NCWIT End of the Year External Evaluation Report
Calendar Year 2017

Prepared by University of Washington
Center for Evaluation & Research for STEM Equity (CERSE)
June 2018

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Introduction to the 2017 External Evaluation Report

NCWIT in 2017

If we don't have women in the tech space, we won't even be asking ourselves some of the right questions.

~ Melinda Gates, 2017

Women are such an important part of the workforce. If STEM-related fields continue to have this low representation of women, then there just will not be enough innovation in the United States. That's just the simple fact of it.

~ Tim Cook, 2017

The year 2017 marked a “seismic shift” in how we talk about gender equality in the tech industry. Compared to prior years, the public conversation focused less on employers’ workforce diversity strategies and more on the organizational cultures and policies that keep women and racial-ethnic minorities out of the workplace to begin with. More than ever before, women’s underrepresentation in computing jobs was attributed to the failure of employers to create inclusive workplaces.

It is no coincidence that the conversation shifted in 2017. The Uber memo, the Google Manifesto, the “culture of harassment” at venture capital firms – these were among several widely-publicized scandals that roiled the tech industry over the last year, increasing public scrutiny. To make matters worse, tech employers mostly failed to show progress since releasing their diversity data. Across firms, women’s representation remains stubbornly low. It should therefore come as no surprise that 73 percent of Americans believe that discrimination against women is a problem in the tech industry.

Yet, for the last several years, policymakers’ and employers’ solutions have tended to focus on “fixing the pipeline” – that is, increasing the number of qualified women and connecting them to jobs. The Obama administration’s CSforAll campaign as well as Code.org’s efforts to expand K-12 computer science programs are but two of the many programs with this goal. Tech employers’ outreach and recruitment efforts also fall into this category. These policies share the belief that, if more women are given

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opportunities to learn computer science and fill job vacancies, tech employers will be able to counter their diversity troubles. Fix the pipeline, fix the problem.

When employers do take internal barriers to inclusion seriously, their solutions tend to focus on the individual rather than the organization and its culture. Take, for instance, tech companies’ preferred method of addressing diversity problems: implicit bias training. As Anita Borg Institute's Telle Whitney recently put it “Virtually every company I know of is deploying unconscious-bias training…It’s a fast and feel-good kind of training that helps you feel like you’re making a difference.” But are these practices enough? While addressing implicit bias likely does make a difference, it locates the problem in the minds of individual employees and ignores the very real organizational policies and cultures that facilitate (white) men’s dominance in the workplace.

In this context, we believe that NCWIT still has a unique and perhaps even more relevant role to play. NCWIT has been an early innovator in advocating for systemic, organizational solutions to the problem of women's underrepresentation in technical workplaces and classrooms. NCWIT has also broken ground by creating resources that extend beyond anti-bias training – resources that encourage careful and systemic approaches to organizational change.

Going forward, NCWIT is well-positioned to play at least two important roles. First, NCWIT should continue to spread awareness and provide research-based expertise. We already have evidence that there is a large and receptive audience for NCWIT’s resources. As we report below, NCWIT’s resources were cited in 163 press mentions in 2017 alone. This is nearly three times the record previously set in 2015. Many of these stories cited NCWIT’s experts and reports to provide context to specific current events. Second, NCWIT should continue to be an advocate for and support system-level change. While organizational change is difficult, it is hardly impossible, especially with the help of a reputable organization like NCWIT. Indeed, our final (and separate) evaluation of the most recent Pacesetters cohort provided numerous examples of academic and industry organizations that took initial steps to enact meaningful and sustainable organizational-level change.

The going, however, will not be easy. In addition to the struggle of encouraging system-level change, there are new and old issues that NCWIT must contend with. NCWIT could pursue an even more intersectional focus to the work, acknowledging the unique assets and barriers that Native American, Latinx, and Black/African American women face in computing. NCWIT might also consider using some resources to raise awareness of the role that motherhood plays in perpetuating gender inequality in work organizations. The notion of the “motherhood penalty” and its contribution to gender wage inequality is no longer confined to the world of academics and is emerging as a hot topic, including, if not especially,


among women in computing jobs. Finally, NCWIT should consider developing resources for and provide support to organizations that face backlashes to diversity efforts. As companies admit and address their inequities, some dominant group members – perhaps emboldened by current political discourse – are likely to become reactionary.

In short, we believe NCWIT can still help lead the way in increasing women’s meaningful participation in computing. While recent events have opened the public’s eyes to the systemic barriers women encounter in technology-focused organizations, NCWIT has been using evidence-based practices to grapple with the issue for years. NCWIT can thus be a resource and example for organizations that wish to change course and regain legitimacy. As the following report demonstrates, NCWIT remains up for the challenge.

Logic of the Report

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

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In this process, NCWIT’s Three-Pronged Strategy – the primary focus of some of past evaluation reports – is viewed as providing the necessary conditions for change. By building capacity (convening), creating and distributing resources (equipping), and conducting outreach (uniting), NCWIT intends to raise awareness, spread knowledge, and motivate members to act. The majority of evaluation metrics in past 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, knowledge, and motivation among NCWIT’s membership base should result in individual and organizational actions, which, in turn, should precipitate the meaningful participation of women in technology. In this report, we include metrics used in past reports as well as newer (as of 2015) measures of individual and organizational actions in order to examine the extent that members forge alliances in their organizations and create change in both minor and major ways. This improves our 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 continue to pursue new ways of evaluating impact. Over the next few years, we intend to collaborate with NCWIT to consider additional possibilities for measuring and evaluating impact.

The 2017 annual report is organized as follows: We first provide a traditional executive summary of our results. Then, we offer detailed presentations of our findings as well as related 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 (2006-2017). Some metrics have been added in different years.
NCWIT Builds a Strong Community of Diverse Organizations and Members

NCWIT continues to grow the community. Membership at the end of 2017 reached 1,132 organizations. Much of the membership growth was concentrated in the Academic Alliance (AA) and K-12 Alliance, which grew to 539 and 349 organizations, respectively. Most of the growth in the K-12 Alliance occurred among associate members. NCWIT's alliances also continued to be comprised of a diversity of organization types.

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 2017, NCWIT created 11 paper/web resources and 107 multimedia resources. Vimeo video uploads comprise nearly all of the new multimedia resources (103). NCWIT's large library of resources were heavily distributed in hard-copy (258,287 resources handed out), and resource page views were very high—especially for reports and statistics which had 31,062 page views. There were 38,891 resource downloads in 2017, a 48% increase from 2016 (2017 Internal evaluation report).

People are learning from NCWIT (from resources and the Summit). A total of 81 percent of Summit attendees said they learned new information from a presentation at the 2017 Summit, and 67 percent of members in 2017 reported learning something new from an NCWIT resource.

NCWIT drives broad awareness through outreach. NCWIT staff or designates attended 602 non-government/non-policy meetings in 2017, breaking the previous record of 453 set in 2013. Seventy-two and 129 of these events, respectively, were conferences and meetings with VIPs. NCWIT also interacted with policy makers or government/policy-related people at least 16 times during the last year. Scholars around the world are sharing NCWIT’s resources by citing them in their scholarly work. In 2017, NCWIT set a new record with 100 scholarly publications citing NCWIT resources. NCWIT also sent 19 e-newsletters in 2017 covering a wide range of material.

NCWIT uses social media and traditional media to increase engagement with non-members. Facebook fans grew nine percent in one year (to 30,470 at the end of 2017), and Twitter Followers grew 23 percent (to 26,265). Impressively, NCWIT was mentioned in 368 different news/press articles in 2017, and a total of 74 blog posts. The increase in press mentions largely owes to mentions of NCWIT’s resources, in particular its statistical reports. Of the 368 press mentions, 168 of them mentioned NCWIT data, stats, website, or resources (45%).

NCWIT's website continues to see high numbers of unique visitors. In 2017, over 202,744 unique visitors came to the NCWIT website, the highest amount thus far.
**Members take responsibility for outreach as well.** Of the 87 percent of Members Survey respondents who reported active involvement with NCWIT in 2017, 73 percent indicated that they distributed NCWIT materials or resources. In addition, at least 10 members have presented on behalf of NCWIT as part of NCWIT2GO, reaching at least 475 people.

**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 2017, 650 people attended the Summit in Tucson. Almost all of them said they would attend another NCWIT event, and 81 percent found the meetings very or extremely valuable. The Summit brings people together who then develop working relationships; 77 percent of 2017 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 2017, 80 percent of members said that they helped or collaborated with another NCWIT member on a project related to women in computing. The top three collaboration outcomes included 75 presentations (to audiences inside or outside of members’ organizations), 70 program or practice implementations, and 41 instances of working together on Aspirations Awards. Even if members are not collaborating, 81 percent of members indicated that they presented or published on women in computing in 2017.

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

**NCWIT provides support for members making their own changes.** In 2017, NCWIT wrote letters of support for six 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 one recommendation letter for an award.

**Members are active making their own individual behavior changes.** A total of 62 percent of NCWIT members indicated that they made changes to their own behavior because of NCWIT membership in 2017. Just over half of respondents (54%) made small behavioral changes, while eight percent of respondents made major behavioral changes. More than one-third of respondents (38%) made no changes to their behavior.

**NCWIT resources and membership help promote organizational change.** In 2017, 56 percent of members indicated that they had used new strategies based on information in NCWIT resources – a five percentage point decrease since 2016 (61%). This decrease appears driven by declines in the AA and WA. In addition, nearly 87 percent of members agreed that they took action because of something they learned through NCWIT.

**Members are active making organizational change.** The Faculty Seed Fund continues to enable individuals in universities to provide organizational supports and initiatives for women in computing; nearly all recipients expect that these new organizational initiatives will be sustained once the outside
funding is gone. In addition, a total of 57 percent of Members Survey respondents indicated that NCWIT membership resulted in organizational change in 2017. Just under half of respondents’ (49%) indicated that their organization made small changes, while eight percent of respondents indicated that their organization made major changes. However, a sizable 43 percent of respondents indicated that they organization made no change as a result of NCWIT membership in 2017.

NCWIT Increases the Meaningful Participation of Women in Technology

NCWIT has had an impact on women’s representation among computer science departments’ graduates. Among institutions with majors in “computer and information sciences and support services,” NCWIT membership is associated with higher percentages of female graduates. In academic year 2015-2016, compared to newly joined AA members (less than 2 years), the percentage of female graduates was, on average, 7.35 and 8.07 percentage points higher among AA members with NCWIT affiliations of 8-9 years and 10+ years, respectively. From 2004 to 2016, a one-year increase in NCWIT membership was associated with a .55 percentage point increase in the number of female completions within institutions. Among Extension Services clients, duration was associated with a .83 percentage point increase in the number of female completions within institutions over time.

Many of NCWIT’s Academic Alliance members saw an increase in female enrollment between the 2014-2015 and 2015-2016 academic years. Change in average percent female enrollment: On average, in 2016, departments in institutions that have been affiliated with NCWIT for nine and 10 years, respectively, witnessed a 10 and 12 percentage point increase in the percent of female declared majors since the institutions first became NCWIT members. Change in average growth rate of female enrollment: For departments in institutions that have been members of NCWIT for at least three years, the average (or mean) number of female declared majors doubled from their first year of membership to 2015-2016. For departments that have been affiliated with NCWIT for at least five years, the average number of female declared majors more than quadrupled since their first year of NCWIT membership (with the exception of 8-year members).

NCWIT Extension Services has had an impact on undergraduate women’s participation, especially in Computer Science departments. In 2017, NCWIT oversaw two Extension Services-related grants: NSF Cohort 2 and Extension Services Undergraduate Programs at Scale (ES-UPS, Learning Circles, funded by IUSE). NSF Cohort 2 succeeded in expanding the pool of women. Among the institutions with available data, the number of women applicants increased by 1,200 (a 110% increase) and the total number of women program acceptances increased by 1,124 (a 168% increase). In addition, participants of NCWIT ES-UPS reported greater human resources, institutional, and informational resources as a result of their Learning Circle participation.

NCWIT has expanded the pipeline to a flowing river through the Aspirations Program. In total, more than 30,610 high school girls have registered and initiated applications at the high school Aspirations Award portal (still waiting on 2017-2018 initiated application data), and 3,637 registered during the 2017-2018 award period. During the 2017-2018 award cycle, 3,014 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 its member community. The strength and diversity of NCWIT’s community – its member organizations and individual leaders – provide the 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 2016 and 2017, NCWIT’s community grew from 891 to 1,132 member organizations, a 27 percent increase in total membership. As the figure below suggests, this marks the sharpest one-year membership increase. Growth, however, did not occur evenly across alliances. As was the case in 2016, a large share of membership growth occurred in the K-12 Alliance associate member category. This alliance accounted for 133 of the 241 new members.

