
6. National culture and policy institutionalizing workplace change: supporting women's career progression in STEM through Athena SWAN

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INTRODUCTION

Despite progress over the past decade, the science, technology, engineering and mathematics (STEM) gender gap continues to persist in Europe, with only 6 out of 36 countries having 50 percent or more of scientists and engineers who are women (Eurostat 2019). An example of this is Ireland, where women remain vastly under-represented in the STEM workforce, despite rising demand for STEM professionals and the importance of the sector to the country's success. This chapter describes why macro and micro-level interventions are equally necessary to advance progression of Irish women in the STEM workplace. Macro-level approaches indicate large-scale government intervention, frequently represented through new laws and national policies. On the other hand, micro-level approaches are characterized by small-scale interventions that are specific to a particular organization or institution, one example being introduction of flexible working opportunities for women.

The chapter starts with a short background discussion outlining how gender equality change differs according to country and how COVID-19 has served to illustrate the fragility of gender equality progression. The nuanced nature of that progress is elucidated through an examination of the gap between men and women's workforce participation in European countries, particularly exemplified through the lack of women in CEO positions in leading STEM organizations, such as Intel and Dell. This trend is also reflected in gender difference within academia. For example, in all Irish Higher Education Institutes (HEIs) (2017–18), while 45 percent of academic staff are female, only 35 percent of senior academic staff are women.¹ This is followed by a discussion of several core factors that continue to inhibit that realization of gender equality, including gender stereotypes, gender role congruity perceptions and the lack of flexible working opportunities. Research detailing how culture influences the nature of change is described. This points to the need for a multi-pronged strategy of intervention mechanism, rather than an exclusive reliance on national cultural and economic progressions, which although valuable, are slowly and incrementally achieved. Women's under-representation in higher levels of academia and recognition of the need for such as a dual strategy approach is discussed.

We then evaluate a specific initiative, Athena Scientific Women's Academic Network (SWAN), a framework established by the UK Equality Challenge Unit (now part of Advance HE) which focuses on supporting and transforming gender equality in higher education and research and recognizes the success of HEIs in advancing gender equality goals. Athena SWAN was initially set up to focus on the advancement of academic women's careers in science, technology, engineering, mathematics and medicine (STEMM). It has expanded to

include arts, humanities, social sciences, business and law (AHSSBL), staff working in professional, managerial and support roles (PMSS), trans staff and students, and men in particular under-represented disciplines. Each of the Athena SWAN awards, Bronze, Silver and Gold, recognizes the success of HEIs and their constituent departments in advancing gender equality, with HEIs progressing from Bronze to Gold through investigation, data analysis and action plan implementation. In the United Kingdom, Ireland, Australia and parts of the United States, this is being used to address gender inequality in higher education, and has caused significant change in STEM disciplines, amongst others. We discuss the challenges and opportunities associated with this initiative, as well as its implications for policy makers. The chapter concludes by summarizing why a dual focus that encompasses both macro- and micro-level interventions is necessary to advance workplace change that supports women's career progression.

BACKGROUND

Socio-economic development and accompanying modernizations have resulted in profound transformations of society, particularly in relation to the erosion of traditional sex-segregated roles, participation of women in the paid workforce and the mobilization of women in public life. This modernization process has been characterized (Inglehart and Norris, 2003) as consisting of two stages, the first being the move from agrarian to industrialized societies, which has reduced fertility rates and brought more women into the paid labor force and increased education levels, and the second being the move from industrial towards postindustrial societies, which has underpinned significant progression towards gender equality in the workplace and public life.

However, the nature of change has differed and there is clear evidence of variation in countries' gender equality advancement. For example, Nordic countries (Finland, Denmark, Norway, Sweden and Iceland) tend to be at the forefront of progression, as demonstrated through numbers of women participating in the workforce and public life, pay parity, comprehensive childcare provisions, improved education opportunities and higher quality of life. For other countries, progress and the pace of change has been slower. Some of this can be explained through the cultural norms and institutional structures of societies, often reflected through varying degrees of democratization. However, differences still exist among countries with similar levels of democratic development, such as the United States and the United Kingdom (Inglehart and Norris, 2003), and even progressive Nordic countries are observing the development of a gender-specific management gap (Sanandaji, 2018).

This gender difference is more pronounced in the STEM subjects where only 36 percent of graduates in these fields and only two of five scientists and engineers are women.² This gender difference is equally present in academia. For example, in Ireland, in December 2020, only 27 percent of full professors were women (December 2020),³ While figures are not published regarding STEM professorships nationally, we can state that in the University of Limerick, for example, 40 percent of STEM academic staff are women, yet only 25 percent of the professoriate is female. This is not atypical across Ireland. Furthermore, given the structure of STEM career policies in academia, the FESTA project⁴ (of which one of the authors was a member) established that a significant change is needed in how STEM career development and recruitment is undertaken. Through Athena SWAN implementation, we have been enabled to change the system rather than changing the women. This has been significant.

Gender Equality

Gender equality has been described (Coron, 2020) as a polysemous concept, indicating that it can have multiple meanings. In part, this is because it encompasses multiple dimensions including equal pay, equality of access to positions of responsibility and gender diversity, a fact that may result in organizations and their employees emphasizing one of these dimensions at the expense of others. Within a workplace context, equality discrepancies manifest in multiple ways. In the first instance, women have less access to the labor market (Mandel, 2013) and gender segregation is evident in the enactment of labor (Cech, 2016). They are more likely to experience barriers to their progression (Kalaitzi et al, 2017), which have been likened to a “glass ceiling,” to be subject to pay disparities (Eurostat, 2021) and to suffer the effects of work–life imbalance (Muzio and Tomlinson, 2012). Because it is characterized by multidimensionality, it can be difficult to address gender equality in a comprehensive and systematic way. Adding to the problem is the fact that how gender inequality is addressed in an organization is often dependent on the benevolence of senior managers (Woodhams and Lupton, 2006) and their willingness to prioritize the implementation of specific initiatives (Perrier, 2015). Moreover, both the emphasis that they ascribe to addressing gender inequality and the way in which they implement those initiatives will reflect their personal perspectives, something that will affect the importance that they ascribe to specific issues.

