

Evaluation Report: 2013 Career Development Workshop from the Earth Science Women's Network "Building Leadership and Management Skills for Success"

June 10-11, 2013

Providence, RI

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EXECUTIVE SUMMARY

Participants were very satisfied with the workshop as a whole. Participants reported impressive gains in management and leadership skills and abilities, as well as confidence in their ability to be an effective leader and manager. They reported high satisfaction on all aspects of the format, logistics, and planning of the workshop. Workshop strengths included facilitation by Chris Olex, the DISC session, networking opportunities, and the sense of community and supportive atmosphere. Workshop participants reported that they would immediately implement the leadership and management tools and skills in their workplace as a result of their participation in the workshop.

PROJECT OVERVIEW

While the number of women receiving advanced degrees in the geosciences has been rising, the faces of scientific leaders in academia remain predominantly male. The Earth Science Women's Network (ESWN) aims to promote career development, build community, and facilitate professional collaborations for women in the Earth sciences. ESWN is a peer-mentoring network of women, mostly early-career, which serves the variety of fields within the geosciences discipline.

In 2009 the Earth Science Women's Network (ESWN) received an ADVANCE PAID grant from the US National Science Foundation to foster connections and support the professional development of early-career women in geosciences. As part of this grant-funded project, ESWN committed to the following initiatives: three intensive career development workshops; professional networking events at major scientific conferences; and development of an ESWN web center to build connections and collaborations for and among women in the Earth sciences.

This workshop, titled "Building Leadership and Management Skills for Success," took place in June 2013 in Providence, RI. The workshop topic was identified from prior data on ESWN members' professional development needs and was intended to address leadership and management of research groups and other scientific work units.

Prior to the workshop, participants completed the online DISC assessment, a personality analysis intended to inform participants of their personality type and how it influences their needs and motivations. These results from the DISC assessment were then used in workshop sessions. The

first day of the workshop was focused on understanding where participants fit in the DISC classification, identify participants' strengths, weaknesses, and essential needs as based on their personality types. Additionally, there was a focus on how understanding other people's personality types can help to better understand, motivate and navigate potentially conflict inducing situations.

The second day of the workshop was focused on practical tools that could be used to facilitate work-related communication, based on the DISC personality framework introduced on the first day. Specifically there was a focus on:

- the importance of regular and consistent communication.
- strategies for giving constructing feedback.
- techniques for communicating needs to supervisors.

The first day of the workshop was facilitated by Chris Olex and the second day of the workshop was facilitated by Katie Hughes. The facilitators' styles differed noticeably, but both incorporated some active learning and hands-on applications into the agenda. Open discussion was welcomed by the facilitators, although both facilitators intervened to keep the discussion on topic. A panel discussion with successful senior scientists provided participants the opportunity to ask questions of experienced leaders and managers.

This report is based on pre-workshop and immediate post-workshop surveys and participant observation. It provides an analysis of the workshop outcomes and formative feedback to the project team for use in planning subsequent workshops and in final reporting to the National Science Foundation.

INTRODUCTION AND DATA SET

The Providence workshop spanned two and a half days, with facilitator presentations, open discussions, and hands-on exercises the most common activities. A detailed agenda is attached as Appendix A.

Participants were asked to pre-register online and complete a brief survey one to four weeks prior to their workshop attendance (n=66) and another questionnaire was administered at the end of the workshop (n=68). Both surveys included both quantitative items and open-ended questions. Likert-scale items were developed or adapted to reflect participants' personal and professional background, their accomplishment in various professional skills and capacities, their gains from attending the workshop and their perceptions of the overall quality of the workshop. For example, on both pre- and post-workshop surveys, participants assessed their clarity about their career goals for the next year on a scale of one to four (1=None, 2=Low, 3=Medium, and 4=High). The items were borrowed or adapted from the ESWN member survey and also used in evaluating the 2011 workshop on 'defining your research identity' and the 2012 workshop on networking. Some new items were added this year to address different workshop goals. These mainly appear as gains items on the post-survey, as information on the workshop objectives was received too late to incorporate targeted items into the pre-survey.

Open-ended questions addressed participants' expectations and motivations for attending the workshop, their impressions and learning, and how they may use that learning in their career. Participants reported personal and professional demographic information such as career stage, workplace type, and race/ethnicity, so that we could analyze for differences between groups. Participants also reported their birthday to provide a unique identifier that could be used to match pre- and post-workshop responses on the anonymous surveys. Some items were adapted from prior evaluations of faculty development by our group, and other items were developed based on discussion with workshop leaders about their goals and expectations for participants. In addition, one of the evaluators attended the workshop as a participant-observer and provided field notes.