Academic Alliance

Between 2016 and 2017, the Academic Alliance (AA) grew from 478 to 539 members, a 13% increase. The AA’s 539 member organizations accounted for nearly half of all NCWIT members (48%).
Affinity Alliance

The Affinity Alliance (formerly the Affinity Group Alliance) was re-named and re-conceived in 2016. Some change in membership between 2016 and 2017 reflects this transition. First, 11 non-academic, non-profits transferred from the AA to the Affinity Alliance. Second, 10 workplace affinity groups were no longer counted as members. Overall, the Affinity Alliance expanded by 29 members in 2017 – an increase of 42 percent. The Affinity Alliance’s 98 members accounted for nine percent of NCWIT’s total membership.

Workforce Alliance

Between 2016 and 2017, the Workforce Alliance (WA) gained seven new members, but it lost six. Thus, in the last year, WA membership increased by one organization. The WA’s 73 members accounted for about six percent of all NCWIT member organizations.

Entrepreneurial Alliance

In 2015, the Entrepreneurial Alliance (EA) underwent significant reorganization, separating members into three categories: Channel Partners, EA Associates, and EA Members. Channel partners consist of small “accelerator,” “incubator,” and “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 purchase full NCWIT membership. These organizations, however, do receive access to NCWIT resources and their company names appear on NCWIT’s website. Finally, EA Members consist of smaller companies in the “growth phase” that pay $2,000 per year for full membership benefits including access to resources, research, and hands on attention from project managers. In 2017, the EA consisted of 74 total members: 33 Full members, eight
Channel members, and 33 Associate members. EA members accounted for seven percent of all NCWIT member organizations.

**K-12 Alliance**

In 2017, the K-12 Alliance welcomed 133 new members, a 62 percent increase in membership. Twenty-one new members were full members, while the remaining 112 new members were associate members—a category that includes formal educational organizations such as secondary schools; informal educational organizations, such as on-campus after school groups; public libraries; and local housing authorities that participate in NCWIT’s partnerships with Google.org and the United States Department of Housing and Urban Development (HUD). The K-12 Alliance’s 349 members accounted for nearly one-third of NCWIT total members (31%), making it the second largest alliance after the AA.

![K-12 Alliance Growth Chart](chart.png)

**NCWIT Continues to Build a Diverse Community**

1) **Objective: Diversity of member organizations increases annually**

**Academic Alliance Diversity**

Among the AA, the number of doctoral-granting institutions increased by seven percent (N=191), the number of Master’s-granting institutions increased by 12 percent (N=163), the number of Bachelor’s-granting institutions increased by 25 percent (N=91), and the number of Associate’s-granting institutions increased by 23 percent (N=75). In addition, the AA includes two institutions accredited by the Council on Occupational Education and 5 non-academic partner organizations. Sixty-nine institutions are classified as Minority Serving Institutions and 13 are classified as all-women institutions. Eleven

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11 Our 2017 count includes 27 members (mostly associate members) that left the EA sometime in 2017. The count presented in the 2018 Annual Report will reflect this sharp decline.

12 In 2016, 10 non-academic partner organizations were transferred to the newly restructured Affinity Alliance. Also, although we count Microsoft and Google as non-academic partner organizations, they are not included in our total AA member counts because we already count them as WA members.
members represent international institutions. Because the categories presented in the figure are not mutually exclusive, summing across categories will not equal the total AA membership.

K-12 Alliance Diversity

Since 2015, we disaggregate our observations of K-12 Alliance diversity by whether members are full versus associate members. Among full members, the number of formal education organizations and professional associations remained the same between 2016 and 2017 – a total of seven and 12 organizations, respectively. In addition, the number of informal education organizations, non-profits, and organizations that serve underrepresented communities respectively increased membership by 53, 40, and 27 percent. Finally, the alliance welcomed three new corporations as full members.

For associate members, membership for each category changed as follows: formal education organizations (66%; 44 new members), informal education organizations (83% increase; 48 new members), non-profits (97% increase; 60 new members); organizations that serve underrepresented communities (62% increase; 34 new members); and housing authorities (58% increase; 7 new members). The K-12 Alliance associate member category also includes one professional association and seven corporations.

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13 Some members are cross-listed as WA and K-12 Alliance members. While we include three industry members in our count of K-12 Alliance corporate members we do not include them in our K-12 Alliance member counts.
Workforce Alliance Diversity

In 2017, the WA included more Fortune 500 companies (N=38) than non-Fortune 500 companies (N=31). The WA also includes four non-private employers: the City of Fort Collins, Colorado; the Institute for Telecommunication Sciences (US Department of Commerce), Wiche Cooperative for Educational Technologies; and Minnesota IT Services (Minnesota State).
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 diversity. We were unable to collect responses from every member of NCWIT’s leadership and staff who was active in 2017. Nonetheless, 91 percent of board of director (BOD) members, 92 percent of Leadership Team (LT) members, 93 percent of the staff/consultants group, and all SSAB members responded to the survey. However, some respondents occasionally skipped individual questions, especially questions pertaining to race-ethnicity.

Race and Ethnicity

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</table>

The SSAB continues to be the most diverse leadership group in terms of racial/ethnic diversity. Just under half of SSAB members identified as nonwhite or mixed race. People of color remain underrepresented in the BOD, LT, and staff and consultants group. Specifically, 17 percent of the BOD and just under a quarter of the LT and staff and consultants group identify as a race or ethnicity other than non-Hispanic white. Put differently, strong majorities of NCWIT’s staff and leadership identify as (non-Hispanic) white. These figures have remained relatively stable over the last few years, though the BOD became less diverse between 2015 and 2016.
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 LT also appears highly educated with sixty-one percent of members holding a PhD and about a quarter of members holding a MA. High levels of educational attainment among this group owes in no small part to the substantial number of AA faculty members. Members of the Board of Directors, however, were equally likely to claim a Bachelor’s degree or a professional degree as their highest level of attainment. Members of the Board of Directors tended to be industry representatives where advanced degrees are less likely to be necessary for employment. Finally, the staff and consultants group was the most educationally diverse. Specifically, one-third earned a PhD or JD, 36 percent earned a MA or equivalent, and 28 percent earned a BA. The small percentage of staff/consultants whose highest degree is a high school diploma reflects students whose BA is in progress.
First Generation College Student

First generation college student status is an indicator of the types of barriers one faced while advancing their career. Nearly half of the BOD (46%) were first generation college students. Fewer members of the LT (32%), SSAB (38%), and Staff and Consultants group (31%) were first generation college students.

Gender

NCWIT’s senior leadership groups are the most gender diverse; a total of 58 percent of the BOD and 68 percent of the LT identified as women. The SSAB and Staff and Consultants groups, on the other hand, are predominantly female; about 86 to 87 percent of these groups identified as female.

Disability

Very few members of NCWIT’s leadership teams reported a disability.
SSAB Expertise

A small majority (57%) of SSAB members earned their doctorate in social sciences such as sociology and economics. A sizable 24 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.

As in prior years, in 2017, NCWIT continued to grow and diversify its membership base. Racial/ethnic diversity continue to be underrepresented among NCWIT’s leadership and staff (excluding the SSAB); gender diversity is also lacking among the SSAB and the staff/consultants group.

As NCWIT pursues a more intersectional and inclusive definition of diversity, it should try to increase racial and ethnic diversity among its Leadership Team and Board of Directors. This is important as NCWIT has been criticized for being overwhelmingly white in leadership and therefore reflective of primarily white perspectives.
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 2017, NCWIT created 11 new paper resources, including five external articles, four posters, one toolkit, and one program-in-a-box. In total, we have counted 202 paper resources since 2005.
NCWIT also created 107 new multimedia resources in 2017. Vimeo videos comprise nearly all of the new multimedia resources (103). For the most part, these videos were not created in 2017; rather, they consist of livestream footage from prior NCWIT events. New multimedia resources also included one webinar and three interactive tools. In total, NCWIT has created 311 multimedia resources since 2006.

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual # of multimedia resources</th>
<th>Cumulative # of multimedia resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2007</td>
<td>23</td>
<td>24</td>
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<tr>
<td>2008</td>
<td>12</td>
<td>36</td>
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<td>2009</td>
<td>19</td>
<td>55</td>
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<tr>
<td>2010</td>
<td>20</td>
<td>75</td>
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<tr>
<td>2011</td>
<td>19</td>
<td>94</td>
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<td>2012</td>
<td>32</td>
<td>126</td>
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<td>2013</td>
<td>23</td>
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<td>2014</td>
<td>34</td>
<td>183</td>
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<tr>
<td>2015</td>
<td>8</td>
<td>193</td>
</tr>
<tr>
<td>2016</td>
<td>11</td>
<td>204</td>
</tr>
<tr>
<td>2017</td>
<td>107</td>
<td>311</td>
</tr>
</tbody>
</table>

2) Objective: NCWIT distributes 30-50K resources annually. NCWIT increases the number of resource downloads.

In 2017, NCWIT distributed 258,287 hardcopy resources and website users downloaded an additional 38,891 resources, a 48% increase from 2016 (2017 Internal evaluation report).

The large increase in hardcopy resource distribution between 2015 and 2016 largely reflects a change in how NCWIT measures distribution (see 2016 internal evaluation report). But the methodology stayed the same from 2016 to 2017, so the increase is likely to reflect real increased distribution. More information about which resources were most distributed can be found in the Internal Evaluation report.

NCWIT continues to expand its hardcopy and media resource base. The spike in the number of media resources reflects NCWIT’s decision to upload dozens of streamed presentations to Vimeo. Compared to 2016, the number of resource downloads increased significantly. Hard copy resource distribution has also increased in a meaningful way.
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, and 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 2017, 81 percent of Summit attendees reported learning new ideas or information from a speaker or presentation. NCWIT thus exceeded its 75 percent target. This figure is two percentage points less than what we observed in 2015 (83%) but six percentage points more than what we observed in 2016 (75%).

“"The Summit was extremely valuable to me as a new leader. I greatly appreciated the amount of time spent with NCWIT researchers to get real, credible info on unconscious bias, the industry change model, and being a better ally. I also got a lot out of the discussions with the other attendees in the Intersectionality & Alpha workforce alliance meetings!” (WA Summit Survey respondent)

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14 In the past, this figure referred to any learning that resulted from attending workshops or plenaries. In 2017 and going forward, this figure only refers to workshop-related learning because plenary and workshop outcomes are queried using different survey instruments (pulse surveys for workshops and post-Summit survey for plenaries).
2) Objective: Each year, more than 75% of members report learning something new because of an NCWIT resource.

In the last three years, NCWIT has failed to meet this objective. In 2017, just over two-thirds of Members Survey respondents (67%) reported that they learned something new because of an NCWIT resource. NCWIT thus missed the mark by eight percentage points. In 2015 and 2016, NCWIT came up short by one percentage point.

As the figure below suggests, some alliances performed better than others on this metric. In 2017, the percentage of members who learned something from an NCWIT resource was well below 75 percent in the AA, Affinity Alliance, and K-12 Alliance. Given that AA members comprise a considerable share of Members Survey respondents, a low percentage in this alliance will weigh heavily on the total outcome. The percentage of EA, WA, and SSAB members who learned something from an NCWIT resource surpassed the 75 percent mark.

Learning something new from an NCWIT resource, across Alliances.

“I found many applicable resources from NCWIT webpage for the project that I plan to implement soon. Those resources seem very useful and helpful to new faculty members like me.” (AA Members Survey Respondent)

As was the case in 2016, high percentages of NCWIT members continue to learn new ideas by participating at the Summit and by using NCWIT resources. However, for three consecutive years, NCWIT has failed to reach its objective that more than 75 percent of members learned something new because of a resource.
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

In 2017, NCWIT staff or delegates attended at least 16 meetings with notable policy makers and government officials – half of what we observed in 2016 (32).

