makers, academic and non-academic staff members, and students.

In order to support this approach, an innovative online crowdsourcing platform, called CrowdEquality (<http://www.crowdequality.eu>), was developed and applied within the project (Gorbacheva, Barann 2017) as well as other challenges related to gender equity, can be addressed with the help of IT-enabled idea crowdsourcing. A systematic literature review was conducted to understand how the topic of gender equity promotion via collaboratively used IT artefacts has been addressed in extant research. Insights from the literature review, overview of existing related IT artefacts, and iterative discussions with scholars in the IT field have resulted in a set of requirements to the idea crowdsourcing platform aimed at the promotion of gender equity in IT research institutions. These requirements were analysed further and could be categorised into those specific for the target platform and those relevant also for other idea crowdsourcing platforms (with or without further adaptation. CrowdEquality is an online platform, which supported the following processes within the EQUAL-IST project: (i) identification of specific challenges related to gender equality, which exist in the research institution ('problems'); (ii) generation of promising initiatives ('solutions') that could address each of the identified challenges; and (iii) voting on the selected feasible ideas. Furthermore, CrowdEquality was aimed at connecting academic and non-academic staff members working in research institutions, policy makers, gender experts, members of NGOs (Non-Governmental Organisations) and national/international networks, as well as all individuals interested in the GEP design and implementation.

This article reports on the course and outcomes of using the CrowdEquality platform for the participatory GEP design within the EQUAL-IST project. Furthermore, it is reflected in the article on the challenges faced and lessons learned during the platform development and operation.

The article starts with explaining the concept of crowdsourcing and providing some background information about the development of the CrowdEquality platform. The approach for participatory co-design of tailored GEPs supported by CrowdEquality is described afterwards. The main challenges and ideas raised on CrowdEquality for each participating research institution, which were then reflected in respective GEPs, are presented in the following section. The paper is concluded by discussing the advantages and lessons learned from the IT (Information Technology)-supported participatory approach to GEP design followed within the EQUAL-IST project.

2 Background

The concept of *crowdsourcing*, which was first introduced by Howe in 2006, means the involvement of an undefined large group of internal and external individuals in the process of accomplishing a specific task or in innovation efforts (Howe 2006). The specific type of crowdsourcing, when novel ideas need to be generated by internal and external contributors, is called *idea crowdsourcing* (e.g., Kosonen et al. 2013). One common way to enable idea crowdsourcing is via Internet-based tools for crowdsourcing and idea management systems (e.g., Bansemir, Neyer 2009). Using idea crowdsourcing for the idea generation process can provide a number of benefits. First, it brings together a diverse set of people with different knowledge and skills, which facilitates the collection of a variety of thoughts and experiences and, as a consequence, the generation of the most innovative ideas (e.g., Whelan, Golden, Donnellan 2013). Studies show that people with diverse backgrounds and roles are likely to create synergies while they brainstorm and discuss ideas, and the solutions identified during this process have a high potential to be successful once implemented (e.g., Wang, Ramiller 2009). Second, idea crowdsourcing allows the collection of a high number of ideas in a cost-efficient way (e.g., Schweitzer et al. 2012). Third, the involvement of a ‘crowd’ can increase the public visibility of an organisation and its support (Johannsson et al. 2015).

In the study by Gorbacheva and Barann (2017) a literature review was conducted, where the gap in research on the potential of IT-enabled idea crowdsourcing to tackle the challenges related to gender equality could be revealed. This study acted as a basis for the development of the CrowdEquality idea crowdsourcing platform within the EQUAL-IST project. Although one of the studies analysed within this literature review (by Trauth, Jessup 2000) provided valuable insights for the identification of initial requirements to the platform, no studies discussing the promotion of gender equality in research institutions via collaboratively used IT artefacts could be identified. Furthermore, within the study a market analysis of existing idea crowdsourcing platforms was conducted and further requirements to the platform were collected via a focus group with the research institutions involved in the EQUAL-IST project. As a result, the requirements to the CrowdEquality platform were defined, analysed, and compared with the features of other idea crowdsourcing platforms.