METHODS

Responses to numerical items were entered into the statistical analysis program SPSS, where descriptive statistics were computed. Pre-workshop and post-workshop survey means, probability statistics and effect sizes were computed for some of the ratings items, and frequencies were computed for all of the items. Tests of statistical significance were conducted for the paired sample comparison of pre- and post-survey responses. Responses of the participants who completed only one survey (pre or post) or those who did not include matching survey identifiers on both the pre and post workshop surveys were excluded from the pairwise comparison of pre- and post-workshop data. The resulting sample size for the pairwise pre-post comparison was $n=58$. The sample size for all other items on the post-workshop survey was $n=68$. Several participants left some items blank; these responses were not included in calculations of the means and standard deviations for survey items. Open-ended responses were entered into MS Excel and analyzed for trends based on the frequency of occurrence of particular qualitative themes.

KEY FINDINGS

From the pre-workshop survey, we sought to establish the personal and professional background of participants and to have them self-assess their accomplishment in various professional skills and capacities, so that these could be compared with their self-assessment after the workshop.

Demographics of Participants

Overall, workshop participants came from diverse institutional backgrounds and represented a variety of career stages. The "average" participant was young (under 40 years old) early in her career, and worked at a university. Participants from the 2011 and 2012 workshops had similar demographic profiles except for participants' career stage. While participants in nonpermanent positions (graduate and postdoctoral scientists) were the largest group, the 2013 workshop included a lower proportion of these participants (45%) compared to 2012 (68%) and 2011 (52%), probably because leadership and management are perceived as more relevant for women already in career-track positions.

Employers

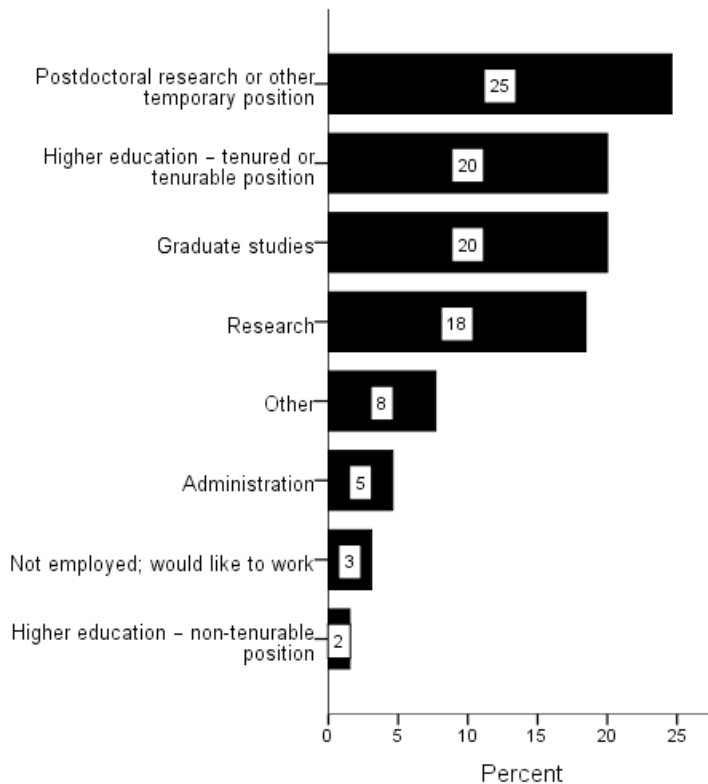
Most respondents worked at Ph.D.-granting research universities (70%), followed by not-for-profit organizations of NGOs (9%), government or national labs/agencies (8%). The remainder came from four-year colleges, for-profit industry or business, master-granting comprehensive

universities, and consulting/self-employed positions. The large proportion of research university participants reflects both the focus of ADVANCE activities on women in academic employment, and the high numbers of graduate student and postdoctoral researchers participating.