Key examples of NCWIT’s presence in DC in 2017 include:

- Kelly Riddle, legislative assistant to Congresswoman Jackie Rosen, “pulled many stats” [her words] from NCWIT’s resources for the congresswoman’s talking points for the House Science, Space, and Technology Committee markup which will introduce Representative Rosen’s “Code Like a Girl Act” in addition to her “Building Blocks of Stem Act”.
- Anne Marie Horowitz (Department of Energy [DOE]) coordinated with NCWIT’s Jannie Fernandez so that DOE staff could participate in a K-12 Alliance member “huddle” to collaborate on CSEd Week activities.
- Lecia Barker attended the Building State Capacity for Leadership in the K12 CS Ed Workshop in Washington D.C. The event is a convening of about 10 state delegations comprised of business leaders, drivers of education policy, teacher development leaders and more. Members represent states that are at the vanguard of CS4ALL and have an explicit interest in equity. One goal of the meeting was to codify best practices in order to improve their efforts and to inform states that are just getting on board.
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 and organizations per year. In 2017, NCWIT’s staff and leadership met with 129 VIPs or high level administrators, a 39 percent increase between 2016 and 2017. Nonetheless, NCWIT missed its objective by 71 meetings. While, NCWIT has witnessed a decline in VIP meetings since 2013 when we recorded 198 meetings, it is reassuring that we observed an uptick in meetings in the last year.

![Number of NCWIT Meetings with VIPs](image)

NCWIT’s presence in DC appears to have declined in recent years, perhaps reflecting shifting priorities in Washington. NCWIT might consider increasing engagement in policy-making at the state and local levels. Or perhaps this objective is no longer as important for NCWIT since there are other organizations now "carrying" the CS Education banner.

**Scholarly Outreach**

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

In 2017, NCWIT’s resources were cited in 100 academic publications, far surpassing the goal of 40 publications. Indeed, for two years straight, NCWIT broke its record for resource citations in academic publications.

![Academic Citations of Resources - Growth Over Time](image)
Of these publications, 41 were articles published in peer reviewed journals such as the *Information Systems Education Journal*, *Computer Science Education*, and the *International Journal on Information Technologies and Security*. NCWIT resources were also cited in seven conference proceedings, 22 student dissertations and theses, and 30 other academic publications such as books, reports, and magazine articles. It is encouraging that a high percentage of NCWIT resource citations are found in academic journals – publications that tend to be more rigorously reviewed.

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

<table>
<thead>
<tr>
<th>Resource Cited</th>
<th># Citations from 2005 to 2017</th>
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<tbody>
<tr>
<td>Fact Sheet</td>
<td>12</td>
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<tr>
<td>Promising Practice</td>
<td>27</td>
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<tr>
<td>2007</td>
<td>29</td>
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<tr>
<td>Programs-in-a-Box</td>
<td>30</td>
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<tr>
<td>Who Invents IT</td>
<td>30</td>
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<tr>
<td>Scorecard 2010</td>
<td>34</td>
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<tr>
<td>ncwit.org</td>
<td>64</td>
</tr>
<tr>
<td>By the Numbers</td>
<td>73</td>
</tr>
<tr>
<td>Women (or Girls) in IT: The Facts</td>
<td>103</td>
</tr>
<tr>
<td>Other</td>
<td>114</td>
</tr>
</tbody>
</table>

“[My collaboration with NCWIT resulted in a] grant submission with board members from NCWIT, journal paper publication with feedback from NCWIT members.” (SSAB Members Survey respondent)

**Media Outreach**

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 2017, NCWIT was cited in 368 press articles. In addition to being a record high for NCWIT, the 2017 count is more than double the total we observed in 2016 (135). Why the increase? One reason is that the press has increasingly scrutinized the practices of large tech employers, largely in response to big news stories like the Uber sexual
harassment scandal, the Google Memo, and, more generally, the #metoo movement. While 2016’s mentions of NCWIT in national news media often were in conjunction with the White House’s CSforAll campaign and announcements about tech companies’ diversity initiatives, in 2017, national-level NCWIT mentions often appeared in articles criticizing the tech industry and questioning its diversity efforts. Consider the following headlines, to name a few: “The Tech Industry Is Facing 'Armageddon,' Says ACLU President,” “Silicon Valley's diversity efforts get mired in scandal,” and “Bro culture is under attack, but women say it’s far from tamed.” In these types of articles, NCWIT appears as a fact-bearer rather than as a co-partner for diversity efforts or as an example of a social change organization.

In critical press coverage of the tech industry, NCWIT’s reports and experts are often cited as fact-bearers. NCWIT should invest in the creation of evidence-based resources that can be cited as solutions for organizations seeking to enact sustainable organizational change.

In addition, NCWIT was also mentioned in 74 blog posts, a 75 percent decrease since 2016. Given that press mentions of NCWIT experienced a sharp increase in 2017, the low blog mention count is probably not an indicator of NCWIT’s declining prestige. Instead, it probably reflects the decreasing popularity of blogs in general or changes made to Google’s blog search engine.

NCWIT greatly exceeded its goal of at least 50 press mentions in more prestigious national or international sources. Specifically, NCWIT was mentioned in 58 national outlets and 38 international outlets (96 national and international mentions). In particular, the number of international press mentions grew at a striking rate. To put the increase into perspective, we counted only two international NCWIT press mentions in 2016. Relatively speaking, 74 percent of press mentions were in local outlets (and lesser known websites), while the remaining 26 percent were featured in more prestigious national or international outlets.

NCWIT’s resources (including its website) were cited in 163 press mentions, which amounts to 45 percent of all press mentions. In addition, the Aspirations in Computing campaign was cited in 123 (33%) press mentions.
2) Objective: Have at least 20% growth in social media communities in 2015 and 2016

Between December 2016 and December 2017, the number of NCWIT Facebook fans ("likes") increased by about 9 percent (from 27,846 to 30,470), missing the 20 percent increase goal. This, however, is probably not a cause for alarm, as NCWIT has already attracted much of its target audience, and this may reflect decreases in the use of the Facebook platform by users. With Twitter followers, NCWIT exceeded its 20 percent goal; specifically, the number of followers increased by 23 percent (from 21,405 to 26,265).

2017 examples of social media campaigns

- #CSEdWeek: NCWIT shared posters and resources for parents, educators, & students; live tweeted the kick-off live stream event.
- #resourceoftheweek: Each week, NCWIT highlighted resources each week
- #NCWITresource: NCWIT shared resources and directed traffic to NCWIT resources.
- #BackToSchool: NCWIT shared resources to help educators recruit and retain students throughout the year.
- **#DeckTheHalls**: NCWIT encouraged educators to “DeckTheHalls” of their schools with NCWIT posters.
- **#SettingThePace**: NCWIT shared Pacesetters videos highlighting the campaign and participating organizations.
- **#NCWITontheroad**: NCWIT highlighted staff participation at conferences and workshops.
- **#AmazonSmile and #GivingTuesday**: From mid-November to late December, NCWIT leveraged giving campaigns.
- **#NotHiddenAnymore**: NCWIT partnered with the Anita Borg Institute, participants of the Black Women and Girls in Computing Roundtable, and special guests for a Twitter chat in honor of the film “Hidden Figures” and to celebrate Black History Month.

Also, in 2017, the number of Instagram followers increased from 1,024 to 1,410, a 38 percent increase. The number of LinkedIn followers increased from 1,821 to 2,279, a 25 percent increase. Finally, as was the case in 2016, NCWIT only gained six new Pinterest followers (from 320 to 326).

In sum, between 2016 and the end of 2017, NCWIT’s social media communities continued to expand, though at different rates. The number of Facebook likes/fans and Pinterest followers has slowed or plateaued, while the number of Twitter, Instagram, and LinkedIn followers continues to gradually increase.

**NCWIT’s Website**

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

NCWIT did not reach its goal of a 10 percent increase in unique visitors to NCWIT.org. Specifically, the website attracted 202,744 unique visitors in 2017 compared to 191,407 unique visitors in 2016. This amounts to a six percent increase in unique visitor s from 2016 to 2017. However, this still represents a record high in the number of unique NCWIT website visitors.
2) Objective: The number of unique visitors to NCWIT’s resource pages increases.

In 2017, a total of 86,527 users visited NCWIT’s combined resources pages. This represents a 15 percent increase above the total we observed in 2016. About 27 percent of visitors were “returning” users – that is, users who viewed NCWIT’s resource pages more than once in 2017. The remaining users were “new” users. The figure below compares the yearly flow of web traffic to NCWIT’s combined resource pages for 2016 and 2017. In general, user patterns appear quite similar across years, but with two exceptions: First, compared to 2016, the number of unique visitors was higher in March and April of 2017. Second, unlike 2016, the number of unique visitors spiked in November of 2017.

3) Objective: A strong majority of website users agree that NCWIT’s website is useful

In 2017, 45 percent of Members Survey respondents who visited the NCWIT website in the last year reported that the site was “very helpful.” The remaining 54 percent indicated that the website was “somewhat helpful.” Thus, while no Members Survey respondent was “dissatisfied with [the website’s]

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To calculate the number of website page users in a given time frame, Google Analytics generates an estimate based on about 90 percent of website sessions. As such, reports of past totals differ slightly than what appeared in corresponding Annual Reports. The estimates, however, are quite close.
overall usefulness,” less than half of respondents showed strong appreciation for the website. In 2016, we used different language to gauge web usefulness, which is reflected in the figure below.

![Helpfulness of the NCWIT Website](chart)

“"I was asked to be a keynote at a workshop at Technische Universität Wien (TU Wien) in March 2017. My presentation was titled 'Women in Computing Technology: The University Setting.' Much of the material came from the NCWIT website. I can provide you a copy of the presentation if interested.” (AA Members Survey respondent)

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

In 2017, NCWIT witnessed a small decrease (6%) in the number of unique Summit webpage viewers compared to 2016. Specifically, 9,419 users visited Summit webpages in 2016 compared to 8,819 users in 2017. This might reflect a small decline in Summit attendance between 2016 and 2017. A total of 55 percent of users were “returning” users and 45 percent were “new” users (this is essentially the same breakdown of “returning” and “new” that we observed in 2016).

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16 Again, Google Analytics generates an estimate based on sample of about 90 percent of website sessions. As such, the figures will not match exactly across reports. The estimates, however, are quite close.
As the figure below demonstrates, patterns in website traffic to Summit webpages were quite similar between 2016 and 2017. In both years, Summit webpage visits increased gradually between January and April, that is, during Summit registration season. Of course, there was a sharp spike in viewers around the actual Summit dates in May. While the figure suggests very few Summit webpage views occurred during the second half of the year, the magnitude of monthly viewership is distorted due to the scale of the figure. For instance, from July 2017 to December 2017, a total of 2,189 unique viewers visited the Summit pages.

5) 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 days. In 2017, the event drew 3,195 unique page views, an 18 percent increase since 2016 (2,700). This figure has increased over three consecutive years.

Newsletter Outreach

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

Newsletters typically include general e-newsletters and campaign-specific emails. NCWIT once again surpassed its goal of six newsletters per year by creating 19 new newsletters, slightly less than what we observed in 2016 (21 newsletters). Newsletters in 2017 covered the following topics: NCWIT “In the News” (9); social media and awareness campaigns (3); NCWIT’s participation in tech workshops, conferences, and CSEdWeek (3); the annual Summit (2); and Aspirations Awards (1). One additional newsletter was distributed solely to the AA. In addition, NCWIT produced 14 TECHNOLOChicas-related newsletters (7 in English and 7 in Spanish). We do not include these in our official count because they are sent to a relatively limited audience.

While the exact number of recipients of the newsletter varies by each newsletter, the average number of newsletter recipients in 2016 was 2,649, a 14 percent increase since 2016 (2,316).
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 MailChimp in September of 2011. In 2016, the non-profit industry average for opened newsletters was roughly 25 percent. On average, 26 percent of NCWIT’s recipients opened newsletters in 2017, suggesting that NCWIT performed slightly better than the typical nonprofit organization. However, 37 percent of all NCWIT newsletters sent out in 2017 resulted in open rates below industry average. NCWIT’s “In the News” and CSEdWeek announcement accounted for the newsletters with below average open rates. These types of newsletters also accounted for most of the below industry average opens in 2016. A handful of newsletters, however, exhibited open-rates that greatly exceeded the industry average. The newsletter, “We’ll see you at SIGCSE. #NCWITOntheRoad,” exhibited the highest open rate (33%), while the newsletters, “NCWIT Academic Alliance (AA) Newsletter: September 2017”, “Calling All 9th-12th Grade Women and Educators, as Well as College Women in Tech,” and “Pay Tribute to Generations of Women in Tech This Month” yielded open rates between 30 and 32 percent.

