

Collaborative Research: Facilitating career advancement for women in the geosciences through the Earth Science Women's Network (ESWN)

Evaluation Report: 2011 Professional Development Workshop

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EXECUTIVE SUMMARY

Overall, workshop participants were very satisfied with the quality of the workshop. They made strong gains in a variety of aspects of professional development specifically targeted by the workshop. For example, attendees reported increases in clarity about their goals, preparedness to navigate their career paths, clarity about their values as scientists, and ability to communicate those values, as well as increases in self-promotion skills, motivation to forge their own career path, ability to identify appropriate mentors, and ability to balance career planning and personal needs. Workshop features that appear to have supported participants' gains include open and communal atmosphere, together with hands-on applications of practical career development skills.

PROJECT OVERVIEW

While the number of women receiving advanced degrees in the geosciences has been rising, the face of scientific leaders in academia remains dominantly 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, serving 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 career development workshops; professional networking events at major scientific conferences; and development of an ESWN web center that will build connections and collaborations for and among women in the Earth sciences.

The first professional development workshop "Developing Your Research Identity" took place in June 2011 in Boulder, CO. It focused on helping participants develop a vision of their desired career and transform it into a research mission, utilizing the individual strengths of the attendees. This was the primary goal of the first day of the workshop, team-coached by two facilitators: Carle Churgin and Kate Roeske. The workshop also aimed at helping participants devise a career plan and offered a variety of practical tools and skills helpful in implementing that plan. This was the focus of the second day of the workshop, facilitated by Kerry Ann Rockquemore. All the facilitators incorporated some active-learning activities and hands-on applications of the learnt material into their agenda. Open discussion was also welcomed by the facilitators, although skillfully steered to stay on topic. At the end of the workshop, accountability groups to help

participants set and keep goals were facilitated by the organizers, and later finalized via email. The organizers also created Google groups as electronic infrastructure for the accountability groups that were formed.

In this report, we provide the analysis of the workshop outcomes and formative feedback to the project team for use in planning subsequent workshops.

INTRODUCTION AND DATA SET

The Boulder 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. Forty-seven of forty-eight participants completed the pre-workshop survey. The one remaining participant registered late and did not have an opportunity to fill out the pre-workshop questionnaire. Another applicant completed the pre-workshop survey but did not attend the workshop. Her responses are included in the pre-survey analysis as representative of the applicant group.

Another questionnaire was administered at the end of the workshop; forty-two of the forty-eight participants completed the post-workshop survey. 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 or capacities, their gains from attending the workshop and their perceptions of the overall quality of the workshop. For example, on both pre- and post- 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). Open-ended questions addressed participants' expectations and motivations for attending the workshop, their impressions and learning from the workshop, 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- 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.

METHODS

Responses to numerical items were entered into the statistical analysis program SPSS, where descriptive statistics were computed. Means and standard deviations 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) were excluded from the pairwise comparison of pre- and post- data. The resulting sample size for the

pairwise pre-post comparison is N=40. 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: Pre-workshop Survey

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 (n=48) came from diverse institutional backgrounds and represented a variety of career stages. Most respondents worked at Ph.D.-granting research universities (77%), followed by government or national labs/agencies (13%), and four-year colleges (4%), not-for-profit organizations or NGOs (4%), and master-granting comprehensive universities (2%). The largest portions of workshop participants were graduate students (27%) and postdoctoral fellows (27%), closely followed by tenured and untenured faculty (21%) and researchers (21%). Most participants (69%) indicated a Ph.D. as their highest degree, with 27% of respondents indicating masters and 4% bachelor's degrees. The most represented discipline was atmospheric science (50%), followed by biogeoscience (10%), with the rest of participants distributed somewhat equally across a dozen disciplines.

Most women were between 30 and 40 years old (50%), with 38% in their twenties and 13% in their forties. Most of the participants were white (77%); 13% (4) of attendees were Hispanic, 4% Asian, 4% (2) African-American, and 2% (1) were multiracial. Compared to the national diversity statistics of 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). The overall proportion of women of color was comparable to the national distribution.