Women’s Participation and Advancement in the Workplace

It is true that significant steps have been made to increase women’s participation in the workplace. Consequently, labor force participation rates among women have increased considerably in most countries over the past decades. In the United States, as of December 2020, women held 50.04 percent of jobs, with the greatest gains in the healthcare and retail industries (Law, 2020). However, the picture is more nuanced than at first glance, as low-paying jobs in these sectors are predominantly held by women. Moreover, these are aggregate figures and labor force participation rates for many groups of women, including women aged between 25 and 54 remains lower than that of men. Added to that is the fact that women are also more likely to work part-time due to caring responsibilities and the high cost of childcare. The number of women working in STEM varies internationally, with the median figure being 38 percent.⁵ According to these figures, 48 percent of STEM workers in the United States and 40 percent of those in the United Kingdom are women. However, STEM “occupations” vary greatly when collecting statistics. There is a large majority of women in health-related positions, but if we examine other STEM disciplines, such as computing and engineering, the percentage of women employed is much lower. As an example, Women in Tech in the United Kingdom have reported that only 19 percent of the tech workforce are women.⁶

Across European countries, increases in women’s labor force participation are also evident, but the gap between men and women’s participation remains more marked, with most countries showing employment rates for women that are approximately 10 percent less than those for men (Catalyst, April 2020). However, similar characteristics apply. For example, a significant portion of women work part time and they also predominate in what tend to be lower paying occupations (Catalyst, April 2020). Exacerbating this difference is the fact that women remain under-represented at senior management levels. For example, in the United States, the number of women running Fortune 500 companies has now increased to 37, but this

accounts for only 7.4 percent of these businesses and only three of these are women of color. The figures tell a similar story elsewhere. For instance, in the United Kingdom at present, women comprise only 5 percent of Financial Times Stock Exchange (FTSE) 100 CEOs, representing an increase of only one woman since 2012 (Ohr, 2020). In 2019, just 23 percent of executive committee members in the FTSE 100 were women, and the combined number of women in executive and senior positions reached only 28.6 percent. Furthermore, a FTSE 100 pay gap persists, with the highest paying male CEO earning almost 90 percent more than the highest paid female CEO. In Ireland, the position is equally stark. Census data from the Irish Central Statistics Office (CSO, 2019) show that, in 2019, only 12 percent or one in nine chief executives of large enterprises were women and women constitute 28 percent of senior executive roles compared with 72 percent men. The majority (93 percent) of company chairpersons were men and women constitute only 20 percent of directors of company boards. In short, the data tells a very clear story of entrenched gender inequality. Reports have shown that men rather than women are taking up jobs in technology. And, causes for this are of concern. A Pew Research Centre report in 2017 has stated that 50 percent of women in comparison to 19 percent of men have experienced gender discrimination. For those in computing jobs, 74 percent of women have experienced such discrimination, while 78 percent have experienced it in male-dominated workplaces.⁷

While women's representation in the workplace has certainly improved over the past decades, these figures point to systemic gendered disadvantage, showing that equality remains aspirational. Awareness of this inequality has not been accompanied by adequate action. In 2015, 193 countries became signatories to 17 internationally agreed targets known as Sustainable Development Goals (SDGs). These goals are a blueprint for addressing global challenges that include gender equality, as well as poverty, climate change, environmental degradation, peace and justice. Their target deadline for achieving these goals is 2030. However, the United Nations Gender Forum Index measures progress towards these targets, and its 2020 findings show that it is unlikely that any country will meet those gender commitments within the agreed time frame.

The causes of the workplace gender equality gap and the reasons for its endurance are multi-factorial and the nature of those factors and the challenge that they present vary according to context. This is because societal progression is unique to each country, reflecting the unique structural context and cultural traditions of a society. However, a number of core challenges repeatedly emerge in the literature as barriers to women's advancement in the workplace, one of which is gender stereotypes. As such, this issue is deserving of particular attention.

Gender stereotypes

Gender stereotypes influence how women are treated in relation to employment (Lips, 2013) and contribute to the imbalance of sex distributions within jobs and in seniority of role. For example, research (McKinnon and O'Connell, 2020; Carli et al, 2016) has shown that they contribute to the ongoing discrimination and under-representation of women in STEM professions, influencing not only career choices for women in STEM but also retention of women in these fields. These stereotypes are grounded on deeply entrenched gendered beliefs about abilities and the acceptability of roles played by women and men in society (Banyard, 2010). These beliefs result in category-based traits or attributes being applied to specific gender groups and result in expectations about what behaviors are or are not acceptable for those

groups (Agars, 2004), reflecting inaccurate generalizations that result in bias. As gender is an obvious social category, it can serve as an easily available cue that can initiate stereotypical beliefs (Blair and Banaji, 1996). Such beliefs tend to draw on two categories of attributes – communal and agentic attributes (Eagly and Karau, 2002). The first of these, communal attributes, encompasses those that are frequently associated with women, such as being kind, helpful, nurturing and expressive. The latter, agentic attributes, are typically associated with men. These encompass attributes such as independence, ambition, confidence, assertion, control and dominance.

Role congruity theory (Eagly and Karau, 2002) provides a framework for understanding how stereotypical beliefs create gender bias regarding workplace role acceptability. It proposes that bias results from the congruence between the beliefs of an individual (such as a manager or interviewer) regarding the stereotypical requirements of the job and the stereotypes that they hold about the characteristics of gender groups. The greater the incongruence between both sets of beliefs, that is between the perceived traits associated with the gender group and the stereotype characteristics of the job, the more this will result in gender bias. Moreover, those who are perceived to deviate from gender norms (e.g., by demonstrating agentic attributes) will also experience bias, despite having the necessary skills required for the job.