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Type of Email</th>
<th>Recipients</th>
<th>Open Rate</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Jan</td>
<td>Application D.</td>
<td>1,207</td>
<td>51.3%</td>
</tr>
<tr>
<td></td>
<td>Jan/2</td>
<td>In the News:</td>
<td>1,419</td>
<td>39.1%</td>
</tr>
<tr>
<td></td>
<td>Feb</td>
<td>NCWIT all</td>
<td>1,037</td>
<td>40.4%</td>
</tr>
<tr>
<td></td>
<td>Mar</td>
<td>In the News:</td>
<td>1,350</td>
<td>42.7%</td>
</tr>
<tr>
<td></td>
<td>Mar</td>
<td>Keep MVC200</td>
<td>1,229</td>
<td>41.9%</td>
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<tr>
<td></td>
<td>May</td>
<td>Tune in to</td>
<td>1,680</td>
<td>47.5%</td>
</tr>
<tr>
<td></td>
<td>May/2</td>
<td>the News:</td>
<td>1,574</td>
<td>46.6%</td>
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<tr>
<td></td>
<td>June</td>
<td>Cue Up This</td>
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<tr>
<td></td>
<td>Jun/2</td>
<td>In the News:</td>
<td>1,035</td>
<td>35.7%</td>
</tr>
<tr>
<td></td>
<td>Aug</td>
<td>In the News:</td>
<td>1,200</td>
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</tr>
<tr>
<td></td>
<td>Sept</td>
<td>NCWIT’s flux.</td>
<td>1,113</td>
<td>35.2%</td>
</tr>
<tr>
<td></td>
<td>Oct</td>
<td>We’ll see you</td>
<td>1,067</td>
<td>35.1%</td>
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<tr>
<td></td>
<td>Nov</td>
<td>Spread the Y.</td>
<td>1,496</td>
<td>37.6%</td>
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<tr>
<td></td>
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<td>Did You R...</td>
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<tr>
<td></td>
<td>Dec/2</td>
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<td>2017</td>
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<td>Make a Scen.</td>
<td>1,492</td>
<td>37.6%</td>
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<tr>
<td></td>
<td>Feb</td>
<td>We’ll see y...</td>
<td>1,087</td>
<td>33.6%</td>
</tr>
<tr>
<td></td>
<td>Mar</td>
<td>Pay Tribute.</td>
<td>1,078</td>
<td>35.3%</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>In the News:</td>
<td>1,670</td>
<td>37.6%</td>
</tr>
<tr>
<td></td>
<td>May/2</td>
<td>Tune in to</td>
<td>2,097</td>
<td>50.6%</td>
</tr>
<tr>
<td></td>
<td>May/3</td>
<td>In the News:</td>
<td>1,364</td>
<td>50.0%</td>
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<tr>
<td></td>
<td>June</td>
<td>2017 NCWIT</td>
<td>1,070</td>
<td>32.4%</td>
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<tr>
<td></td>
<td>Jun/2</td>
<td>In the News:</td>
<td>1,077</td>
<td>32.1%</td>
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<tr>
<td></td>
<td>July</td>
<td>It’s INCWIT!</td>
<td>1,194</td>
<td>38.6%</td>
</tr>
<tr>
<td></td>
<td>July/2</td>
<td>In the News:</td>
<td>1,350</td>
<td>38.5%</td>
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<tr>
<td></td>
<td>Aug</td>
<td>Sexual Haras.</td>
<td>1,176</td>
<td>35.8%</td>
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<td></td>
<td>Aug/2</td>
<td>Change Is in</td>
<td>1,076</td>
<td>35.0%</td>
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<td>Aug/3</td>
<td>Gender Chrit.</td>
<td>1,056</td>
<td>35.5%</td>
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<tr>
<td></td>
<td>Sept</td>
<td>Calling All</td>
<td>1,179</td>
<td>37.6%</td>
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<td></td>
<td>Sept/2</td>
<td>We’ll see y...</td>
<td>1,179</td>
<td>37.6%</td>
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<tr>
<td></td>
<td>Sept/3</td>
<td>In the News:</td>
<td>1,079</td>
<td>32.4%</td>
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<tr>
<td></td>
<td>Dec</td>
<td>Did You R...</td>
<td>2,010</td>
<td>30.8%</td>
</tr>
<tr>
<td></td>
<td>Dec/2</td>
<td>In the News:</td>
<td>1,079</td>
<td>31.0%</td>
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</tbody>
</table>

As was the case in prior years, the “In the News” Newsletters continue to exhibit the lowest open rates. NCWIT may want to consider rebranding these newsletters to better appeal to the interests of intended audiences.

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17 Because of the switch from Constant Contact to MailChimp in 2011, statistics before and after the service change are not directly comparable.
The "percentage of click-throughs" represents the "number of click-throughs" divided by the number of people who opened the email ("number of opens"). The non-profit industry average of click-throughs was roughly 2.8 percent in 2017 according to MailChimp. In 2017, NCWIT performed slightly worse than the typical non-profit. Specifically, an average of about two percent of recipients who opened NCWIT’s newsletters clicked through the content. About 89 percent of the newsletters opened in 2017 resulted in click-through rates below industry average. These figures are nearly identical to our 2016 observations.

Only two newsletters met or exceeded the industry click-through average - “Sexual Harassment in the Tech Industry: Why Now? What Now?” and “Calling All 9th-12th Grade Women and Educators, as Well as College Women in Tech.”

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 2017, the average open rate for Did You Know (DYK) newsletters was 33 percent – about eight percentage points above industry average. The DYK newsletter click-through rate was two percent, just slightly under industry average (2.80%). While the average DYK newsletter open rate is similar to what we observed in 2016, the average click-through rate decreased slightly over the past year.
The table to the right presents variation in Did You Know newsletter open and click-through rates by alliance for 2017. First, it is important to note that the average open rates for Did You Know newsletters exceed the average open rate for general NCWIT newsletters. Specifically, 33 percent of all Did you Know newsletters were opened. However, the average click-through rates for Did you Know newsletters and general NCWIT newsletters are about equivalent (2%). In other words, Did You Know newsletters are more likely than standard newsletters to be opened by recipients, but they are just as likely to be clicked-through.

Breaking down by alliance, the Entrepreneurial Alliance had the highest average open rate (43%), while the Affinity Alliance and WA exhibit the lowest average open rates (24% and 27%, respectively). Only the Affinity Alliance exhibited a below industry average open rate. As for click-through rates, only the K-12 Alliance exceeded industry average (4%). The AA, SSAB and WA all exhibited click-through rates of about 2 percent, while the Affinity Alliance and EA exhibited click-through rates of about 1 percent.

As the figure below attests, these patterns have been relatively stable between 2015 and 2017.

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Average open rate</th>
<th>Average click-through rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurial Alliance</td>
<td>43%</td>
<td>1%</td>
</tr>
<tr>
<td>K-12 Alliance</td>
<td>39%</td>
<td>4%</td>
</tr>
<tr>
<td>SSAB</td>
<td>35%</td>
<td>2%</td>
</tr>
<tr>
<td>Academic Alliance</td>
<td>32%</td>
<td>2%</td>
</tr>
<tr>
<td>Workforce Alliance</td>
<td>27%</td>
<td>2%</td>
</tr>
<tr>
<td>Affinity Alliance</td>
<td>24%</td>
<td>1%</td>
</tr>
<tr>
<td>Industry Average</td>
<td>25%</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

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**Did You Know’s by Alliance**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Academic Alliance</td>
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<td>K-12 Alliance</td>
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<td>Workforce Alliance</td>
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**Did You Know’s by Alliance**

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<tbody>
<tr>
<td>Affinity Alliance</td>
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<tr>
<td>K-12 Alliance</td>
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<td>SSAB</td>
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</table>
Conference/Meeting Outreach

3) Objective: NCWIT staff and leadership continue to have strong attendance/presence at conferences and meetings

In 2017, NCWIT demonstrated considerable improvement in meeting attendance compared to 2016. NCWIT’s staff or executive team attended an impressive 602 non-government/non-policy meetings or events in 2017, breaking its previous record of 453 non-government/non-policy meetings in 2013. This represents a 46 percent increase in non-government/non-policy meeting attendance between 2016 and 2017 (413 to 602).

Turning to conference attendance, NCWIT’s staff and leadership made a strong showing in 2017. In total, NCWIT staff or leadership had a presence in 72 conferences – seven more than what we observed in 2016 (65 conferences). This represents a reversal in the trend of declining conference attendance observed between 2013 and 2016.

4) Objective: NCWIT leadership gives at least 3 keynotes in 2015; 4 in 2016 and 2017.

NCWIT’s leadership presented at least nine keynotes in 2017, surpassing its goal by six keynote addresses.
Member-Driven Outreach

17) Objective: At least 70% of member representatives distribute resources in 2016 and 2017.

Distributing NCWIT resources and materials is one of the most common ways in which member representatives remain actively involved with NCWIT. Indeed, of the 91 percent of Members Survey respondents who indicated that they were involved with NCWIT in 2017, nearly three-quarters (73%) indicated that their involvement included “distributing NCWIT materials and resources.” NCWIT therefore surpassed its goal. This figure is nearly identical to what we reported in 2016.

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

We are aware of 10 NCWIT2GO events in 2017. Together, these events reached at least 475 people. NCWIT is still working on ways to improve tracking NCWIT2GO outreach

NCWIT2GO is a valuable outreach resource. We strongly encourage NCWIT to better track who uses this resource, how the resource is used, and how many people are reached.

NCWIT set a record for scholarly citations for two consecutive years, confirming its reputation as a research authority on women and computing. NCWIT also broke a record in number of press mentions, largely due to impressive growth in the number of national press mentions and press mentions that cite NCWIT resources. NCWIT also broke a record in total outreach, while staff and leadership continued to maintain a strong presence at conferences. While the number of Facebook likes/fans has stabilized, the number of followers on Twitter and other social media continues to climb. NCWIT’s website continues to expand its viewership while directing viewers to resources and Summit information. Most viewers, however, only find the website sort of/somewhat helpful. NCWIT continued to produce newsletters for its members, though click-through rates tended remain below industry average.
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: Over 500 people attend the NCWIT annual Summit.**

NCWIT surpassed its goal of 500 people in attendance at the annual Summit, though attendance decreased slightly from 2016 (Las Vegas) to 2017 (Tucson). Specifically, 650 NCWIT members and allies attended the 2017 Summit compared to 697 attendees at the 2016 Summit, a seven percent decrease in attendance. Still, attendance at the 2014, 2016, and 2017 Summits has been notably higher than prior years. As NCWIT continues to grow in size and diversity, we expect levels of attendance at the Summit to remain high.

![Growth of Meeting Attendance](image)

2) **Objective: Each year, more than 80% of meeting attendees indicate that they will likely attend another NCWIT event**

After the 2017 Summit, an impressive 94 percent of Summit Survey respondents indicated they were “somewhat likely” or “highly likely” to attend another NCWIT event. Of these respondents, 73 percent
reported that future attendance was “highly likely.” This figure is largely consistent with what we observed in 2016 and prior years. See the 2017 Summit Survey report for a list of why 15 attendees will not likely attend another Summit.

“I just think this is an amazing conference, I learned so much, was so inspired. I think it’s necessary to get this yearly at least to keep momentum on this. (WA Summit Survey respondent)

“I wish I could come every year but my org will send someone else so that we can all get the great experience.” (AA Summit Survey respondent)

NCWIT continues to excel at convening change leaders. The 2017 Tucson Summit drew 650 attendees, ranking third in highest attendance. Per usual, nearly all Summit Survey respondents indicated that they would likely attend another NCWIT event.

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” increased by two percentage points from 2016 to 2017 (from 79% to 81%). The Tucson Summit marked the third year that NCWIT was unable to meet the 85 percent objective. It is possible that recent decreases in perceptions of value reflect the growing diversity of NCWIT’s membership base.
As NCWIT’s alliances become larger and more differentiated, it becomes increasingly difficult to set an agenda that appeals to all members.

In 2017, we saw little variation across alliances when it came to perceptions of Summit value. One important exception is that, compared to respondents in all other alliances, industry respondents were the least likely to find the Summit to be “very” or “extremely” valuable and the most likely to view the Summit as only “slightly” or “not at all” valuable. All SSAB respondents found the Summit “very” or “extremely” valuable.