Goals and motivations for the workshop

Open-ended responses revealed that respondents had fairly high hopes for the workshop. Several themes that emerged from the responses to questions on registrants' goals and motivations were defining career goals and identifying a path towards those goals, exploring alternative career paths, networking and developing mentoring relationships, and building confidence, communication, negotiation, and self-promotion skills. In general, respondents' personal aims were congruent with planners' aims, indicating that the intent of the workshop was accurately communicated to potential participants.

KEY FINDINGS: Post-workshop Survey

Overall, workshop participants (n=42) rated the workshop very highly and were satisfied with both conceptual and logistical aspects of the workshop.

For all the measures of accomplishment in various professional skills and capacities discussed below, we used a four-point Likert scale. However, the scale items inadvertently got renamed in the pre-survey but not in the post-survey. Thus, in the pre-workshop survey the scale items are ‘None’(1), ‘Low’(2), ‘Medium’(3), and ‘High’(4), while in the post-workshop survey the same scale items are named ‘None’(1), ‘A little’(2), ‘Some’(3), and ‘A lot’(4). For the sake of brevity, we hereafter will use the item names used in the pre-survey scale.

Clarity about career goals for the next year: Pre/post comparison

Workshop participants were asked to rate their current clarity about career goals for the next year on both pre- and post-workshop surveys. On the pre-survey, the largest group of participants (46%) rated their goal clarity as Medium, followed by High (40%). The mean of goal clarity on the pre-survey was 3.23, with standard deviation (st.dev.) of 0.73. However, in the post-survey, most participants rated their goal clarity as High (73%), followed by Medium (24%). The mean of next-year goal clarity on the post-survey rose to 3.70 (st.dev.=0.52). The difference between post- and pre-workshop means was statistically significant, indicating a significant increase in the clarity about career goals for the next year among participants after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	0	0%	None (1)	0	0%
Low (2)	7	15%	Low (2)	1	2%
Medium (3)	22	46%	Medium (3)	10	24%
High (4)	19	40%	High (4)	30	73%

Overall, 98% of participants left the workshop rating their clarity about career goals for the next year as Medium or High.

Clarity about career goals for the next 5 years: Pre/post comparison

Workshop participants were also asked to rate their current clarity about career goals for the next 5 years on both pre- and post-workshop surveys. On the pre-survey, the largest group of participants (56%) rated their goal clarity as Low, followed by Medium (33%). The mean of 5-year goal clarity on the pre-survey was 2.48 (st.dev.=0.68). However, on the post-survey, most participants rated their goal clarity as Medium (56%), followed by High (22%). The mean of 5-year goal clarity on the post-survey rose to 3.00 (st.dev.=0.72). The difference between post- and pre-workshop means was statistically significant, indicating a significant increase in the clarity about career goals for the next 5 years among participants after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	1	2%	None (1)	1	2%
Low (2)	27	56%	Low (2)	8	20%
Medium (3)	16	33%	Medium (3)	23	56%
High (4)	4	8%	High (4)	9	22%

The percentage of participants feeling clear about their 5-year goals is understandably lower than the portion of those who felt clear about their goals for the next year.

Clarity about your values as a scientist: Pre/post comparison

Workshop participants were also asked to rate their current clarity about their values as scientists. On the pre- survey, most participants (54%) rated their value clarity as Medium, followed by Low (25%). The mean of clarity about values on the pre- survey was 2.88 (st.dev.=0.65). However, on the post- survey, most participants rated their clarity about their values as scientists as High (56%), followed by Medium (42%). The mean of value clarity on the post- survey rose to 3.55 (st.dev.=0.55). The difference between post- and pre-workshop means was statistically significant, indicating a significant increase in respondents’ clarity about their values as scientists after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	1	2%	None (1)	0	0%
Low (2)	12	25%	Low (2)	1	2%
Medium (3)	26	54%	Medium (3)	17	42%
High (4)	9	19%	High (4)	23	56%

Overall, 98% of participants left the workshop rating their clarity about their values as scientists as Medium or High.