Employment Status

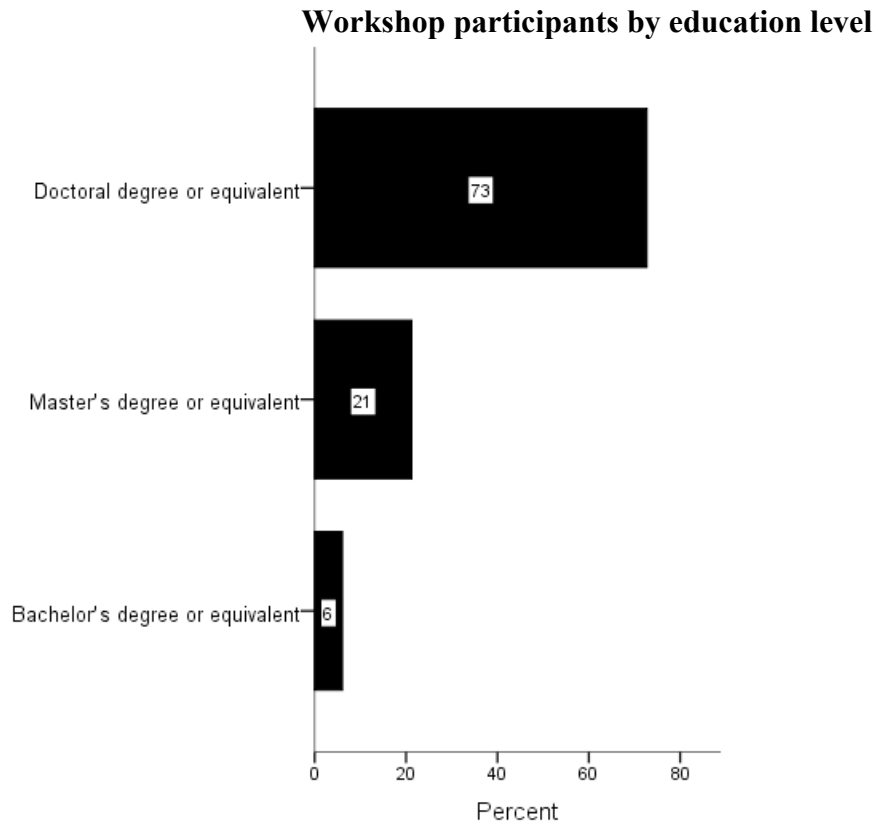
Most workshop participants were postdoctoral scholars (25%), graduate students (20%), and tenured and untenured faculty (20%).

Workshop participants by employment type



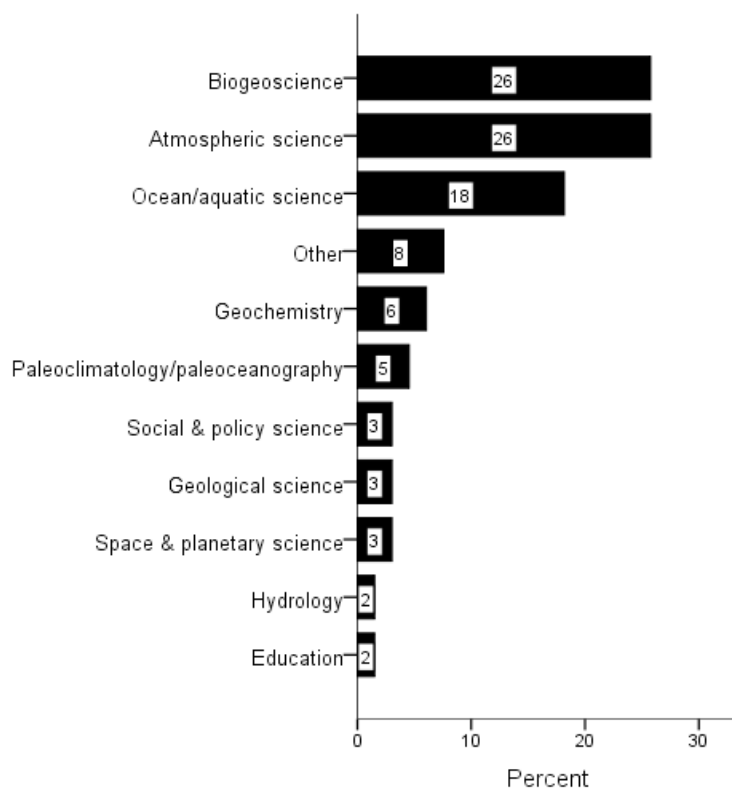
Education Level

Most participants (73%) indicated a Ph.D. as their highest degree, with 21% of respondents indicating masters and 6% bachelor's degrees.