2) Objective: Each year, more than 85% of members indicate that they benefit from NCWIT networking
In 2017, NCWIT surpassed its objective with 92 percent of Members Survey respondents indicating that they benefited from networking. This figure has been remarkably consistent across years (the exception in 2015
was likely an artifact of a measurement change.18

“I was able to make some great initial connections with people who work in a similar field as I do (k-12 outreach). It is helpful to have people I can reach out to for resources and answers to questions. I also really enjoyed the evidence-based presentations focusing on gender. It helped get my brain thinking about how to build my program.” (AA Summit Survey respondent)

“[NCWIT provided] high-quality professional development workshops with ample and strategic networking time that allows for new and old partnerships to develop and solidify.” (K-12 Alliance Summit Survey respondent)

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 2017, 77 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 27 percentage points. This is largely consistent with what we observed in 2015 (75%) and 2016 (78%).

---

18 In order to shorten the Members Survey, we retired a question which asked respondents to indicate whether their NCWIT membership resulted in various networking benefits by checking off boxes on an itemized list. In 2015, we used a global indicator: “Have you received any benefits as a result of networking at NCWIT events or with other NCWIT members elsewhere?” Respondents could answer “yes” or “no.” The absence of specific examples may have prevented a subset of respondents from recalling benefits. So, in 2016, we added to the prompt “Benefits could include new relationships, increased collaboration, new ideas, additional resources, or being introduced to a new person outside of NCWIT.” We also added a “not applicable” option with the text: “Not applicable: Haven’t attended events with other NCWIT members).
We also observed variation across alliances on whether Summit attendance resulted in contact with past of current collaborators. Most notably, EA/WA respondents were more likely than respondents from other alliances to not agree (remain neutral or disagree) with the statement (41%) and they were less likely than respondents from other alliances to “strongly agree” with the statement (39%; p<.05). We have posited in past reports that industry members may have fewer incentives to collaborate with other industry members. Additionally, a high percentage of industry attendees are guests of their organizations rather than core members – a group that would have fewer means to initiate collaborations.

“The Summit was valuable because I was able to make connections with new potential partners to help expand our coding project and our work with role models. The Breakouts were also an opportunity to learn from experts.” (K-12 Members Survey Respondent)

Motivation and engagement via NCWIT membership

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

In 2017, NCWIT surpassed this objective by 30 percentage points. That is, 80 percent of Members Survey respondents helped or assisted other members on a project related to women in computing. This figure, however, should be interpreted with caution. For the 2017 Members Survey, we retired a question asking Members Survey respondents to indicate whether or not (yes/no) they had helped or collaborated with other members. We did, however, query respondents about their collaboration outcomes (see below). Thus, to calculate the number of respondents who helped or collaborated with other members, we subtracted the number of respondents who selected “not applicable” for all collaboration outcomes from the number of respondents who indicated that their collaboration did or did not result in an outcome. That is, we assume that respondents who indicated “not applicable” for all collaboration outcomes did not collaborate or help members, while respondents who indicated any collaboration outcome did collaborate or help each other.
“Collaboration with other NCWIT members has provided me with additional ideas and suggestions to advance women in technology careers.” (AA Members Survey respondent)

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 2017, diverse outcomes continued to result from NCWIT members’ collaborations. The percentages should be interpreted as the number of respondents who indicated an outcome out of the total number of respondents who did not choose “not applicable” or did not provide a response. The

<table>
<thead>
<tr>
<th>Collaboration outcome</th>
<th>Total number of respondents</th>
<th>% of applicable respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation (in or outside of org.)</td>
<td>75</td>
<td>64%</td>
</tr>
<tr>
<td>Program or practice implementation</td>
<td>70</td>
<td>60%</td>
</tr>
<tr>
<td>Aspirations affiliate award</td>
<td>41</td>
<td>40%</td>
</tr>
<tr>
<td>NCWIT/Alliance project</td>
<td>33</td>
<td>23%</td>
</tr>
<tr>
<td>Grant proposal submitted or funded</td>
<td>28</td>
<td>27%</td>
</tr>
<tr>
<td>AspireIT program</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td>Journal article or conference paper</td>
<td>18</td>
<td>17%</td>
</tr>
</tbody>
</table>
percentages do not sum to 100 because respondents could choose multiple outcomes.

The top three collaboration outcomes in 2017 – presentations, program or practice implementations, and Aspirations affiliate awards – were also ranked as the top three most common outcomes in 2016 and are typically outcomes that occur most frequently across years. Twenty-seven Members Survey respondents wrote in “other” collaboration outcomes such as creating a diversity and inclusion committee or presenting during K-12 Alliance conference calls. The numbers for 2017 are lower because we utilized a sample rather surveying the population.

“NCWIT has been a big part of our diversity and inclusion work for so long, it's hard to say where the NCWIT influence begins/ends! In 2017, we: - created/refined an inclusiveness training based in CMU/Google's work (NCWIT partners, but not an NCWIT effort), then directly utilized NCWIT expert guidance on revising the workshop. We've trained 100+ members of our school.” (AA Members Survey Respondent)

6) Objective: At least half of NCWIT members presented or published on women in computing issues annually

As has been the case since 2010, NCWIT surpassed this objective. In 2017, 81 percent of Members Survey respondents reported presenting or publishing on women in computing.
Here too we saw variation across alliances. All K-12 Alliance respondents, 89 percent of Affinity Alliance respondents, and 82 percent of WA and SSAB respondents indicated published or presented on women in computing in 2017. The figures were somewhat lower in the remaining alliances. Specifically, 78 percent of AA members and 60 percent of EA members presented or published on women in computing in 2017.

How many publications or presentations did members make in 2017?

In 2017, Members Survey respondents completed at least 493 presentations or publications on women in computing. This estimate is conservative because we top code the measure as “10 or more.” We do, however, include totals that exceed 10 if the respondent writes in a specific value.

While this appears to be a sharp reversal relative to recent years, the decrease is largely an artifact of our decision to send the Members Survey to a sample of NCWIT members rather than to the population. Because the number of presentations and publications is a raw count, the fewer the survey respondents, the lower the figure. The 2017 figure should therefore not be interpreted longitudinally.

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 2017. Specifically, 91 percent of respondents indicated that they have been involved with NCWIT or its alliances in at least one way during the last year. This represents a consistent pattern over time. Indeed, the percentage of respondents who indicated that they were involved with NCWIT or its alliances in any given year has never dropped below 82 percent.
Most alliances exhibited high levels of member engagement. Indeed, over 87 percent of Members Survey respondents in each alliance reported being actively involved with NCWIT in 2017. With rare exception, this pattern has persisted uninterrupted over time.

**Members continue to be involved in activities with NCWIT and its alliances**

In 2017, what types of activities were NCWIT members involved in? In 2017, distributing resources (73%), responding to NCWIT staff requests (62%), and participating at meetings (56%), were the three most common forms of involvement. This pattern has generally persisted across time.

“[NCWIT provided] significant support. We rolled out a leveling guide for managers that the social scientists at NCWIT helped wordsmith to ensure inclusive language was used.”

(WA Members Survey respondent)

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 2017, 80 percent of Members Survey respondents “somewhat” or “strongly” agreed that NCWIT membership helped them build allies in their organizations, a figure that closely resembled what we observed in 2016 (83%). This means eight out of 10 respondents believed that NCWIT helped them find organizational advocates with the potential to support them in their change efforts.

**Across Alliances, strong majorities of members report that NCWIT helped them build allies or advocates for women in their organizations**

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Strongly agree</th>
<th>Somewhat agree</th>
<th>Somewhat or strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>37%</td>
<td>45%</td>
<td>18%</td>
</tr>
<tr>
<td>AGA</td>
<td>29%</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>EA</td>
<td>38%</td>
<td>50%</td>
<td>13%</td>
</tr>
<tr>
<td>K-12</td>
<td>57%</td>
<td>43%</td>
<td>13%</td>
</tr>
<tr>
<td>SSAB</td>
<td>64%</td>
<td>36%</td>
<td>13%</td>
</tr>
<tr>
<td>WA</td>
<td>48%</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>Total</td>
<td>41%</td>
<td>39%</td>
<td>20%</td>
</tr>
</tbody>
</table>

These results are especially important for members in the AA and WA, as organizational change in these alliances is necessary for broader impact. Still, high percentages of member representatives in the other alliances (except the SSAB) also agreed that NCWIT helped them establish relationships with allies in their organizations, suggesting that NCWIT membership can be leveraged to build allies and advocates in a variety of organization types.

It is important to point out that sizable percentages of member representatives “strongly” agreed that NCWIT membership helped them build allies and advocates in the SSAB (64%), K-12 Alliance (57%), and WA (48%).

**NCWIT continues to convene members, leading to motivation and engagement.** The 2017 Summit resulted in high levels of perceived value and networking. The Summit also led to high levels of collaboration, though less so among industry members. Consistent with prior years, NCWIT membership led to high rates of collaboration/helping between members that often resulted in presentations, program or practice implementations, and Aspirations affiliate awards. Importantly, strong majorities of Alliance members agreed that NCWIT membership helped them build allies in their organizations – an outcome that is an important catalyst for change in AA, EA, and WA organizations.
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 Change 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 five worthwhile projects per year

![Number of Letters of Support Written by NCWIT for Projects](image)

In 2017, NCWIT’s staff and leadership wrote or co-signed six letters of support for worthwhile projects (typically, grant proposals). The figure above tracks the number of letters of support for projects over time and the table below provides more detail about the letters written in 2017.

<table>
<thead>
<tr>
<th>Letters of support for worthwhile projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Lucy Sanders wrote a letter to support the online post-baccalaureate program in Applied Computer Science proposed by the Department of Computer Science at University of Colorado.</td>
</tr>
<tr>
<td>2) Lucy Sanders wrote a letter to NSF INCLUDES Program Review Committee to collaborate with Maureen Biggers entitled “NSF INCLUDES: Collective Impact Approach to Build an IN Network.”</td>
</tr>
<tr>
<td>3) Lucy Sanders wrote a letter of support for CRA-W’s ADVANCE proposal entitled “Computing Faculty Career Mentoring and Recognition within Sub-disciplines and across Academic Institutions.”</td>
</tr>
<tr>
<td>4) Terry Morreale wrote a letter of support for WGBH’s (Marisa Wolsky) grant proposal to NSF’s Innovations in Development project for Design Squad+Coding: Researching the Integration of Computational Thinking into Engineering Instruction in Diverse Middle School Classrooms.</td>
</tr>
<tr>
<td>5) Terry Morreale wrote a letter to the Intel Foundation to support the Televisa and LULAC proposal to expand the TECHNOLOChicas Lift program. The program will increase the number of Latino middle school girls who engage in computer science, engineering, and technology.</td>
</tr>
<tr>
<td>6) NCWIT wrote a letter of collaboration for the proposed ADVANCE grant from CRA-W Undergraduate Cohort Program entitled “ Undergraduate Cohort: A nationwide mentoring program to Bring Women CSE Majors into the Graduate School Pipeline”</td>
</tr>
</tbody>
</table>
In 2017, NCWIT’s staff committed to or were asked to advise six new projects. These only represent recent advisory board commitments, not on-going commitments.

### Recent Advisory Board Commitments

1. Lecia Barker is on Advisory Board for CS Principles (College Board).
2. Lecia Barker is on Advisory Board for a grant ETR has to study boot camps (PI Jill Denner, current PI Louise Ann Lyon).
3. Lecia Barker is on Advisory Board for a grant with NSF for CS Teaching Tips (PI Colleen Lewis).
4. Lecia Barker is on Advisory Board for CSNYC (PI Leigh Ann Delyser, now also funded by NSF).
5. Lecia Barker is on Advisory Board for FICSIT (NSF funded) (PI Philip M. Sadler)
6. Techbridge asked Jannie Fernandez to be part of an advisory committee

We also track the number of letters written by NCWIT in support of awards. This year, NCWIT’s staff and leadership wrote only one letter of support for awards. This is the lowest total we have observed since 2011. 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.