3 Approach

The CrowdEquality platform was developed by a team of eight Bachelor students studying Information Systems at University of Muenster as part of their project seminar in October 2016 – February 2017.

(Note: A project seminar is a special teaching format, usually done in collaboration with companies, where the students work in teams on some task relevant for practice.) The students were supervised by researchers from the University of Muenster who acted as stakeholders. Afterwards the platform was tested and further improved by the Working Group members of the EQUAL-IST project at the University of Muenster. The platform technical basis is the OpenideaL distribution of the widely recognised Content Management System Drupal (<https://www.drupal.org/project/idea>). Within the EQUAL-IST project the platform was used from March – June 2017, when students and staff members from the involved six research institutions, as well as external users, had an opportunity to contribute to the platform.

The phases of participatory co-design of tailored GEPs supported by CrowdEquality are presented in Figure 1. During Phase 1, the specific challenges related to gender equality, which exist at each participating research institution ('challenges' hereafter), were identified. Phase 2, in turn, was aimed at the generation of the promising initiatives that could address each of the identified challenges ('ideas' hereafter). Phase 1 and Phase 2 were both supported by the CrowdEquality platform and formed the *Ideation* step in the participatory co-design of tailored GEPs. It is noteworthy that the initial sets of challenges and ideas submitted to the platform were derived from an internal gender audit conducted in each research institution, which were then extended with further contribution from the registered users. The *Review* step, which corresponds to Phase 3, included the analysis of the collected ideas and the selection of those of them, which were meaningful and feasible to be implemented in research institutions. Within the EQUAL-IST project this phase took place outside the CrowdEquality platform (and therefore marked with grey in **[fig. 1]**), although the platform also offered the recommendation functionality for the identification of the most promising ideas based on the average number of 'likes' an idea received per day since its publishing. The pre-selected ideas then entered Phase 4, which corresponds to the *Voting* step. Here the users were invited to up-vote or down-vote on the platform on each idea. Based on the results of this phase, the *winning ideas*, i.e. those that received the highest number of up-votes and the lowest number of down-votes, were identified and communicated to the involved research institutions. Finally, the *Implementation* step, which corresponds to Phase 5, took place outside the platform. Here action plans were developed for the *winning ideas*, which then formed the core of the tailored GEPs and implemented by the research institutions in two iterations (1st iteration: October 2017-May 2018; 2nd iteration: July 2018-April 2019).

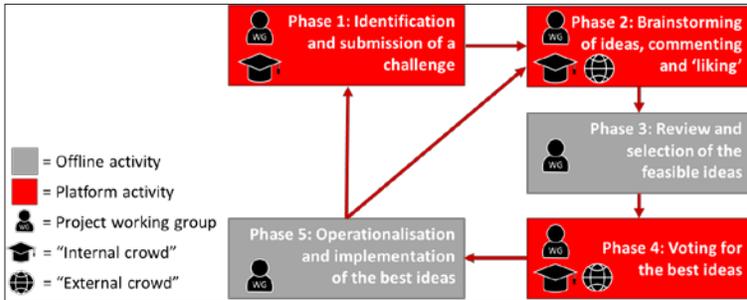


Figure 1 Phases of participatory co-design of tailored GEPs (adapted from Gorbacheva, Barann 2017)

All personal data collected on the platform was stored in a secure way on the server of the Department of Information Systems at the University of Muenster ('department' hereafter). The platform was maintained by the department during its active phase within the EQUAL-IST project. Afterwards, for the code security and maintenance reasons, it was transcoded to a static website. The platform will remain in this static mode for at least three years after the end of the project. The platform code (without content) is available on the University of Muenster's GitHub repository (<https://wiwi-gitlab.uni-muenster.de/equal-ist/crowdequality>).

