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Introduction to the 2015 External Evaluation Report

NCWIT in 2015
More than ten years after NCWIT’s founding, women remain grossly underrepresented in technical fields. According to a 2015 report released by “Change the Equation” - an alliance of Fortune 500 companies committed to expanding tech education - women comprise 24 percent of the engineering workforce (a 25 percentage point decrease since 2001) and 36 percent of the computing workforce (a figure that remains unchanged since 2001). In higher education, the figures are also grim. According to the National Student Clearinghouse’s analysis of IPEDs data, only 19 percent of engineering bachelor’s degrees are awarded to women - a figure that has not budged since 2004. As for computer science majors, the percentage of women who earned bachelor’s degrees dropped from 23 percent in 2004 to 18 percent in 2014. Because a preponderance of job growth is concentrated in the technology sector, and because technical jobs tend to be desirable in terms of pay, benefits, and amenities, women’s underrepresentation in these jobs contributes substantially to gender inequality.

But beyond a social justice issue, ensuring a labor supply to the rapidly expanding technology industries (as well as virtually every other industry whose survival depends on some degree of technical proficiency) is vital to America’s economic competitiveness. This reality is not lost on America’s competitors. For instance, in 2015, German politicians began seriously discussing implementing a compulsory computer science track in their secondary school system (England already introduced mandatory computer science education in 2014). It is therefore unequivocally clear that NCWIT and like-minded organizations are needed to ensure a more representative technical labor force.

To the U.S.’s credit, in 2015, several states and locales, such as New York City, continued to expand K-12 access to computer science in public schools, and the Obama administration has aggressively pushed to expand computer science education with a focus on underrepresented groups. Also in 2015, Code.org declared that it met its goal of reaching 100 million students for its hour of code. And, strikingly, the organization announced that 4,000 girls enroll on its Code Studio platform per day. Thus, although major obstacles preclude women’s advancement into technical majors and jobs, there is considerable momentum at the local, state, and national level to address these challenges. NCWIT continues to be an important player in this movement.

In 2015, NCWIT began a serious conversation about enacting its “sunset clause” – that is, its commitment to disband after 20 years of change making. About halfway toward this 20-year mark (2024), NCWIT has begun to take stock of what it has accomplished and what remains to be done. On one hand, a number of NCWIT’s longer-term members have, as Lucy Sanders puts it, “diversity embedded in their DNA.” These organizations have, in a sense, “graduated” having instituted sustainable programs, are continually working to transform their organizational cultures, and increased the number of net new women. On the other hand, NCWIT’s membership base continues to expand, and many newer members continue to benefit from NCWIT’s efforts to spread awareness and motivate change. Moving ahead, NCWIT must now consider how to leverage the expertise of long-term, success story members while still providing support and spreading awareness to incoming organizations. This
tension is perhaps most strongly felt in NCWIT’s intensive change programs – Pacesetters and Extension Services – where experienced members convene with newer members to fast-track organizational change.

In order to more effectively evaluate NCWIT at this transitional moment, we need a model that allows us to evaluate NCWIT’s traditional efforts around organizational capacity-building while also providing empirical evidence of how and to what extent NCWIT has helped increase the meaningful participation of women in technology. That is, we need a model that links NCWIT’s inputs – its traditional three-pronged strategy – to NCWIT’s outputs – sustainable organizational change. We therefore have decided to structure our annual external evaluation report in accordance with NCWIT’s “Theory of Change,” as we believe this allows us to better evaluate the process by which NCWIT creates sustainable impact through organizational transformation. Thus, this report is intended to help NCWIT evaluate the effectiveness of its traditional efforts as well as contribution to creating lasting and meaningful change.

Logic of the Report
Below we present NCWIT’s Theory of Change – the product of collaboration between the external and internal evaluators.

In this process, NCWIT’s Three-Pronged Strategy – the primary focus of our previous evaluation reports – is viewed as providing the necessary conditions for change. By building capacity, creating and distributing resources, and conducting outreach, NCWIT intends to raise awareness, spread knowledge,
and motivate members to act. The majority of evaluation metrics in prior reports were designed to measure these outcomes.

We have less thoroughly evaluated the latter stages of the change model: action and impact. In theory, increased awareness and knowledge and heightened motivation among NCWIT’s membership base should result in individual and organizational actions, which, in turn, should result in the increased meaningful participation of women in technology.

In this report, we revisited a handful of old metrics and evaluated them as indicators of action and impact. In addition, we also added new items to the Members Survey that more explicitly measure individual and organizational actions. These new items revealed a great deal about the extent that NCWIT helps members forge alliances in their organizations. They also helped us understand what members do to facilitate change in ways both minor and major. We therefore believe we have a better understanding of how action – the mechanism that links NCWIT’s Three-Pronged Strategy to sustainable impact – plays out in NCWIT’s member organizations.

Evaluating NCWIT’s impact has proven to be more difficult, given methodological and logistical constraints. Yet, we believe that some metrics reported in earlier reports provide a glimpse into NCWIT’s potential impact. The growth of the Aspirations in Computing program and the positive association between NCWIT membership and female graduation rates are two examples. But, much like NCWIT, we are in the process of determining new ways to evaluate impact. Some of these new strategies appear in our impact section, though, at the moment, they serve as placeholders until we gather the relevant data for analysis. Over the next few years, we intend to collaborate with NCWIT to consider additional possibilities for measuring and evaluating impact.

The 2015 annual report is organized as follows: We first provide a traditional executive summary of our results. Then, following the Theory of Change model from NCWIT’s Three-Pronged Strategy to impact, we offer more detailed presentations of our findings as well as recommendations. Finally, we include a section that briefly summarizes NCWIT’s progress on its NSF promises so that NCWIT can easily reference these figures while drafting its annual RPPR report.

In this report, this icon indicates a suggestion or recommendation for NCWIT to consider.

Conclusions for each section are indicated by an arrow.

Member feedback and anecdotes from NCWIT communications are indicated by a dialogue box.

Note: Success Metric data is not available for all years (2006-2015). Some metrics have been added in different years.
2015 External Evaluation Report Executive Summary

NCWIT Builds a Strong Community of Diverse Organizations and Members

**NCWIT continues to grow the community.** Membership at the end of 2015 was at a high of 665 organizations. The Academic Alliance grew to 405 organizations and the K-12 Alliance grew 53% with the introduction of associate member types. NCWIT’s alliances also continue to be comprised by a diversity of organization types and two alliances – the EA and K-12 Alliance – have undergone significant reorganizations.

**The community is strong and values their work with NCWIT.** In 2015, more than 96% of members found NCWIT membership useful to them personally or to their organization. Belief in the value of diversity is shown through the healthy level of diversity in NCWIT’s leadership and staff.

NCWIT Spreads Awareness and Knowledge to Change Leaders, Targeted Non-Member Audiences, and the Public

**NCWIT creates research-based resources to spread awareness and increase motivation.** In 2015, NCWIT created 20 new resources (12 paper/web, 8 multimedia). NCWIT’s huge library of resources were heavily distributed in hard-copy (80,903 resources handed out), and resource downloads were very high—for example, just the Programs-in-a-Box series was downloaded 5,843 times in 2015.

**People are learning from NCWIT (from resources and the Summit).** A total of 83% of Summit attendees said they learned new information from the 2015 Summit, and 75% of members reported learning something new from an NCWIT resource in 2015.

**NCWIT drives broad awareness through outreach.** NCWIT staff or designates attended 67 different conferences in 2015, and gave six different keynotes. NCWIT meets with VIP’s to spread the word—over 130 times in 2015, and also worked to educate policymakers in DC 30 different times. Scholars around the world are sharing NCWIT’s resources by citing them in their scholarly work—in 2015, 46 different scholarly publications cited NCWIT resources, thus broadening NCWIT’s reach to a scholarly audience. NCWIT sent 24 e-newsletters in 2015 covering a wide range of material.

**NCWIT uses social media and traditional media to increase engagement with non-members.** Facebook fans grew 95% in one year (to 19,269 at the end of 2015), and Twitter Followers grew 38% (to 17,729). NCWIT was mentioned in 266 different news/press articles in 2015, and a total of 253 blog posts. This is the first year since 2008 in which the number of press mentions was higher than the number of blog mentions. Of those 266 press mentions, 136 of them mentioned NCWIT data, stats, website, or resources (51%).
NCWIT’s website continues to see high numbers of unique visitors. In 2015, over 178,000 unique visitors came to the NCWIT website, and over 62,000 users visited the NCWIT Resources pages. In addition, in 2015, 684 different sites referred users who downloaded a resource from the NCWIT website.

Members take responsibility for outreach as well. In 2015, 82% of members said that they had shared or recommended ideas from at least one NCWIT resource. And some members have presented on behalf of NCWIT using NCWIT’s support materials as part of NCWIT2GO.

NCWIT Convenes Change Leaders and Motivates Them to Engage with one Another and Their Own Organizations

The Summit serves as a key mechanism to engage new people. In 2015, 575 people attended the Summit, almost all of them say they would attend another NCWIT event, and 82% said that they found the meetings very or extremely valuable. The Summit brings people together who have never met before; 75% of 2015 Summit attendees said that attending the Summit introduced them to people that they have collaborated with on current or past projects.

Members are active in engaging with other members to forward the cause. In 2015, 55% of members said that they helped or collaborated with another NCWIT member on a project related to women in computing. The levels of collaboration differed across alliances, with the SSAB, K-12, WA and AA all reporting collaboration levels higher than 50%. The top three collaboration outcomes included 113 presentations, 100 program or practice implementations, and 78 instances of working together on Aspirations Awards. Even if they aren’t collaborating, 78% of members indicated that they presented or published on women in computing in 2015.

NCWIT Equips Change Leaders with Strategies to Enact Individual and Organizational Change

NCWIT provides support for members making their own changes. In 2015, NCWIT wrote letters of support for 6 projects/grant proposals working to improve women’s representation in technology, and helped members be recognized for their work related to women in technology by writing 6 recommendation letter for awards and 7 letters to support people’s promotions or position changes.

Members are active making their own individual behavior changes. A total of 71% of NCWIT members indicated that they made changes to their own behavior because of NCWIT membership in 2015. While 59% said they made small changes, 12% indicated that they made major changes to their behavior because of NCWIT membership.
NCWIT resources and membership help promote organizational change. In 2015, 50% of members indicated that they had used new strategies based on information in NCWIT resources. Only slightly less, 47% of members said that they were able to achieve something they wanted to do because of an NCWIT resource. Finally, 89% of members said that something they learned through NCWIT helped them to take action.

Members are active making organizational change. A total of 63% of NCWIT members indicated that their organization had made either small (52%) or major (11%) organizational changes because of their membership with NCWIT.

NCWIT’s programs and action platforms support organizational change. The Student and Faculty Seed Funds have enabled individuals in universities to provide organizational supports and initiatives for women in computing; a majority of recipients expect that these new organizational initiatives will be sustained once the outside funding is gone.

NCWIT Increases the Meaningful Participation of Women in Technology

NCWIT has had an impact on women’s representation among computer science departments’ graduates. Among computer science departments – departments that are traditionally less gender inclusive than departments that include information science – NCWIT membership is associated with higher percentages of female graduates. Specifically, in 2014, the average female share of graduates was 14.91 percent among AA members with two years of NCWIT membership compared to 12.62 percent among non-members, a statistically significant difference (p<=.05). In addition, a regression analysis indicates that every additional year of membership in the Academic Alliance is associated with nearly a 1 percent (0.91%) increase in the percent female graduating in 2014.

NCWIT Extension Services has had an impact on undergraduate women’s participation, especially in Computer Science departments. Results from Cohort 1 of the current Extension Services grant indicate that there was a 39% increase in the number of women enrolled in cooperating departments from 2011 to 2013, and that participating departments had stronger enrollment growth rates for women than for men. Participating computing departments were more likely to report stronger growth for women than men compared to engineering departments. The role of the Extension Services Consultants is critical to help facilitate implementation of research-based practices.

NCWIT has expanded the pipeline to a flowing river through the Aspirations Program. In total, 24,441 high school girls have registered and initiated applications at the high school Aspirations Award portal, and 4,141 just during the last award period. In 2016, 1,956 girls were recognized as winners or runners-ups.
NCWIT Builds a Strong Community of Diverse Organizations and Members

Building a strong community of diverse organizations and members is crucial to NCWIT’s continued success, as NCWIT is only as strong as the community it brings together. The strength and diversity of NCWIT’s community – its member organizations and individual leaders – provide the foundation or backbone for NCWIT’s change efforts.

NCWIT Continues to Build a Strong Community that is Generally Useful to Its Members

1) Objective: NCWIT increases its membership base each year.

Between 2014 and 2015, NCWIT’s total membership grew from 636 to 665 members, representing about a 5 percent increase. As the figure below suggests, NCWIT’s rate of growth has slowed compared to the period of 2011 to 2013. This is, however, to be expected. NCWIT has likely attracted most of the organizations that were “at risk” of becoming members.
NCWIT’s alliances, however, grew (or declined) at different rates (see below). The Academic Alliance (AA) increased membership by 15 percent (54 new members), the Affinity Group Alliance (AGA) increased membership by 11 percent (six new members), and the Workforce Alliance’s (WA) increased membership by two percent (one new member).

In 2015, the K12 Alliance introduced a new type of membership: associate members. These members include formal educational organizations, such as secondary schools; informal educational organizations, such as on-campus after school groups; and local housing authorities that participate in the K12 Alliance’s partnership with Google.org and the United States Department of Housing and Urban Development (HUD). We include associate members in our total count of K-12 members, which
is reflected in the relatively large membership increase between 2014 and 2015. In total, the K-12 Alliance increased its member base by 53 percent (8 new “core” members and 20 new “associate” members).