#### Number of Letters written by NCWIT in Support of Member Awards

<table>
<thead>
<tr>
<th>Year</th>
<th>Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
</tr>
<tr>
<td>2010</td>
<td>1</td>
</tr>
<tr>
<td>2011</td>
<td>1</td>
</tr>
<tr>
<td>2012</td>
<td>7</td>
</tr>
<tr>
<td>2013</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>3</td>
</tr>
<tr>
<td>2015</td>
<td>8</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
</tr>
<tr>
<td>2017</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Letters in support of awards

1. Lucy Sanders and Lecia Barker wrote a letter of support for Dr. Jan Cuny for the ACM Distinguished Service Award.

Finally, we also monitor the number of endorsement letters NCWIT writes in support of promotions and new organizational positions. As was the case in 2016, NCWIT’s staff and leadership wrote only one position/promotion endorsement letter in 2017.

#### Position and promotion endorsement letters

1. Lecia Barker wrote a letter supporting Dr. Sonnert’s eight-year review for his reappointment in the Science Education Department in the Harvard-Smithsonian Center for Astrophysics.

2) **Objective:** Members report changing their behaviors related to NCWIT membership *(Survey item appears every other year starting in 2015.)*

In 2015, we added two new items to the Members Survey to better understand how NCWIT membership results in change. The first item 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 2017, how would you describe any behavior changes that you made?”

The results of the survey suggest that a sizable percentage of respondents, 62 percent, changed their behavior as a result of their participation with NCWIT. Based on responses to the open-ended portion of the question, we counted 102 examples of individual behavioral change in 2017.

Since 2015, the percentage of respondents reporting behavioral changes because of NCWIT has declined by 9 percentage points (from 71% in 2015 to 62% in 2017). This change appears driven by decreases in the AA, Affinity Alliance, K-12 Alliance, and SSAB (though the decrease among AA members was quite small). However, in both industry alliances, the percentage of respondents who reported a behavioral change due to NCWIT increased between 2015 and 2017.

In most alliances, the percentage of respondents who reported any behavioral change because of NCWIT varied over time.

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 as part of the 2017 Members Survey Report (available on request). The table to the right 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>Changed pedagogical style</td>
<td>17 (25%)</td>
</tr>
<tr>
<td>Improved recruitment and retention efforts</td>
<td>17 (25%)</td>
</tr>
<tr>
<td>Increased awareness and knowledge</td>
<td>16 (24%)</td>
</tr>
<tr>
<td>Educated peers about issues related to diversity in tech</td>
<td>11 (16%)</td>
</tr>
<tr>
<td>Consciously monitored implicit bias</td>
<td>4 (6%)</td>
</tr>
<tr>
<td>Applied for research funds or improved research practices</td>
<td>4 (6%)</td>
</tr>
<tr>
<td>Increased women’s representation in position of influence</td>
<td>3 (4%)</td>
</tr>
<tr>
<td>Sponsored affinity or support groups</td>
<td>2 (3%)</td>
</tr>
</tbody>
</table>
3) Objective: Members report behavioral changes that range from minor to comprehensive

When respondents were asked to indicate whether they made behavioral changes (see above) most indicated that their changes were small; specifically, 54 percent of respondents reported making small changes to their behavior, while eight percent of respondents reported major changes to their behavior. Just over one-third of respondents (38%), however, reported making no change to their behavior in 2017.

Whether respondents made small, major, or no behavioral changes because of their NCWIT membership varied by alliance. All EA respondents and 88 percent of WA respondents reported changing their behavior in 2017. In these industry alliances, 18 to 25 percent of respondents reported making “major” behavioral changes. Close to half of AA, Affinity Alliance, and K-12 Alliance respondents reported making behavioral changes; however, no Affinity Alliance or K-12 Alliance respondents and nine percent of AA respondents indicated making “major” changes. Also note that more than one-third of AA members (36%) did not report making behavioral changes in 2017. Only 22 percent of SSAB respondents made a behavioral change because of their NCWIT affiliation, while the remaining 78 percent reported no behavioral change. This is not surprising, though, as SSAB members behave in ways consistent with NCWIT’s agenda.

The percentage of respondents who made changes to their behaviors because of their affiliation with NCWIT varied by alliance.
More than one-third of Members Survey respondents did not change their behavior in 2017. Going forward, NCWIT should research why some members in this alliance are unwilling or unable to change their behaviors. It may be that many members are only loosely connected to NCWIT, and thus do not feel that they can attribute examples of change to their membership.

NCWIT membership and its resources support individual-level change. Sixty-two percent of Members Survey respondents indicated that NCWIT membership helped them change their behavior. Most respondents who reported individual change indicated that changes were minor, and just over one-third of AA members reported making no individual changes at all. Common examples of individual change included changing pedagogical behaviors, improving recruitment and retention efforts, and increasing awareness and knowledge. In addition, NCWIT continues to leverage its authority to endorse and support individual change leaders through written letters of support.

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 surpassed this objective by six percentage points. Specifically, in 2017, 56 percent of Members Survey respondents reported that they used a new strategy based on one of NCWIT’s resources.

The percentage of members who used a new strategy based on an NCWIT resource declined overall from 2016 to 2017, though there was a great deal of variation across Alliances.
The figure shows that NCWIT met the “majority” objective for every alliance except the WA. Troublingly, between 2016 and 2017, the percentage of WA members who reported using a strategy based on an NCWIT resource decreased 34 percentage points.\textsuperscript{20}

NCWIT’s resources are an important tool for enacting organizational change. The percentage of Members Survey respondents who reported using a new strategy because of an NCWIT resource, however, decreased from 61 percent in 2016 to 56 percent in 2017.

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. Just as we observed in 2016 (and almost every other survey year), nearly 9 out of 10 Members Survey respondents (87\%) reported that they agree that something they learned through NCWIT helped them take action. Over time, NCWIT has performed consistently well on this objective.

“Being immersed in bias interruption research and practices through NCWIT staff, materials, Summit, and pilots has made me vigilant in recognizing bias and then doing something about it, and helping individuals and our org do the same. It has also helped me understand the long arc of change and the need for patience, process, commitment, transparency, and consistency. If it weren’t for NCWIT over the many years of our partnership, I firmly believe we would not be on our current trajectory in this work! As a coach and consultant, I’m finding that the awareness, information and expertise I’ve gleaned from working with NCWIT is invaluable to my clients!”

(WA Members Survey respondent)

\textsuperscript{20} We only provide results for 2015, 2016, and 2017 because we changed the survey item in 2015 to create a more straightforward and comparable measure.
4) **Objective:** Seed fund winners continue to report using funds to implement long-term change strategies

**Student Seed Fund:** The Student Seed Fund was on hiatus in 2017. No results were reported.

**Academic Alliance Seed Fund:** To date, 55 member organizations have received a total of $625,450 to grow their technology-related outreach program. In 2017, the following institutions were each awarded $10,000 from the Academic Alliance Seed Fund:

- Claflin University
- Green River College
- Farleigh Dickinson University
- University of North Carolina at Charlotte

**Seed Fund Outcomes:** In 2017, NCWIT’s contracted with Cynosure Consulting to produce a detailed report documenting the effects of the AA seed fund. We pulled some of the important findings and reproduced them here:

**Projects Varied in Nature:** The programs had a variety of foci such as K-12 outreach, professional development for K-12 educators, supports for undergraduates, recruitment for graduate students, infusion of growth mindset strategies, and even recruitment material development (e.g., videos).

**Original Project Continued in Most Cases:** Almost all of the projects (14 out of 18) were offered at least one time beyond the funded period and a large number of the efforts persisted for multiple years beyond the original funded project period. Interestingly, a few projects involved the creation of resources (e.g., a video). In these cases, “continuation” was defined by the continued use of the resource.

**Departmental Leadership:** Sustainability seems to be closely tied to department leadership. When the department leadership is acting in concert with the awardee or is committed to improving the recruitment and retention of women in technology, there appears to be more momentum for change.

**Institutional Home Predicted Sustainability:** Finding an institutional home for events made them more likely to be continued. As events became institutionalized in the schools, colleges, or departments, their continuation was more likely.

**Lack of Clear, Consistent Evidence of Institutional Impact:** In the vast majority of cases, interviewees weren’t able to point to institutional impacts. There were exceptions. For example, one awardee used the Seed Funds to infuse growth mindset ideology into the introductory course such that all teachers of the course would be teaching with the same modified curriculum.

**Summary of Impact:** Awardees listed off a variety of perceived impacts including: collective progress towards recruitment and retention of women, improved faculty buy-in and participation in diversity efforts, attention to the need to address diversity issues, greater faculty exposure to talented women students, increased availability and interest of women in leadership positions, creation of recruiting tools, increased access to resources (e.g., tutoring) for females, fostering a growth mindset in students and within courses, initiating change processes that would have otherwise not begun, and producing credibility that spilled over into other efforts.
2) **Objective:** Members report organizational changes occurring related to NCWIT membership (Survey item appears every other year, starting in 2015)

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 2017, how would you describe any changes that your organization made?”

Our results show that 57 percent of applicable Members Survey respondents reported that their organization enacted some form of change in 2017. This is noteworthy, given the fact that members may encounter resistance and organizations are often slow to change. Based on responses to the open-ended portion of the question, we counted 88 examples of NCWIT-influenced organizational change in 2017.

Between 2015 and 2017, the total percentage of Members Survey respondents who reported an example of organizational change due to NCWIT decreased by six percentage points (from 63% in 2015 to 57% in 2017). This decrease appears to be mostly driven by WA members. Specifically, between 2015 and 2017, the percentage of WA members who reported organizational changes that resulted from NCWIT membership decreased from 83 percent to 73 percent—a ten percentage point decrease. With the exception of EA and SSAB respondents, the percentage of respondents who reported NCWIT-influenced organizational change did not differ much between years.

Apart from the EA and SSAB, the percentage of respondents who reported any organizational change because of NCWIT was relatively stable over time.
The table to the right summarizes the most common themes we observed when we asked respondents to 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>Community changes that culminated from individual changes</td>
<td>14 (25%)</td>
</tr>
<tr>
<td>Improved recruitment and hiring efforts</td>
<td>13 (22%)</td>
</tr>
<tr>
<td>Improved curricula or introduced formal programs</td>
<td>12 (20%)</td>
</tr>
<tr>
<td>Increased involvement with NCWIT</td>
<td>10 (17%)</td>
</tr>
<tr>
<td>Established or improved support networks</td>
<td>8 (14%)</td>
</tr>
<tr>
<td>Applied for or received funding for diversity-related projects</td>
<td>5 (8%)</td>
</tr>
<tr>
<td>Evaluated work settings or the organizational climate</td>
<td>4 (7%)</td>
</tr>
</tbody>
</table>

Importantly, we found that a handful of organizations were successful in **sustaining long-term organizational change**. While examples in this category may have occurred in 2017, respondents used language suggesting that the seeds for change were planted in years prior, in some cases with help from NCWIT. Respondents in this category provided statements such as “It's no longer one person or a few individuals carrying the banner! It's becoming a part of our business model and most importantly, our culture!”, “…I believe that our long-term involvement with NCWIT has enabled consistent progress over the last decade”, and “My organization made major changes a few years ago, but now we constantly tweak our policies and work and continuously make small changes.” (We reflected in more detail on organizational change stages in the 2017 Members Survey Report)

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

Organizational change, like individual change (see above), tended to occur incrementally. Slightly under half (49%) of Members Survey respondents indicated that their organization made small changes because of NCWIT membership. Only eight percent of respondents indicated that their organization underwent a major change in 2017 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, 43 percent of respondents indicated that their organization did not change during 2017, a six percentage point increase since 2015 (from 37% in 2015 to 43% in 2017).
When broken down by alliance, reports of organizational change largely mirrored what we observed with individual-level change. All EA respondents and 88 percent of WA respondents reported changing their behavior in 2017. About three-quarters of EA and WA respondents reported that their NCWIT membership resulted in organizational change in 2017. About two-thirds of K-12 Alliance members (67%) and just over half of AA respondents (59%) reported NCWIT-influenced organizational change. However, note that 42 percent of AA respondents reported that their organization made no change in 2017 because of their NCWIT membership. Only 33 percent of Affinity Alliance respondents and one-quarter SSAB respondents reported organizational change because of their NCWIT affiliation. This is not surprising, though, as Affinity Alliance and SSAB members are not in the business of changing their organizations.

As was the case with individual-level change, a high percentage of Members Survey respondents (43%) indicated that their NCWIT membership did not result in organizational changes in 2017. Here too we suggest that NCWIT should research why some members in this alliance are unwilling or unable to enact organizational-level change.