Preparedness to communicate your values clearly: Pre/post comparison

Workshop participants were asked to rate their preparedness to communicate their values clearly. On the pre- survey, the largest group of participants (48%) rated their preparedness as Medium, closely followed by Low (42%). The mean of preparedness on the pre- survey was 2.55 (st.dev.=0.72). However, on the post- survey, the overwhelming majority of participants rated their preparedness as Medium (76%), followed by High (17%). The mean of preparedness on the post- survey rose to 3.10 (st.dev.=0.55). The difference between post- and pre-workshop means was statistically significant, indicating a significant increase in respondents’ preparedness to communicate their values clearly after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	2	4%	None (1)	1	2%
Low (2)	20	42%	Low (2)	2	5%
Medium (3)	23	48%	Medium (3)	31	76%
High (4)	3	6%	High (4)	7	17%

Overall, 93% of participants left the workshop rating their preparedness to communicate their values clearly as either Medium or High.

Motivation to forge a career path that is right for you: Pre/post comparison

Workshop participants were asked to rate their motivation to forge the right career path. On the pre- survey, the largest group of participants rated their motivation to forge their own career path

as High (42%), closely followed by Medium (37%). The mean rating of career path motivation on the pre-survey was 3.08 (st.dev.=0.88). However, on the post- survey, the overwhelming majority of participants rated their career path motivation as High (71%), while the proportion of respondents rating their motivation as Medium decreased to 22%. Overall, the mean of career path motivation ratings on the post- survey rose to 3.63 (st.dev.=0.63). The difference between post- and pre-workshop means was statistically significant, indicating a significant rise in respondents' motivation to forge a career path that's right for them after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	1	2%	None (1)	0	0%
Low (2)	9	19%	Low (2)	3	7%
Medium (3)	18	37%	Medium (3)	9	22%
High (4)	20	42%	High (4)	29	71%

Overall, 93% of participants left the workshop rating their motivation to forge a career path that's right for them as either Medium or High.

Preparedness to navigate a path to your career goals: Pre/post comparison

Workshop participants were also asked to rate their preparedness to navigate a path to their career goals. On the pre- survey, half of participants rated their preparedness as Low, followed by Medium (42%). The mean of preparedness on the pre- survey was 2.60 (st.dev.=0.63). However, on the post- survey, most participants rated their preparedness as Medium (68%), followed by High (25%). The mean of preparedness in the post- survey rose to 3.18 (st.dev.= 0.55). The difference between post- and pre-workshop means was statistically significant, indicating a significant increase in respondents' preparedness to navigate a path to their career goals after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	1	2%	None (1)	0	0%
Low (2)	24	50%	Low (2)	3	7%
Medium (3)	20	42%	Medium (3)	28	68%
High (4)	3	6%	High (4)	10	25%

Overall, 93% of participants left the workshop rating their preparedness to navigate their career path as Medium or High.

Self-promotion skills: Pre/post comparison

Workshop participants were also asked to rate their skills in promoting themselves. They started out with somewhat low ratings of their self-promotion skills. On the pre- survey, most participants (67%) rated their self-promotion skills as Low, followed by Medium (17%). The mean rating of self-promotion skills on the pre- survey was 2.25 (st.dev.=0.71). However, on the post- survey, the largest group of participants rated their skills in promoting themselves as Medium (44%), and the proportion of respondents rating their self-promotion skills as Low

decreased to 42%. Overall, the mean of self-promotion skills ratings on the post- survey rose to 2.68 (st.dev.=0.73). The difference between post- and pre-workshop means was statistically significant, indicating a significant rise in respondents' self-promotion skills after the workshop was completed.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	4	8%	None (1)	1	2%
Low (2)	32	67%	Low (2)	17	42%
Medium (3)	8	17%	Medium (3)	18	44%
High (4)	4	8%	High (4)	5	12%

Overall, the self-promotion skills ratings remained moderate, with 66% of participants rating their skills as either Medium or High at the completion of the workshop.