The Entrepreneurial Alliance (EA) also went through a significant reorganization with members separated into three categories: Channel Partners, EA Associates, and EA Members. Channel partners consist of small “accelerator,” “incubator,” or “co-sharing” organizations. These members receive access to NCWIT research, resources, and expertise in exchange for helping NCWIT reach 10,000 founders by 2020. EA Associates are small organizations in the “seed stage” that lack the resources to buy into full NCWIT membership. These organizations, however, do receive access to NCWIT resources and their company names are listed on NCWIT’s website. Finally, EA Members are comprised of smaller companies in the “growth phase” that pay $2,000 for full membership benefits, including access to resources, research, and hands on attention from project managers. After reorganization, the size of the EA decreased by 59 percent. The loss of membership did not reflect an exodus of members, but rather NCWIT determined it was necessary to expunge a number of inactive members - members who rarely, if ever, participated or communicated with NCWIT. In 2015, the EA consisted of 6 Channel members, 14 full members, and 22 associate members.

NCWIT should support the engagement of members in the new K-12 Alliance and EA categories. K-12 associate members in particular may have fewer incentives to participate in NCWIT projects.

2) Objective: Each year, more than 80% of members derive usefulness from membership (organizational usefulness is more important than individual usefulness)

Once again, NCWIT easily surpassed this objective. Nearly all (97%) of Member Survey respondents agree that NCWIT membership is “somewhat,” “very,” or “extremely” useful to their organization. If we focus only on the top two categories, a still impressive 68 percent of respondents believe that NCWIT membership is “very” or “extremely” useful to their organization.
As is the case with organizational usefulness, nearly every Members Survey respondent (96%) reported that NCWIT membership was at least “somewhat” personally useful. Limiting the focus to the top two usefulness categories once again yields impressive results; about 70 percent of respondents NCWIT membership to be “very” or “extremely” useful to them personally. In the last year, we also observed growth in the percentage of respondents who find NCWIT membership “extremely” personally useful; between 2014 and 2015 this category increased by 15 percentage points.

“NCWIT is a great organization and is having impact especially in attention to the pipeline issues with K-12 that need to be resolved in the US (and elsewhere of course) to broaden participation. NCWIT has greatly raised consciousness about implicit bias that women in computing face.” (AA member)

“I think NCWIT is the change enabler, facilitator that ties together and bridges the gaps in education (primary, secondary and post-secondary) to industry. Generates champions and advocacy across constituents. Highlights the need to recognize, reward and scholarship young women to enter and stay in tech curriculum. Creates tools for members and non-members to use - from web content to hand out materials that are compelling and fact based, unbiased recommendations. On the radar all the time. Advocacy all the way to the White House and to our local schools. No other org can do that and have the broad and deep impact.” (WA member)

NCWIT Continues to Build a Diverse Community

1) Objective: Diversity of member organizations increases annually

NCWIT’s membership base remains diverse. Between 2014 and 2015, NCWIT continued to increase organizational diversity among its members. Among the AA, the number of doctoral-granting institutions increased by 12 percent, the number of Master’s-granting institutions increased by 10 percent, the number of Bachelor’s-granting institutions increased by 30 percent, and the number of
Associate’s-granting institutions increased by 22 percent. Note that our AA categories are not mutually exclusive; the totals in the figure thus do not reflect the size of the AA as a whole.

Most of the growth in the K-12 Alliance in the last year was concentrated among informal education and nonprofit organizations, which increased by 52 percent and 50 percent, respectively. The expansion of these categories is largely owed to the introduction of 20 associate members. Our K-12 Alliance categories are not mutually exclusive. For instance, some formal education organizations also serve undeserved communities. The values in the figure below therefore do not reflect the size of the K-12 Alliance as a whole.

As has been the case for several years, the composition of the WA remains about evenly split between Fortune 500 and non-Fortune 500 companies.
2) Objective: Leadership & SSAB is diverse in race, sex, experience, background

Each year we send a brief survey to new NCWIT leadership and staff members to evaluate the extent that NCWIT itself exhibits membership diversity. Below, we summarize the results of this survey. Importantly, we were unable to collect responses from every member of NCWIT’s leadership and staff who was active in 2015. Response rates, however, varied across the NCWIT organizational hierarchy. For instance, a little more than one in five (21%) current board of directors members offered a response, while only 13 percent of Leadership Team members and 8 percent of the Staff/Consultants Group declined to respond. Among the SSAB – a group who we would expect to show a strong appreciation for data – all members responded to the survey. It is also important to note that some respondents occasionally skipped individual questions. This happened most frequently with regards to self-labeled race and ethnicity.

Race and Ethnicity

The SSAB continues to be the most diverse leadership group in terms of racial/ethnic diversity. Just under half of SSAB members identify as nonwhite or mixed race. A fairly high percentage of the Leadership Team – about one third - also identify as nonwhite or mixed race. The BOD and Staff and Consultants groups remain the most racially/ethnically homogenous; about one in four members of both groups identifies as nonwhite or mixed race.

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Educational Attainment

As should be expected, all members of the SSAB—a group comprised of academic experts—have earned a doctorate or professional equivalent. The Leadership Team is also generally highly educated. Just over half of the Leadership Team earned a PhD and about a quarter earned a MA. The high percentage of PhD holders among the Leadership Team owes to the inclusion of AA faculty members. Members of the Board of Directors, however, are more likely to have only earned a Bachelor’s degree (59%) than a graduate level degree. Members of the Board of Directors tend to be industry representatives where advanced degrees are less likely to be necessary for employment. Finally, the staff and consultants group is the most educationally diverse. About equal percentages of this group have earned a Bachelor’s degree, Master’s degree, and PhD (or professional degree).
First Generation College Student

First generation college student status is a strong indicator of the types of barriers one faced while advancing their career. Across all groups, sizable percentages of NCWIT leadership are first generation college students. Close to half of the Board of Directors (41%) and Leadership Team (42%) were first generation college students. Fewer members of the SSAB and Staff and Consultants group claim first generation college student status; specifically, 36 percent of the SSAB and 27 percent of staff and consultants were the first in their generation to graduate college.

![Percent First Generation College Student](image)

Gender

NCWIT’s senior leadership groups are the most gender diverse; a total of 59 percent of the Board of Directors group and 67 percent of the Leadership Team identify as women. The SSAB and Staff and Consultants groups, on the other hand, are predominantly female; between 86 and 89 percent of these groups identify as female.

![Percent Female](image)
Disability

Very few members of NCWIT’s leadership teams reported a disability. The low percentages are based on one individual’s response.

<table>
<thead>
<tr>
<th></th>
<th>LT</th>
<th>BOD</th>
<th>SSAB</th>
<th>Staff &amp; Consultants</th>
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</thead>
<tbody>
<tr>
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<tr>
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<tr>
<td>2015</td>
<td>6%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
</tr>
</tbody>
</table>

SSAB Expertise

A slight majority (55%) of SSAB members earned their doctorate in social sciences, such as sociology and economics. A sizable 27 percent of SSAB members specialized in education. The remaining 20 percent of SSAB members reported urban planning, science and technology, communications, and public administration as their highest degree.

In 2015, NCWIT continued to grow its membership base. NCWIT’s alliances also continue to be comprised by a diversity of organization types, and NCWIT maintains a healthy level of diversity among its staff and leadership. Two alliances – the EA and K-12 Alliance – have undergone significant reorganizations. The K-12 Alliance added new associate members, while the EA created three categories based on EA members’ attachment to NCWIT.
NCWIT Spreads Awareness and Knowledge to Change Leaders, Targeted Non-Member Audiences, and the Public

NCWIT seeks to achieve its impact (Increased Meaningful Participation of Women in Technology and Increased Innovation) through developing and distributing research- and evidence-based resources for recruiting, retaining and advancing girls and women in tech, helping people to learn new ideas, pushing for broad awareness through outreach, social and traditional media, maintaining a strong website, and helping members take responsibility for the awareness and knowledge of others.

NCWIT Creates Resources to Spread Awareness and Knowledge

1) Objective: NCWIT creates 10-15 resources annually

In 2015, NCWIT created 12 new paper resources and 8 new multimedia resources. New paper resources included, three NCWIT Tips, two Promising Practices, two Top 10 Ways, two workbooks and guides, two research reports/articles, and one Program in a Box. New multimedia resources include five Vimeo streaming videos and three Heroes Podcasts. In total, NCWIT created 173 paper resources and 191 multimedia resources since 2006.
2) Objective: NCWIT distributes 30-50K resources annually. NCWIT increases the number of resource downloads.

According to NCWIT’s internal evaluation report, NCWIT distributed 80,903 hardcopy resources in 2015 and website users downloaded an additional 24,750 resources.

Compared to the previous year, NCWIT’s hardcopy resource distribution decreased by nine percent (from 89,003 in 2014 to 80,903 in 2015). This represents a sharp decline compared to 2012 and 2013 when NCWIT distributed 102,447 and 105,783 resources, respectively. This year’s figure, instead, seems more consistent with the 2011 total (82,093). As NCWIT’s internal evaluator suggested, it is possible that downloadable resources have become substitutes for hard copies. We also note that NCWIT has recently distributed “resource promo cards” which point people to online resources. In support of this hypothesis, we see evidence of increased online resource usage. Between 2014 and 2015, the number of resource downloads increased by 53 percent (from 16,136 in 2014 to 24,750 in 2015).

In 2015, Top 10 Ways (18,281); posters, workbooks, guides, and pathway cards (11,074); and Talking Points (10,409) were the three most distributed hard copy resources.

The number of downloaded “Programs-in-a-Box” increased from 4,431 in 2014 to 5,843 in 2015, representing a 32% increase in downloads during the last year.

NCWIT continues to expand its hardcopy and media resource base. Although hardcopy resource distribution has decreased in recent years, the number of resource downloads continues to rise. We suspect that downloadable resources are increasingly becoming a substitute for hardcopy resources.
NCWIT’s Resources and Services Increase Knowledge Among Its Community

NCWIT’s resources are designed to stimulate individuals and organizations to make change. For this to happen, the content in the resources must be relevant to the audience’s particular situation, be readily usable, provide some piece of information they were missing prior so that they can achieve an outcome meaningful to them. In all these ways, the resources support individuals to move into action.

1) **Objective:** Each year, more than 75% of meeting attendees report learning new information/ideas from the Summit

In 2015, 83 percent of Summit attendees reported learning new ideas/information from a speaker or presentation. This figure is identical to what we reported in 2014. As we noted in 2014, this seems to reflect an upward trend since 2010. This also marks the fourth consecutive year that NCWIT has surpassed the 75 percent goal.

“I was able to learn more about the NCWIT resources and better understand how we can implement and utilize them. They became more tangible.” (WA member)

“The collaboration of ideas is amazing! I learn so much about different ways to implement new programs and I am able to share my successes with others as well.” (AA member)

2) **Objective:** Each year, more than 75% of members report learning something new because of an NCWIT resource.

NCWIT just missed this objective by a percentage point in 2015. Exactly 75 percent (instead of more than 75 percent) of Members Survey respondents reported that they learned something new because of an NCWIT resource. While this figure is 10 percentage points less than what we observed in 2014, the
decrease is at least partially an artifact of the 2015 survey instrument. In 2014 we measured resource learning by presenting respondents with a series of resources and asking them to indicate if they learned something new from each individual resource. In 2015, we used a global item that simply asked respondents to indicate whether or not they learned something from an NCWIT resource (we alternate between these items each year to reduce survey length). We suspect that more respondents would have indicated they learned from resources had they been reminded of specific resources.

Members of the EA, K-12 Alliance, and WA ranked highest on this outcome. Specifically, in 2015, over 80 percent of Members Survey respondents in each of these alliances reported learning something new because of NCWIT resources. As for the remaining alliances, 71 percent of AA respondents, 67 percent of AGA respondents, and 69 percent of SSAB respondents reported learning something new because of an NCWIT resource.

“NCWIT continues to be one of the best sources for information and really nice, ready to use resources related to women in computing.” (AA member)

High percentages of NCWIT members continue to learn new ideas by participating at the Summit and by using NCWIT resources. While the percentage of respondents who learned new ideas from resources appears to have declined between 2014 and 2015, at least part of this is an artifact of different question wording on the Members Survey.
NCWIT’s message reaches a Broad Audience of Change Leaders, Targeted Non-Member Audiences, and the Public

Another one of the key strategies NCWIT uses to reach its goal of increased meaningful participation of women in technology is to improve awareness by uniting and engaging members and non-members in national action platforms.

Policy and VIP Outreach

1) Objective: NCWIT has a regular presence in DC

NCWIT does not have a specific numeric goal for its presence in Washington DC, but seeks to maintain a regular presence. In 2015, NCWIT staff or delegates attended at least 30 meetings with notable policy makers and government officials – four less than we observed in 2014 (34). As we noted in the last report, this figure is much lower than our counts in previous years; for instance, in 2012 and 2013, our counts indicated that NCWIT staff and leadership participated in 47 and 61 events, respectively.

Key examples of NCWIT’s presence in DC in 2015 include:

- On February 19th, Lucy Sanders contacted the office of Congressman Jared Polis, representative for Colorado’s 2nd congressional district, to discuss his diversity and innovation agenda.
- In March, three aspirations award recipients were invited to the White House Science Fair through NCWIT. This year's fair is emphasizing the participation of underrepresented groups. Two are exhibiting and one is an honored guest. Aspirations winners were also featured in several local news outlets including The Bellingham Hearld and Cronkite News, as well as mentioned in national outlets including U.S. News. Two girls were also featured in a White House video featuring President Obama’s tour of the science fair exhibits. Several NCWIT Alliance Members also participated including the National Girls Collaborative Project (NGCP) who announced their upcoming launch of The Connectory.
- On October 29th, the Wilson Center’s Global Women’s Leadership Initiative hosted a panel discussion on female leadership in the technology field featuring prominent leaders from both the private and public sectors. Paula Stern spoke on the underrepresentation of women in the private technology sector, stating how female technology graduates remain an underutilized resource to fill crucially important positions in areas such as cybersecurity.
On December 3rd, Paula Stern presented a talk entitled, “Diversity in Cybersecurity for Superior Outcomes,” to the White House office of Science and Technology Policy. The goals of the speech were to explain how NCWIT can “…offer an opportunity to enhance the talent pipeline; 2) to suggest tools to track diversity progress; 3) and to introduce pilot projects to expand the diversity pipeline.