In practice, this can mean that highly skilled women who are capable of assuming a position of responsibility may experience hiring or promotion discrimination. That discrimination may cause them to be excluded on the basis of *either* the gender stereotypes associated with a particular job, or *because* they actually meet agentic stereotypes associated with that job. The latter (meeting agentic stereotypes) can cause them to be viewed at interview as deviating unacceptably from societal gender norms, resulting in exclusion. This bias, on the basis of a woman displaying attributes that do not align with gender stereotypes, has been described as a bias backlash effect (Rudman et al, 2012; Rudman and Fairchild, 2004) and is particularly problematic as embodying acceptable agentic attributes in addition to meeting competency requirements is clearly an impossible task. Moreover, it highlights the particularly problematic implications of stereotypes being not only descriptive but also prescriptive in nature, in that they propose how women should be (Eagly, 1987). In this way they normatively perpetuate gender bias and discrimination in the workplace.

A meta-analysis of gender stereotypes and bias in workplace decision making by Koch, D'Mello and Sackett (2015) found that gender-role congruity bias was particularly evident with men being rated more favorably than women for male-dominated jobs and that male raters exhibited more of that bias than did women when evaluating applicants for such positions. This is consistent with literature that indicates that men are more likely to rely on gender stereotypes when evaluating appropriateness for job roles (Koenig, Eagly, Mitchell and Ristikari, 2011). However, the study also found that gender-role congruity bias was reduced, not when individuating information was provided, but when information clearly indicated the high competence of those being evaluated. This contains an important implication for women, specifically the critical need for them to focus on communicating their competence for the role effectively and directly, rather than assuming that it will be automatically recognized or emerge during an interview. One final finding with important implications was that when participants had increased feelings that they would be held accountable for their decisions, they believed that those decisions had real-life consequences or were reminded of equity norms in the organization, this resulted in less biased hiring decisions for male-dominated jobs (Koch et al. 2015). This highlights the need to educate those responsible for hiring and promotions

regarding the implications of gender equity for women and the organization. It also highlights the need for accountability in hiring decisions.

Flexible working opportunities

One challenge that remains a persistent inhibitor of women's workplace advancement is the lack of flexible working opportunities (Banyard, 2010). Both flexibility in the duration of work and the scheduling of that work are essential requirements for women seeking to balance the demands of work with family commitments (Applebaum et al, 2006). It may account for the higher percentage of women who continue to work on a part-time basis as compared to men. It may also motivate their choice of lower paid and often precarious jobs which have family-friendly policies rather than higher paying jobs with less flexibility, something that has been described by economists as compensating differentials (Becker, 1991).

Interestingly, research conducted in the United States between 2002 and 2008 (Nadler, Voyles Cocke and Lowery, 2016) found that higher educational attainment did not reduce the gender pay gap for women and that men reported greater levels of work scheduling flexibility than was the case for women with similar levels of education. As Budig and England, (2001) note, the expectation that women will assume the majority of child-rearing responsibilities has resulted in a motherhood wage penalty, where mothers earn less than other women because having children can cause them to have fewer years of job experience. Using data from the 1982–93 National Longitudinal Survey of Youth, they found that women experience approximately a 7 percent wage penalty for each child that they have. However, this figure is most likely an underestimate and subsequent work by Gangl and Ziefle (2009) using UK, German and US survey data determined that women across these countries experienced a wage penalty that varied between 10 and 18 percent for each child. This “motherhood wage penalty” reinforces gender inequality as women typically assume the greater portion of child-rearing responsibilities which places them at an automatic disadvantage compared to men who do not have to undertake this caring labor to the same extent. It restricts their ability to advance in the workplace, to achieve pay parity with men and places them in a position of greater probability of experiencing gender inequality.

Cultural Values and the Nature of Change

Some have suggested that gender inequalities will diminish in response to economic growth. From this perspective, any differences that exist between men and women in relation to education, workforce opportunities and progression result from human capital differentials emanating from traditional structures and will naturally diminish in parallel with economic progression and market competition (Forsythe, Korzeniewicz and Durrant, 2000). A study by Inglehart (1997) using national-level data from 43 societies included in the 1990 World Values Survey, identified two main dimensions that accounted for more than half of cross-cultural variance involving many different values across a range of domains spanning politics, economic life and sexual behavior. These dimensions tap an axis of variation in relation to “Traditional vs. Secular-rational values” and “Survival vs. Self-expression values.” A later study (Inglehart and Baker, 2000) replicating this analysis with data from subsequent surveys elicited the same dimensions of cross-cultural variation, despite the fact that it included an additional 23 countries. The dimension of Traditional/Secular-rational values dimension reflects the contrast between societies in which religion is very important and those in which

it is not. The former emphasizes the importance of familial ties and traditional family values. They tend to be characterized by a deference to authority and a rejection of divorce, abortion, euthanasia and suicide. Such societies tend to have a strong nationalistic orientation. Societies on the other end of the axis (i.e., those with secular rational values) demonstrate far weaker and opposite preferences in relation to these specific issues, as manifested through increased willingness to challenge social norms and values that were previously considered to be absolute and a shift towards values characterized by increased tolerance and with greater emphasis on individual autonomy.

The beliefs and values that correlate with the survival/self-expression dimension reflect a shift in emphasis from a foremost focus on economic and physical security, towards an intergenerational shift in emphasis towards self-expression, a more participatory role in politics, subjective well-being and quality of life concerns (Inglehart, 1990, 1997). These self-expression values correlate with higher levels of democracy and align with Maslow's (1970) "Hierarchy of Needs" theory. Recent work by Inglehart, Norris and Welzel (2002) employed both dimensions to provide a cultural map of the world and found that a coherent pattern emerges between rich and poor countries, with the former tending to rank high on both dimensions and poorer countries ranking low on both dimensions. The first dimension, Traditional vs. Secular, is linked to the transition from agrarian society to industrial society and the Survival/Self-expression dimension is linked to the transition from industrial society to a service or knowledge society. These results confirm that economic development effects changes to societal values. For example, gender equality issues are a fundamental component in the intergenerational shift in beliefs and values as captured by the survival/self-expression dimension. As Inglehart et al. (2004) note, the move from survival values to self-expression values incorporates a shift in child-rearing values, where the emphasis on hard work moves towards a progressively increasing emphasis on imagination and tolerance as important values to teach a child.