Listening skills: Pre/post comparison

Workshop participants started out with already strong ratings of their listening skills. On the pre-survey, most participants (52%) rated their preparedness as High, followed by Medium (38%). The mean rating of listening skills on the pre- survey was 3.40 (st.dev.=0.71). The distribution of responses did not shift dramatically on the post- survey. The percentage of participants rating their listening skills as High slightly increased (56%). The mean rating of listening skills on the post- survey rose very slightly to 3.53 (st.dev.= 0.55). The difference between post- and pre-workshop means was not statistically significant, indicating no significant change in the listening skills between pre- and post- surveys.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	0	0%	None (1)	0	0%
Low (2)	5	10%	Low (2)	2	5%
Medium (3)	18	38%	Medium (3)	16	39%
High (4)	25	52%	High (4)	23	56%

The lack of significant difference is somewhat surprising, since the workshop included a listening exercise, which however was peripheral to the main focus of the workshop. The participants started the workshop with rather high ratings for their listening skills, making the improvement not statistically significant. It is likely that such high initial ratings were based on a more basic definition of listening skills than the three-level model advocated by the facilitators. Thus, it is possible that lack of significant improvement on this indicator points to the heightened and more sophisticated standards for listening, as opposed to the lack of learning and improvement in this skill.

Communication skills: Pre/post comparison

Workshop participants started out with rather strong ratings of their communication skills. On the pre- survey, most participants (63%) rated their communication skills as Medium, followed by High (29%). The mean rating of communication skills on the pre- survey was 3.15 (st.dev.=0.58). The distribution of responses did not shift dramatically on the post- survey. The

percentage of participants rating their communication skills as Medium slightly decreased (61%) as did the proportion of participants rating their communication skills as High (22%). The mean rating of communication skills on the post- survey thus fell slightly to 3.03 (st.dev.=0.70). The difference between post- and pre-workshop means was not statistically significant, indicating no significant change in the communication skills between pre- and post- surveys. This is not surprising, as the workshop was not aimed at development of communication skills.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	0	0%	None (1)	1	2%
Low (2)	4	8%	Low (2)	6	15%
Medium (3)	30	63%	Medium (3)	25	61%
High (4)	14	29%	High (4)	9	22%

Negotiation skills: Pre/post comparison

Workshop participants started out with rather low ratings of their negotiation skills. On the pre-survey, most participants rated their negotiation skills as Low (65%), followed by Medium (19%). The mean rating of negotiation skills on the pre- survey was 2.17 (st.dev.=0.68). The distribution of responses did not shift dramatically in the post-survey. The percentage of participants rating their negotiation skills as Medium somewhat increased (32%), while the proportion of participants rating their negotiation skills as Low somewhat decreased (44%). The mean rating of negotiation skills in the post- survey rose very slightly to 2.23 (st.dev.=0.83). The difference between post- and pre-workshop means was not statistically significant, indicating no significant change in negotiation skills between pre- and post- surveys. This is somewhat expected, since the workshop was not specifically geared towards developing negotiation skills.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	5	10%	None (1)	8	19%
Low (2)	31	65%	Low (2)	18	44%
Medium (3)	9	19%	Medium (3)	13	32%
High (4)	3	6%	High (4)	2	5%

Ability to identify mentors who are right for you: Pre/post comparison

Workshop participants were asked to rate their ability to identify mentors who are right for them. On the pre- survey, the largest group of participants (40%) rated their ability to identify the right mentors as Medium, followed by Low (30%). The mean rating for ability to identify the right mentors on the pre- survey was 2.82 (st.dev.=0.85). However, on the post- survey, the proportion of respondents who rated their ability in identifying right mentors as Medium increased to 49%, together with the percentage of participants rating their ability as High (32%). Overall, the mean of mentor-identifying ability ratings on the post- survey rose to 3.10 (st.dev.=0.82). The difference between post- and pre-workshop means was statistically significant, indicating a significant rise in respondents’ ability to identify mentors who are right for them after the workshop completion.

Pre (N=47)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	2	4%	None (1)	2	5%
Low (2)	14	30%	Low (2)	6	14%
Medium (3)	19	40%	Medium (3)	20	49%
High (4)	12	26%	High (4)	13	32%

Overall, 81% of participants left the workshop rating their ability to identify mentors who are right for them as either Medium or High.

