GENDER DIVERSITY IN COMPUTING MAKES AN IMPACT

Gender-balanced and gender-diverse technology organizations and departments:

- perform better financially, particularly when women occupy a significant proportion of top management positions
- demonstrate superior team dynamics and productivity
- produce work teams that stay on schedule and under budget
- demonstrate improved employee performance

Additionally, gender diversity expands the qualified employee pool, promotes equality, and reflects the customer base.

WOMEN IN COMPUTING ARE UNDERREPRESENTED

Few women of all races, ethnicities, class, and disability status are pursuing education or careers in computing.

In 2015, 56 percent of Advanced Placement (AP) test-takers were women, yet only 22 percent of AP CS test-takers were women.

In 2015, 57 percent of bachelor’s degree recipients were women, yet only 15 percent of CS bachelor’s degree recipients at research universities were women.

In 2015, 57 percent of the professional workforce were women, yet only 25 percent of the computing workforce were women.

The underrepresentation of girls and women in computing represents a failure to capitalize on the benefits of diverse perspectives: in a world dependent on innovation, diversity can bring the best and broadest problem solvers to the table. And, at a time when technology drives economic growth, diversity can yield a larger and more competitive workforce.

In high school, girls are less likely to take CS courses.

Cultural stereotypes (e.g., about gender, race, and technology) suggest to girls and those who influence them that they are less likely than boys to have talent or interest in creating computing technology. And, these messages play out in different ways for girls of varying races and ethnicities. Even when CS is offered in schools, girls are less likely to take courses unless their perceptions and the perceptions of others change.

In college, women study CS under different conditions than men. These conditions are further complicated by race, class, and ability, among other identities.

Women:

- stand out as different
- face stereotypes that they are not capable
- perceive that others are better prepared
- have a lower tolerance for average or above-average grades
- have difficulty finding “possible selves” in historically male classrooms
- leave CS majors more often than men, often with higher grades than the men who stay

When seeking doctoral degrees in CS, women are more likely to leave than men.

Women:

- observe overt sexism (e.g., jokes about women’s abilities) at a rate of 25 percent of all women graduate students
- leave graduate programs 10 times more often when they observe overt sexism than when they do not observe overt sexism
- experience additional barriers, including barriers related to racism, classism, and ableism
- more often think about leaving their programs of study than men (half of women, compared to 35 percent of men)

In the workforce, women often feel stalled in their careers, and they leave at higher rates than men.

Societal biases:

- push women out of the technical track
- limit women’s access to informal networks, role models, and mentors
- negatively influence women’s performance evaluations, promotion rates, and salaries
- result in women feeling stalled in their careers (particularly true for African-American women who report feeling stalled at higher rates than any other group)
- cause mid-career technical women to leave the workforce at a higher rate than any other STEM discipline
NCWIT IS MAKING A DIFFERENCE

NCWIT mobilizes the computing community in collective action, allowing them to speak with a unified, amplified voice for increasing the meaningful participation of girls and women in computing.

With NCWIT’s influence, the national conversation about computing has changed. Today, more high school girls study computer science (CS), more college freshman women intend to major in CS, and the number of women awarded bachelor’s degrees in CS from PhD-granting institutions is at its highest point since the post-dot.com bust in 2004.

NCWIT awards, campaigns, programs, resources, and communications influence the way the press and the public talk about the problem. While press coverage previously focused on the problem (i.e., few women and the persistent notion of the solitary male genius), today’s national conversations have broadened to include solutions, progress, and inspiration.

PERCENTAGE OF FEMALE BACHELOR’S DEGREES AWARDED, 2007-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-members</th>
<th>NCWIT Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>18%</td>
<td>13%</td>
</tr>
<tr>
<td>2015</td>
<td>16%</td>
<td>18%</td>
</tr>
</tbody>
</table>

U.S. computing departments that have been NCWIT members for two or more years have steadily increased the percent of bachelor’s degrees they award to women; non-members have lost ground.