Discipline

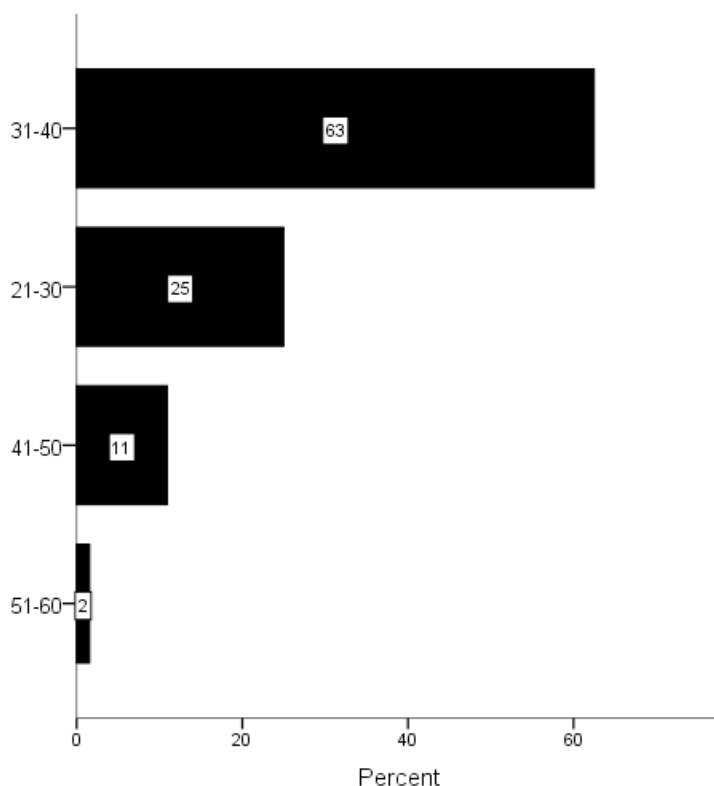
Three fields accounted for two thirds of participants: atmospheric science (26%), biogeoscience (26%), and ocean/aquatic science (18%). The rest of participants were distributed roughly equally across several other disciplines.

Workshop participants by discipline

Age and Ethnicity

Most women were between 31 and 40 years old (63%), with 25% in their twenties and a few in their forties. Most of the participants were white (71%); 11% (7) of attendees were Hispanic and 11% (7) Asian or Pacific Islander. In all, 16% (10) were from groups underrepresented in the sciences. Compared to the national statistics on U.S. Earth science women Ph.D. graduates, the workshop participants were slightly more racially and ethnically diverse ([S&E doctorates awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1998–2007](#), NSF reports).

Age distribution of workshop participants



Workshop motivations and expectations

We asked participants a series of questions about their motivations and expectations of the workshop. Only 27% of respondents had previously received similar training. An open-ended question asking what respondents hoped to gain from the workshop revealed one dominant response: more knowledge and skill in leadership and management.

The workshop met the expectations of all participants to some degree: 68% reported the workshop “fully met my expectations,” and 32% reported the workshop “somewhat met my expectations.” In comments on how the workshop met or did not meet their expectations the most common themes included:

- Confidence and belief in having gained knowledge and skills in leadership and management.
- Opportunity to network with other women scientists
- Supportive and encouraging environment.
- Expectations were not met because some participants found one particular day more relevant or valuable than the other. Most commonly, the first day met expectations and the second day met expectations to a lesser degree.

Accomplishment in career development

The table below compares participants' pre- and post-workshop self-assessments of their skills, abilities, knowledge, and perspectives in several areas of career development.

**Pre- and post-workshop survey means, t-test results, and effect sizes
for accomplishment in career development (n=47, matched sample only)**

| Survey Item | Pre-survey mean | Post-survey mean | P value | Effect Size <i>Cohen's D</i> |
|---|-----------------|------------------|---------|---------------------------------|
| Ability to communicate effectively with people I supervise | 2.72 | 3.05 | 0.003 | 0.53 |
| Preparedness to communicate your values clearly | 2.77 | 3.07 | 0.007 | 0.46 |
| Clarity about your values as a scientist or professional | 3.22 | 3.51 | 0.001 | 0.44 |
| Preparedness to navigate a path to your career goals | 2.81 | 3.05 | 0.029 | 0.39 |
| Self-promotion skills | 2.34 | 2.51 | 0.077 | 0.22 |
| Negotiation skills | 2.28 | 2.36 | 0.451 | 0.10 |
| Motivation to forge a career path that is right for you | 3.52 | 3.57 | 0.553 | 0.09 |
| Communication skills | 3.21 | 3.26 | 0.553 | 0.08 |
| Ability to identify mentors who are right for you | 2.88 | 2.93 | 0.635 | 0.07 |
| Access to role models or mentors | 2.78 | 2.79 | 0.886 | 0.01 |
| Ability to balance your career planning with your personal and family needs | 2.72 | 2.70 | 0.871 | -0.02 |
| Listening skills | 3.38 | 3.36 | 0.849 | -0.03 |
| Clarity about your career goals for the next 5 years | 2.93 | 2.90 | 0.766 | -0.05 |
| Clarity about your career goals for the next year | 3.31 | 3.31 | 1.000 | 0.00 |

Mean scores are given on a 4-point scale: 1=no accomplishment, 2= a little accomplishment, 3= some accomplishment, 4= a lot of accomplishment.

