

ADVANCE PURDUE

CENTER FOR FACULTY SUCCESS

in collaboration with
The Center for Research on Diversity & Inclusion
The Butler Center
and
The Program in Women's Gender & Sexuality Studies

PRESENTS:

Gender
2013 &
STEM

RESEARCH SYMPOSIUM

ADVANCE is a National Science Foundation (NSF) program aimed at increasing the representation and advancement of women in academic science, technology, engineering, and mathematic (STEM) careers. Purdue is among more than 35 colleges and universities that have received five-year ADVANCE Institutional Transformation grants to help develop a more diverse STEM workforce. For more information about ADVANCE-Purdue and the Purdue Center for Faculty Success, visit www.purdue.edu/dp/advance.

Collaborators for the 2013 Gender and STEM Research Symposium include:

The Program in Women's, Gender, and Sexuality Studies housed in the College of Liberal Arts at Purdue University which offers students ways of systematically studying normative and non-normative sexualities, gender, and women's experience in all aspects of life. For more information about this Program, visit <http://www.cla.purdue.edu/womens-studies/>.

The Center for Research on Diversity and Inclusion, based in the College of Liberal Arts, is a research center which aims to support and highlight the excellent scholarly work on diversity and inclusion happening in Liberal Arts and across the University. For more information about this Center, visit <http://www.cla.purdue.edu/crdi/>.

The Butler Center Research Group supports scholarship on the subjects of leadership development; inclusion related to gender and diversity; and organizational change. Current research includes evaluating and implementing leadership and work-life change management initiatives to improve how people manage technology and work-life boundaries, and leader and organizational cultural support of sustainable careers and occupational resilience. For more information about this Group, visit <http://www.purdue.edu/butler/research.shtml>.

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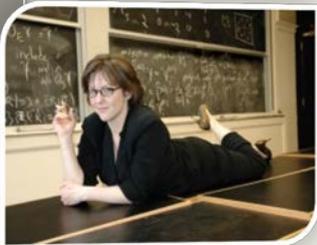
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Agenda

Wednesday, November 13, 2013

- | | |
|---------------------|--|
| 11:00 am - 12:15 pm | Registration (STEW 310) |
| 11:00 am - 7:00 pm | Posters on Display (STEW 302) |
| 12:20 pm | Welcome and Opening Remarks (STEW 310)
Dr. Chris Sahley
Director, ADVANCE Purdue Center for Faculty Success
Special Advisor to the Provost on Gender Equity
Professor, Biological Sciences

Introduction of Dr. Peggy McIntosh
Dr. T.J. Boisseau
Director, Women's, Gender, and Sexuality Studies
Associate Professor, History |
| 12:30 pm - 1:30 pm | Keynote Address
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Dr. Peggy McIntosh
Senior Research Scientist and Associate Director
Wellesley Centers for Women |
| 1:45 pm - 2:00 pm | Session 1: Social Communications (STEW 310)
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and Female STEM Faculty: A Preliminary Analysis</i>
Stacie Furst-Holloway, Rachel Kallen, Steve Howe, and Brian Eiler
University of Cincinnati |
| 2:00 pm - 2:15 pm | <i>Immigrant Women's Experiences of Using Mobile Phones:
Counting Pennies to Connect Across Continents</i>
Parul Malik and Lorraine Gayle Kisselburgh
Purdue University |
| 2:15 pm - 2:30 pm | Break |

- 2:30 pm - 2:45 pm **Session 2: STEM Faculty Classrooms (STEW 310)**
*Women Faculty in STEM Colleges at Purdue University:
Perceptions of the Classroom Environment Related to
Student Interactions*
Susan Geier and Chris L. Sahley
Purdue University
- 2:45 pm - 3:00 pm *Evaluation of Women and Men Professors:
How Gender Scripts Affect Students' Assessments*
Elizabeth Hoffman
Purdue University
- 3:00 pm - 3:15 pm **Session 3: Recruitment and Retention (STEW 310)**
Hiring and Retention Results at the University of Cincinnati
Steve Howe, Stacie Holloway, Rachel Kallen
University of Cincinnati
- 3:15 pm - 3:30 pm **Break**
- 3:15 pm - 3:30 pm *Online Course Advising:
Differences in Student Response by Gender and Ethnicity*
Rui (Celia) Pan, Matthew D. Pistilli, and Joyce Main
Purdue University
- 3:30 pm - 3:45 pm *EPICS: Broadening the Pathway into STEM*
Mindy Hart, Patrice M. Buzzanell, William Charles Oakes,
Carla B. Zoltowski
- 4:30 pm - 6:30 pm **Networking (STEW 302)**
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One Girl's Romp Through M.I.T.'s Male Math Maze**
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(Fowler Hall)