Access to role models or mentors: Pre/post comparison

Workshop participants were asked to rate their access to role models or mentors. On the pre-survey, the largest group of participants (40%) rated their access to role models as Medium, followed by Low (31%). The mean rating for access to mentors on the pre-survey was 2.80 (st.dev.=0.88). The distribution of responses did not shift dramatically on the post-survey. The proportion of respondents who rated their access to role models as Medium increased slightly (46%), together with the percentage of participants rating their access as High (29%). The mean of access to mentors ratings on the post-survey rose slightly to 3.00 (st.dev.=0.85). The difference between post- and pre-workshop means was not statistically significant, indicating no significant change in respondents' access to role models between pre- and post-surveys. This is somewhat expected, since the workshop was not specifically geared towards connecting participants with mentors.

Pre (N=48)			Post (N=41)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	3	6%	None (1)	2	5%
Low (2)	15	31%	Low (2)	8	20%
Medium (3)	19	40%	Medium (3)	19	46%
High (4)	11	23%	High (4)	12	29%

Ability to balance your career planning with your personal and family needs: Pre/post comparison

Workshop participants were asked to rate their ability to balance their career planning with their personal and family needs. On the pre-survey, the largest group of participants (46%) rated their ability to balance their career planning and personal needs as Low, followed by Medium (37%). The mean rating for this indicator on the pre-survey was 2.71 (st.dev.=0.73). However, on the post-survey, the largest portion of respondents rated their ability to balance career and family planning as Medium (44%), closely followed by High (41%). The mean for this indicator in the post-survey increased to 3.26 (st.dev.=0.72). The difference between post- and pre-means was statistically significant, indicating a significant rise in respondents' ability to balance career planning with personal and family needs at the workshop completion.

Pre (N=48)			Post (N=39)		
Rating	# of respondents	%	Rating	# of respondents	%
None (1)	0	0%	None (1)	0	0%
Low (2)	22	46%	Low (2)	6	15%
Medium (3)	18	37%	Medium (3)	17	44%
High (4)	8	17%	High (4)	16	41%

Overall, 85% of participants left the workshop rating their ability to balance career planning and personal and family needs as Medium or High.

On the whole, the workshop participants made significant improvements in several aspects of professional development. They reported pre-to-post improvement in clarity about their goals for the next year and the next 5 years, clarity about their values as scientists, preparedness to communicate those values clearly, motivation to forge career paths that are right for them, preparedness to navigate a path to their career goals, self-promotion skills, ability to identify mentors who are right for them, and ability to balance career planning with personal needs. All these professional skills and capacities were specifically addressed in the workshop content. Thus, it is encouraging that the participants report improvement in the skills and capacities, development of which was the intended focus of workshop. On the other hand, participants reported no significant improvement in the aspects of professional development not specifically addressed by the workshop, such as listening skills, communication skills, negotiation skills, and access to role models or mentors.

Moreover, the indicators that did not change much from pre- to post- survey serve as tests of the validity of the instrument. The fact that some indicators showed improvement and others did not, attests to the meaningfulness of the reported improvements. Also, respondents' ability to discriminate between the ability to identify an appropriate mentor and their access to mentors is noteworthy. These are both aspects of mentoring, but they show distinct gains, which are appropriate for the focus of the workshop.

At the end of the workshop, participants felt strong about some of their skills and capacities. They rated highly their clarity about their goals and values, their motivation to forge careers right for them, and their abilities to identify appropriate mentors and to balance career planning and family needs. All these indicators are related to rather internal process of decision-making. However, when it comes to more external, practical skills and steps needed to achieved the desired goals, respondents did not feel as strong. Despite the significant increase from pre- to post-, the mean ratings for self-promotion skills, the preparedness to communicate values clearly, and the preparedness to navigate a path to their career goals remained somewhat low at the end of the workshop. This is an important indication of ESWN members' further needs.

Overall quality of workshop

Workshop attendees rated the overall quality of the workshop very highly. A sizable majority of participants (73%) indicated that the workshop fully met their expectations, and the remaining participants indicated that the workshop somewhat met their expectations (27%). No attendees reported that the workshop did not meet their expectations.

Most participants (83%) indicated that the length of workshop was just right, and the remaining participants (17%) indicated that the workshop was too short. No attendees reported that the workshop as a whole was too long. Most participants (78%) also reported that the length of individual sessions was just right, while 10% of respondents thought the sessions were too long and 12% felt they were too short.