4 Results

The CrowdEquality platform was used by the following six STEM research institutions involved in the EQUAL-IST project during the participatory co-design of their tailored GEPs (GEP details are available on the website of the EQUAL-IST project at <https://equal-ist.eu/gender-equality-plans>):

1. Finland: University of Turku (UTU), Information Systems Science Unit (ISS) at the Department of Management and Entrepreneurship
2. Germany: University of Muenster (WWU), Department of Information Systems (DIS)
3. Italy: University of Modena and Reggio Emilia (UniMORE), Department of Engineering (DIEF)
4. Lithuania: Kaunas University of Technology (KTU), Faculty of Informatics (IF)
5. Portugal: University of Minho (UMINHO), School of Engineering
6. Ukraine: Simon Kuznets Kharkiv National University of Economic (KhNUE), Information Systems Department

In total 331 users registered to the platform, including 142 students (101 students from RPOs and 41 external students); 107 academic staff members (90 academic staff members from RPOs and 17 external academic staff members); 28 non-academic staff members (25 non-academic staff members from RPOs and 3 external non-academic staff members), and further 54 users. 54 challenges and 104 comments to the challenges, as well as 91 ideas and 75 comments to the ideas were submitted to the platform.

The main challenges and ideas raised on CrowdEquality for each participating research institution, which were then reflected in respective GEPs, are presented below.

For **KhNUE** the information on CrowdEquality was provided in both English and Ukrainian languages in order to increase the participation of the targeted audience. In order to address the existing work-life balance challenge, the activities included in the GEP focused on determining the need in establishing a children's room on the campus and the resources required for it, as well as on ensuring opportunities for teleworking for academic staff members with young children. Another challenge identified at the Information Systems Department was the gender imbalance among the students of computer and economic sciences study programme. It was agreed to include in the GEP awareness-raising activities, such as the events to spread information about women in the IT industry and special nominations for all-women teams in IT competitions. Finally, attention was paid to existing at the department lack of gender culture and awareness about gender equality issues. Here the activities to improve the content of promotional material and to raise awareness of students and academic staff were proposed.

For **KTU** the priority was to support women in IT academic careers in creating a clear career vision. Based on the voting results, the activities included individual counselling on designing and monitoring their career plans. Furthermore, it was proposed to create a mentoring network connecting senior researchers with PhD students. In order to address the challenge of the lack of visibility of women in IT, the CrowdEquality audience suggested a range of communication activities, which were then included in the GEP.

One of the main challenges identified at **UMINHO** was the need in improving gender equality reflexivity and in increasing awareness about the topic. The proposed idea, which was included in the GEP, was to develop an online knowledge portal, called the Gender Observatory, which later on was extended with the information from other universities in Portugal.

At **UniMORE** in order to tackle the challenges of existing gender stereotypes about IT studies and careers, as well as the lack of female role models in the IT field, the following key activities were included in the GEP: (i) creation of an educational module for high

schools about gender equality and gender stereotypes and (ii) extension of the IT summer camp “Digital Girls”. Regarding the challenge of the lack of gender neutral communication and the lack of awareness of gender equality issues at all levels within the university, the following activities were included in the GEP: (i) guidelines for gender neutral communication at the institutional level; (ii) seminars on gender neutral communication for academic staff members; (iii) identification and promotion of existing at the university expertise and initiatives in the area of gender equality; and (iv) organisation of workshops and seminars on gender equality. Both academic and non-academic staff members, especially those with young children, faced the work-life balance challenge. Here the GEP activities were aimed at increasing visibility of existing information and regulations about parental leave and work flexibility. Furthermore, a study was carried out about setting up childcare facilities at the university. The proposed first step to address the scarcity of resources and coordination in existing committees on gender equality included the identification of a reference person for gender equality matters at each university department. Another activity included in the GEP was aimed at improving the monitoring and evaluation of gender equality indicators by designing an IT-supported system for it.

For **UTU** the priority was to improve peer support between the employees. The relevant activities included in the GEP were focused on setting up of a peer support program at the ISS unit. In order to give voice to women and empower them, respective activities to improve institutional communication were proposed.

At **WWU** in order to tackle the challenge of the low share of women among Bachelor Information Systems students, activities to evaluate existing communication channels and materials to promote this study programme were included in the GEP. The challenge of existing lack of awareness of the topic of gender equality and interest in it was addressed by developing marketing materials about the importance of gender equality and the value of gender-sensitive language. Further challenges raised by the CrowdEquality audience included, on the one hand, vertical gender segregation and, on the other hand, the need in reacting to negative attitude (of both men and women) towards existing interventions aimed at advancing women in their academic careers. Activities here focused on improving the communication and clarification of the content of such interventions, as well on promoting them. Another key challenge was about the difficulties in balancing work and family life. Here the CrowdEquality audience suggested that it was necessary to communicate more clearly during the hiring process the expectations from staff members.