A paired samples T-test was conducted to determine if, on average, participants' pre-workshop self-rating of accomplishment in each area of career development differed from her post-workshop self-rating. A 95% confidence interval was selected to determine statistical significance. Because nearly the entire population of workshop participants was sampled, we do not necessarily need to rely upon significance testing to determine difference between pre and post-test means. Cohen's *D* was calculated for each mean difference (posttest mean minus pretest mean); this measure characterizes the magnitude of the differences between pre and post-test means. Cohen's *D* should be interpreted as follows: ≤ 0.20 = minimal effect, ≤ 0.50 = typical effect, ≥ 0.80 = substantial effect of the intervention on the participants (Vaske, 2008).

The mean scores for accomplishment in all but three career development items were higher in the post-survey than the pre-survey, indicating that participants perceived benefit from the workshop. Workshop participation had a statistically significant and meaningful effect on participants' level of accomplishment in four areas:

- Ability to communicate with subordinates
- Preparedness to communicate values as a scientist
- Clarity about one's values as a scientist or professional
- Preparedness to navigate a path to career goals.

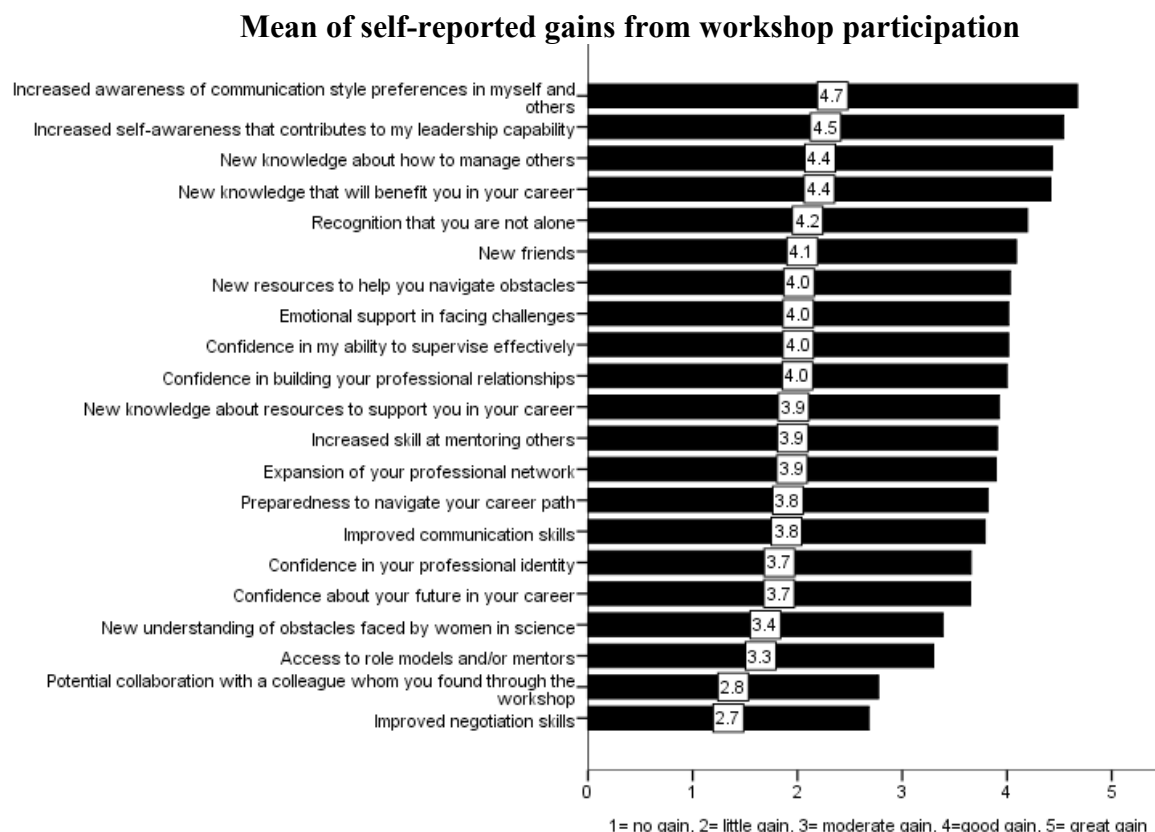
All other aspects of career development accomplishment were not statistically significant and exhibited negligible to minimal effect sizes.