Three aspirations award recipients were invited to the White House Science Fair through NCWIT. This year’s fair is emphasizing the participation of underrepresented groups. Two are exhibiting and one is an honored guest. Aspirations winners were also featured in several local news outlets including The Bellingham Herald and Cronkite News, as well as mentioned in national outlets including U.S. News. Two girls were also featured in a White House video featuring President Obama’s tour of the science fair exhibits. Several NCWIT Alliance Members also participated including the National Girls Collaborative Project (NGCP) who announced their upcoming launch of The Connectory.

"I want to express how truly grateful I am for having been given the opportunity to participate in the White House Science Fair. Sharing my passion with so many influential and accomplished people, in such a historical setting, was an honor I'll never surpass. When the President himself asked me about my work, I thought I would collapse or forget my name and start mumbling gibberish! As he held me in the photograph, only then did I realize I had intelligently answered his inquiries. A wave of empowerment swept over me and, because of the generosity of NCWIT, I am forever changed." (Aspirations award recipient)

2) Objective: NCWIT meets with at least 200 VIP’s at companies annually

When NCWIT conducts outreach to members and non-members, they seek to connect with at least 200 VIPs at companies per year. In 2015, NCWIT met with 130 VIPs or high level administrators – three less than what we reported in 2014 (130). NCWIT thus fell short of the objective by 70 meetings. NCWIT has witnessed a rather dramatic decline in VIP meetings since 2013 when we recorded 198 meetings.
NCWIT’s presence in DC and the number of VIP meetings appears to have declined in recent years. NCWIT should take measures to ensure that this does not become a continuing pattern. NCWIT’s mission coincides with a period of strong support among policy makers. NCWIT should take advantage of the political momentum that seems to exist.

Scholarly Outreach

1) Objective: NCWIT resources are cited in 40 academic publications, annually

In 2015, NCWIT’s resources were cited in 46 academic publications, surpassing the goal of 40 publications. While this figure is lower than what we observed in 2013 (63 publications) and 2014 (54 publications), it is still more than what we observed in any year prior to 2013.

Of these publications, 24 were articles published in peer reviewed journals such as Sociology Compass, Journal of Research in Science and Teaching, and International Journal of Gender, Science, and Technology. NCWIT resources were also cited in 10 conference proceedings, 4 student dissertations and theses, and 8 other academic publications such as books, reports, and magazine articles. It is noteworthy that a much higher percentage of NCWIT resource citations occurred in academic journals – publications that tend to be more rigorously reviewed.

Over time, By the Numbers, Women in IT: The Facts, and “other” resources (e.g. Top 10 Ways, Extension Services mentions, etc.) have been the three most frequently cited resources.

<table>
<thead>
<tr>
<th>Resource cited</th>
<th># Citations from 2005-2015</th>
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<tbody>
<tr>
<td>Fact Sheet</td>
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<tr>
<td>Who Invents IT</td>
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<td>Programs in a Box</td>
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<td>Scorecard 2010</td>
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<td>Scorecard 2007</td>
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<td>Women in IT: The Facts</td>
<td>41</td>
</tr>
<tr>
<td>Other</td>
<td>47</td>
</tr>
<tr>
<td>By the Numbers</td>
<td>51</td>
</tr>
</tbody>
</table>
1) Objective: Increase in the combined number of NCWIT press and blog mentions each year (At least 50 press mentions are at a national or international level)

In 2015, NCWIT was mentioned in 266 press mentions – a 7% increase since 2014. This, yet again, broke the record for most NCWIT press mentions in a single year (the previous record, set in 2014, was 248 press mentions). In addition, NCWIT was also mentioned in 253 blog posts. While impressive, this is a 29 percent decrease since 2014. This is also the lowest figure reported since 2011. Part of the decrease could reflect a “cooling off” of gender diversity as a news topic. Both 2013 and 2014 were unusual years for press mentions, as major tech companies and conferences were drawing attention to the dearth of women in tech-related jobs and high profile incidents of sexual harassment and misogynistic statements by heads of companies drew outrage.

NCWIT’s resources (including its website) were cited in 136 press mentions, which amounts to, just over half (51%) of all press mentions. In addition, the Aspirations in Computing campaign and Extension Services program, respectively, were cited in 82 (31%) and 11 (4%) press mentions. As the figure below suggests, we observed a spike in press mentions that include NCWIT resources between 2014 and 2015. Specifically, the number of press mentions of NCWIT resources increased by 152 percent in the past year.
NCWIT also met its goal of at least 50 press mentions at the national or international level. Specifically, NCWIT was mentioned in 50 national outlets and 12 international outlets. Relatively speaking, 76 percent of press mentions were in local outlets, while the remaining 24 percent were featured in national or international outlets. Here too we see a notable spike between 2014 and 2015, one that represents a 119 percent increase in NCWIT press mentions at the national or international level.

"I noticed NCWIT had a great article in Fast Company! I can’t remember the last time I read an article in Fast Company and didn’t roll my eyes so hard that I couldn’t see straight for days. Awesome to see it published there. I hope it gets attention." (Interaction designer and information architect)

2) Objective: Have at least 20% growth in social media communities in 2015 and 2016

Between January 2015 and December 2015 the number of NCWIT Facebook fans (“likes” and “followers”) nearly doubled from 9,194 to 19,269 (a 95% increase), and the number of Twitter followers grew from 12,330 to 17,729 (a 38% increase). While growth in Twitter followers has been relatively consistent over time, the number of Facebook likes and fans has increased precipitously since 2014.
Also, in 2015, the number of Instagram followers increased from 307 to 551 (a 69% increase), the number of LinkedIn followers increased from 697 to 1,336 (an 81% increase), and the number of Pinterest followers increased from 187 to 310 (a 53% increase).

In total, between 2014 and 2015, NCWIT’s social media communities expanded by impressive margins. This has been the general trend since 2010. In fact, since 2010, NCWIT has never witnessed a membership decrease in any of its social media communities.

"...I'm incredibly grateful to be in this community!! Every time I'm asked in an interview "How did you get started in engineering?" or "Who/what motivates you?", my answer without hesitation is you all." "...luckily, I applied for this award and my whole life changed. Thank you all so much for your support no matter what it's about and answering my questions so patiently/kindly! Let me know if there's anything I could do for any of you!!" (Aspirations Award recipient on the importance of the Aspirations Facebook community)

NCWIT’s Website

1) Objective: The number of unique visitors to the NCWIT website increases by 10% annually

In 2014, NCWIT’s website drew 162,660 unique visitors and, in 2015, the website attracted 178,212 unique visitors. This represents a 10 percent increase – just meeting NCWIT’s objective. The increase in unique visitors to NCWIT’s webpage reestablished the pattern of annual increases in web viewers that was interrupted in 2014.

2) Objective: The number of unique visitors to NCWIT’s resource pages increases (10k in 2015 and 11K in 2016)

NCWIT easily surpassed its goal of 10,000 unique visitors to its resources pages. In 2015, a total of 62,825 users visited NCWIT’s combined resources pages.

Just under a third of users were “returning” users – that is, users who viewed NCWIT’s resource pages more than once in 2015. The remaining users were “new” users. Note, however, that this represents a
small (less than one percent) decrease since 2014 when 63,345 users visited the NCWIT.org combined resources pages.

The figure below compares the number of unique users that visit NCWIT’s combined resource pages between 2014 and 2015. It appears that the greater number of visitors to NCWIT’s resource pages in 2014 is due to a greater spike around the Newport Beach Summit and an unusually large spike in October. What explains the October spike? During the 2014 Grade Hopper Celebration (in October), Satya Nadella, CEO of Microsoft, told women that they should not ask for a raise, but rather trust “faith” and “karma” to reward them. In the midst of this controversy, NCWIT tweeted out resources. NCWIT’s decision to tweet resources during this controversy may have resulted in increased web traffic. If this is the case, NCWIT’s immediate response to a high profile example of gender bias appears to be a highly effective strategy for spreading awareness.

While we can only speculate if the spike in visitors to NCWIT’s resource pages did indeed result from their tweets immediately after Nadella’s gaffe, NCWIT should be prepared to hit social media when other high profile “scandals” occur. Responding with information and tools during times of crisis can provide built in motivation for using the resources.

3) Objective: The number of websites that refer downloads of NCWIT resources increases each year

We estimate that in 2015, approximately 684 websites (this includes NCWIT domains but not direct links) referred visitors who ultimately downloaded an NCWIT resource (this includes NCWIT domains but not direct links). This is an increase from 552 referral websites in 2014, thus meeting the objective. The top ten referring websites were: Google (17,903), bing (1,233), yahoo (819), facebook.com (776), csunplugged.org (669), bls.gov (643), edutopia.org (581), surveymonkey.com (470), m.facebook.com (462), and ngcproject.org (455). A list of all referring websites is available upon request.
4) Objective: The number of resource downloads based on website referrals increases each year

In total, approximately 34,338 downloads were a result of referrals from the 684 referring websites – an impressive 63% increase since the total reported last year (21,044) and a 206% increase from 2013 (11,210). This number does not include NCWIT domains or direct links (with those included, the number of downloads was 45,775).

5) Objective: A strong majority of website users agree that NCWIT’s website is useful (80% in 2015 and 90% in 2016.)

In 2015, only half of Members Survey respondents who visited the NCWIT website in the last year reported that the website was “very helpful;” however, virtually all of the remaining respondents (49%) indicated that the website was “somewhat helpful.” Only one respondent indicated that NCWIT’s website was “not at all helpful.”
“This is terrible to say, but the main reason I have not used the NCWIT website is that it is almost too rich in its offerings!!! It’s a bit daunting for someone for whom these activities are only a part of the overall duties! This is probably more my problem than NCWIT’s!” (AA member)

6) Objective: The number of unique visitors to the Summit website increases by 20% annually

In 2015, NCWIT witnessed a slight decrease (2%) in the number of unique Summit webpage viewers compared to 2014. Specifically, 10,376 users visited Summit webpages in 2015 compared to 10,596 in 2014.

A total of 56 percent of users were “returning” users in 2015 and 44 percent were “new” users.

As the figure below demonstrates, patterns in website traffic to Summit webpages were quite similar between 2014 and 2015. In both years, Summit webpage visits increased gradually between January and April, probably because potential attendees were registering for the conference and viewing the program. Then, there is a sharp spike in May around the time of the Summit. In the wake of the Summit, webpage views decline precipitously. While the figure suggests very few Summit webpage views occur during the second half of the year, the magnitude of monthly viewership is distorted due to the scale of the figure. Between July and December, about 1,200 unique viewers visit the Summit pages each month.
7) Objective: The number of virtual Summit attendees increases each year (500 in 2015 and 1,000 in 2016)

NCWIT measures virtual attendance to the Summit by counting the number of unique page views of the Summit livestream webpages during the Summit weekend. In 2014, the Summit live stream attracted 1,005 unique webpage views and, in 2015, the event drew 1,265 unique page views. This represents a 26 percent increase in live stream webpage views during the Summit since 2014.

“Livestreaming is fantastic - please keep this up and possible increase it to other sessions.” (WA Member)

Newsletter Outreach

1) Objective: Each year, the number of people who receive the newsletters increases (sent-bounces)

For NCWIT, newsletters include general e-newsletters and campaign-specific emails. NCWIT set a goal to produce at least six newsletters per year, a goal they once again surpassed in 2015 with a total of 24 newsletters. Newsletters in 2015 covered the following topics: NCWIT “In the News” (11), Aspirations Awards (4), NCWIT resources and research (3), the annual Summit (2), and NCWIT at CSED week (2). One additional newsletter was distributed solely to the AA. In addition, NCWIT produced five TECHNOLOchicas-related newsletters. We do not include these in our official count because they are sent to a very limited audience.

While the exact number of recipients of the newsletter varies by each newsletter, the average number of newsletter recipients in 2015 was 2,416. This represents a considerable increase since 2014 (1,745 recipients) and 2013 (2,042 recipients).¹

¹ Until NCWIT began using MailChimp in 2012, the general trend showed an overall increase in the numbers of recipients over time. The average number of recipients annually was: 2006=1,852, 2007=2,332, 2008=3,127, 2009=2,994, 2010=3,889. Averages for 2011 were not instructive because of the wide variation in the number of newsletter recipients between services.
2) Objective: Each year, the percentage of opened newsletter emails and click-thru's is above non-profit industry average

NCWIT began sending out their newsletter communications with Mail Chimp in September of 2011. In 2015, the non-profit industry average for opened newsletters was roughly 26 percent. On average, 27 percent of NCWIT's recipients opened newsletters in 2015, suggesting that NCWIT performed generally better than the typical nonprofit organization (see figure on next page). However, half of all NCWIT newsletters sent out in 2015 resulted in open rates below industry average. This is a surprising turnaround, given that all newsletters sent in recent years resulted in open rates above industry average. Indeed, the last time an NCWIT newsletter achieved a below average open rate was in 2007 (this is obscured in the figure below because this year's industry average is higher than past industry averages). NCWIT’s “In the News” newsletters accounted for all but three of the newsletters with below average open rates. The remaining newsletters with below average open rates were the AA newsletter, the 2015 Summit Rewind, and the announcement for CSEd Week.

The "Percentage of Click-throughs" represents the "Number of Click-throughs" divided by the number of people who opened the email ("Number of Opens"), not the "Number of Recipients." The non-profit industry average of click-throughs was roughly 3 percent in 2015 according to for MailChimp. As with the open-rates, NCWIT performed, on average, slightly better than the typical non-profit. Specifically, an average of 3.5 percent of recipients who opened NCWIT’s newsletters clicked through the content. However, this figure is one percent less than what we observed in 2014 (4.5%). About 38 percent of opened newsletters resulted in below industry average click-through rates. These included three research and resources newsletters, two “In the News” newsletters, two “Where can you find NCWIT” updates, one CSEd Week announcement, and one 2015 Summit recap.