The case of Ireland

Ireland is a particularly suitable exemplar of how cultural values shift in line with economic development and their influence on gender equality. The position of Irish women has changed dramatically in line with the country's transformation from an impoverished, traditional and peripheral European country to a contemporary economy and global participant. In a relatively short period of time, as a result of concerted efforts at industrial inward investment, Ireland's identity has been redefined from a conservative, isolationist and rural nation into a progressive, outward-looking, and engaged player in the world economy (Bradley and Murphy 1989; Coogan 1987; Lee 1989; O'Malley 1989). The opening up of careers to Irish women took place in tandem with considerable socio-economic change, and the liberalization of women's position in society has remained consistent even despite economic fluctuations.

A granular insight into the nature of this change, specific to women in STEM/IT careers, is provided by Trauth and Connolly (2021). Through their longitudinal examination of women's participation in the Irish information technology (IT) sector, they show that the position of women and their choice of STEM/IT career does not exist in a vacuum, but rather that environmental, identity and individual factors have exerted a collective influence that affected changes in gender relations in the IT sector in that country across five eras. Societal barriers to change came from the culture, economic factors, societal infrastructure, and laws and policies, while institutional barriers included mass media messages about gender roles, an educational

system that limited girls' exposure to STEM/IT careers, and the structure of the industry in which women work. They were experienced through influential people, organizations and women's own personal characteristics. Transformation at times manifested as impact, reflecting normative societal changes, and also through the direct influence of laws. It also manifested through the indirect influence of intermediaries. In a personal context, this could be the influence of a parent or teacher, while in an organizational context, indirect influence could be represented through a mentor or person in authority.

Of particular interest is that the study results demonstrate *how* these factors had their effect with respect to women's participation in STEM/IT careers. For example, factors such as new laws resulted in *abrupt change*; factors such as culture demonstrated *incremental change*. This confirms the critical importance of national laws and policies and their potential to catalyze cultural change that can support women's participation and retention in the STEM/IT sector. In that context, the oversight provided by bodies such as the European Commission is particularly important in ensuring systematic implementation of gender equality policies at the national level and stringent progress accountability in that regard. For example, the recent European Union (EU) Gender Equality strategy (2020–25) includes objectives such as challenging gender stereotypes; closing gender gaps in the labor market; achieving equal participation across different sectors of the economy; addressing the gender pay and pension gaps; closing the gender care gap and achieving gender balance in decision-making and in politics.

The relevance of Trauth and Connolly's (2021) study to the current discussion lies in the fact that it indicates that the gender gap in the IT workplace participation can be reduced through a multi-pronged strategy of intervention and mechanism, rather than an exclusive reliance on national cultural and economic evolutions, which are slowly and incrementally achieved. Neither is economic progression any guarantor of gender equality and it is possible for equality advances to regress in the face of changing circumstances (such as COVID-19). This is not to detract from the valuable scaffolding provided by national gender equality policies, but an acknowledgement that change is not assured even in economically advanced contexts. For example, Duflo (2010) points to the sustained or increasing disempowerment of women that persists regardless of economic progress, a fact that is illustrated by the disappointing findings of the 2020 Gender Forum Index. That multi-pronged strategy is a response to the fact that, while the influence of national culture and policy should ideally be reflected at the organizational level in terms of the degree to which workplaces advance women's career progression, this is not always the case. For that reason, if workplace gender equality is to be achieved, macro-level environmental interventions such as laws, policies and strategic national interventions, need to be matched by micro-level systemic initiatives that focus on embedding gender equality best practice through private and public sector organizations. Academia is one example of where this has been recognized.

ADVANCING GENDER EQUALITY IN STEM THROUGH IRISH ACADEMIA

Women are under-represented in higher levels of academia across many countries. For example, in 2017, only 21.7 percent of heads of higher education institutions across Europe were women and although women academics accounted for nearly half of academic positions, they accounted for a minority of senior academics in most of those countries (Catalyst, January

2020). From a pay parity perspective, figures from 2019 (Times Higher Education) show that women academics in the United Kingdom earned on average 15.9 percent less than their male counterparts, with some institutions reporting a gap of up to 20 percent. In Ireland, the pace of change has been remarkably slow, moving from 18 percent of women professors in 2013 to 26 percent in 2019, compared to over half of entry-level lecturing posts being filled by women. Moreover, prior to 2020, no woman had ever been a President in the Irish university sector.

The availability of such data is informative, but attention needs to focus on identifying and addressing the organizational culture and practices that perpetuate such gendered divisions. Barriers to women's advancement in academia are not uniformly experienced and research capturing the voices of women is in short supply. One such study by Harford (2018) examined the perspectives of women professors in Ireland on the professoriate for the period 2010–17. Her research identified four distinctive themes which were that they:

- viewed universities as operating in line with male definitions of merit;
- had strategically decided against taking on senior management roles and responsibilities;
- considered there to be no acknowledgement of caring responsibilities;
- highlighted the importance of validation, selection, and networks of support.

Importantly, national macro-level drivers have the potential to influence necessary micro-level interventions and in Ireland this has been evidenced through some seismic events. The first relates to a high-profile case, Galway University, where a woman academic (Michelle Sheehy-Skeffington), despite her obvious competency, did not attain promotion from lecturer to senior lecturer in an internal promotion round. She took a successful legal challenge against this decision. Her case and other similar cases in this university received significant media attention.