On average, participation in the workshop produced moderate improvements for participants in one area clearly relevant to the workshop goals. Moderate improvements in three other areas seem to be more general benefits of career-related professional development, consistent with the 2011 and 2012 workshop results which showed similar performance on these more general benefits. Little to no improvement was seen in domains less strongly related to the workshop goals. These aspects were not emphasized in the workshop; the items were developed for the two previous years' survey and used here for comparison.

The results from both the 2011, 2012, and 2013 workshops indicate that our instrument demonstrates content validity in pre-test and post-test measurements. Results from each of these workshops showed the largest improvements in that workshop's areas of focus, and significantly lower gains in aspects of career development that were not emphasized. If the results showed similar gains across all career development measures, then the validity of the measurement would be questionable—a "halo" effect that suggests the items are measuring general satisfaction rather than specific areas of gain. Instead, differences in gains from item to item and from year to year suggest that our pre-test and post-test instruments accurately reflect real changes in participants' perceived career development.

Gains from workshop participation

Workshop participants were asked to rate their level of gain resulting from participation in the workshop for 21 items related to career development. The figure below shows these gains in order of gain score (lowest to highest). Participants reported gains in all 21 aspects; ten items showed “good” to “great” gains, nine items showed “moderate” to “good” gains, and two items showed “a little” to “moderate” gains. Similar to the pre- and post-test measures, the greatest gains were reported in areas emphasized by the workshop, with the exception of one item “confidence in my ability to supervise effectively.” The top two gains were associated with content most emphasized on the first day.



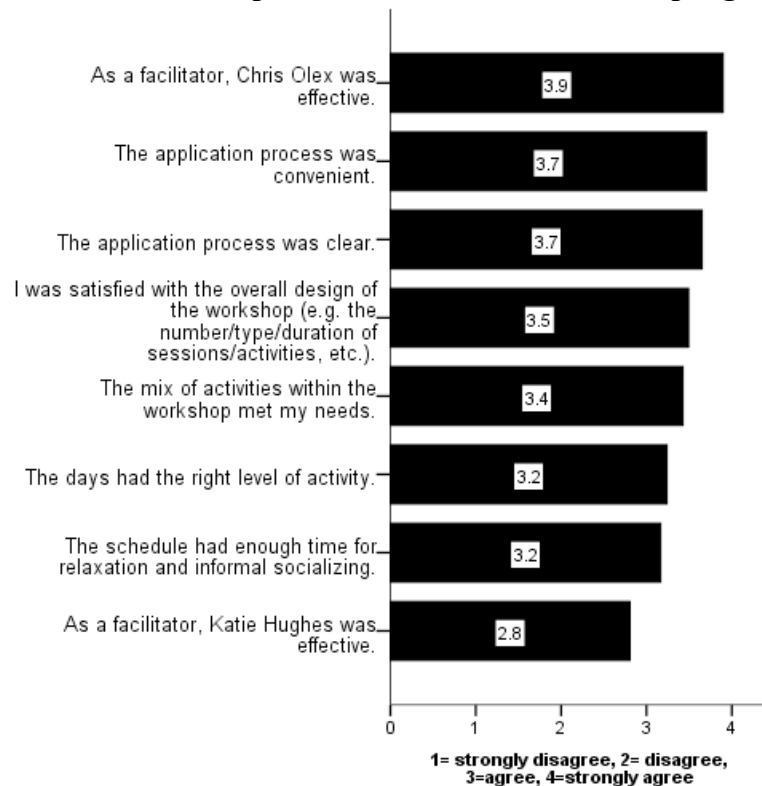
Logistics, format, and planning process of workshop

Overall, workshop participants were very satisfied with the logistics, format, and planning of the workshop. All but one respondent agreed that they were satisfied (45% strongly agree, 42% agree) with its overall design. Fewer than 4 participants disagreed with any one item shown in the figure below.

Respondents indicated that the length of the workshop as a whole was just right (93%) with the rest evenly split between too short and too long. Most respondents felt the length of individual sessions was just right (76%) with 18% reporting sessions as too long and 7% as too short.

We asked respondents for comments on the mix of activities or any particular activity. Some common themes were praise and/or critique of both workshop days, and the need for more breaks including some kind of physical or outdoor activity.