In 2017, a total of 87 percent of Members Survey respondents reported that something they learned through NCWIT helped them take action. Fifty-seven percent of Members Survey respondents reported that their organization enacted change because of NCWIT membership, though most changes were perceived as small rather major, and a high percentage of AA respondents indicated that their NCWIT membership did not result in organizational change. Common examples of organizational change included community changes that culminated from individual changes, improved recruitment and hiring efforts, and improved curricula and formal programs. Finally, NCWIT continued to support educators (but not students) with Seed Funds; these small cash grants commonly resulted in sustainable programs that support NCWIT’s mission.
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: 70% of AA members report an increase in female enrollment in 2015 and in 2016 75% report an increase in female enrollments

To analyze patterns of female enrollment, we use Tracking Tool data provided by AA members from 2005 to 2015. The data represent 562 departments nested within 194 NCWIT member institutions, resulting in a sample of 3,044 department-year observations. Our analyses cover a wide-range of computing-fields including engineering, information technology, and computer science. We currently do not distinguish between these categories, so our findings represent broad patterns among Academic Alliance (AA) members. We may pursue analyses that disaggregate trends by degree type in future reports.

In fall of 2017, we produced a detailed report to NCWIT summarizing our enrollment analyses. We present a condensed version here (the full report remains available upon request). In brief, we found a modest increase in the percentage of females who declared majors in computing-related degrees among AA members between academic years 2005-2006 and 2015-2016. Additionally, beginning around academic year 2009-2010, the growth rate of number of female declared majors tended to outpace the growth rate of number of male declared majors. Finally, length of NCWIT membership was associated with higher percentages of female majors and higher rates of growth in the total number of female majors, particularly when we compared female enrollment during departments’ first year of NCWIT membership to female enrollment in 2015.

Additional Highlights of 2017 Enrollment Analyses

On average, the percentage of female declared majors increased by 6.44 percentage points between academic years 2005-2006 and 2015-2016 (from 13.08% to 19.52%; see original report).

The figure below demonstrates the average female enrollment in academic year 2015-2016 by NCWIT membership duration. In academic year 2015-2016, on average, the percentage of female declared majors tended to be greater among departments in institutions with membership durations of at least seven years compared to departments with membership durations of less than seven years.
For departments in institutions with membership durations of 10 years (the 2005 membership cohort), on average, females accounted for nearly one-third of declared majors (31.35%).

Average % female declared majors in 2015-2016 by membership duration

<table>
<thead>
<tr>
<th>Duration</th>
<th>Average % female declared majors in 2015-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>18.17%</td>
</tr>
<tr>
<td>2 years</td>
<td>15.49%</td>
</tr>
<tr>
<td>3 years</td>
<td>19.29%</td>
</tr>
<tr>
<td>4 years</td>
<td>15.25%</td>
</tr>
<tr>
<td>5 years</td>
<td>16.25%</td>
</tr>
<tr>
<td>6 years</td>
<td>16.71%</td>
</tr>
<tr>
<td>7 years</td>
<td>23.95%</td>
</tr>
<tr>
<td>8 years</td>
<td>20.56%</td>
</tr>
<tr>
<td>9 years</td>
<td>22.04%</td>
</tr>
<tr>
<td>10 years</td>
<td>31.35%</td>
</tr>
</tbody>
</table>

This table summarizes change in average female enrollment from first year of NCWIT membership to academic year 2015-2016 by membership duration. On average, in 2015, departments in institutions that have been affiliated with NCWIT for nine and 10 years, respectively, witnessed a 10 and 12 percentage point increase in the percent of female declared majors since the institutions first became NCWIT members.

The figure below summarizes median annual growth rates of female and male declared majors among NCWIT members over time. Beginning in 2009-2010, the year-to-year

Median annual growth rates of female and male declared majors

Do not make any longitudinal comparisons, the sample changes in each year.
median growth rate in number of female declared majors remained equal to or greater than the median annual growth rate in total male declared majors, among Academic Alliance members.

The figure below documents the percent of departments where the growth rate in total female majors exceeded the growth rate of total male majors among NCWIT members over time. For each academic year since 2007-2008, more than half of NCWIT departments in institutions that provided data witnessed an annual rate of growth in total female declared majors that exceeded the annual rate of growth in total male declared majors.

The table below describes change in the average growth rate in the number of female and male declared majors from their first year of NCWIT membership to academic year 2015-2016 by membership duration. For departments in institutions that have been members of NCWIT for at least three years, the average (or mean) number of female declared majors doubled from their first year of membership to 2015-2016. For departments that have been affiliated with NCWIT for at least five years, the average number of female declared majors more than quadrupled since their first year of NCWIT membership (with the exception of 8-year members).
We want to stress that the enrollment results, while positive, are based on a small percentage of AA members who submitted enrollment data via the Tracking Tool—a population that probably does not represent all AA members. NCWIT should continue to push more AA members to regularly submit data via the Tracking Tool so that we can better understand the impact 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 NCWIT’s Academic Alliance (AA) members and non-member institutions using 2016 IPEDs graduation data (for the academic year 2015-2016). Our analyses were based on all instructional programs classified as “Computer and information sciences and support services” (CIP 11) and included data on first majors. Our analyses provide strong circumstantial evidence that members of NCWIT’s AA tend to outperform non-member institutions in female graduation rates, and that, among AA members, membership duration is positively associated with the female graduation rate (in academic year 2015-2016). However, it was only in recent years that AA members begin to consistently outperform non-members in growth in total female completions, which reflects current understandings that concerted change efforts take many years to see the long-term effects.

In 2016, on average, women comprised 18.43 percent of graduates in AA member institutions; among non-AA member institutions, on average, women comprised 16.59 percent of graduates. The average percentage of female graduates was 1.84 percentage points higher among AA members compared to non-AA members.

Among AA institutions that have been NCWIT members for at least two years, women, on average, comprised 18.97 percent of graduates. This amounts to a 2.38 percentage point gap in the average percent female graduates between longer-term NCWIT members and non-AA members.

Among Extension Services NCWIT members, women comprised, on average, nearly one-in-five graduates (19.91%). This amounts to a 3.32 percentage point difference in female graduates between extension services members and non-AA members. All comparisons between members and non-members are statistically significant at the $p < .05$ or $p < .01$ levels.

<p>| NCWIT Academic Alliance members and long term members exhibit higher percentages of female completions in computer science than non-members in 2016 |
|-------------------------------------------------|----------------|----------------|-----------------|----------------|----------------|</p>
<table>
<thead>
<tr>
<th>Average Percent Female Graduates</th>
<th>All Institutions</th>
<th>Non-Members</th>
<th>All AA Members</th>
<th>AA Members (At Least 2 Years)</th>
<th>ES member</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1,168</td>
<td>810</td>
<td>358</td>
<td>275</td>
<td>69</td>
</tr>
</tbody>
</table>

* $p < .05$ ** $p < .01$ (one-tailed test)

Note: All-female and for-profit institutions were excluded from the analyses.
In 2016, a one-year increase in length of NCWIT membership was associated with a .87 percentage point increase in the number of female completions among AA members and a 1.58 percentage point increase in the number of female completions among ES members (controlling for the total number of graduates in a given year). These associations are statistically significant at the $p < .01$ level.

### Length of AA membership is positively associated with the percentage of female completions in computer science

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\hat{\beta}$</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership duration</td>
<td>.87***</td>
<td>.18</td>
</tr>
<tr>
<td>Total graduates</td>
<td>-.01</td>
<td>.01</td>
</tr>
<tr>
<td>$\alpha$ (constant)</td>
<td>15.24**</td>
<td>.92</td>
</tr>
</tbody>
</table>

N = 358

$** p < 0.01$ (one-tailed, Ha: $\beta > 0$)

Note: All-female and for-profit institutions were excluded from the analyses.

AA Members who have been affiliated with NCWIT for at least eight years appear to be driving the results described above. The percentage of female graduates tended to be 7.35 percentage points higher in AA institutions with membership durations of eight to nine years, compared to AA institutions that were members for less than two years (controlling for the total number of graduates). Likewise, the percentage of female graduates tended to be 8.07 percentage points higher in institutions that had been NCWIT members for at least 10 years compared to institutions that were members for less than two years (controlling for the total number of graduates). While being an NCWIT member for 4-5 years and 6-7 years was associated with higher percentages of female graduates (compared to newer members), the associations were not statistically significant.

### Membership duration is positively associated with the percentage of female completions in computer science for members who have been with NCWIT for at least 8 years compared to newer members

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\hat{\beta}$</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 years</td>
<td>-2.09</td>
<td>1.93</td>
</tr>
<tr>
<td>4-5 years</td>
<td>2.29</td>
<td>1.76</td>
</tr>
<tr>
<td>6-7 years</td>
<td>2.61</td>
<td>1.93</td>
</tr>
<tr>
<td>8-9 years</td>
<td>7.35**</td>
<td>2.49</td>
</tr>
<tr>
<td>10+ years</td>
<td>8.07**</td>
<td>2.59</td>
</tr>
<tr>
<td>Total graduates</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>$\alpha$ (constant)</td>
<td>17.12**</td>
<td>1.32</td>
</tr>
</tbody>
</table>

N=358

$** p < 0.01$, (one-tailed test, Ha: $\beta > 0$)

Note: All-female institutions and for-profit institutions were excluded from these analyses.

Results from a fixed effects model indicate that, among NCWIT members, a one-year increase in NCWIT membership was associated with a .55 percentage point increase in the number of female completions within institutions over time. Membership duration among institutions that have at some point been involved with Extension Services was associated with a .83 percentage point increase in the number of female completions within institutions over time. Fixed effects models provide two
advantages for this type of analysis. First, they control for time-invariant unobserved effects at the department-level. This means that characteristics that we cannot measure that remain unchanged during our period of interest are not driving the association between membership duration and the percent of female completions (e.g. geography). Second, because the results are based on change within departments over time, we can rule out the possibility that the causal order is reversed. That is, we know that the effect does not result because institutions that have had success with female completions were more likely to join NCWIT in its earlier years. This is strong (though not perfect) evidence that length of NCWIT membership causes an increase in female completions.

| Among AA members, length of membership duration over time is associated with an increase in the percentage of female completions within departments. |
|---------------------------------------------|---------------------------------------------|
| Variable       | β       | Standard Error | Variable       | β       | Standard Error |
| Membership duration | .35**   | .13             | Membership duration | .83**   | .17             |
| Total graduates   | .02**   | .01             | Total graduates   | .01     | .01             |
| α (constant)      | 13.47** | 13.78           | α (constant)      | 10.70** | .83             |

* p < 0.05, **p < 0.01 (one-tailed test, H₀: β > 0)

Note: All-female institutions and for-profit institutions were excluded from these analyses.

Between 2004 and 2012, NCWIT members lagged behind non-members in terms of the percentage of completions awarded to women. However, by 2013, NCWIT members tended to demonstrate slightly higher percentages of female completions.

Between 2005 and 2008, the average rate of increase in total female completions from year to year was lower among NCWIT members compared to non-members. But by 2009, the average rate of increase in total female completions was higher among NCWIT members compared to non-members. Between 2015 and 2016, on average, the number of female graduates increased by 33.63 percent among AA members and 12.47 percent among non-AA members.
Between 2005 and 2008, men’s completions grew at a faster rate than women’s completions in NCWIT member institutions, while the opposite was observed among non-member institutions. By 2009, however, the rate of growth in women’s completions in NCWIT institutions was greater than that of non-member institutions. Between 2015 and 2016, on average, the rate of growth in the number of female completions outpaced the rate of growth in the number of male completions in 52.09 percent of AA institutions. The corresponding figure for non-AA institutions was 49.44 percent.

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

*Extension Services Grant: Expanding the Pool (“NSF 2”)*

In 2017, we documented Extension Services NSF2’s progress in a more detailed evaluation report (forthcoming). The following provides preliminary findings:
• The second cohort of 15 client institutions was established in Year 3 and includes 38 degree programs: 16 Computing (including Computer Science, Computer and Information Science), 7 Computer Engineering, 9 Electrical Engineering, and 6 Mechanical Engineering. This cohort has succeeded in expanding the pool of women: combining the 12 institutions for which we were able to conduct analysis, 1,200 more women applied and 1,124 more women were accepted into these programs. Women applicants grew by 110%, while men applicants grew by only 63%; similarly, the percent of women accepted grew by 168%, while the percent growth of men was 59%.