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- 9:20 am Welcome and Remarks (STEW 310)
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*Navigating pregnancy and parenthood:
Work-family considerations for men and women graduate students in STEM and other disciplines*
Ziyu Long, Abigail Selzer King, and Patrice M. Buzzanell
Purdue University
- 9:45 am - 10:00 am *Appreciating Episodic Mentoring:
Reconsiderations of and Interventions for a Comprehensive Mentoring Process for Engineering Faculty*
Patrice M. Buzzanell, Ziyu Long, Klod Kokini, Lindsey B. Anderson, and Jennifer C. Batra
Purdue University
- 10:00 am - 10:15 am *Diversity Catalysts Involvement and Impact*
Klod Kokini, Patrice M. Buzzanell, Clint Chapple, Andrew Hirsch, Kathleen Howell
Purdue University
- 10:15 am - 10:30 am **Session 5: Upcoming Research on Gender and STEM**
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Felica Ahasteen Bryant and Suzanne Zurn-Birkhimer
Purdue University
- 10:30 am - 10:45 am *CIC AGEP Post-Doctoral Mentoring*
Mark Smith, Linda Mason, Chris Sahley
Purdue University
- 10:45 am - 11:00 am *Assessing and Moving Implicit Bias*
Aman Yadav
Purdue University
- 11:00 am - 11:30 am Next Steps on Publication and Future Symposiums
- 11:30 am - 11:45 am Evaluation and Wrap-Up (STEW 310)



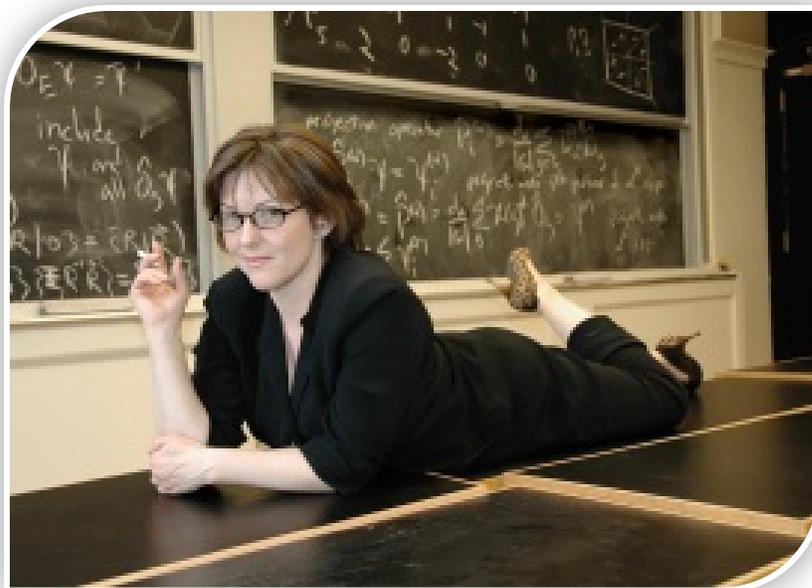
Peggy McIntosh, Ph.D.

Senior Research Scientist and Associate Director Wellesley Centers for Women

Peggy McIntosh, Ph.D., is an American feminist and anti-racist activist, the associate director of the Wellesley Centers for Women, a speaker, and also the founder, of the National SEED Project on Inclusive Curriculum (Seeking Educational Equity & Diversity). The SEED Project helps teachers create their own year-long, school-based seminars on making school climates, K-12 curricula, and teaching methods more gender fair and multi-culturally equitable. Dr. McIntosh currently leads the expansion of the SEED Project, with funding from the W.K. Kellogg Foundation.