Participant satisfaction with workshop logistics, format, and planning



Participant experience

We asked respondents to tell us the greatest strength of the workshop and which aspect most needed improvement. The most commonly listed strengths included:

- Chris Olex's facilitation
- DISC session
- Networking opportunities
- Sense of community, safe and supportive environment.

The most commonly listed areas for improvement included:

- Second day: most participants indicated the information was valuable, but the delivery could have been improved. Instructions for activities were not always clear. The framework presented was too rigid and not flexible enough to fit their current work situations. Participants' attention was not fully held.
- More breaks or free time to exercise, socialize with other attendees, or explore Providence.
- Accommodations and food, especially uncomfortable beds and more vegetarian options.

After the workshop

We asked respondents how they planned to use their new knowledge and skills in their career.

The dominant themes included:

- Immediately implement newly acquired skills in current workplace or work group
- Tailor communications based on personality types
- Collaborate with other workshop attendees
- Conduct one on one meetings with subordinates.

We asked how respondents planned to stay in touch with or collaborate with colleagues from the workshop. The dominant themes included:

- Participate more often on the ESWN website
- Organize and attend meet-ups at conferences
- Attend local ESWN events (e.g. Front Range happy hour)
- Follow up via phone, Skype, email, and/or in person with other ESWN members.

Comments on the panel discussion and the third day activities were not extensive, but a few observations suggested that overall participants found these sessions useful. At least one participant suggested that the activity that required moving around would also have been useful for the second day activities.

When the written comments are combined with results from the quantitative items, the evidence shows that the workshop was overall a positive learning experience for participants. However, there is less evidence that participants took away a single, strong learning outcome from the workshop as compared to, for example, the 2012 workshop. Participants may have had more difficulty relating the content to their own academic and scientific settings or in seeing an overall coherent message across the workshop. Initial momentum in learning, cementing and applying new knowledge may have been dissipated on Day 2. For future workshop planning, this speaks to the importance not only of experienced facilitation, but of the workshop planners having clear goals and a strong understanding of the coherence of message across the workshop as a whole.

We do note some emphasis in the comments and in the reported gains on more general kinds of follow-up, such as making connections and participating in other ESWN activities. This may be related to changes in how members interact due to the transition from the listserv to the new web center, or to some discussion of ways to engage with ESWN on the final half day.

Conclusion

Overall, participants were very satisfied with the workshop. Participants reported distinct gains in several skills and abilities related to management and leadership, as well as growth in confidence in their ability to be an effective leader and manager. They reported satisfaction on all aspects of the format, logistics, and planning of the workshop. Workshop strengths included Chris Olex's facilitation, the DISC session, networking opportunities, and the sense of community and supportive atmosphere. Many workshop participants planned to immediately implement the leadership and management tools and skills in their workplace and to use the ESWN website to expand and use their professional network.

Acknowledgments

We thank Marina Kogan for observing workshop and administering the post-workshop survey. We also acknowledge Chris Olex and Katie Hughes for their help in identifying workshop objectives that were used to develop gains items used in the post-workshop survey.

Reference

Vaske, J.J. (2008) Survey research and analysis: Applications in parks, recreation and human Dimensions. State College, Pennsylvania: Venture Publishing Inc.

Appendix A



2013 Professional Development Workshop

Building Leadership and Management Skills for Success

Brown University
Providence, RI 02912



Chris Olex

Chris Olex is a Corporate Trainer and Facilitator specializing in team and personal development. Relying on experience gained from all levels of the training process — from customer management to delivery and evaluation — she works in partnership with a wide range of clients to design, develop, and deliver professional programs serving 10 to 500 participants.



Katie Hughes

Katie Hughes received her PhD in Chemistry from Princeton in 2008 where her advisor provided an excellent example of good management in an academic setting. Dr. Hughes cultivated her management skills in McMaster-Carr's management development program. In 2010 she patented a product and started her own manufacturing company while working full-time. After 3 months the company was profitable. After 8 months she was able to leave her job in the management development role and work as CEO of her own company.

MONDAY overview: Leadership Begins with YOU

The foundation to any great leader is the ability for that person to have a solid understanding of who they are and how they impact people. Whenever we can take time to further understand ourselves, our style, our motivations, and our ability to connect with others, we have the potential to identify what is helping us get what we want AND what might be getting in our way.

Some differentiating factors of great leadership include critical self-knowledge, sustained proactive inquiry, and a willingness to share our story as a means to building relationships and trust.