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2 Because of the switch from Constant Contact to MailChimp in 2011, statistics before and after the service change are only somewhat comparable
Signs suggest that NCWIT’s newsletter readership has declined in 2015, with respect to newsletter opens. At the same time, it appears that the non-profit industry average open rate has increased. NCWIT should consider altering the subject lines of emails, newsletter content, and timing of delivery in order to increase the open rate.

NCWIT also sends out periodic, alliance-specific “Did You Know?” newsletters. The audience for these informational newsletters is much smaller, ranging from a few dozen recipients in smaller alliances to a few hundred recipients in the AA. In 2015, the average open rate for Did You Know (DYK) newsletters was 33 percent – 7 percentage points higher than the industry average. As for click-throughs, the average rate for DYK newsletters was just slightly over industry average (3.3%).

The table below breaks down the average open rates and average click-through rates by alliance. The SSAB exhibits the highest average open rate (44%), while the EA and WA exhibit the lowest average open rates (26% and 28%, respectively). No alliance exhibits an average open rate below industry average. The AGA and WA have the highest average click-through rates (4.3% and 4%, respectively), while the EA has a considerably lower average click-through rate compared to other alliances (1.3%). Only the EA has an average click-through rate below industry average.
### Alliance Performance

<table>
<thead>
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<th>Alliance</th>
<th>Average open rate</th>
<th>Average click-through rate</th>
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<tbody>
<tr>
<td>Academic Alliance</td>
<td>31%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Affinity Group Alliance</td>
<td>34%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Entrepreneurial Alliance</td>
<td>26%</td>
<td>1.3%</td>
</tr>
<tr>
<td>K-12 Alliance</td>
<td>37%</td>
<td>3.3%</td>
</tr>
<tr>
<td>SSAB</td>
<td>44%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Workforce Alliance</td>
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<td>4.0%</td>
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In response to the Did You Know newsletter, "NCWIT Workforce Alliance: Moving the Needle... How Fast is Fast Enough? Can Bias Training Really Improve Diversity in Tech?" Rachel Book (Bloomberg) wrote to Lucy Sanders, "I really like these newsletters and appreciate your commentary on all the noise in the news."

In response to a Did You Know newsletter about problems with faculty and staff diversity at universities, Sheila Humphreys (UC Berkeley) wrote to Kim: "These tips for inclusive faculty searches are very useful and I am sending them to the Search Chairs in our Dept. Thank you!"

### Conference/Meeting Outreach

#### 3) Objective: NCWIT staff and leadership continue to have strong attendance/presence at conferences and meetings (8 to 10 events in 2015 and 2016)

NCWIT’s staff and leadership continue to have strong attendance at conferences and meetings. NCWIT handily surpassed the goal of at least eight to ten conferences in 2015. In total, NCWIT staff or leadership had a presence in 67 conferences or meetings – just two meetings short of what we observed in 2014 (69 meetings). Over time, we have consistently observed large values for meeting attendance, suggesting that NCWIT performs well with this form of outreach.

"I was stopped by people later who thanked me for bringing the diversity aspect into it, including by our new program officer. ...My talk on faculty adoption of teaching practices had 60-70 people and I had a line of people wanting to talk to me afterward for about a half hour." (Staff member, Lecia Barker on participating at the Association for Computing Machinery's Special Interest Group on Computer Science Education [ACM-SIGCSE])
4) Objective: NCWIT leadership gives at least 3 keynotes in 2015; 4 in 2016

NCWIT’s leadership presented at least six keynotes in 2015. The number of keynotes varies by year, but, since 2010, NCWIT has always met or surpassed this goal.

This year, NCWIT’s leadership offered the following keynote addresses: Ruthe Farmer spoke at the Stanford Women’s Leadership Summit, the Appalachian IT Extension Services Sustainability Summit, and the OWL Gala dinner/auction. Lucy Sanders spoke at the Internet 2 Global Summit and an Eastman Kodak Unconscious bias luncheon and event. Sanders also served as a distinguished lecturer for an NSF event that included several program directors.

"I found your talk to be spot on and so did our NSF Program Director in the Advanced Cyberinfrastructure (ACI) Division...The information you covered regarding influences negatively impacting women and technology innovators and suggestions on adoptable practices that can mitigate these impacts would be very beneficial to our management team." (Assistant Director, Training, Education & Outreach at Southeastern Universities Research Association on Lucy Sander’s NSF presentation)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Keynote Presentations by NCWIT Staff lower than in 2014</th>
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</thead>
<tbody>
<tr>
<td>2010</td>
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<tr>
<td>2011</td>
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<tr>
<td>2012</td>
<td>8</td>
</tr>
<tr>
<td>2013</td>
<td>15</td>
</tr>
<tr>
<td>2014</td>
<td>8</td>
</tr>
<tr>
<td>2015</td>
<td>6</td>
</tr>
</tbody>
</table>

Member-Driven Outreach

17) Objective: At least 65% of member representatives distribute resources in 2015 and 70% in 2016

In 2015, 82 percent of Members Survey respondents indicated that they shared or recommended ideas from at least one NCWIT resource. We also observed some notable findings specific to alliances. For instance, nearly a third (32%) of K-12 Alliance respondents shared resources with more than 100 people. In addition, high percentages of AGA and WA respondents distributed resources to more than 10 people – 67 percent and 53 percent, respectively.
Importantly, a nontrivial number of respondents reported distributing no resources in 2015. The percentage of respondents who did not distribute resources ranged from eight percent in the K-12 Alliance to 20 percent in the AA.

Non-members also engage in resource distribution. For instance:

The president of the Computer Science Teacher Special Interest Group emailed Ruthe Farmer, asking for 300 copies of several K-12-related NCWIT resources. He plans to distribute them in several seminars and workshops he will be participating in over a several month period. He writes: "Thank you! It’s easy to be an advocate for NCWIT given your mission and the high quality of your materials."

The Mentoring Program Lead at Women Who Code DC, writes to Lucy Sanders: "One of our biggest focus areas is providing ongoing support and opportunities for the professional development of women in technology. We are currently in the process of setting up a mentoring program for our organization. I was very impressed with the materials I found in the NCWIT Mentoring-in-a-Box kit. They are terrific and very comprehensive! We plan to use these materials as a framework for our mentoring program."

18) Objective: NCWIT’s member ambassadors continue to represent NCWIT at conferences and other outreach events (24 ambassador events in 2015; 36 in 2016)

NCWIT indicated in the NSF report for the 2015-2016 cycle: “NCWIT has struggled to launch NCWIT2GO. In the past year, efforts focused on the technical side of the effort, as the previous iteration required considerable follow-up and didn’t represent a good return on investment. While alliance members and the Aspirations community (among others) continued to represent NCWIT at events, we don’t have an accurate number to report, as the tracking system wasn’t yet in place.”
Spreading awareness and knowledge through outreach continues to be an area where NCWIT excels. In 2015, NCWIT witnessed increases in press mentions, social media followers, and visitors to its website. Impressively, the number of press mentions in national and international outlets and the number of press mentions that reference NCWIT resources more than doubled between 2014 and 2015. However, NCWIT has also exhibited a gradual decline in its presence in DC and meetings with VIPs. NCWIT has also witnessed a slight reduction in academic citations of resources, and blog mentions. And, somewhat unexpectedly, many of NCWIT’s newsletters were opened less frequently than the typical non-profit organization.
NCWIT Convenes Change Leaders and Motivates Them to Engage with One Another and Their Own Organizations

Another way NCWIT moves toward its goal (Increased Meaningful Participation of Women in Technology) is through convening member organizations and building their capacity to make change. According to the Theory of Change, this convening and capacity-building is part of what brings stakeholders from awareness and knowledge into a state of being informed and motivated to make change.

NCWIT Convenes Change Leaders via the Annual Summit

1) Objective: NCWIT has over 500 people in attendance at the annual Summit.

Summit attendance decreased between 2014 (Newport Beach) and 2015 (Hilton Head). In 2014, NCWIT reached record high attendance with 689 attendees, while the 2015 Summit was attended by 575 people. This represents a 17 percent decrease in Summit attendance. We noted in the prior report that it was unlikely that NCWIT would meet the goal of a 10 percent increase in 2015 because the highly attended 2014 Summit was somewhat of an anomaly. Unlike the 2015 Hilton Head Island Summit, the 2014 Newport Beach Summit marked NCWIT’s 10 year anniversary and was more accessible. For these reasons, 575 attendees in 2015 should still be counted as a success. Indeed, the 2015 meeting attracted the second largest audience in Summit history.
2) Objective: Each year, more than 80% of meeting attendees indicate that they will likely attend another NCWIT event

After the 2015 Summit, 94 percent of Summit Survey respondents indicated they were “somewhat likely” or “highly likely” to attend another NCWIT event. Of these respondents, 70 percent reported that future attendance was “highly likely” (down from 80% in 2014). Fifteen respondents (6%) indicated they were “somewhat unlikely” or “highly unlikely” to attend another NCWIT event; seven were from the AA, one was from the AGA, two were from the K-12 Alliance, three were from the WA, and two were visitors. Five of these respondents offered explanations for why they may not attend again. Funding, childcare issues, scheduling, and relevance appear to be inhibitors to future attendance. Three respondents who are “somewhat” or “highly” likely to attend also noted that funding may prevent future attendance.

NCWIT continues to excel at convening change leaders. The 2015 Hilton Head Summit boasted the second largest audience in the meeting’s history. And, almost all Summit Survey respondents indicated that they would likely attend another NCWIT event. Of the very few respondents who would not attend another event, funding and logistical issues, rather than Summit quality, were thought to preclude future attendance.
Exposure to NCWIT and its Community Motivates Change Leaders to Collaborate and Engage

We also believe that the member capacity-building that NCWIT focuses on both at the Summit and throughout the year provides learning that moves individuals and organizations to action (i.e., creates behavioral change). We believe (and data have reinforced) that these capacity-building activities increase enthusiasm and that NCWIT’s member representatives’ engagement at NCWIT convenings along with the increases in social science and activist capacity-building, create momentum in the “change leader network,” all of which brings NCWIT closer to its goal.

Motivation and Engagement via Summit

1) Objective: Each year, more than 85% of meeting attendees find the meetings very/extremely valuable

The percentage of attendees who reported that the Summit overall was either “very” or “extremely valuable” decreased by seven percentage points from 2014 to 2015 (from 89% to 82%); nonetheless, 82 percent represents a strong majority of members and is consistent with the recent trend of high levels of perceived value.

*Note: Prior to May 2010 the wording of the question was: “Overall, how valuable was the Practices Workshop to you?”

Conference attendees’ perceptions of Summit value appear to vary by their alliance membership as well as ES consultant or visitor status. All ES consultants and EA members who responded to this survey item reported that the Summit was “extremely” or “very” valuable. A high proportion of AA, SSAB, and Summit visitors also reported perceiving value, with 83 percent, 90 percent, and 87 percent perceiving value, respectively. Slightly fewer members of the AGA, K-12 Alliance, and WA reported finding the Summit “very” or “extremely” valuable. Nonetheless, the proportion of members among these latter alliances that found the Summit “very” or “extremely” valuable was still high, ranging from a low of 73 percent of WA members to a high of 79 percent of K-12 Alliance members.
The Provost and Academic Vice President of a California State University, expressed the following praise for the Summit to Lucy Sanders: "This was the first time that I attended the NCWIT Summit. It was an amazing conference. I know it takes lots of work to deliver a top-notch conference. There is no 'accidental excellence'. Congratulations."

The program advisor at the U.S. Patent and Trademark Office wrote to Ruthe Farmer: "The Summit was great!! I have been ranting and raving about it to others since returning. As a matter of fact, I was talking about it over dinner on Monday with one of our partners. I believe that the NCWIT approach should be used as the ‘model’ for addressing a plethora of education and employment matters. I also mentioned to an NSF Program Director that Joan C. Williams would be a perfect speaker for next year’s SBIR Phase II Annual Conference. I cannot wait to attend the Summit next year (LOL)!!"

2) Objective: Each year, more than 85% of members indicate that they benefit from NCWIT networking

In 2015, only 65 percent of Members Survey respondents indicated that they benefited from networking. However, we strongly doubt that this represents a failure on NCWIT’s part to promote networking in 2015. Instead, we suspect that this sudden drop reflects a change in how we measured networking benefits. In prior surveys, we asked respondents to indicate whether they benefited from a variety of networking outcomes, such as ongoing communication or increased collaboration. We suspect that providing specific examples of networking outcomes increased the likelihood that respondents recalled positive networking effects. However, in order to reduce survey length, the 2015 Members Survey simply asked respondents to indicate whether or not they experienced “any benefits as a result of networking at NCWIT events or with other NCWIT members elsewhere?” Without listed examples to choose from, respondents may have applied a narrower definition of what it means to benefit from networking. In future surveys, we will likely include examples of benefits as a parenthetical when we ask about networking.
“The primary reason I attend is to network. Having the opportunity to meet people from other organizations is invaluable to me.” (K-12 Alliance member)

“It is a fantastic way to network with others who are doing the same job. I come back energized with new ideas to try. I enjoy hearing how others implement similar programs.” (AA core)

3) Objective: Each year, at least 50% of meeting attendees indicate that they have worked with or plan to work with someone they met at an NCWIT meeting

In 2015, 75 percent of Summit Survey respondents indicated that attending NCWIT meetings had introduced them to people they collaborated with on past or current projects. NCWIT thus surpassed its objective by 25 percentage points. This is largely consistent with what we observed in 2012 (70%) and 2013 (77%). However, this year’s figure is six percentage points lower than the 2014 figure (83%).