Dr. McIntosh directs the Gender, Race, and Inclusive Education Project, which provides workshops on privilege systems, feelings of fraudulence, and diversifying workplaces, curricula, and teaching methods. Dr. McIntosh has taught English, American Studies, and Women's Studies at the Brearley School, Harvard University, Trinity College (Washington, D.C.), Durham University (England), and Wellesley College.

She is co-founder of the Rocky Mountain Women's Institute, and has been consulting editor to *Sage: A Scholarly Journal on Black Women*. In 1993-1994, she consulted with women on 22 Asian campuses on the development of Women's Studies and programs to bring materials from Women's Studies into the main curriculum. In addition to having two honorary degrees, she is a recipient of the Klingenstein Award for Distinguished Educational Leadership from Columbia Teachers College. She earned her doctorate degree from Harvard University. McIntosh is most famous for authoring the 1988 essay "White Privilege and Male Privilege: A Personal Account of Coming to See Correspondence through Work in Women's Studies."



Gioia De Cari, M.S.

Actress, playwright, classical singer and recovering mathematician

The passionately eclectic **GIOIA DE CARI** (*Playwright and Performer*) is an actress, playwright, classical singer and “recovering mathematician.” She began her performance career in experimental opera while a teaching fellow in mathematical logic at Harvard. Since then, she has played numerous leading acting roles in theater, commercials and films, including the multi-award-winning film *Lower East Side Stories*, which screened at the Museum of Modern Art in New York City, Slamdance, and many festivals in the U.S. and internationally. Gioia’s first solo play, *The 9th Envelope*, which she wrote and performed, received a rave in the *Off-Off-Broadway Review* (OOBR): “De Cari commanded the stage with energy, poise and range.”

Her second solo, *Truth Values: One Girl’s Romp Through M.I.T.’s Male Math Maze*, an autobiographical story of her past as a mathematician, has become a runaway national hit. After receiving a Puffin Foundation grant, *Truth Values* premiered in the New York International Fringe Festival in August 2009, winning an Overall Excellence Award for Best Solo Show and enthusiastic reviews: “[FOUR STARS] De Cari ... inhabits no fewer than 30 roles with gusto” (*TimeOut New York*). “Funny and insightful ... replete with hilarious characters ... The story is riveting ... go see this show!” (*CurtainUp*). *Truth Values* received its regional premiere on the mainstage of the Central Square Theater in Cambridge, MA where it sold-out an extended run and was nominated for an Independent Reviewers of New England (IRNE) Award. *Truth Values* continues to be in demand for touring engagements at universities and performing arts centers throughout the United States.

Gioia has studied acting with legendary teacher Wynn Handman and playwriting with the late Milan Stitt of Carnegie Mellon. After graduating *summa cum laude* from UC Berkeley, she earned a master of science degree from the Massachusetts Institute of Technology. An accomplished singer as well, Gioia released her debut album, *Quiet Songs*, with her husband, classical guitarist John Olson, in 2006. They have toured throughout the United States. Gioia is a proud member of Actors' Equity Association, SAG-AFTRA and The Dramatists Guild.

Abstracts

Session 1: Social Communications

Assessing the Intra-Departmental Social Networks of Male and Female STEM Faculty: A Preliminary Analysis

Stacie Furst-Holloway, Rachel Kallen, Steve Howe, and Brian Eiler
University of Cincinnati

Social relationships and intra-organizational networking have repeatedly been shown to predict career success.¹ However, building social networks may become difficult when STEM women enter into an area where they are judged, implicitly or explicitly, to be less competent outsiders. Social networks can also become more difficult to manage when work-life demands become unmanageable. Thus, a key component to analyzing the success of the ADVANCE program at the University of Cincinnati (UC LEAF) entails assessing the social climate through real connections between people within UC. To this end, LEAF has begun collecting closed network data from faculty in each of UC's STEM departments to assess department-level network characteristics. We will use these data specifically to examine whether the networks of men and women faculty within each department differ according to (1) overall number of ties, (2) the types of ties they have (e.g., research vs. teaching, professional vs. personal support), and (3) the "quality" of ties as measured by the rank of those individuals in their departmental networks. We will also match these data with findings from our climate survey to identify whether network characteristics are associated with more or less positive workplace perceptions. In this presentation, we will compare findings from three STEM departments and discuss how these data will be used to assess ADVANCE-related progress and to inform future programming.