In their open-ended comments about workshop length, respondents acknowledged that 2 ½ days was the right duration most scientist could stay away from work, but many would have liked to spend more time learning about important topics covered in the workshop. Thus, logistically the length was perfect, but from the point of view of interest and learning, many participants wanted more. While many respondents commented on the good balance between the first day of general and personal reflection and the second day of very practical information and skills, many also would have preferred a shorter or more compact first day and more time with the second facilitator. Several respondents also commented on the need for more reflection and practice time.

In their open-ended responses, participants also commented on particular aspects of the workshop that worked especially well for them. Many pointed out the openness and approachability of both presenters and participants, together with a warm and friendly atmosphere as the aspects they appreciated most. Many participants suggested that networking, developing a community, and talking to other women who are going through or already went through similar experiences was invaluable to them. Many respondents also found the practical skills to advance their career especially useful. The most useful topics and activities included planning and scheduling, accountability groups, finding applications of one's strengths in their work, vision and mission statement, overcoming resistance, and the weekly planning strategy of "Sunday meeting."

On the other hand, attendees suggested some improvements to the workshop. Many participants commented that presented information needed to be relevant for all types of participants – with different career paths, not only tenure-track faculty. For example, several participants suggested that they were not planning to seek tenure-track jobs, and thus the focus of the second day on the tenure process was unhelpful to them. Similarly, some respondents expressed a need for activities suitable for both extroverted and introverted participants. Some organizational improvements include clearer communication and more advanced notice in preparation for the workshop. The activities and topics that seemed least useful to some attendees include embodying one's strengths, the listening exercise, the tenure-track focus of the second day, as well as strong focus of the senior scientist panel on their personal stories rather than transferable career advice.

Logistics

Participants were asked to rate various aspects of the workshop logistics. All the respondents strongly agreed (63%) or agreed (37%) that they were satisfied with the overall design of the workshop. No participants disagreed or strongly disagreed. An overwhelming majority of respondents strongly agreed (60%) or agreed (38%) that the application process was convenient. Only one respondent disagreed with that statement. Similarly, all but one respondent strongly agreed (54%) or agreed (44%) that the application process was clear.

All the participants strongly agreed (61%) or agreed (39%) that the workshop days had the right level of activity. Similarly, all the participants strongly agreed (63%) or agreed (37%) that the mix of activities within the workshop met their needs. Moreover, all the participants either strongly agreed (83%) or agreed (17%) that the workshop facilitators were overall effective.

The majority of respondents strongly agreed (38%) or agreed (57%) that the workshop schedule had enough time for relaxation and informal socializing; 5% disagreed. While 25% of workshop participants strongly agreed and 59% agreed that the amount of time given for working in accountability groups was adequate, a sizable minority (16%) disagreed. Similarly, some participants (7%) disagreed that they were satisfied with the amount of interaction they had with colleagues in the workshop overall, while the majority of participants either agreed (36%) or strongly agreed (57%) with this statement. In their open-ended responses, some attendees noted that they would have preferred having some more time for reflection and socializing.

Gains and Deliverables from the Workshop

Participants were asked about their level of completion of several deliverables that were emphasized in the workshop activities. By the end of the workshop, most participants had either developed a mission statement (27%) or were in the process of developing one (71%); one participant had not started. The majority of respondents had developed a professional plan for the next six months (66%) and 30% were still in the process; only 2 respondents had not started. On the other hand, only 15% of participants had developed a research statement, with another 40% in progress. The largest portion of participants (46%) had not developed a research statement by the end of the workshop. Similarly, a majority of respondents (68%) had not yet developed a professional website, with 12% in progress; only 20% had developed a site. This is not surprising, since developing both a research statement and a professional website are laborious and time-consuming tasks, and no time was set aside for them during the workshop.

In addition to direct pre/post comparison on their self-ratings on specific professional skills and capacities, respondents were asked to rate the gains they had made through their participation in the workshop. On these items, the Likert scale ranged from “No gain” (1), through “A little gain” (2), “Moderate gain” (3), and “Good gain” (4), to “Great gain” (5). The largest portion of participants (48%) reported a good gain in expanding their professional network, followed by moderate gain (26%). The mean rating for this item was 3.50 (st.dev. =0.89), placing the group overall between moderate and good gain. Respondents made even stronger gains on other measures. For example, most participants (69%) reported great gains in new knowledge that will benefit them in their career, followed by good gain (26%). The mean rating for this item was 4.64 (st.dev. =0.58), placing the group overall between good and great gains.