![Collaboration Results from Networking at Meetings](image)

We also observed variation across alliances on this metric. While at least 75 percent of respondents in most alliances agreed that they met people at NCWIT meetings that they have collaborated with on past or current projects, only 50 percent of EA respondents and 56 percent of WA respondents agreed with the statement. Note, however, that only two respondents identified as EA members. (We observed similarly low frequency among WA members in 2016. Only 61 percent of WA respondents agreed that they met people at NCWIT meetings that they have collaborated with on past or current projects. The other alliances exhibited considerably higher percentages on this outcome)
Most Summit Survey respondents agree that attending NCWIT meetings has introduced them to people they collaborated with on past or current projects

<table>
<thead>
<tr>
<th></th>
<th>Strongly/Somewhat Agree</th>
<th>Neither Disagree nor Agree</th>
<th>Strongly/Somewhat Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>76%</td>
<td>10%</td>
<td>14%</td>
</tr>
<tr>
<td>AGA</td>
<td>100%</td>
<td>50%</td>
<td>11%</td>
</tr>
<tr>
<td>EA</td>
<td>83%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>K-12</td>
<td>78%</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>SSAB</td>
<td>56%</td>
<td>27%</td>
<td>17%</td>
</tr>
<tr>
<td>WA</td>
<td>75%</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“I have a stack of cards from people that I’m planning to contact to collaborate with on initiatives in the San Diego area. Oh, and I learned that I can teach a HCI class at Girl Develop it, which I plan to do!” (AA member)

“Got several new ideas specifically through my committee work with the Families 4 Computing committee formed at the 2014 conference.” (K-12 Alliance member)

It appears that WA members are more resistant to the Summit’s efforts to motivate collaboration compared to other alliance members. This makes sense as many WA members are in direct competition for technical women. NCWIT should suggest to WA members ways that they can collaborate with other members – including those outside of the WA – that do not require the release of proprietary data and do not constitute “helping the competition.” The WA more broadly may benefit from the Pacesetters discussions that occur around this topic.

Motivation and engagement via NCWIT membership

4) Objective: Each year, over 50% of NCWIT members help/collaborate with one another

In 2015, NCWIT just barely surpassed its objective that more than half of NCWIT members have helped or collaborated with each other during the previous year. Specifically, 56 percent of Members Survey respondents helped or assisted other members on a project related to women in computing. This is the lowest figure we have seen for this metric since 2010.
We also found that the percentage of respondents who helped or assisted another member on a project related to women in computing varied by alliance. As the figure below demonstrates just over half of AA, K-12 Alliance, and WA members indicated that they helped another member during the prior year. And, among the SSAB – a group whose position was designed to assist NCWIT staff and members – 73 percent reported helping behaviors. However, very few members of the EA and AGA reported helping behaviors; specifically, 17 percent of EA members and 20 percent of AGA members reported helping or assisting another member on a project related to women in computing. These lower rates are not alarming as EA members likely lack the time and resources to assist on projects and it is not as clear whether a goal for all AGA members to help or collaborate with other NCWIT members.

“The percent of respondents who helped or assisted other members on a project related to women in computing varies by alliance”

“My NCWIT network has been instrumental in helping me forge new collaborations on research.” (SSAB member)

“Have made new connections and re-connected with old ones. A specific example was the chance to meet several K-12 members who provided me with information around state regulations and resources that were helpful for my role as a board member for a charter school.” (WA member)
5) Objective: Each year, diverse outcomes result from collaboration between NCWIT members (meet & discuss, grant proposals, journal articles, conference papers, presentations, program or practice implementation)

Similar to prior years, in 2015, diverse outcomes resulted from NCWIT members’ collaborations. The table below presents the absolute (total number of respondents) and relative number (percentage of respondents) of respondents who indicated a particular collaboration outcome. Percentages do not sum to 100 because respondents could choose multiple outcomes. These figures also exclude respondents who chose “not applicable” (i.e. those who did not collaborate).

<table>
<thead>
<tr>
<th>Collaboration outcome</th>
<th>Total number of respondents</th>
<th>Percentage of applicable respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>113</td>
<td>65%</td>
</tr>
<tr>
<td>Program or practice implementation</td>
<td>97</td>
<td>60%</td>
</tr>
<tr>
<td>Aspirations affiliate award</td>
<td>78</td>
<td>50%</td>
</tr>
<tr>
<td>NCWIT/Alliance project</td>
<td>57</td>
<td>37%</td>
</tr>
<tr>
<td>Grant proposal submitted</td>
<td>51</td>
<td>34%</td>
</tr>
<tr>
<td>Grant proposal funded</td>
<td>33</td>
<td>23%</td>
</tr>
<tr>
<td>Conference paper</td>
<td>18</td>
<td>13%</td>
</tr>
<tr>
<td>Journal article</td>
<td>13</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>8%</td>
</tr>
</tbody>
</table>

The top two collaboration outcomes – presentations and program or practice implementations – are consistently the top two outcomes across years, though this year they are reversed. For the first time in the last few years, Aspirations affiliate awards ranked in the top three most frequent outcome (third place). This year, fewer respondents reported that collaborations resulted in grant proposal submissions and, instead, were more likely to report that collaboration resulted in helping NCWIT or their alliance with projects.
6) Objective: At least half of NCWIT members presented or published on women in computing issues annually

As has been the case in prior years, NCWIT easily surpassed the objective. This year, a healthy 78 percent of Members Survey respondents reported presenting or publishing on women in computing.

These results reflect a durable pattern over time. As the figure below demonstrates, at least 72 percent of respondents have reported presenting or publishing on women in computing each year since 2010.

The percentage of Members Survey respondents who presented or published on women in computing has remained high across time

Here too, the percentage of respondents who reported presenting or publishing on women in computing varied somewhat by alliance. Nearly every member of the SSAB and AGA presented or published on women in computing (this is to be expected from the SSAB, especially). An impressive 78, 79, and 72 percent of respondents in the AA, K-12 Alliance, and WA, respectively, presented or published on women in computing. While EA respondents were the least likely to indicate they presented or published on women in computing, more than half (60%) reported doing so.

A strong majority of members in each alliance presented or published on women in computing
If many NCWIT members presented or published on women in computing, just how many publications or presentations did they make in 2015?

In 2015, Members Survey respondents completed at least 643 presentations or publications on women in computing. The estimate is conservative because we count the top category, “10 or more,” as 10. Examining across time, 643 is considerably lower than the figures we reported in the last three reports. On the other hand, 643 is still much higher than the figures we observed in reports prior to 2012. We thus conclude that NCWIT’s members performed well in terms of presentations and publications on women in IT with the caveat that 2015 may mark a presentation/publication lull.

7) Objective: Each year, at least 75% of members report active engagement with NCWIT

Continuing the pattern observed in prior years, a high percentage of Members Survey respondents reported engagement in 2015. Specifically, 86 percent of respondents indicated they have in at least one way been involved with NCWIT or its alliances.

This represents a consistent pattern over time. For instance, compared to 2014, about the same percentage of respondents reported active involvement in some activity in 2015.
What types of activities were NCWIT members involved in? The figure below presents the percentages of respondents who indicated involvement in various NCWIT-related activities. In 2015, distributing resources (73%), responding to NCWIT staff requests (55%), and participating at meetings (51%), were the three most common forms of involvement. This pattern persists uninterrupted since 2009.

Comparing active engagement across alliances, most alliances exhibit high levels of member engagement. Indeed, over 84 percent of Members Survey respondents in each alliance, excluding the EA, reported being actively involved with NCWIT or its alliances in 2015. As we would expect, all SSAB members reported some form of active involvement with NCWIT. Only 57 percent of EA members, however, reported active involvement during the last year, suggesting that many EA members are only loosely attached to the EA and NCWIT more generally. This finding supports NCWIT’s decision to reorganize the EA by focusing on active members.

A high percentage of Members Survey respondents in each alliance, except the EA, reported active involvement with NCWIT or its alliances in 2015

NCWIT should carefully monitor levels of involvement among the EA, given the EA’s recent restructuring. NCWIT should also keep in mind the possibility that EA involvement is low because members of these smaller organizations may believe they have little to offer. NCWIT should make sure to frame EA projects as important member contributions.
8) Objective: Each year 75% of members agree that their affiliation with NCWIT has helped them build allies or advocates for women in technology in their organizations

We added this objective in 2015 because our interviews with members over the years demonstrated that organizational support – especially support from high-ranking organizational authorities – was a necessary antecedent for change. In 2015 we asked Members Survey respondents to indicate their level of agreement with the following statement: “To what extent do you agree or disagree that your affiliation with NCWIT has helped you build allies or advocates for women in technology in your organization?”

In total, 89 percent of Members Survey respondents “somewhat” or “strongly” agreed that NCWIT membership helped them build allies in their organizations. This means nearly 9 out of 10 respondents believed that NCWIT helped them find organizational advocates with the potential to support them in their change efforts.

Across all alliances, nearly every Members Survey respondent agreed that NCWIT membership helped them build allies or advocates for women in their organizations

The AA and WA results deserve special attention. A strong majority of respondents in the AA and WA – the alliances in which organizational change is arguably most important – agree that NCWIT helped them connect with allies or advocates in their organizations. What is more, in both alliances, nearly half of respondents, strongly agreed with the statement. Finding allies, of course, is an important goal in EA organizations too. However, EA respondents were much more likely to only “somewhat” agree with the statement. Ally building may be less important overall for EA members, as we would expect members of small organizations to be more familiar with their colleagues.

The results of this new Members Survey item suggest that NCWIT membership is an important conduit to engaging with like-minded individuals in organizations. This NCWIT function, in our minds, is largely underappreciated (though it is vital to the Pacesetters program). Because change tends to occur once a “critical mass” is onboard, NCWIT should work on ways to leverage its ability to bring individuals together in order to make change.
NCWIT continues to convene members, leading to motivation and engagement. The 2015 Summit resulted in high levels of perceived value and a more modest level of networking (perhaps because of our new measure). The Summit also led to high levels of collaboration, but not among the WA. More generally, NCWIT membership led to high rates of collaboration/helping between members that often resulted in presentations, program or practice implementations, and Aspirations affiliate awards. NCWIT membership also resulted in high numbers of presentations/publications (though comparatively less than recent years) and high rates of member engagement.
NCWIT Equips Change Leaders with Strategies to Enact Individual and Organizational Change

NCWIT Membership Promotes Individual Change

While NCWIT aims at social change, structural change, and systemic change, part of that change is prompting individuals to change their own behaviors – sometimes with the help of NCWIT’s written endorsements and support. NCWIT’s Theory of Changes contests that individual influencers of girls and women can make a difference in achieving its ultimate objective of increasing the meaningful participation of women in tech.

1) Objective: NCWIT writes letters of support for 5 worthwhile projects per year

In 2015, NCWIT’s staff and leadership wrote or co-signed six letters of support for worthwhile projects (typically, grant proposals). The figure below tracks the number of letters of support for projects over time and the table below provides more detail about the letters written in 2015.
Letters of support for worthwhile projects

1) Terry Morreale wrote a letter of support for NCWIT commitment for WGBH’s 3-year Innovations in Development grant proposal to the National Science Foundation titled: Monkeying Around: Digital Media and Parent/Child Engagement Resources to Increase Preschool Computational Thinking

2) Terry Morreale wrote NCWIT’s letter of commitment for Joanne Cohoon’s for the Lighthouse HS: Tapestry MOOC’s program for high school computer science teacher professional development

3) Robert Beck, Maureen Biggers and Patricia Morreale wrote a letter of collaboration on behalf of the NCWIT Academic Alliance (AA) for the NSF IUSE proposal by CRA-W Undergraduate Cohort Program entitled, “Undergraduate Cohort: A Nationwide mentoring program to bring women CSE majors into the graduate school pipeline”

4) Lucy Sanders and Beth Quinn wrote a letter of commitment for how EngageCSEdu and NCWIT will contribute to the Roadmap for scaling, adaptation and other dissemination activities as outlined in the National Science Foundation IUSE/RED project. PI is Dr. Gita Alaghband from University of Colorado, Denver

5) Lucy Sanders wrote a letter of support to the National Science Foundation reviewers to endorse the Computing Alliance of Hispanic-Serving Institutions’ (CAHSUI) proposal to NSF entitled, “Building a Resilient, Sustainable, and Adaptable CAHSI Ecosystem”

6) Lucy Sanders wrote a letter of support to Glenn Larsen (IIP Program Director, NSF) for Simbulus’ NSF SBIR grant proposal for Curriculum-Centric Programming Environments for NSF FBIR program funding

We also track the number of NCWIT’s letters of support for awards. This year, NCWIT’s staff and leadership wrote six letters of support for awards and seven endorsement letters. The next figure depicts the trend in total number of award letters across time, while the next table offers additional details about each award letter.
Letters in support of awards

1) Ruthe Farmer wrote a letter of support for Lynda Grindstaff for the Society of Women Engineers (SWE) Advocating Women in Engineering Award

2) Ruthe Farmer wrote a letter of support for Barbara McAllister for the SWE Spark Award.

3) Ruthe Farmer wrote Barbara McAllister a letter of support for the Society of Women Engineers (SWE) Advocating Women in Engineering Award

4) Lucy Sanders wrote a letter of support for Sumita Basu’s nomination for the Society of Women Engineers’ Emerging Leader Award

5) Lucy Sanders wrote a letter of support for Lynda Grindstaff’s nomination for the Society of Women Engineers Fellow Grade.

6) Wendy Du Bow, Ruthe Farmer, Catherine Ashcraft and Lucy Sanders co-signed a letter of support for Patty Lopez for the Society of Women Engineers (SWE) Advocating Women in Engineering Award.

Finally, we also track the number of endorsement letters NCWIT writes in support of promotions and new organizational positions. In 2015, NCWIT’s staff and leadership wrote seven such letters. We have not reported on these letters in the past, so we cannot currently compare the number of position and promotion endorsement letters over time. But we summarize these letters in greater detail below.