¹Sparrowe, R.T., Liden, T.C., Wayne, S.J., & Kraimer, M.L. (2001). Social networks and the performance of individuals and groups. *Academy of Management Journal*, 44, 316-325.

social network analysis, STEM, gender differences

Immigrant Women's Experiences of Using Mobile Phones: Counting Pennies to Connect Across Continents

Parul Malik and Lorraine Gayle Kisselburgh
Purdue University

There are many success stories of women around the world using information communication technologies (ICTs) to empower themselves. Most research on ICT-enabled empowerment tends to focus on rural women in emerging economies. Little attention has been paid to their low income, immigrant counterparts living in North American cities. Using 30 interviews with Bangladeshi and Ethiopian women who recently immigrated to New York City, this exploratory study describes the barriers to the use of mobile phones amongst immigrant women. A majority of these women were dependents of construction workers and cab drivers, while the others had operative level positions in retail and restaurant sectors. Through grounded theory methods of data analysis, the findings indicate the access and use of mobile technology is impeded by limited incomes and the effort needed to learn the technology. The use of mobile phones is also a negotiation between the immigrant need to assimilate and the anxiety to preserve their native culture.

immigrant, gender, working class, mobile phone, culture

Session 2: STEM Faculty Classrooms

*Women Faculty in STEM Colleges at Purdue University:
Perceptions of the Classroom Environment Related to Student Interactions*
Susan Geier and Christie Sahley
Purdue University

As part of the mission to increase faculty success, the ADVANCE-Purdue Center for Faculty Success (PCFS) sought to understand faculty experiences related to student interactions and the classroom environment. Consequently, the PCFS launched a university-wide survey to understand the various faculty perceptions of their classroom environment specifically related to student interactions. The survey was administered to faculty members during fall 2012. This paper will focus on the perceptions of women faculty members in the Colleges/Schools of Agriculture, Engineering, Pharmacy, Science, Technology, and Veterinary Medicine (STEM).

In addition to demographic items such as gender, rank, and college, participants were asked to rate the overall classroom climate based on perceived level of respect from students and teaching assistants, general satisfaction with the classroom environment, and sense of fairness related to students' ratings for the courses and instructors. Participants also commented on their classroom management style and their overall perception of the classroom environment and interactions with undergraduate and graduate students.

Faculty members were asked about teaching experiences across four semesters from fall 2010 to spring 2012. Factors such as rank, gender, course level, course format, class size, whether the course was required for major, and the instructor's experience teaching the course were considered in the data analysis. Faculty actions in response to student incivility were also examined. Preliminary results will be presented.

women faculty in STEM, post-secondary, student incivilities, classroom environment

*Evaluation of Women and Men Professors:
How Gender Scripts Affect Students' Assessments*
Elizabeth Hoffman
Purdue University

All universities strive for high quality teaching. In the late 1970's, colleges and universities began systematically soliciting feedback from students regarding teaching. Rather than relying on colleague-evaluations, the new administrative philosophy advocated bringing in students' own assessment of their professors. Today, these student assessments are often the only evaluation of college teaching.

The change to include students' perspectives was particularly supported by women faculty. Ironically, some research suggests that student evaluations might be quite biased against women professors. Such a bias would not only be unfair, but it would have substantial consequences for those women faculty, since student evaluations are used to evaluate teaching as part of a candidates' promotion document. Negative teaching evaluations could result in denied tenure.

This paper draws on data from three years of student evaluations at a Research 1 university. Quantitative analysis shows significant differences in the evaluation of men versus women professors, with men receiving more positive evaluations and women more lower-scored, negative evaluations. The qualitative data illustrate how gender complicates students' evaluations.