Consequent to this outcome, the Irish Minister for Higher Education commissioned a national review of gender equality in Irish Higher Education Institutions (HEIs)⁸ (HEA, 2016), to provide public insight into the issues. Recommendations presented in this report were further clarified in a Gender Action Plan (HEA, 2018). In order to accelerate progress in achieving gender balance within Irish academia, gender actions listed are incentivized by funding and have associated consequences for lack of engagement. These recommendations are closely monitored by the Higher Education Authority (HEA), which is the body with oversight of and funding decisions for Irish third-level institutions. Thus, these “recommendations” can be seen as “rules and regulations,” whose express purpose is to motivate change across the HEI sector. These, in turn, drive cultural change at the micro-level. We describe a selection of recommendations from the Gender Action Plan (HEA, 2018) which are of particular interest to this chapter.

Task Force recommendation (Leadership) – Each institution should appoint a Vice-President/ Director for Equality, Diversity and Inclusion: Although different job descriptions are used, there is now an equality, diversity and inclusion appointee in every university and in many other HEIs in Ireland. This person has responsibility for equality in that institution, and is either a member of or responsible to the executive committee. At a national level, these individuals are members of two national groups who focus on equality, diversity and inclusion. These are within the Irish University Association (encompassing the seven member universities) and Higher Education Authority (encompassing seven universities, two technological universities, and 24 other HEIs). Membership of these committees has provided the opportunity to learn from each other, to jointly lobby for diversity and inclusion advances at national government

level and the ability to provide input into the development of national policy regarding equality initiatives. In some cases, the post has extended to social inclusion beyond gender equality, to include, for example, human rights.

Task Force recommendation (Recruitment and Promotion Procedures and Practices) – New and additional gender-specific posts ... Should be considered where they would be a proportionate and effective means to achieve rapid and sustainable change: Generally, in Ireland, we use 40 percent as our target for gender equality. Estimating that it could take up to 20 years to achieve an average of 40 percent women at professor level, Ireland's Department of Education and Science, through the HEA, is now providing additional funding 45 Senior Academic Leadership Initiative (SALI) Professorships for women over three years (2019–22). Others who can prove disadvantage due to grounds of equality, as stated in the Irish Equal Status Acts 2000–18,⁹ are eligible to apply for these posts. Initially, HEIs must apply to a competitive call to obtain a professorship or senior academic position – the position applied for is dependent on whether the HEI is a university or not, as only universities can employ at professor level. In 2020, 20 such positions were awarded, with 15 and 10 more are planned to be awarded in 2021 and 2022 respectively. The position must then be filled by the HEI through a competitive process following requirements and standards normal to that position.

Task Force recommendations (Athena SWAN charter in Ireland) – HEIs shall apply for an Institutional Bronze award by 2019 and HEIs should retain the Bronze award until such time as they obtain a Silver award: Originating in the United Kingdom, the Athena SWAN framework focuses on supporting and transforming gender equality in higher education and research. In Ireland, in 2013, three universities were partners in EU-funded projects, Trinity College Dublin (TCD) was in INTEGER, Institutional Transformation for Effecting Gender Equality in Research,¹⁰ the University of Limerick (UL) was in FESTA, Female Empowerment in Science and Technology Academia,¹¹ and University College Cork was in GENOVATE, Transforming organizational culture for gender equality in research and innovation.¹² Both INTEGER and FESTA focused on issues for Women in Science, Technology, Engineering and Mathematics (STEM). As a result of their project findings, the TCD project team proposed to the HEA to pilot Athena SWAN. This proposal was supported by the two other university project teams. This proposal was accepted and funded by the HEA with awards first presented in 2015. Through these recommendations, Athena SWAN is the primary means through which gender initiatives are being undertaken in Irish HEIs. Attainment of this award determines eligibility for research funding, and the HEA require that all publicly funded third-level institutions progressively engage with Athena SWAN.

Athena SWAN in Ireland

As mentioned in the Introduction, Athena SWAN initially focused on academic women in STEMM careers, and has, in recent years, expanded to include AHSSBL staff and students. Awards are given at institutional and department¹³ level. Attainment of each award is seen as a progression point. To gain an award the institution or department must set up a Self-Assessment Team (SAT)¹⁴ which takes responsibility for the Athena SWAN process. They organize discussion, data collection and analysis, develop the award submission including the action plan. The Bronze, Silver and Gold are progressive, and recognize that HEIs and departments are advancing gender equality. The Bronze award recognizes that a “solid foundation for eliminating gender bias and developing an inclusive culture that values all staff” has

been established; the Silver award recognizes “a significant record of activity and achievement in promoting gender equality and in addressing challenges across different disciplines; and the Gold award recognizes “the advancement of gender quality in higher education, encompassing representation, progression and success for all” (Athena SWAN charter, 2021). Once an award is achieved, the SAT oversees the action plan implementation.

By August 2021, in Ireland, 19 institutions, including the seven universities, and 68 departments have been awarded Athena SWAN Bronze awards. In order to attain Athena SWAN accreditation, HEIs must undertake a self-assessment of the current status of gender equality and identify what actions can be taken as a result of this assessment. In many universities the institutional SAT is chaired by the President and requires collation of qualitative and quantitative staff and student data, undertaking institutional surveys, workshops and focus groups and international benchmarking. The HEI must identify weaknesses and challenges from which they develop an achievable SMART (specific, measurable, attainable, relevant and time-bound) action plan, which identifies responsibilities, and whose progress monitored within institutions and departments. Apart from the task force recommendation regarding Athena SWAN, each HEI must submit an annual Gender Action Plan to the HEA who themselves have set up a Centre for Excellence for Gender Equality. This plan contains explicit recommendations and actions in relation to HEI gender equality.

Furthermore, in Ireland, there is also a legal requirement to implement the Irish Human Rights and Equality Commission (IHREC) Act, 2014,¹⁵ whose overarching legal framework requires that all public bodies, including universities, to be cognizant of equality and human rights. Implementing this act requires that the organization undertakes a human rights audit, develops a strategy and produces an annual report outlining progress.