Position and promotion endorsement letters

1) Ruthe Farmer wrote a letter to the US Department of Homeland Security in support of Dr. Joanne White’s EB-1 immigration status

2) Lucy Sanders wrote a letter of endorsement for Bobby Schnabel's CEO position at ACM

3) Lucy Sanders wrote an endorsement letter for the promotion of Ken Anderson to become a full professor at the University of Colorado's Department of Computer Science

4) Lucy Sanders wrote an endorsement letter for the promotion of Ken Anderson to become a full professor at the University of Colorado's Department of Computer Science

5) Lucy Sanders wrote an endorsement for Jean F. Hakim for the position of Executive Director (CSTA – ACM)

6) Leisa Thompson also completed a 360 feedback survey for Dr. Eugene Judson's promotion at Arizona State University

7) Leisa Thompson wrote a letter of support for Dr. Rebecca Dohrman’s application for promotion to the rank of Associate Professor at Maryville University
2) Objective: Members report changing their behaviors related to NCWIT membership

In 2015, we added two new items to the Members Survey to better understand how NCWIT membership results change. The first pertains to examples of individual-level change and the second, summarized later in this report, pertains to organizational change. For individual-level change, we inquired: “We are interested in any behavior changes that you made which were informed by your participation in NCWIT. In 2015, how would you describe any behavior changes that you made?”

The results of the survey suggest that a very high percentage of respondents, 71 percent to be exact, changed their behavior as a result of their participation with NCWIT.

How did respondents experience individual change? To answer this question, we content coded responses to an open-ended follow up question that asked respondents to describe the changes that they made. We presented a detailed report of our findings earlier in the year (available on request). As a general summary, the table below offers a brief summary of the major themes that emerged from the data as well as the number/percentage of respondents who experienced each theme. Percentages based on the total number of respondents who offered an example of individual-level change.

<table>
<thead>
<tr>
<th>Individual change themes</th>
<th>Number of respondents who reported theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used and shared NCWIT resources</td>
<td>27 (16%)</td>
</tr>
<tr>
<td>Increase in members’ awareness and knowledge</td>
<td>24 (15%)</td>
</tr>
<tr>
<td>Change in mentoring practices</td>
<td>24 (15%)</td>
</tr>
<tr>
<td>Change in pedagogical style</td>
<td>23 (14%)</td>
</tr>
<tr>
<td>Increased outreach</td>
<td>22 (13%)</td>
</tr>
<tr>
<td>Efforts around recruitment and retention</td>
<td>20 (12%)</td>
</tr>
<tr>
<td>Develop new programs</td>
<td>14 (9%)</td>
</tr>
<tr>
<td>Build networks and create opportunities for women</td>
<td>13 (8%)</td>
</tr>
</tbody>
</table>

3) Objective: Members report behavioral changes that range from minor to comprehensive

The new survey items about individual-level change revealed that most individual change occurred incrementally. Specifically, 59 percent of respondents indicated that they made small changes to their behavior. Large-scale change was considerably rarer; only 12 percent of respondents indicated they made a major change to their behavior because of exposure to NCWIT. Just under a third (29%) of respondents reported that they made no change to their behavior.
Whether and how respondents changed their individual behaviors varied by alliance. In general, responses were similar regardless of alliance. No more than 14 percent of respondents in any alliance adjusted their behavior because of NCWIT membership. Instead, respondents in most alliances tended to report small changes. However, the AA differs from other alliances in that fewer respondents report small changes (54%) and somewhat more respondents reported no change (31%).

Across alliances, most Members Survey Respondents report that their NCWIT membership resulted in small individual changes

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Made Major Changes</th>
<th>Made Small Changes</th>
<th>Did Not Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>14%</td>
<td>54%</td>
<td>31%</td>
</tr>
<tr>
<td>AGA</td>
<td>29%</td>
<td>71%</td>
<td>29%</td>
</tr>
<tr>
<td>EA</td>
<td>14%</td>
<td>71%</td>
<td>14%</td>
</tr>
<tr>
<td>K-12</td>
<td>4%</td>
<td>70%</td>
<td>26%</td>
</tr>
<tr>
<td>WA</td>
<td>14%</td>
<td>64%</td>
<td>22%</td>
</tr>
</tbody>
</table>

As the figures above suggests, Members Survey respondents who answered the question about individual change reported behavior changes ranging from minor to comprehensive. The most frequently occurring themes – using/sharing NCWIT resources, increased awareness/knowledge, and changing mentoring or pedagogical practices – typically constituted minor changes. Some examples include:

- “Continued to update my classroom examples to include at least 50% females.”
- “Basically I tweaked existing practices in how I mentor and how inclusive my pedagogy is.”
- “Increased awareness in the classroom and providing information to our Women in CS group about NCWIT’s opportunities.”
Unsurprisingly, major individual change was rarer. Yet, examples demonstrate how a small handful of change makers can change their individual behaviors to make a large impact. Examples include:

We started an AiC Affiliate Awards program, so I started doing a lot of outreach. I was named the diversity coordinator for my school, and I started working on recruiting female students into our computing programs. We also applied to the NCWIT Pacesetters program, and I'm the point person.

I asked two new administration members to join our Pacesetters team. The two women are new administrators – in positions formerly held by people who would not have agreed to help. So... my first point is: Our administration has changed its behavior. But (second point) I also changed my behavior by being a Pacesetter. I used to think I had to "do everything" and did not think in terms of vertical team building. NCWIT/Pacesetters stresses the need to include administrators in order to effect sustainable change.

I have increased my outreach activities. I have also increased internal advocacy and am encouraging curriculum revisions and changes in learning support systems to better serve our underrepresented student populations.

NCWIT membership and its resources support individual-level change. NCWIT continues to leverage its authority to endorse and support individual change leaders through written letters. Individual members tend to view their behavioral changes as incremental rather than major. The most common forms of individual-level change involve using and sharing NCWIT resources, increasing awareness and knowledge, and changing mentoring practices. But a nontrivial number of members also made substantial individual changes, such as increasing their outreach and advocacy efforts.
NCWIT’s Resources Promote Organizational Change

Once an individual is aware of the problem and motivated to enact change, s/he can sometimes affect changes at the organizational level. NCWIT’s resources help transform individual behavior into organizational change.

1) **Objective:** Each year, a majority of alliance members, excluding K-12 Alliance members and the SSAB, report use of strategies based on NCWIT resources

NCWIT just missed this objective by one percent if we include all alliance members. In 2015, exactly half of Members Survey respondents reported that they used a new strategy based on one of NCWIT’s resources. However, if we remove K-12 Alliance respondents and SSAB respondents (members who are unlikely to be advocating change in their organization), we observe that 52 percent of members used a new strategy because of an NCWIT resource. Because this seems to be the more appropriate benchmark, we conclude that NCWIT achieved this goal, albeit just barely.

Across alliances, the figure shows that NCWIT met the majority objective for only the AGA, EA, and WA. NCWIT should explore why AA members are less likely to use strategies based on NCWIT’s resources. One possibility is that many AA members may perceive that NCWIT’s resources are more applicable to industry organizations. We are not surprised that the SSAB and K-12 Alliance exhibit low rates of success on this metric because, as we noted above, members in these alliances mostly do not join NCWIT to make change in their organizations.

However, we should note that, as was the case with the learning from resources metric, the lower percentages are partly an artifact as we measured using strategies based on resources. In 2015, we used a global item rather than providing respondents with specific resources and asking them whether each resource resulted in using a new strategy.
2) **Objective:** Each year, a majority of alliance members agree that they achieved something based of an NCWIT resource

The percentage of Members Survey respondents who achieved something because of an NCWIT resource appears remarkably similar to the percentage of respondents who used new strategies because of an NCWIT resource. However, in this case, NCWIT just missed the objective by three percentage points (47%). The within alliance patterns for achieving something because of NCWIT resources differ somewhat from using a strategy because of NCWIT resources. Less than a third of EA and SSAB respondents achieved something because of an NCWIT resource. This is to be expected among the SSAB, though it is worrisome that so few EA respondents used a resource to achieve something. It also seems problematic that only 45 percent of AA respondents achieved something because of an NCWIT resource. Also, recall that this year’s Members Survey excluded AA affiliate members, so this figure pertains to core AA members – the AA members better positioned to use NCWIT resources to enact change.

However, we should again mention that the lower percentages are partly an artifact of how we measured achieving something based on resources. In 2015, we used a global item rather than providing respondents with specific resources and asking them whether each resource resulted in achieving something.

We think it is noteworthy that a sizable percentage of WA respondents (59%) indicated that they achieved something because of an NCWIT resource. NCWIT should consider why resources seem more likely to result in achieving something among WA respondents compared to AA respondents.

“The service that NCWIT provides by posting resources and enabling professors to access them is without a doubt something that needs to continue. Without shared resources many professors simply don’t have the time or inclination to change.” (AA member)

NCWIT’s resources are an important tool for enacting organizational change. About half of Members Survey respondents report that they either used a new strategy or achieved something because of NCWIT resources. However, these figures could be higher, given the efforts NCWIT puts into creating usable resources. Part of the issue can be attributed to how we operationalized these measures in 2015. However, both resource-based outcomes – using new strategies and achieving something – have traditionally been less common than resource-based learning.
NCWIT Membership Promotes Organizational Change

Apart from its resources, NCWIT membership more broadly may precipitate organizational change as individuals exposed to NCWIT staff, social scientists, and other alliance members may be informed and empowered to make organizational-level changes.

1) Objective: Each year, 80% of alliance members agree that something they learned through NCWIT helped them take action

One of NCWIT’s primary objectives is to spread knowledge in order to inform organizational change. We consider individual action as a first step toward organizational change. In general, NCWIT performs very well on this objective. Overall, nearly 9 out of 10 (89%) of Members Survey respondents reported that they agree that something they learned with through NCWIT helped them take action. When we disaggregate by alliance, we do detect some variation on this outcome.

As the figure below suggests, nearly all AA, K-12, and WA respondents agree that NCWIT taught them something that led to action. Fewer EA, SSAB, and AGA respondents agree with the statement, though the figures still exceed the majority (71%, 77%, and 63%, respectively). The figure also demonstrates that these results are not unique to 2015. Since 2010, NCWIT has easily exceeded the 80 percent objective for most alliances.
2) Objective: Members report organizational changes occurring related to NCWIT membership

In 2015, we also added two new Members Survey items to better understand how NCWIT membership results in organizational change. The survey item read: “We are also interested in any changes that your organization made that were informed by its participation in NCWIT. In 2015, how would you describe any changes that your organization made?”

Our results show that 63 percent of Members Survey respondents reported that their organization enacted some form of change in 2015. This is an impressive feat, given the fact that members may encounter resistance and organizations are often slow to change.

The table below summarizes the most common themes we observed when we asked respondents do provide specific examples of organizational change related to their NCWIT membership. As was the case with Members Survey examples of individual-level changes, we content coded the open-ended responses to uncover common themes. These results are also provided in a detailed report of our findings that we delivered earlier in the year (available on request).

<table>
<thead>
<tr>
<th>Organizational change themes</th>
<th>Number of respondents who reported theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment and retention practices</td>
<td>37 (24%)</td>
</tr>
<tr>
<td>Implementation of new programs</td>
<td>25 (16%)</td>
</tr>
<tr>
<td>Used/shared NCWIT resources or programs</td>
<td>23 (15%)</td>
</tr>
<tr>
<td>Increased outreach</td>
<td>18 (12%)</td>
</tr>
<tr>
<td>Applied for/received/provided funding</td>
<td>16 (10%)</td>
</tr>
<tr>
<td>Organizational awareness and knowledge</td>
<td>14 (9%)</td>
</tr>
<tr>
<td>Training</td>
<td>13 (8%)</td>
</tr>
<tr>
<td>Recognition and encouragement of women in tech</td>
<td>8 (5%)</td>
</tr>
</tbody>
</table>

3) Objective: Members report organizational changes that range from minor to comprehensive

Organizational change, like individual change (see above) tended to occur incrementally. Slightly over half (52%) of Members Survey respondents indicated that their organization made small changes because of NCWIT membership. About one in ten respondents indicated that their organization underwent a major change in 2015 due to NCWIT membership. While major changes were relatively rare, it is important to keep the finding in perspective. Not only are major organizational changes difficult to achieve, but their potential for impact is much greater. Finally, over a third of respondents (37%) reported that their organization did not change during 2015.
We observed variation in the percentage of respondents who reported organizational changes, as the figure below demonstrates. Impressively, WA respondents were the most likely to report organizational changes. Specifically, 64 percent of WA respondents reported that their organization made small changes, while nearly one in five (19%) reported major changes. This is important because industry organizations are often prone to organizational inertia, making it difficult to implement change. High percentages of K-12 respondents also reported that organizational change occurred as a result of NCWIT membership, which is interesting, given that K-12 organizations are largely non-profits that support change in outside organizations. The high percentages of AGA and EA respondents that did not report organizational change is not entirely surprising. The objective of affinity groups is not necessarily to promote organizational change, while EA members may lack the resources that are available to larger organizations to implement change.

As the figure above suggests, Members Survey respondents who answered the question about organizational change reported behavior changes ranging from minor to comprehensive. Some examples of small organizational changes include:

“Collected data, started talking to admissions and advising about recruiting female students to CS classes.”

“We increased the extent of our Teaching Assistant training to cover more material including information related to diversity issues. The training is also now required of undergraduates that support teaching activities, along with the graduate teaching assistants.”
“My organization made good strides towards implementing unconscious bias trainings for hiring managers, as well as started to design an initiative to increase awareness around the patent process so that women's patent applications would rise.”

Some examples of major organizational changes include:

“Bringing in speakers to increase awareness of issues; developing materials for outreach activities; pedagogical changes to intro programming courses; creation of small support groups for female students.”

“Adjustments to recruiting processes; developed male advocacy program; expanded internal employee resource group initiatives.”

“Established performance objectives for all my managers to ensure recruiting slates are 50% females. As a consequence 40% of our new hires in Technology are female.”