• Institutions met with their Extension Services Consultants (ESCs) and ES-EP staff to learn additional recruitment and retention strategies and share practices at the NCWIT Summit in Tucson, AZ May 22-24, 2017. Previous clients volunteered to present their experiences and new wisdom about what works and what does not to new clients.

• The 15 teams in the 2015-2017 cohort maintained their institutional commitments from the previous year. In addition, 12 teams administered a first course entry survey; 15 teams received a Baseline Analysis Report of their tracking tool data; and 15 teams submitted final reports that detailed outcomes from their mini-grant and strategic recruitment and retention initiatives.

• ESCs continued to hold monthly meetings with their client teams, providing locally relevant information and suggestions and guiding clients in the use of evidence-based recruiting, retention, and evaluation practices. ESCs met with their clients face-to-face at the 2017 NCWIT Summit.

• Monthly teleconferences for ESCs have been held, during which staff shares information with ESCs and gather knowledge the ESCs gain from their on-the-ground efforts and interactions with clients. Monthly ESC “small calls”--small group conference calls for ESCs to discuss strategy and build community--were held. Webinars for ESCs and clients have been conducted and disseminated beyond the project participants to NCWIT’s Academic Alliance; and a substantial array of existing resources and several new resources have been provided. A research project is underway to associate client interventions with outcomes. Finally, ES staff and ESCs are conducting a new set of interviews with ESCs to capture and document the experiences that helped or hindered ESCs’ successes in working with academic clients.

*Extension Services Grant: IUSE (“Extension Services Undergraduate Programs at Scale”)*

The Extension Services Undergraduate Programs at Scale (ES-UPS) program model (Learning Circles) is a departure from prior Extension Services models and is meant to achieve widespread deployment of effective instructional, curricular, and co-curricular practices in support of student engagement, learning, and retention. The new ES-UPS model is a method of scaling the successful Extension Services model to many more schools.

The external evaluation of the ES-UPS activities includes both formative and summative elements. During the 2017-2018 grant year we focused our evaluation efforts on formative feedback, collecting data through document review; interviews with ESCs, Guide Schools (guides), and Change Leader Teams (CLTs); and online meeting observations. The primary evaluation goals this year related to
analyzing and better understanding the relationships between the Learning Circles roles, the effectiveness of the online meetings in teaching new tools and fostering a learning community, and the aspects of the Learning Circles that most contribute to the outcomes of the work. We summarize these results in detail in the NCWIT Learning Circles Annual Evaluation Report (forthcoming). The report includes much helpful information about how respondents perceive the program. For the purposes of this report, we offer three initial indicators of program effectiveness:

- **Human Resources Investments in Computer Science.** The training and knowledge that participants receive from the Learning Circles model has a major impact on the human resources within each school or department that participates in the program. Faculty, staff, and sometimes students have access to NCWIT resources and the expertise of the ESC for the duration of the program. This allows experts in computer science or university administration to expand their knowledge and expertise into the area of recruitment and retention of diverse students.

- **Institutional Resources that Form Infrastructure.** Collecting the Tracking Tool data and performing the self-evaluation at the start of the Learning Circles process contributes significantly to school and department understanding of the institutional resources available to them to make change and improve diversity.

- **Information Resources that Form Infrastructure.** NCWIT provides numerous and robust informational resources to Learning Circle client institutions. In interviews with CLT representatives we heard that the resources and toolkits provided by NCWIT are extremely helpful for the Learning Circle participants and the data analysis provided by NCWIT staff was especially appreciated by the CLTs.

  “I integrated more of the resources into projects I manage, enhancing student interactions, and in the classroom.” (AA Members Survey Respondent)

  “I was chair and I provided information and data to my colleagues about NCWIT and the challenges for underrepresented groups and best practices. This has helped us to secure resources to move forward.” (AA Members Survey Respondent)
4) Objective: Aspirations Talent pool continues to grow

The National K-12 Award for Aspirations in Computing (AiC) receives funding from Apple, Bank of America, Microsoft, Motorola Solutions Foundation, and Symantec. AiC serves all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, Guam, and all U.S. overseas military bases. Each year, NCWIT expands its recognition of girls by leveraging its member organizations to host and organize award ceremonies. Further, to its Aspire IT program, NCWIT has gifted more than $800,000 to 300 programs, providing an estimated 240,000 instruction hours to nearly 8,000 girls in 40 states.

During the 2017-2018 award cycle, [an as yet unknown number of] girls initiated applications, bringing the total number of girls in the Aspirations talent pool to 30,610+2017-2018 number (registered since 2007).

Our yearly compilation of NCWIT communications is rife with examples of how the AiC program has impacted young women’s educational and career trajectories. We include a few of the 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. In 2016, NCWIT reported on a more in-depth analysis of the meaning of the program and its potential impact. The results of this analysis have been published in reputable outlets.
“Hi NCWIT, I just wanted to share some good news: our all-NCWIT team...won 2nd place overall at HSHacks, the largest high school hackathon in the world, this past weekend! We formed the team through the NCWIT Facebook community; it was especially encouraging because award after award after award were given out to all-male teams and we were able to make our way up there and compete with them to win one of the most coveted prizes at such a large hackathon.” (Aspirations Award recipient)

"I applied to NCWIT and became an Indiana Affiliate Runner-Up. Hearing Ruthe speak then was something I could never forget; I knew I had to do something with CS, and I felt that it was an area of education that many HS lack. After the ceremony four years ago, I came back home and joined this FB group. I heard about [the] AspireIT grant not long later, and that spring, I trekked through the snow to Purdue to plan on starting an AspireIT club with...for Indiana HS. Because of this community, I had come to know so many incredible and amazing people throughout the next few years. This community has allowed me to grow and develop not just as a computer scientist, but also as a person.” (Aspirations Award recipient)

NCWIT membership appears associated with higher female enrollment and graduation rates in computer science degree programs. Analyses of Tracking Tool data revealed increases in female enrollment, particularly among longer-term members. Analyses of IPEDs data revealed that NCWIT members tend to graduate higher percentages of women than non-NCWIT members and that length of membership is positively associated with female completion rates. These outcomes may be related to the fact that a strong majority of AA Members Survey respondents report taking action because of something they learned through NCWIT. There is also some indication that these outcomes are partially driven by some members’ participation in Extension Services – a program that separate evaluations indicate continues to exhibit success. Finally, the Aspirations in Computing program continues to grow and impact the lives of young women.
NSF Commitments for Year Six

Goals noted below are year 5 goals

- **AA Quantifiable Goals:** At least 75 percent of AA member representatives report an increase percent in female enrollment.
  - 62 percent of AA member departments that provided Tracking Tool data for academic years 2014-2015 and 2015-2016 reported an increased percent in female enrollment over the period.

- **AA – Pacesetters and “net new women”:** Cohort 3 adds 1K-2K “net new women”
  - Cohort 3 reached the end of its cycle in December 2017. NCWIT did not set a goal for net new women, instead opting for a focus on initiating and sustaining change strategies.
  - However, 83 percent of Final Progress Survey respondents reported increased recruitment due to their Pacesetters team efforts.
  - Only two Final Progress Survey respondents saw a decrease in recruitment numbers.

- **AA Growth and Reach:** 20 percent membership growth and 30 percent total US BS “reach”
  - AA grew by 13% (61 organizations) in 2017, which is five percentage points lower than the growth rate in 2016 (18%), but two percentage points below the target (20%).
  - In 2017, of the U.S. bachelor’s degree-granting institutions that offered “Computer and information sciences and support services” majors (CIP 11) and provided valid data to IPEDS, 33 percent were AA members.

- **NCWIT Summit:**
  - 10 percent attendee growth in 2016.
    - A total of 697 individuals attended the 2016 Las Vegas Summit and a total of 650 individuals attended the 2017 Tucson Summit. This represents a seven percent decrease in Summit attendance between 2016 and 2017.
  - 85 percent of attendees see value in 2017.
    - A total of 81 percent of Summit Survey respondents rated the 2017 Summit as “very” or “extremely valuable.” This represents a two percentage point increase compared to the previous Summit (79%). Ninety-four percent of Summit Survey respondents indicated they were likely to attend another NCWIT event.
  - 1,000 virtual attendees in 2017.
    - The 2017 Summit drew 3,195 page views to its live stream webpage and encouraged nearly 218 engagements/reactions via social media.
    - NCWIT invited press to virtually tune into the livestream via two press releases specifically targeting the Tucson region.
  - The number of unique Summit webpage viewers increases by 20 percent in 2017.
    - In 2017, NCWIT witnessed a small decrease (6%) in the number of unique Summit webpage viewers compared to 2016. Specifically, 9,419 users visited Summit webpages in 2016 compared to 8,819 users in 2017.

- **Resource Creation:**
  - 10-15 new resources created
    - NCWIT created 11 new paper resources and 107 new multimedia resources in 2017.
  - Resource committees advise on 5 projects in 2017.
    - At least four resources were produced as a result of Alliance resource committees.
• **Resource Delivery Vehicles:**
  o 2 navigational guides/tools in 2016 and 2017.
    ▪ In 2017, NCWIT created eight navigational guides (not counting resource collections).
  o 70 percent of members have distributed resources in 2017.
    ▪ Of the 91 percent of Members Survey respondents who indicated that they were involved with NCWIT in 2017, nearly three-quarters (73%) indicated that their involvement included “distributing NCWIT materials and resources.”
  o Increase the number of mobile applications in 2017.
    ▪ NCWIT created an app for the 2017 Summit, which was downloaded by 785 users (300 more users than the 2016 NCWIT Summit app). App users opened and used the app more than 15,180 times (about 3,480 more times than the 2016 NCWIT Summit app).

• **Resource Distribution:**
  o NCWIT customizes website user experience in 2016 and 2017.
    ▪ In 2017, NCWIT indicated that they have no new output to report.
  o 90 percent of members find website “very helpful” in 2017.
    ▪ In 2017, 45 percent of Members Survey respondents indicated that the NCWIT website was “very useful.” The remaining 54 percent of respondents indicated that the website was “somewhat helpful.” No respondent indicated that the website was not at least somewhat helpful.
  o Resources are targeted at 3 new audiences in 2017.
    ▪ In 2017, NCWIT created resources that targeted the following four audiences potentially unfamiliar with NCWIT’s mission: Latina girls and their families, female and minority patent makers, interdisciplinary-focused students, and bystanders to bias.
    ▪ NCWIT conducted at least 13 social media resource campaigns in 2017 (see above for a detailed list)
  o 30-50K hard copy resources distributed in 2017.
    ▪ NCWIT distributed 258,287 hardcopy resources in 2017.
  o In 2017, a total of 86,527 users visited NCWIT’s combined resources pages. This represents a 15 percent increase above the total we observed in 2016. Users downloaded 38,891 resources in 2017, a 48% increase since 2016.

• **Research on Aspirations Program (publish final results):**
  o We reported in 2016 that NCWIT transcribed and analyzed 63 interviews, published an article, and presented paper on findings.
  o During the 2017-2018 award cycle, X,XXX girls initiated applications, bringing the total number of girls in the Aspirations talent pool to XX,XXX (registered since 2007). [Data not available at the writing of this report.]

• **Digital Outreach and PR:**
  o 4 digital newsletters
In 2017 NCWIT sent out 19 original digital newsletters/e-communications to members and non-members.

- 10 percent increase in overall unique visitors/website page views
  - The number of unique visitors to NCWIT.org increased from 191,407 in 2016 to 199,480 in 2017. This represents a four percent increase in overall unique visitors.

- 20% growth in social media community
  - Between December 2016 and December 2017 the number of NCWIT Facebook fans (“likes”) increased by about nine percent (from 27,846 to 30,470). The number of Twitter followers increased by 23 percent over the course of the year (from 21,405 to 26,265).

- 5 press releases in 2016

**Events Outreach:**

- Three Keynotes
  - In 2017, NCWIT keynoted at nine different meetings/conferences.

- NCWIT attended 8-10 events
  - In 2017, NCWIT attended a total of 602 non-government events/meetings. Seventy-two of these meetings occurred at conferences and 129 involved VIPs. NCWIT officials met with DC-related policy makers at least 16 times.

- Twenty-four NCWIT ambassador outreach events (note, “ambassadors” has been renamed NCWIT2GO).
  - We are aware of 10 NCWIT2GO events in 2017. Together, these events reached at least 475 people. NCWIT is still working on ways to improve tracking NCWIT2GO outreach.