Case study – University of Limerick

We present this case study as an example of how the implementation of the national macro-level requirements discussed in the previous section have resulted in micro-level policies accelerating cultural gender equality change within an Irish HEI, the University of Limerick (UL). UL has been at the forefront of this change in Ireland. As an EU FESTA project partner, UL was involved in the initial proposal to the HEA to set up Athena SWAN Ireland. Through Richardson (author 2 and Software Engineer), they had membership on the initial national Athena SWAN committee set up by the HEA, and attained an Athena SWAN award in 2015. UL currently holds a Bronze Award (Expanded Charter), the first HEI to renew to this level, has appointed a Director of Human Rights, Equality, Diversity and Inclusion, and has been awarded two SALI Professorships.

History

There is a history of commitment to advancing gender equality in UL, a young Irish university that was founded in 1972. The first postgraduate program offering a graduate diploma in women's studies in Ireland was initiated at UL in 1990 (Byrne, 1992). This meant that an academic base with a specific interest and focus on gender equality issues was in existence, thus ensuring that gender issues were frequently discussed both informally and formally across the university. For example, members of the graduate course team were involved in setting up events for International Women's Days during the 1990s. In 1999, UL became the first Irish university to build an on-campus crèche (childcare centre) for use by staff and students,

after receiving a grant from the European Social Fund,¹⁶ following lobbying by parents. Subsequently, they applied for and received funding in collaboration with a local primary school providing “after school” facilities as an extension to this service.

UL’s Equal Opportunities Committee was chaired by the Vice-President of Academic Affairs, with representation from interests across the university. In 2005, this committee was instrumental in receiving a grant from Atlantic Philanthropies to advance gender equality and diversity, through which, the first equality officer was employed in the Human Resources (HR) Division, a position that was then mainstreamed to HR Director of Equality and Diversity. The grant also supported the setting up of a women’s forum which was in situ for a period of seven years (2005–12). This forum launched the UL mentoring scheme, the aim of which is to “provide a platform through which experiences can be shared on a one-to-one informal basis, thus providing support to people at various stages in their careers” (University of Limerick Mentoring Scheme, 2021). This is now mainstreamed and still running today.

Science Foundation Ireland, the Irish funding agency for STEM, which had been founded in 2000, recognized that few women were applying for funding awards in these disciplines and offered two awards in 2005 and 2006 to examine this problem within HEIs. Successful applicants were UL, TCD and UCC. In UL, a number of actions followed, such as encouraging women to become external examiners for STEM subjects, to join editorial boards of STEM journals and to become active members of program committees of STEM conferences. Subsequently, UL and TCD were awarded EU grants to examine gender equality issues in STEM (FESTA, INTEGER), while UCC were awarded one to examine gender equality issues more broadly. It is therefore unsurprising that, when Athena SWAN was launched in Ireland in 2015, the first recipients of a Bronze Institutional Award were UL and TCD, followed by UCC in 2016. In the remainder of this section, we describe outcomes from the Athena SWAN effort within UL.

Cultural change

Given the base of academic gender equality expertise and associated initiatives as discussed in the previous paragraph, there has always been support for gender equality within UL. However, this support was episodic, undertaken in pockets around the university and led by individuals. Apart from the equal opportunities committee, which was disbanded in the late-2000s, equality efforts were not explicitly led by executive committee.¹⁷ Equality and diversity was within the HR portfolio, rather than being embedded across UL. Thus, regardless of the desire for change across the organization, individuals involved found it difficult to consistently devote the time and focus necessary to further that change. Gender equality work was not recognized as part of an individual’s workload, it was not highlighted in promotional CVs, and, in the main, was undertaken as a “voluntary” effort across the organization.

Once Athena SWAN was introduced, with institutional accreditation now a stipulation from the HEA and funding agencies, this changed dramatically. For example, ensuring that gender equality, diversity and inclusion are mainstreamed throughout the organization has now become a presidential responsibility, with Athena SWAN now included in the work of Executive Committee. A UL Self-Assessment Team (SAT) was established, chaired by the President and including representation from executive committee and management teams in UL. Local level SATs have been established in all faculties, schools and departments, and gender equality is included in their meeting agendas. With over 300 people involved in Athena SWAN SATs, including students, it is now recognized as part of an individual’s workload

including within promotion and recruitment. The focus on gender equality has expanded, and in 2017, UL appointed a special advisor to the President on equality, diversity and inclusion for three years, resulting in the launch of an Equality and Human Rights Strategy (2019–22), which includes Athena SWAN, and taking account of 12 other equality grounds including ethnicity, race disability and social status. In 2021, this position was replaced by the director of human rights, equality, diversity and inclusion. This responsibility includes Athena SWAN, and recognition of equality, particularly gender equality, now manifests across campus on a regular basis. Twenty-five percent of STEMM professors in UL are women. UL proudly hosts a nationally recognized annual International Women's Day Conference, run by the HR Division, opened by the UL President, supported by local companies and regularly over-subscribed. This is a far cry from those celebrations held in a dark corner in UL during the 1990s! A conference to celebrate International Men's Day has been organized annually since 2019.

When companies come to UL faculties, schools and departments with scholarships to support women, particularly in science, technology, engineering and mathematics, there is a greater willingness to promote these scholarships to students, and there is pride in the students' attainment of these. Breast-feeding facilities have been set up, including rooms and availability of fridges, and buildings have been modified to include gender-neutral toilets. When there are specific days to be celebrated such as those recognizing Lesbian, Gay, Bisexual, Transgender, Queer and Intersex (LGBTQI) communities, the relevant flag is raised on the main flagpoles at the entrance to UL, and/or directly outside Plassey House, where the President's and some Vice-Presidents' offices are located. In 2019, UL set up Ireland's first "Rainbow Housing" on-campus initiative for students who wish to live together in a house/apartment that supports the LGBTQI community, ensuring that they have a living space which is affirming to all sexual and gender identities. Additionally, all of the on-campus accommodation is accessible and has rooms which cater for students with disabilities.