This year’s Members Survey revealed much about members’ individual and organizational change efforts. A common pattern with both types of change is that the preponderance of change effort is incremental. Yet we still observe a nontrivial number of members who report substantial individual and organizational overhauls. NCWIT should work with members on how to link small everyday changes to large-scale change in theory and in practice.

4) Objective: Seed fund winners continue to report using funds to implement long-term change strategies

**Student Seed Fund**: The Student Seed Fund is used to support student-run initiatives that demonstrate a strong alignment with NCWIT’s goal to increase the number of technical women. Since 2011, more than 141 programs have been awarded a total of $234,250. The following institutions received Seed Fund awards in 2015:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indiana University Bloomington</td>
<td>The University of North Carolina</td>
</tr>
<tr>
<td>Cal Poly State University, San Luis Obispo</td>
<td>Miami Dade College</td>
</tr>
<tr>
<td>Missouri University of Science and Technology</td>
<td>Renesselaer Polytechnic Institute</td>
</tr>
<tr>
<td>The University of Pennsylvania</td>
<td>University of Minnesota Twin Cities</td>
</tr>
<tr>
<td>Villanova University</td>
<td>Brigham Young University</td>
</tr>
<tr>
<td>California State Polytechnic University, Pomona</td>
<td>Columbus State University</td>
</tr>
<tr>
<td>Farleigh Dickinson University</td>
<td>Michigan Technological University</td>
</tr>
<tr>
<td>Monmouth University</td>
<td>Santa Fe College</td>
</tr>
<tr>
<td>The University at Albany – SUNY</td>
<td>The University of Pittsburgh</td>
</tr>
<tr>
<td>The University of San Francisco</td>
<td>Berea College</td>
</tr>
<tr>
<td>Bryn Mawr College</td>
<td>Georgia Gwinnett College</td>
</tr>
<tr>
<td>Livingstone College</td>
<td>Rensselaer Polytechnic Institute</td>
</tr>
<tr>
<td>San Jose State University</td>
<td>University of Delaware</td>
</tr>
<tr>
<td>University of Massachusetts Amherst</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>University of South Alabama</td>
<td>Western Washington University</td>
</tr>
</tbody>
</table>
Student Seed Funds are intended to provide students with opportunities to initiate sustainable organizational changes. According to data from the Student Seed Fund Survey of Award Recipients, in 2015, at least half of awardees reported that they expect their organization to sustain seed fund activities.

Faculty Seed Fund: To date, 47 member organizations have received a total of $545,450 in funds (since 2007). In 2015, the following institutions were each awarded $10,000 from the Academic Alliance Seed Fund:

- Embry-Riddle Aeronautical University-Daytona Beach
- University of Maryland-College Park
- University of North Carolina-Greensboro in collaboration with Kennesaw State University
- University of Texas-Dallas

Data based on award recipients’ own surveys of students suggest that NCWIT-funded programs made an impact. For instance, once award recipient concluded that nearly all (96%) surveyed students reported increased confidence in computing. The same award recipient also indicated that almost all (96%) of student respondents reported increased computing skills as well as an intention to pursue computing study or computing careers. As is the case with Student Seed Funds, NCWIT prioritizes project proposals that are likely to be sustainable. In 2015, 67 percent award recipients (14 out of 21) reported that they expected their organization to sustain Seed Fund project activities.

Organizational change can only occur if NCWIT’s members transform what they know into action. While we observe average rates of strategizing and achievement based on resources (~50%), we do observe high rates of transforming learning into action – action with the potential to result in organizational change. Most Members Survey respondents report enacting organizational change. From their perspective, organizational change tends to occur incrementally (like individual change), often in the form of adjusting recruitment and retention practices, implementing new programs, and using/sharing NCWIT resources or programs within their organizations. We do find that a minority of members have enacted organizational changes that we (and they) would classify as major. Some organizational changes would not likely have been feasible or sustainable without NCWIT seed funding.
NCWIT Increases the Meaningful Participation of Women in Technology

The final stage of NCWIT’s theory of change explains how individual and organizational change translates into the increased meaningful participation of women in technology. For NCWIT’s mission to be achieved, those changes need to affect more than individual women’s careers or experiences, and instead affect the organizational culture. Changes not only need to be broad enough but also in place long enough to actually affect the environment and culture of the organization.

1) Objective: Majority of AA members experience increases in % females graduating, 2-3 years after year of membership

To evaluate this metric, we compared gender diversity in graduation rates among AA member and non-member institutions using 2014 IPEDs graduation data. Some methodological limits are worth noting. First, the data are two years old, making it difficult to establish membership effects for members who joined after 2012. Second, the external evaluator limited the analysis to institutions classified by IPEDs as “Computer and Information Sciences, General” or “Computer Science.” Thus, some institutions, such as engineering departments, were excluded. Third, IPEDs does not provide graduation data for the entire population of computing-related educational institutions, nor does NCWIT possess this data for each of its AA members. Finally, we excluded graduation data on students who majored in computing as a “second major,” as these relatively ambitious students were too rare to meaningfully analyze.

Below we summarize differences in female graduation rates among AA members and non-members in 2014. We separately analyze departments classified as “Computer and Information Sciences, General” (CIP code: 11.01) and departments classified as “Computer Sciences” (CIP code: 11.07). Our results were calculated by taking the average percent female graduating for the following samples: all institutions that reported data, non-members, all AA members that reported data, and AA members who were affiliated with NCWIT for at least two years.

The first table indicates that, among General Computer and Information Science departments, AA member institutions – even those with longer NCWIT affiliations – are not distinguishable from non-member institutions in terms of female graduation rates. This suggests that, in 2014, affiliation with NCWIT did not affect the percentage of women graduating from these programs. If anything, the data suggest that non-member institutions exhibit a slightly higher female graduation rate. However, the differences are not statistically significant. It is possible that the inclusion of “information science” majors may have diluted the effect, as these majors tend to already be more female inclusive. In other words, the “payoff” for NCWIT membership may be lower in settings where women are more evenly represented. These results closely resemble what we reported in 2014 (which relied on 2013 data)
### NCWIT Academic Alliance Members and Non-members Exhibit Similar Rates of Female Graduates in General Computer and Information Science (CIP 11.01)

<table>
<thead>
<tr>
<th></th>
<th>All Institutions</th>
<th>Non-Members</th>
<th>All AA Members</th>
<th>AA Members (At Least 2 Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Percent Female Graduates</td>
<td>16.63%</td>
<td>17.07%</td>
<td>15.22%</td>
<td>15.91%</td>
</tr>
<tr>
<td>N</td>
<td>658</td>
<td>499</td>
<td>159</td>
<td>137</td>
</tr>
</tbody>
</table>

* p < .10 ** p < .01 based on a two sample difference in mean test (one-tailed). “Non-members” is comparison group.

Note: All-female institutions were excluded from these analyses to reduce outlier effects (i.e. cases with 100% female graduates)

The second table suggests a more favorable pattern for NCWIT. Among computer science departments – departments that are traditionally less gender inclusive that departments that include information science – membership is associated with higher percentages of female graduates. Specifically, in 2014, the average female share of graduates was 14.65 percent among AA members compared to 12.62 percent among non-members and 13.14 percent among all institutions (the baseline rate). The average percent female graduates is slightly higher among AA members who had been affiliated with NCWIT for at least two years compared to the rate for all AA members (14.91% vs. 14.65%). What is more, a two sample t-test suggests that there is less than a five percent chance that the higher rates of female graduates exhibited among longer term AA member organizations compared to the average rate among non-members was merely a product of chance. Likewise, there is less than a 10 percent chance that our observation that the higher average female graduation rates of all AA members is higher than non-members occurred due to chance alone. In other words, we are confident that NCWIT membership, and particularly longer term membership, is associated with a higher average female graduation rate compared to non-members. **These figures support the observation that NCWIT membership – particularly long term membership – helps computer science departments increase the number of females who complete the major and graduate.**

### NCWIT Academic Alliance Members Exhibit Higher Rates of Female Graduates in Computer Science than Non-Members (CIP 11.07)

<table>
<thead>
<tr>
<th></th>
<th>All Institutions</th>
<th>Non-Members</th>
<th>All AA Members</th>
<th>AA Members (At Least 2 Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Percent Female Graduates</td>
<td>13.14%</td>
<td>12.62%</td>
<td>14.65%*</td>
<td>14.91%**</td>
</tr>
<tr>
<td>N</td>
<td>517</td>
<td>385</td>
<td>132</td>
<td>118</td>
</tr>
</tbody>
</table>

* p < .10 ** p < .05 based on a two sample difference in mean test (one-tailed). “Non-members” is comparison group.

Note: All-female institutions were excluded from these analyses to reduce outlier effects (i.e. cases with 100% female graduates)

It is also worth noting that the average female graduation rate among AA members using 2013 data was 13.46. This suggests, that the average female graduation rate among AA members in 2014 is 0.61 percentage points greater than what we observed last year.
As an additional test, we conducted an ordinary least squares (OLS) regression analysis to further understand the association between member duration and the percent female graduates among members with “computer science” departments (CIP code: 11.07). The model controls for the total number of graduates in 2014 to account for any unobserved bias related to department size and resources. In 2016, we hope to analyze models with additional controls to rule out potential sources of bias not explored here (e.g. private vs. public institutions). This analysis is limited to AA members who were affiliated with NCWIT in 2014 or earlier. Thus, non-members and new members are excluded.

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership duration</td>
<td>0.90*</td>
<td>0.42</td>
</tr>
<tr>
<td>Total graduates</td>
<td>-0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>α (constant)</td>
<td>11.20**</td>
<td>1.98</td>
</tr>
</tbody>
</table>

* p < 0.05  ** p < 0.01 (two-tailed test)

Note: All-female institutions were excluded from these analyses to reduce outlier effects (i.e. cases with 100% female graduates)

The results indicate that every additional year of membership in the Academic Alliance is associated with nearly a 1 percent (0.91%) increase in the percent female graduating in 2014. These results are statistically significant at the .05 level, suggesting that there is less than a five percent chance that we would observe this association due to chance. Also, because this estimate was generated while controlling for the total number of graduates in 2014, we can rule out the possibility that our result is driven by the possibility that larger institutions with more resources are more likely to self-select into NCWIT membership.

Taken together, these results demonstrate that AA members in computer science departments, particularly AA members with longer membership durations, exhibited higher rates of female graduates in 2014. These effects, however, only appear salient in traditional computer science departments – departments that exhibit especially low female graduation rates relative to departments that include information sciences.

In addition, these findings are remarkably similar to what we observed in our 2014 report (which used 2013 data). The apparent impact of longer term AA membership, thus, appears stable over a two-year period. Future analyses will help us determine the nature of this trend.

One important caveat remains: While these analyses support the hypothesis that NCWIT membership has “moved the needle” by helping members increase their percentage of female graduates with computer science majors, these results cannot rule out the possibility that member institutions that were, on average, more motivated and better positioned to increase female representation, were also more likely to join NCWIT. This alternative explanation would suggest that NCWIT membership was not a catalyst for change, and, instead, that these members were already primed to increase women’s share of computing degrees prior to their affiliation with NCWIT. To most effectively rule out the possibility of
selection bias (the technical term for this alternative explanation), future analyses must account for change in female graduation rates over time among members and non-members – a project that the external evaluator intends to pursue in 2016.

2) Objective: 70% of AA members report an increase in female enrollment in 2015 and in 2016 75% report an increase in female enrollments

We currently lack the data to effectively evaluate this objective. We hope to utilize expanded Tracking Tool data in 2016 to provide an estimate of how AA membership affects female enrollment. While, we attempted to do so in 2015, too few institutions reported their numbers to warrant a meaningful analysis.

3) Objective: Extension Services clients show improved participation of women in participating majors

**Program value.** NCWIT Extension Services has been able to accomplish important change at participating organizations. This change would not have been possible without the resources provided to the Extension Services Consultants (ESCs) or without the ESCs themselves. In the client and collaborative surveys, clients described their ESC as their most helpful resource. The ESC provides a motivational mechanism which helps the client keep pushing forward as well as an informational mechanism to provide the client with the right information at the right time for the right problem. NCWIT Extension Services has also clearly built the awareness of proven practices for recruitment and retention of underrepresented groups among the ESCs and the Extension Services clients. The ESC is a necessary component to facilitate implementation of research-based practices.

**Program outcomes.** Outcomes data will be available for cohort 2 once the cohort has ended and fall enrollment data are available. A review of this data by the external evaluator will provide an overview of the impact that this grant has had on these schools. We did not analyze Tracking Tool data outcomes from Cohort 1 as applied to Tracking Tool data goals, as the updated data was not available to us.

We did, however, interview five 2015 NEXT awardees from three different institutions for about 30 minutes each. These interviews helped us uncover the following patterns:

- Interviewees described an increase in their motivation for increasing women’s participation in computing on many accounts. One reported that they gained more institutional credibility by re-educating faculty, explaining that now more faculty are interested in doing things to promote women in their department. Also, an institution described a feeling of empowerment that the grant gave them, prompting them to want to share best practices with others in the STEM fields. Individuals involved with the grant definitely experienced increased motivation, although that motivation did not spread through the participating departments at all schools. A nice unexpected impact for one school was their increased focus on underrepresented minority students.
• Women in computing received increased recognition and public attention. There was significant mention that the NEXT awards helped departments gain recognition and visibility for their work to equitably shift computing demographics. One institution expressed that they gained increased visibility with an article published across campus, more discussions, an awareness campaign, and increased grant writing as a result of the NEXT award. Participants remarked on being seen as role models, noting an increase in faculty buy-in regarding bringing more women into computing. More could be done with future awardees, however, to broadcast this award and increase recognition. This could include encouraging awardees to reach out to their local constituencies to broadcast their mission and associated projects.

• Participants were grateful for NCWIT’s commitment and (NSF’s) to and allocation of funds dedicated towards more equitable representation in computing.