5 Discussion and Conclusion

The CrowdEquality platform developed within the EQUAL-IST project enabled an innovative IT-supported approach to participatory co-design of tailored GEPs. CrowdEquality was aimed at collecting ideas and triggering discussions about promising initiatives for promoting gender equality and diversity and improving work-family balance in research institutions. The platform was developed using the Drupal Content Management System by the team of eight Bachelor students studying Information Systems at the University of Muenster and then tested and further improved by the Working Group members of the EQUAL-IST project at the University of Muenster.

Development of the platform was based on the study by Gorbacheva and Barann (2017), which included (i) a literature review of academic studies discussing how gender equality can be promoted with the help of IT-enabled idea crowdsourcing; (ii) a market analysis of existing idea crowdsourcing platforms; and (iii) the collection and analysis of requirements to the idea crowdsourcing platform aimed at the promotion of gender equality in STEM research institutions. As a result of the study, the requirements to the CrowdEquality platform could be identified and classified into (i) *generic* (relevant also for other idea crowdsourcing platforms), (ii) *adapted* (relevant for other idea crowdsourcing platforms, but adaptation for CrowdEquality was required), and (iii) *specific* (peculiar for CrowdEquality). The *specific* requirements included, for instance, a challenge life cycle (see Figure 1) and private and shared areas on the platform. The private area was accessible for the so-called “internal crowd”, i.e. the staff members and students from the respective research institution. The shared area, in turn, was accessible for all users (the so-called “external crowd”).

One of the lessons learned during the platform development and operation was the challenge faced in structuring information in the shared area of the platform, namely the need in combining the “wisdom of crowds” with the non-disclosure of sensitive information. Another challenge faced was low participation and a general lack of interest of the “internal crowd”. This could be caused by the fact that the participatory co-design of tailored GEPs took place right after or even in parallel with the internal gender audit conducted at the involved research institutions. The internal gender audit included face-to-face interviews and workshops, as well as (online) surveys. This could limit the participation, as staff members and students who have already expressed their views and perceptions during the audit could perceive contribution to CrowdEquality as redundant. Thus, the research institutions, which intend to follow a participatory approach to the GEP design, might find useful to apply the crowdsourcing process instead of the internal gender audit, as well as to develop incen-

tives to contribute to the platform and the platform dissemination strategy for both “internal crowd” and “external crowd”.

To conclude, the CrowdEquity platform supported (i) identification of the specific challenges related to gender equality, which exist at each participating research institution; (ii) generation of the promising ideas that could address each of the identified challenges; and (iii) voting on the selected feasible ideas. The participatory co-design of tailored GEPs included the following steps. First, the *Ideation* step, where the challenges were identified and the ideas to address them were generated. Second, the *Review* step included the analysis of the collected ideas and the selection of those of them, which were meaningful and feasible to be implemented. Third, the *Voting* step, where the users were invited to up-vote or down-vote on the platform on each pre-selected idea. Fourth, the *Implementation* step, where action plans were developed for the *winning ideas*, which then formed the core of the tailored GEPs and implemented by the research institutions. Here special attention was paid to securing the sustainability of the GEP implementation also after the end of the EQUAL-IST project. The *Ideation* and *Voting* steps were performed using the CrowdEquity platform, while the *Review* and *Implementation* steps took place outside the platform.

The collaborative IT-supported participatory GEP design that was followed within the EQUAL-IST project facilitated the internal raise of awareness about the topic of gender equality, triggered creativity in the GEP design, and provided valuable input to the involved stakeholders and decision-makers to set up GEPs that consider the needs and perceptions of affected staff members. Therefore, despite the challenges faced, we recommend it to the research institutions willing to implement structural changes and modernise their management towards higher gender equality.

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