Other strong gains include gains in new knowledge about resources to support respondents in their career. Most respondents reported either good (45%) or great (48%) gain on this measure. The mean rating for this item is 4.38 (st.dev.=0.70). Similarly, the majority of participants reported making good (15%) or great (68%) gains in recognition that they are not alone. The mean rating for this item is 4.39 (st.dev.=1.046). In the same vein, the largest portion of respondents reported making a great gain (45%) in new resources to help them navigate

obstacles, closely followed by good gain (43%). The mean rating for this item is 4.33 (st.dev.=0.69).

Participants reported more mild gains on other indicators. Most were moderate, but some were rather small, generally on indicators that measured gains in spheres or skills not specifically addressed by the workshop:

- Emotional support in facing challenges – mean=4.02, st.dev.=1.01
- Confidence about your future in your career – mean=3.93, st.dev.=0.75
- Preparedness to navigate your career path – mean=3.88, st.dev.=0.83
- New understanding of obstacles faced by women in science – mean=3.81, st.dev.=1.15
- Confidence in your professional identity – mean= 3.71, st.dev.=0.97
- New friends – mean=3.68, st.dev.=1.08
- Confidence in building your professional relationships – mean=3.38, st.dev.=0.99
- Access to role models and/or mentors – mean=2.98, st.dev.=1.17
- Increased skill at mentoring others – mean=2.79, st.dev.=0.84
- Improved communication skills – mean=2.71, st.dev.=0.98
- Potential collaboration with a colleague whom you found through the workshop – mean=2.44, st.dev.=1.31
- Improved negotiation skills – mean=1.74, st.dev.=0.80

Again, the gains were lower on the skills not specifically emphasized in the workshop, such as communication and negotiation skills. Moreover, some areas where participants indicated high and moderately high gains coincide with the professional skills and capacities that increased from pre- to post- survey. For example, the rather high gains in preparedness to navigate a career path coincide with the significant increase in ratings for preparedness to navigate a path to career goals. Thus, these two measures could be seen as two distinct means of measuring the same effect, and thus validating each other. Moreover, some areas where gains were weak match the skills and capacities, ratings for which did not increase significantly from pre- to post- survey, such as communication skills and negotiation skills. Once again, this congruence validates both instruments.

Staying in touch

Attendees were asked how they were planning to stay in touch with other participants. Most respondents reported planning to meet at the future conferences, specifically the upcoming Fall AGU meeting, and keeping in touch through email and social networking sites, as well as through their local and long-distance accountability groups.

CONCLUSION

Overall, workshop participants were very satisfied with the quality of the workshop. They reported significant changes in their clarity about their goals and about their values as scientists, in their preparedness to navigate their career paths and preparedness to communicate their

values. Attendees also reported significant changes in their self-promotion skills, motivation to forge a career path that's right for them, ability to identify mentors who are right for them, and ability to balance career planning and personal and family needs. At the end of the workshop, all these indicators were significantly higher than at its beginning. Workshop features that appear to have supported participants' gains include its open and supportive atmosphere, together with hands-on applications of the practical career development skills learnt. However, to further improve the workshop, planners should make an effort to ensure that workshop materials are helpful to all types of participants, including those pursuing career paths other than academia, those in various career stages, and with different preferences for workshop learning.

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Survey Item Sources:

1. Collaborative Research: Research, Dissemination, and Faculty Development of Inquiry-Based Learning (IBL) Methods in the Teaching and Learning of Mathematics. Evaluation Report: University of Texas, Austin Workshop (May 2010)
2. ESWN Baseline survey
3. Evaluation of the Atmospheric Science Collaborations and Enriching NeTworks (ASCENT) Conference, June 15-17, 2009
4. Long-term outcomes from the Atmospheric Science Collaborations and Enriching NeTworks (ASCENT) workshop: Results from the longitudinal survey