• Extension Services in partnership with Google’s NEXT Awards, supported the development and sustainability of resources including doing community outreach in the form of developing regional recruitment networks and building recruitment programming for local girls, allocating and amplifying donor funds for women in computing, and sharing resources and practices with others eager to learn from their projects. It could be helpful for ES staff to share suggestions with former Extension Services clients to facilitate continued inter-departmental collaboration after the Extension Services consultation time has passed.

Program impact. The Extension Services project has significantly demonstrated the value of their philosophy and approach to the corporate world in terms of diversifying the technical workforce. As evidence of this demonstration, in December 2015, Johnson & Johnson Services, Inc. (“JJSI”) gifted ES $70,000. The funds from JJSI support expansion of social change and teaching reform beyond the present clients and Academic Alliance members. JJSI’s involvement validates not only the ES approach, but the value of these activities for society, such as the importance of diversifying the technical workforce. JJSI funds will also contribute to advancing women’s social and financial standing in the United States and beyond.

"Working with [our Extension Services consultant] and NCWIT has been phenomenal! It has made big changes possible...We are so grateful for this recognition. The award will help propel us even further forward in our attempts to increase diversity in the EGR undergraduate student body and ensure their success." (AA member, email correspondence)

"[Our Extensions Services consultant] was instrumental in creating a unified team which worked on a comprehensive strategic plan to increase the representation of women in computing and other engineering majors at MSU and on creating effective retention programs. Our team was very successful: we worked hard, stayed on task, and accomplished our goals. [Our consultant] provided guidance and leadership. She provided us with resources and pushed us to think critically. She kept refocusing our attention on the numbers and the data. We used that data to tell a compelling story in our NEXT application." (AA member, email correspondence)
4) Objective: WA and non-WA corporate data transparency – collect and report progress over time, as more orgs put out new years of data

We intend to evaluate this impact objective in 2016.

5) Objective: Data shows an association between the influence of NCWIT resources and increased female representation at AA member schools

We intend to evaluate this impact objective using updated Tracking Tool data in 2016.

6) Objective: Aspirations Talent pool continues to grow

The National K-12 Award for Aspirations in Computing receives funding from The Aspirations program is supported nationally by Apple, AT&T, Bank of America, Bloomberg, Google, Hewlett Packard Enterprise, Intel, Microsoft, Motorola Solutions Foundation, Northrop Grumman, and the Symantec Corporation. AiC serves 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, and all U.S. military bases overseas. The award program leverages the network of over 450 NCWIT member organizations to recognize increasingly more girls each year by implementing the award locally.

During the 2015-2016 award period, 4,141 girls initiated applications, bringing the total number of girls in the Aspirations talent pool to 24,441 girls who registered in the database since 2007. NCWIT has more than surpassed its goal of reaching 10,000 girls in the Aspirations Talent pool by 2013, and each year the number of applicants and winners increases precipitously. [Note: Some numbers in the Figure have changed since last year because NCWIT researchers discovered that “Total Girls Recognized” represented “Total Awards Given” rather than unique girls who received awards.]
As a source of impact, however, the AIC program must do more than provide honorees with scholarships and exposure to a support network – it must also be clear that the awards link participants to expanded educational and career opportunities. With this in mind, we strongly believe that the AIC program does live up to its promise of impact and we have much evidence, albeit largely qualitative, to support this claim. Our yearly compilation of qualitative evidence of how NCWIT affects change is rife with examples of how the AIC program has impacted young women’s educational and career trajectories. We include a handful of testimonials below, but note that they represent a small fraction of the examples of how the AIC program transformed young women’s interest in computing into a long-term pursuit. Finally, although it is difficult to empirically validate, if only a fraction of AIC awardees goes on to pursue careers in computing, this almost certainly represents a significant expansion of the supply of technical women. NCWIT’s internal evaluator is currently conducting a more in-depth analysis of the meaning of the program and its potential impact.

“Just wanted to say thanks! Without this group, I wouldn't have had the courage to speak up when my school sent out a coding competition where the winner would be named the 'Grand Master Coding King.'” (Aspirations award recipient to Aspirations Facebook community)

“The National Center for Women & IT (NCWIT) has definitely influenced my career. They provide a high school award to girls who aspire to succeed in tech. I won this back in 2010 when it was a small handful of girls getting it, but since then the award and the organization as a whole has really flourished. The mentorship, opportunity, advice, and friendships I’ve gotten through that organization are so valuable to me, and heavily influenced how I chose certain paths” (Aspirations Award recipient in interview for LinkedIn's blog Pulse)
“THANK YOU, THANK YOU, THANK YOU! I can't really express how happy and proud I feel that my daughter... is a recipient of the national award from NCWIT Aspirations in Computing with Bank of America as the sponsor! I am so honored and genuinely grateful that your distinguished companies and team of employees took the time, effort, energy, and financial resources to orchestrate such a beautiful and flawlessly-designed event! All the staff members were so hospitable, gracious, and professional! My daughter is so blessed to have been given such an opportunity to participate and be affiliated with such prestigious organizations that uplift highly accomplished female high school students and give them a forum to have a voice! It is a testament to your high standards as world-class organizations that you would take the time to do this! Other companies should follow your lead! Thank you for being a beacon of light for these young women to follow. You are all awe-inspiring, even to us parents! [We] are forever grateful for the experience!” (email correspondence between parent of an Aspirations Award recipient and Lucy Sanders)

Impact: Where are they now?

Kathryn Bartel (2011 award recipient) created the app “Solar Sprint,” which won first prize in an iOS game competition held at MIT. The game was released in Apple’s app store. Kathryn also serves as a student representative on the Faculty Student academic committee of MIT’s Computer Science Department. She collaborated on a report in 2014 to MIT Computer Science faculty about recruiting more women majors. Finally, she has worked as a summer intern in Software Design at Apple in Summer 2014 and will work at Google in Summer 2015. (email correspondence between Kathryn’s mother, Debbie Bartel, and Ruthe Farmer)

Royce Cook (2013 award recipient) is currently studying to become an IT/security analyst. She writes, “NCWIT has motivated me to achieve a career in a fast-paced, male-dominated field of expertise.” She is also employed by the U.S. Army, working in information systems and creating networks of communication. She is currently stationed in South Korea and is in the process of starting an online business that will be powered on a marketing framework code that she created to organize products and shipment information. (email correspondence between Cook and Avis Yates Rivers)

We do not know enough about NCWIT’s impact – increasing the meaningful participation of women in tech – in member organizations or in society more broadly, but what we do know is heartening. For two consecutive years, analyses of IPEDs data suggest that AA members – particularly longer term members – graduate slightly more women in computer science departments than non-member institutions. Among AA members with computer science departments, each year of NCWIT membership is associated with about a one percent increase in the percent of female graduates. Our evaluation of Extension Services suggests that it is possible that the program may be linked to AA members’ increased graduation rates. Finally, the Aspirations in Computing program continues to grow and impact the lives of young women.
NSF Commitments

- **AA Quantifiable Goals:** At least 70% of AA member representatives report an increase percent in female enrollment. 75% in 2016.
  - Some new enrollment and degrees granted data was collected, but it was not a large enough addition to the existing data to perform new analyses. In the next year, NCWIT will make more requests of the Academic Alliance for updated data.

- **AA – Pacesetters and “net new women”: No specific objectives for year 4.**
  - 30 AA members joined 3rd Pacesetters Cohort
  - 49 total organizations joined (30 from the Academic Alliance)

- **AA Growth and Reach:** The AA increases membership by 20% in both 2015 (365 members) and 2016. The AA includes 28% of U.S. bachelor's degree-granting institutions in 2015. 30% in 2016.
  - AA grew by 15% (54 organizations) in 2015, which is about equal to the growth rate in 2014 (14%).
  - In 2015, 32 percent of the listed colleges with “general computer and information science” majors were NCWIT members, while 35 percent of the listed colleges with “computer science” majors were NCWIT members. Note that the Academic Alliance’s reach extends beyond these schools and includes community colleges and small number of international universities and non-degree granting institutions that have a stake in increasing women majors.

- **NCWIT Summit:**
  - 10% attendee growth in 2015 and 2016.
    - The 2016 Summit in Las Vegas witnessed record breaking attendance. Specifically, 697 individuals attended, a 21 percent increase compared to the 2015 Summit at Hilton Head Island.
  - 85% of attendees see value in 2015 and 2016.
    - A total of 79% of survey respondents rated the 2016 Summit as “very” or “extremely valuable.” This represents a three percentage point decrease compared to the previous Summit (82%). Ninety-six percent of respondents to the Summit survey indicated they were likely to attend another NCWIT event.
  - 500 virtual attendees in 2015. 1,000 virtual attendees in 2016.
    - The 2016 Summit was live streamed, and viewed more than 2,700 times, with 300 engagements/reactions via social media.
    - *Not reported*
  - The number of unique Summit website viewers increases by 20% in 2015 and 2016.
    - Summit content is now archived and available year round. Between 1/1/2015 and 7/1/2015, there were 13,606 pageviews and 10,023 unique pageviews of the main Summit landing page.
  - 50% of attendees make pledges in 2015 and 75% in 2016.
    - During the 2016 Summit, NCWIT encouraged members to submit goals during Summit registration. This voluntary process was successful and a total of 315 new goals were submitted.

- **Resource Creation:**
  - 10-15 new resources created
    - 12 new paper resources and 8 new multimedia resources were created
  - Resource committees advise on 5 projects in 2015 and 2016.
All Alliances have project teams that contribute to the creation of NCWIT resources. At least eight resources were produced as a result of these committees.

**Resource Delivery Vehicles:**
  - NCWIT continues to use Custom Catalogs to deliver resources. More than 250 collections have been created. NCWIT’s collections were visited 2,616 times. A community college filter was added to the site. NCWIT created an evaluation landing page. NCWIT also added the “Explore NCWIT” navigation guide to help new visitors find the most relevant content and programs.
  - 65% of members have distributed resources in 2015 and 70% in 2016.
  - 81% of Members Survey respondents shared a resource or recommended ideas from one in 2015.
  - Increase the number of mobile applications in 2015 and 2016.
    - In April of 2015, NCWIT updated its mobile app with additional facts and pushed its use among members. An app was also created for the 2016 Summit, which was downloaded by 487 users. App users opened and used the app more than 11,700 times.

**Resource Distribution:**
- NCWIT customizes website user experience in 2015 and 2016.
  - NCWIT has invested significantly in customizing the user experience by redesigning the NCWIT homepage and creating a set of “Explore” pages that help users identify the content, resources, programs, and other information most relevant to them. In 2016, these pages will continue to be refined and user-tested.
  - 80% of members find website “very helpful” in 2015 and 90% in 2016.
    - In 2015, half of Members Survey respondents who visited the NCWIT website in the last year reported that the website was “very helpful;” however, virtually all of the remaining respondents (49%) indicated that the website was “somewhat helpful.” Only one respondent indicated that NCWIT’s website was “not at all helpful.”
  - Resources are targeted at 3 new audiences in 2015 and 2016.
    - In 2015, NCWIT created resources that targeted the following four audiences unfamiliar with NCWIT’s mission: community college faculty and administrators, racial and ethnic minorities, Spanish language speakers, and faculty hiring committees.
  - 6 social media resource campaigns in 2015 and 2016.
    - During this grant year, NCWIT conducted at least 8 resource campaigns.
  - 30-50K hard copy resources distributed in 2015 and 2016.
    - 89,003 hardcopy resources were distributed in 2015, a 9% decrease since 2014. In 2015, website users downloaded 24,750 resources, a 53% increase between 2014 and 2015.
    - In 2015, website users downloaded 24,750 resources, a 53% increase between 2014 and 2015.
  - 3 training sessions in 2015 and 2016.
    - In 2015 NCWIT hosted 40 training sessions.

**Research on Aspirations Program (conduct focus groups):**
- Transcribed and analyzed 63 interviews
Published article and presented paper on findings
More private and public research dissemination in works
During the 2015-2016 award cycle, 4,141 girls initiated applications, bringing the total number of girls in the Aspirations talent pool to 24,441 (registered since 2007)

- **Digital Outreach and PR:**
  - 4 Twenty-three digital newsletters/e-communications were produced and sent to both members and non-members
    - Twenty-three digital newsletters/e-communications were produced and sent to both members and non-members.
  - 10% increase in overall unique visitors/website page views
    - The number of unique visitors to NCWIT.org increased from 162,660 in 2014 to 178,212 in 2015, reflecting a 10% increase in overall unique visitors.
  - 20% growth in social media community
    - Between December 2015 and January 2016 NCWIT Facebook fans (“likes” and “followers”) nearly doubled from 9,194 to 19,269 (an increase of 95%), and Twitter followers grew from 12,330 to 17,729 (an increase of 38%).
  - NCWIT distributed 16 press releases in 2015
  - NCWIT completed at least five new pushes to targeted media in 2015
    - NCWIT completed at least five new pushes to targeted media in 2015. Media advisories were sent in an effort to increase event coverage. In addition, the following feature articles concerning NCWIT research were pitched and published in outlets: “10 Actionable Ways To Actually Increase Diversity In Tech in Fast Company” and “The Tricky (And Necessary) Business Of Being A Male Advocate For Gender Equality in Fast Company.”

- **Events Outreach:**
  - Three Keynotes
    - In 2015, NCWIT keynoted at six different meetings/conferences.
  - NCWIT attend 8-10 events
    - NCWIT attended or sent resources to a total of 570 events/meetings in 2015, as well as 30 meetings with notable policy makers and government officials.
  - Twenty-four NCWIT ambassador outreach events (note, “ambassadors” has been renamed NCWIT2GO).
    - NCWIT has struggled to launch NCWIT2GO. In the past year, efforts focused on the technical side of the effort, as the previous iteration required considerable follow-up and didn’t represent a good return on investment. While alliance members and the Aspirations community (among others) continued to represent NCWIT at events, we don’t have an accurate number to report, as the tracking system wasn’t yet in place.