The goal of this training session is to expand our personal perspective in all of these areas. The workshop will have the following learning outcomes:

- Increase your self-awareness in different areas of leadership (and life!)
- Identify the 4 DISC personality styles – what are your tendencies and how do you 'play' with others?
- Discover the differentiating factors of great leaders – what do they do differently and how can I do that?
- Understand key factors in motivation for yourself and others – what increases motivation and what detracts?
- Learn about what vulnerability is, how it works, and if we need it to be a great leader

TUESDAY overview: Effective Management in a Research Environment

One common practice in academia is that we learn how to manage people based on observing the managerial styles of those under whom we have worked. Unfortunately, learning management by observation of others may leave some very serious gaps in basic knowledge. At the same time, being a good manager can make a huge difference in a career with better results from those that work for you and an easier work environment for you as a manager.

Using the DISC training from Monday's sessions and building upwards, we will focus on specific behaviors that lead to effective management and communication in an academic or research environment. The basics of good management lie in how we communicate and the relationships we have with those we work with.

The goal of this portion of the workshop is for us to leave the conference with a framework for managerial communication. Learning based goals for this workshop:

- Understand how good management is rooted in good communication
- Identify how your DISC personality style will affect your managerial communication
- Learn the power of positive feedback and how to deliver it effectively
- Discover the key factors that make one-on-ones successful and understand the differences between one-on-ones and work-update meetings
- Learn about coaching as a way to develop those working for you
- Practice modifying your communication style to better match those of people you work
- Have a basic a basic plan for introducing feedback, one-on-ones, coaching, and delegation in your group
- Gain confidence around delivering feedback

Sunday, June 9 7:30pm-9pm

Welcome
Introductions, Registration and Overview

Monday, June 10

9:00-9:15 Welcome and Overview from ESWN

9:15-10:45 Your Style
DISC Personality Assessment Review
What are the 4 styles?
What is your preferred style? Strengths? Drawbacks?
What do we need to know about other styles to connect better?

(Break)

11:00-12:30 Your Impact
What do you know and appreciate about great leaders?
How does your brain help you AND hurt you in key moments?
What needs really drive your behavior?
What do we need to know about heart and edge?

12:30-1:30 Lunch

1:30-3:00 Your Motivation
What really drives our motivation (and the motivation of those around us)?
How do we create an environment that allows for more motivation?
What drains our energy?
How can we shift our habits/schedules to get more motivation?

(Break)

3:15 -4:45 Your Story
What role does vulnerability play in your work? Does it have a place?
Are you a good listener?
What does trust look like for you?
What is potentially the most difficult part of trust?

Monday, June 10 6:00-9:30pm

Working Dinner
A panel of experts on leading and managing everything from field research to international, collaborative research projects to groups of undergraduate researchers. See registration insert for panelist bios.

Tuesday, June 11

- 9:00-9:05 Welcome and Overview from ESWN
- 4:45-5:00 Closing and Wrap-up from ESWN
- 9:05-10:45 Review of DISC; How communication relates to management
 How One-on-Ones, Feedback, Coaching lead to better communication?
 How can we break "communication" down into a series of behaviors?
- (Break)
- 11:00-12:00 Introduction to One-on-ones
 What is the goal of a one-on-one?
 Timing: Length, Frequency and Agenda
- 12:00-12:30 Introduction to Feedback
 What is feedback?
 Positive/adjusting feedback ratio
- 12:30-1:30 Lunch
- 1:30-2:15 Feedback Continued
 What is the feedback continuum?
 What do you need to do to start the feedback model in your own group?
- 2:15-3:00 Introduction to Coaching
 What does coaching entail?
 How does coaching relate to academia, research or teaching?
- (Break)
- 3:15-3:30 Delegation
 How do you hand off responsibility for a project?
 How do you follow-up to be sure that the delegated task is being done?
- 3:30-4:00 Rolling out the management trinity
 Time frame for introducing new management practices
 Common reactions to expect
- 4:00-4:45 Using these management behaviors in Academia and wrapping up
 What should I communicate to new members of my group when they join?
 Answering any final questions left in the "parking lot"
- 4:45-5:00 Closing and Wrap-up from ESWN

Tuesday, June 11 5:00-8:00 pmNetworking Reception

Open to all ESWN Members and invited guests. Sponsored by Brown University and the Environmental Change Initiative.

Wednesday, June 12 9am-12pm

9:30-9:35 Welcome and overview from ESWN

9:35-10:15 Redefining your leadership and management challenges

10:15-10:45 Workshop Survey

(Break)

11:15-11:45 Goal setting (with a twist)

11:45-12:00 Closing and Wrap-up from ESWN
Pick up box lunch