National and Institutional Policies

Apart from national rules and regulations implemented within UL, Athena SWAN and the equality and human rights strategy has ensured the development and implementation of new and modified internal policies and procedures. Equality and human rights is on the Corporate Governance Risk Register, which records the risks and opportunities that may affect the delivery of UL strategy, and so, is closely monitored by governing authority.¹⁸ Additionally, equality is reported on biannually to two governing authority sub-committees focusing on staff – the finance, human resources and asset committee – and focusing on students – the access, equality and student affairs committee. When modified or developed, all UL policies must now exclusively state the effect, either positive or negative, which it has on the each of the equality grounds. Recruitment, promotions and progression policies require that every board is balanced with 40 percent gender representation on boards with more than three members, and at least 30 percent when smaller than this. Internal board members must have completed unconscious bias training, and applicants' career gaps due to maternity or other relevant leave are explicitly taken into account. All senior positions require that candidates show *demonstrable experience of leadership in advancing gender equality*. Both internal quality reviews and those by UL's linked providers include equality as one of the topics to be discussed. UL has also introduced a research grant for returning academic carers, for example, from maternity

leave and carer's leave, and, in the 2020 round of promotions, 36 percent of those who were promoted were recipients of this grant.

These changes have extended to the student level. For example, students are involved in the development of policies, mainly through student life and the postgraduate students' union, the representative bodies for undergraduate and postgraduate students. As required at the national level, UL is implementing the Department of Education's *Framework for Consent in Higher Education Institutions: Safe, Respectful, Supportive and Positive – Ending Sexual Violence and Harassment in Irish Higher Education Institutions*. The university has recently set up sub-committees to review academic structures for inclusive learning and to promote racial equality and multiculturalism. A gender identity and recognition policy is currently being developed and trans awareness workshops have been delivered to staff and students.

Outcomes

There has been a dramatic cultural shift in relation to gender equality, diversity and inclusion in UL over the past ten years. That shift encompasses how these issues are prioritized and mainstreamed and is predicated on a basis of accountability directly related to funding recognition. The implementation of national requirements has ensured that equality is now a priority action and the responsibility of the governing authority, President and executive committee. It is no longer something that exists on the sidelines – it is now front and center of university policies. As a result of this culture shift, individuals throughout the university are now more aware about what they can and cannot do from an equality perspective. When setting up research discussion panels or organizing research speakers, a conscious effort is now made to ensure that these events are gender balanced. When marketing materials are being developed, individuals consider the images and pictures, ensuring that no grouping is unfairly or unequally represented. These actions are not governed by rules and regulations – rather, there is a management focus on equality issues which has heightened awareness. Furthermore, the addition of training modules, such as mandatory unconscious bias training for those participating in interview panels, does, in fact, cause people to shift their thinking.

We have seen a shift in culture within UL STEM departments due to Athena SWAN implementation. There is a recognition that the recruitment and promotion systems have been set up to support women and men equally, and seen improvement in the numbers of STEM senior female academics at associate professor and full professor level, and both of UL's SALI professors appointed in 2021 have been in STEM disciplines. People think about equality and how it can be actively implemented, and the environment has changed to support early career academics, both men and women. Staff are now afforded the opportunity to be mentored, to discuss their career plans and issues, often relating to being in STEM departments. From the potential student perspective, marketing materials now include cohorts of female students, women from STEM are shown telling their story on web pages and we run workshops for younger women showcasing STEM as an interesting career. For current students, we now bring in women working in STEM to give talks and our external examiner pool is gender balanced. Students have set up a Women in STEM society which is active in, for example, organizing talks and STEM industry visits. Increasingly, individuals are ready to speak out about equality, to talk about the issues and to provide support to those who need it, regardless of their circumstances.

Athena SWAN – Not A Panacea

While Athena SWAN provides an excellent, systematic way of advancing workplace gender equality at the micro-level, it should not be viewed as a cure-all panacea. Firstly, it needs to be enacted in a way that does not unintentionally reinforce inequity. For example, in their examination of the effectiveness and impact of an Athena SWAN program using data gathered from five departments within a UK medical school, Caffrey et al (2016) reports both positive and negative outcomes. They found that the implementation of Athena SWAN principles was viewed by staff as a predominantly positive initiative that created the necessary social space to address gender inequity and highlighted problematic practices that could then be addressed. However, they also found that gender inequity was unexpectedly reinforced in the program's enactment, with female staff assuming a disproportionate amount of responsibility for Athena SWAN work, which may negatively impact career progression for those women. This points to the fact that unless recognition is given for the workload that is involved in enacting these programs, they can unintentionally reproduce inequality. Their findings also show that staff considered the impact of the program to be weakened by broader institutional practices (such as inconsistent or limited workshare opportunities), national policies (e.g., the need to extend the duration of paid paternity leave) and societal norms (including expectations that women still shoulder more responsibility for childcare within the home), which extend beyond the remit of the program.

A subsequent study by Ovseiko et al. (2017) exploring the experiences and perceptions of staff who participated in Athena SWAN programs in medical science departments in Oxford University provided similar insights. The study participants also viewed Athena SWAN program participation as resulting in positive structural and cultural changes, advancing development of a more supportive work environment which systematically and intentionally sought to eliminate discrimination and bias. Many participants observed that this would not have been achieved without linkage of government funding to achievement of Athena SWAN accreditation. However, they also considered that Athena SWAN was limited in its ability to improve gender equality in the absence of broader institutional and societal changes. Areas highlighted included entrenched power and pay imbalances, enduring lack of work–life balance in academic medicine, concerns regarding the sustainability of positive changes, concerns that achieving the award could become an end in itself, and resentment about perceived positive discrimination (i.e., the perception that women are benefiting from favorable treatment to the detriment of men).

