

Advancing women in STEM: institutional transformation

Despite decades of efforts aimed at equity, women continue to be underrepresented among STEM faculty at research-intensive universities,¹ where they experience structural barriers to access, promotion, and retention.² Funded by the National Science Foundation ADVANCE programme, Oregon State University researchers intentionally recruited high-level, influential administrators and faculty to engage in institutional transformation work, through the attainment of deep, nuanced, and emotional understandings of how barriers operate at both the individual and institutional level. The innovative portion of OREGON STATE ADVANCE involves an intensive immersion seminar modelled on the university's longstanding seminar for curricula transformation. The ADVANCE seminar, with a curriculum based on Systems of Oppression theories, enables participants to construct and implement action plans that apply their new knowledge to transform institutional policies and practices within their sphere of influence.

Although theories of Systems of Oppression are core to women and gender studies, Oregon State University was the first ADVANCE institution to centre these theories to challenge and change academic STEM culture. These theories recognise that discrimination is not the result of individual bad actors but of systematically related, self-reproducing institutional structures and ideologies.³⁻⁵ Furthermore, these theories recognise that systems of gender do not exist apart from systems of race or ethnicity, sexuality, and other differences. Moreover, individuals do not experience gender isolation but are shaped by other forms of difference.^{3,6} These systems obscure the origins and operations

of power, so that the workings of power seem natural, inherent, and merited.⁷ The theories provide a method to account for the persistence of discrimination, despite the good intentions of individuals, by making visible the systems that purposefully distribute power inequitably across social differences to reproduce and maintain the dominance of an elite social group.⁷ Transforming academic STEM requires shifting power relations and restructuring institutional arrangements to create more equitable and just policies, processes, and structures.

Oregon State University's immersion seminar uses critical pedagogies⁸ to introduce participants to theories of Systems of Oppression, helps them apply these theories to their work, and facilitates their development of action plans to bring about structural change. The seminar meets for 9 days, 6 hours a day, across 2 consecutive weeks and includes various follow-up meetings. Co-facilitated by a faculty member from liberal arts and another faculty member from STEM, the seminar fosters crucial intellectual analyses of systems of power, with attention to gender and its intersections with other forms of difference and deep personal reflective and affective engagement. To date, 125 individuals have participated in nine seminars, including the university president, provost, 22 deans and associate deans, and 20 heads of department. An additional seminar involved staff of University Relations and Marketing, focusing on their role as brand managers and storytellers, and resulted in intentional critiquing of the university's public relations materials.

Data (from interviews, surveys, and conversations) indicate that participants gain a nuanced understanding of Systems of Oppression, both their broad historical and contemporary effects and those specific to Oregon State University. Participants indicated that several concepts were new to them (eg, intersectionality, binaries,

and microaggressions) and that these presented effective ways to construct institutional hierarchies. The cohorts emerged with a shared language to discuss challenges around equity and justice and to imagine a transformed institution. As one participant noted: "[The ADVANCE seminar was] a life-changing programme. Everybody walked out...thinking they had the responsibility to make things better, look at things quite differently".⁹ Data also suggest that the seminar is effective in advancing structural changes that lead to women and marginalised groups' greater institutional participation and advancement. Action plans and their implementation show notable changes to college processes and policies, ranging from increased emphasis on raising awareness of gender and diversity issues, to changes in hiring and promotion practices, and advancement of women into leadership roles. Inclusion of both administrators and faculty in the seminar ensures that top-down policy changes find buy-in from the faculty, and bottom-up efforts are enabled and supported by leadership.

An example of substantial structural change involved the College of Engineering. The College Dean's action plan included a goal to increase recruitment and hiring of women in the faculty, which necessitated structural changes to the recruitment and hiring processes. These structural changes consisted of including a formally-trained Search Advocate on search committees, requiring the chair of the search to complete Search Advocate training, communicating in the position announcement an expectation for a commitment by all faculty to equity and inclusion, and requiring a formal statement from the candidate to show their commitment, and finally, articulating screening criteria to be as inclusive as possible and aligning advancement of candidates with these criteria. The effect of screening is assessed at each

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For more information on OREGON STATE ADVANCE see <https://dpsd.oregonstate.edu/>

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point of candidate advancement to ensure that candidates from particular demographic groups are not disproportionately eliminated.¹⁰ As a result, the percentage of women among the College of Engineering's tenure-line faculty increased from 15% in 2014 to 20% in 2017, propelling the College from ranking 16th among research-intensive land grant universities (in terms of the percentage of women faculty in 2014) to 3rd in 2017. As of 2018, the College of Engineering has more than doubled the number of women faculty.

Evidence suggests that the OREGON STATE ADVANCE is an effective intervention for catalysing institutional transformation in diversity and advancing the role of women in academic STEM. By centring theories of Systems of Oppression, the seminar ensures that analysis and application are systemic and structural in addition to personal and behavioural, disrupting the normative workings of gender in higher education and demanding solutions that revolutionise the structures, policies, and processes that maintain naturalised gender hierarchies. Participants learn to behave better as individuals, but, more importantly, they plan and implement concrete action plans to shift the dynamics of institutional power toward greater equity and justice for everyone. The evaluation data indicate that the effort is substantially effecting Oregon State University in terms of hiring practices, promotion, retention, and institutional culture. The approach could benefit other institutions aiming to transform academic disciplines to be more equitable for women and other underrepresented groups.

All authors report grants from the National Science Foundation during the conduct of the study.

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