gender, student assessments, promotion evaluation, bias

Session 3: Recruitment and Retention

Hiring and Retention Results at the University of Cincinnati

Stacie Holloway, Rachel Kallen
University of Cincinnati

Achieving higher levels of representations of women in the STEM sciences requires that science departments do a better job of recruiting, hiring, and retaining women scientists. In order to help the University of Cincinnati ADVANCE project team assess whether the under-representation of STEM women at UC is more a matter of not recruiting and hiring enough women or more matter of not retaining them, we conducted survival analyses. We were able to construct a data base of all UC employees who were hired from 1990 to 2012. For employees who left UC, we were able to calculate years of UC employment. Employees still on the UC faculty, or who left the faculty and moved into administrative positions at UC, were right-censored. Key results are as follows: (1) STEM hires have shorter spells of employment than non-STEM hires; (2) STEM women have slightly longer spells of employment than STEM men; (3) the three colleges in which STEM scientists work at UC differ markedly in average length of employment, with there being much higher turnover in Medicine and Engineering than in Arts and Sciences (A&S); (4) however, women in Medicine and Engineering had slightly longer spells of employment than did men, whereas women in A&S had shorter spells; and (5) African American STEM scientists had shorter spells of employment than other STEM scientists. The results of these analyses have important implications for how we create change at the level of academic units.

recruitment, retention, STEM, survival analysis

Online Course Advising: Differences in Student Response by Gender and Ethnicity

Rui (Celia) Pan, Matthew D. Pistilli, and Joyce Main
Purdue University

Although the participation of women and minorities in engineering has increased over time, they still constitute a lower share of engineering undergraduates. Therefore, developing strategies to effectively recruit and retain female and minority students is one of the top priorities for engineering educators. One potential solution to improve student retention in engineering is academic advising. Previous research suggests that effective academic advising can lead to better academic outcomes among undergraduate students and many computer tools and systems have been invented to facilitate the advising process. Among these tools is Course Signals, which uses real-time data pertaining to student performance and other indicators to provide up-to-date feedback to students. Course Signals can also be used to deliver advising interventions aimed at promoting more effective study strategies and other changes that can lead to better outcomes. In this study, we examined patterns between the use of Course Signals, and course performance among students in engineering and technology. Specifically, we asked: is frequency of advising interventions delivered through Course Signals associated with improved academic performance? Are there variations in student response to Course Signals by gender or race/ethnicity? By analyzing data from over 900 engineering and technology students who enrolled in a course utilizing Course Signals, we found that the number of advising interventions distributed through Course Signals tends to be positively associated with improved student course performance, particularly among female students. Findings suggest that online advising has the potential to be an effective method to improve student academic performance.

online advising, course performance, gender

EPICS: Broadening the Pathway into STEM

Mindy Hart, Patrice M. Buzzanell, William Charles Oakes, Carla B. Zoltowski
Purdue University

The Engineering Projects in Community Service (EPICS) program was co-founded at Purdue University in 1995 and has since spread throughout the United States and globally with inroads into K-12 education through EPICS High. This presentation offers a synthesis of research findings and interventions gleaned from several datasets about students' and alumni's reported experiences with EPICS and the consequences of their participation. In particular, this presentation discusses the ways in which EPICS provides a different vantage point on the underrepresentation of women in STEM (science, technology, engineering, and math). Specifically, researchers have been tackling this issue of underrepresentation for decades with very little change. When examining the typical responses to STEM recruitment and retention, it seems as though the same things are being attempted with slight repackaging (e.g., a twist on a robotics competition) rather than considering the need to take a completely different approach.

The solution to gender inequity in STEM isn't simply making projects interesting to women and assuming that they'll flood into STEM majors but creating relevant experiences. Women want to be involved in meaningful work, that is, work that matters to them individually and to their communities. From our research, we argue that framing STEM within a community and within human contexts offers the single best way to create an impact on gender equity initiatives in institutions of higher education. We argue that EPICS is a site in which the conversation has been and continues to be changed with demonstrable outcomes for STEM recruitment and retention.