Similar to Caffrey et al.'s (2015) study, these participants emphasized the need for additional structural and cultural changes in the university and society. The work of both Ovseiko et al. (2017) and Caffrey et al (2015) points to the need for careful management of how gender equality initiatives are enacted at the organizational level. Specifically, they clarify that for sustainable workplace gender equality changes to be achieved, a symbiotic, mutually reinforcing approach where national policies underpin organizational initiatives and the success of those initiatives in turn stimulates further national gender equity policy development is required. Third, they recognize that cultural and societal change is dependent on state and organizational level incentivization to increase participation of men in unpaid family caring work, something that extends beyond the scope of higher education policy and micro-level initiatives. Such intentional incentivization does however achieve critical social change. For example, countries such as Sweden have implemented a progressive 16-month paid parental leave policy that

stipulates that the father must take some of that leave and it cannot be transferred to the mother. Moreover, that leave is available up to eight years post-birth. This has resulted in a cultural shift where a more equal sharing of caring responsibilities has now become the norm rather than the exception, resulting in a more gender-equal society. In summary, for national policies and organizational workplace equality initiatives to achieve sustainable cultural change, they need to be structured in such a way as to intentionally incentivize gender equality in relation to unpaid caring work.

CONCLUSION

Over the past decades, national policies have provided a critical gender equality scaffolding for the removal of workplace access barriers. That scaffolding has facilitated women's participation in the workplace generally. However, although some progress has been made, women continue to remain vastly under-represented in the STEM workforce in most European countries despite rising demand from employers for such professionals. This chapter has described why it is necessary for the environmental scaffolding of national policies to be accompanied by micro-level organizational initiatives that focus on systematically removing multi-layered gender inequalities in the workplace in a way that is specific, measurable, accountable and time-bound. Such interventions are critical if employers wish to attract and retain more women in the STEM sector.

The urgent need to implement systematic organizational initiatives has been highlighted by COVID-19 which exposed the gendered impact of lockdown for working women and the fragility of gender equality progress. As Lewis (2020) notes, pandemics affect men and women differently, with school closures and household isolation moving the responsibility of caring to the unpaid economy, causing women's independence to fall as a silent victim of the pandemic. For example, the UK Office for National Statistics (2020) showed that during the first lockdown, women in the United Kingdom assumed the bulk of childcare in households with young children, typically spending at least three hours a day more on daily childcare duties in households, than did men. Further evidence from a survey of 20,000 working mothers showed that 51 percent of mothers were not able to access necessary childcare supports in order to return to work and as a consequence, 67 percent of key workers were forced to reduce their hours because of a lack of access to childcare (PTS, 2020). Similarly, in the United States, a lack of childcare has been shown (Chotiner, 2020) to be an impediment to bringing workers back into the workforce and Philadelphia Federal Reserve Beige Book data shows that during August to September 2020, labor-force participation among women between the ages of 35 and 54 reduced at four times the rate for men of the same age categories.

These figures point to the inadequacy of childcare provision and its implications for women in the workforce. They paint an uncomfortable picture of entrenched gender inequalities in labor force participation and advancement, one with important ramifications for organizations experiencing STEM talent shortages and exacerbated recruiting and retention difficulties, an issue underpinning a growing global workplace crisis (Amaram, 2019). They confirm that national, macro-level policy approaches to support women's career progression must be accompanied by micro-level organizational initiatives that focus specifically on embedding gender equality best practice, systematically throughout the organization. Athena SWAN is one such example of this type of initiative with significant potential to advance and embed

gender equality changes. Although predominantly employed in academic contexts, it is of equal value within broader organizational contexts, including the STEM sector. However, the ability of policy and organizational initiatives to effect sustainable workplace gender equality is likely to remain bounded and localized unless they are accompanied by change at the cultural and societal level. Achieving this will require intentional development of gender equality state policies that incentivize men to assume more responsibilities in relation to unpaid family caring work. Countries and organizations that engage in such incentivization strategies are less likely to suffer talent shortages of women STEM professionals and more likely to become destinations of choice for those seeking gender equal workplaces and societies.

NOTES

1. See <https://hea.ie/assets/uploads/2021/01/Institutional-Profiles-2017-18-Jan-2021.pdf>.
2. European Parliament Briefing Newsletter 7–10 June 2021 – Strasbourg plenary session www.europarl.europa.eu/news/en/agenda/briefing/2021-06-07/20/tackling-the-under-representation-of-women-in-science-and-engineering.
3. See <https://hea.ie/assets/uploads/2019/07/Higher-Education-Institutional-Staff-Profiles-by-Gender-2021.pdf>.
4. FESTA EU Project (Female Empowerment in Science and Technology Academia (www.festa-europa.eu/).
5. See <https://ilostat.ilo.org/how-many-women-work-in-stem/>.
6. See <https://www.womenintech.co.uk/8-facts-women-tech-industry>.
7. See www.cio.com/article/3516012/women-in-tech-statistics-the-hard-truths-of-an-uphill-battle.html.
8. In Ireland, Higher Education Institutions are universities, technological universities, institutes of technology and other higher education colleges.
9. See www.irishstatutebook.ie/eli/2000/act/8/enacted/en/html.
10. See cordis.europa.eu/project/id/266638/reporting.
11. See www.festa-europa.eu/.
12. See cordis.europa.eu/project/id/321378/reporting.
13. Department level awards can be given to departments, schools or faculties as defined within individual HEIs.
14. See www.ecu.ac.uk/wp-content/uploads/2014/06/SAT-Guidance-July-2017-PDF.pdf.
15. See www.ihrec.ie/download/pdf/ihrec_act_2014.pdf.
16. See ec.europa.eu/esf/home.jsp.
17. See www.ul.ie/presidents-office/university-executive-committee.
18. See www.ul.ie/corporatesecretary/governing-authority.

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