K-12, EPICS, education, recruiting, retention

Session 4: Career Development

Navigating pregnancy and parenthood: Work-family considerations for men and women graduate students in STEM and other disciplines

Ziyu Long, Abigail Selzer King, and Patrice M. Buzzanell (Purdue University)

Scholars and non-academics consider popular key advantages to be flexibility in career trajectories as well as autonomy and control over one's schedule and the work that one chooses to do (e.g., Buzzanell & Lucas, 2006, 2013). Although academic careers seem to offer these benefits, there are questions about whether and how such flexibility actually occurs, particularly in times of pregnancy/adoption, family leave, and work-life "balance" (e.g., Stone, 2008). Implicit in academic flexibility is that graduate student careers might evidence some of the same flexibility but within institutional structures that can range from lockstep to a build-your-own plan and timetable model. In graduate school, concerns about parenthood, career, and policy use were not considered as relevant or important as those of faculty. It was assumed that students were invested in their degree programs and willing to forego "balance" for the goal. This presentation discusses findings from graduate student interview data gathered during the last year at a major Midwestern U.S. research intensive university. We chart the landscape with overt findings which differentiate challenges faced by female and male graduate students and by those seeking degrees in STEM and other disciplines. We then provide a glimpse of what might lie underneath these descriptions – gendered scaffolding for the construction of graduate students and their reported experiences. We draw upon research on work-life communication, power and status, paradoxes, and policy use. Theoretical and practical implications, particularly those regarding communication and work-life policy, conclude this presentation.

academic career, graduate students, pregnancy, family leave, gender

Appreciating Episodic Mentoring: Reconsiderations of and Interventions for a Comprehensive Mentoring Process for Engineering Faculty

Patrice M. Buzzanell, Ziyu Long, Klod Kokini, Lindsey B. Anderson, and Jennifer C. Batra (Purdue University)

The benefits of formal and informal mentoring systems in academe and other organizational settings are well documented. However, a third form of mentoring—known as episodic or spontaneous mentoring as well as mentoring moments—offers a different entrée point into the everyday construction of mentoring. Whereas most mentoring either focuses on one-on-one long-term relationships or group/cluster mentoring arrangements, episodic mentoring emphasizes processes, relational aspects of the mentoring experiences, multiple inputs, and individual empowerment. Based on inductive-deductive analyses of in-depth interviews and other empirical data about engineering faculty members' mentoring experiences in a mid-western university, we discuss how episodic mentoring is a way to receive and provide "just in time" career advice and psychological support from colleagues in an informal or unstructured way. This advice and support helps faculty members' career development, work/life balance issues, and management of workplace politics. In this paper, episodic mentoring is proposed not only as a means of career development but also as faculty engagement and empowerment. We do not propose that episodic mentoring should replace more structured mentoring practices and policies. However, the role of the episodic mentoring has been underestimated in its positive impact on faculty advancement. We argue that without recognizing the value of episodic mentoring, one cannot assess the full extent of a comprehensive mentoring process. We also recommend practical applications of episodic mentoring from our findings in the context of faculty development.

mentoring, episodic, career, diversity and inclusion

Diversity Catalysts Involvement and Impact

Klod Kokini, Patrice M. Buzzanell, Clint Chapple, Andrew Hirsch, Kathleen Howell (Purdue University)

The National Science Foundation's (NSF) ADVANCE program has funded over \$130 million USD in efforts "to increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse science and engineering workforce" (<http://www.nsf.gov/crssprgm/advance/index.jsp>).

The PURDUE-ADVANCE project has three major goals: 1) to increase the number and success of STEM women faculty of color; 2) to increase the success and leadership of women faculty in STEM, and 3) to educate all the faculty and in particular, the majority, about the benefits of diversity and inclusion (see <http://www.purdue.edu/discoverypark/advance/>). Across this institution, different stakeholders have been involved in an integrated approach to lay out and sustain an infrastructure for institutional change. In our presentation, we discuss our own parts within Purdue's broad institutional effort. To accomplish our goal of educating the majority (Goal 3), PURDUE-ADVANCE recruited Diversity Catalysts (DC's), three successful, well-respected senior faculty who were educated about diversity and inclusion issues to have an impact on STEM disciplines and the entire campus community. These original three DCs have interacted with others in formal and informal settings to engage in deep cultural change one conversation at a time. We developed (a) our intersectional co-learning engagement (i.e., how and what we, as Diversity Catalysts, learned as we engaged with diversity and inclusion literature and with each other), as well as (b) how we describe their personal experiences as Diversity Catalysts individually. We trace the DCs course over the last few years and describe the next phase of our work, in which we are joined by a second cohort of DCs.

ADVANCE, diversity, inclusion, catalysts, intersectionalities

NOTES

Acknowledgements

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