PERCENT OF WOMEN TAKING AP CS, 2004-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>15%</td>
</tr>
<tr>
<td>2015</td>
<td>22%</td>
</tr>
</tbody>
</table>

The percentage of female students taking the Advanced Placement Computer Science (AP CS) exam has increased by seven percent since 2004, when we began creating widespread awareness of women’s underrepresentation.

PERCENT OF FRESHMEN INTENDING TO MAJOR IN CS, 2004-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>0.3%</td>
</tr>
<tr>
<td>2015</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

The percentage of incoming first-year college students who want to major in computer science has increased overall; the women’s percentage has increased fourfold since 2004.

NCWIT THEORY OF CHANGE

National Center for Women & Information Technology (NCWIT)

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NCWIT MEMBER ORGANIZATIONS

NCWIT is a non-profit community of nearly 900 universities, companies, non-profits, and government organizations nationwide working to increase women’s meaningful participation in computing and technology. These change-leading organizations are grouped into five Alliances, creating a broad reach into the areas of K-12 education, higher education, and the workforce.

BREAKDOWN OF MEMBER ORGANIZATIONS BY ALLIANCE

- 53.5% Academic Alliance
- 24.2% K-12 Alliance
- 8.2% Workforce Alliance
- 7.9% Affinity Alliance
- 6.3% Entrepreneurial Alliance

NCWIT MEMBER ORGANIZATIONS

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NCWIT THEORY OF CHANGE

MEMBER ORGANIZATION GROWTH:

891 ORGANIZATIONS AT THE END OF 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>79</td>
</tr>
<tr>
<td>2007</td>
<td>116</td>
</tr>
<tr>
<td>2008</td>
<td>144</td>
</tr>
<tr>
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<tr>
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<td>2012</td>
<td>428</td>
</tr>
<tr>
<td>2013</td>
<td>515</td>
</tr>
<tr>
<td>2014</td>
<td>610</td>
</tr>
<tr>
<td>2015</td>
<td>702</td>
</tr>
<tr>
<td>2016</td>
<td>891</td>
</tr>
</tbody>
</table>
The NCWIT Theory of Change captures NCWIT’s overall approach to increasing women’s meaningful participation by providing a strategic and evaluative framework.

The NCWIT Theory of Change explains how NCWIT tackles the problem of low gender diversity in tech. It also explains why NCWIT thinks this approach will result in systemic change. By making explicit the NCWIT Three-pronged Strategy and the assumptions underlying the approach, the Theory of Change explains how short- and medium-term outcomes move toward sustained reform.
NCWIT STRATEGY AND STRUCTURE

NCWIT is a non-profit community that convenes, equips, and unites change leader organizations to increase the meaningful participation of all women — at the intersections of race, ethnicity, class, age, sexual orientation, and disability status — in the influential field of computing, particularly in terms of innovation and development.

Before NCWIT was formed in 2004, programs focusing on women and computing existed mostly in isolation — without the benefit of shared best practices, effective resources, communication with others, or national reach. Today, these programs are part of the NCWIT community, creating a far greater impact than if institutions acted alone.

THE NCWIT THEORY OF CHANGE INFORMS A SUCCESSFUL THREE-PRONGED STRATEGY

The NCWIT Theory of Change identifies the necessary conditions for change, while supporting action that accomplishes sustained reform of social systems. NCWIT puts its Theory into practice through the NCWIT Three-pronged Strategy. The Strategy aims to improve awareness and knowledge, and motivate change leaders to act. Thus, the Strategy works to ensure the necessary “pre-states” in change leaders to make their own individual changes and to initiate organizational changes to bring about sustained systemic change.

Through staff expertise and activities, NCWIT acts as the backbone for coordinating, supporting, and accelerating members’ collective impact:

**NCWIT convenes:** NCWIT brings together men and women change leaders who carry out projects and initiatives in support of NCWIT’s mission. They represent nearly 900 universities, companies, non-profits, and government organizations that are grouped into five Alliances. These change leaders convene annually at the NCWIT Summit — a three-day event where collaboration leads to action and produces positive results for others to follow.

**NCWIT equips:** NCWIT provides free, online research-based resources for reform at every level to help individuals implement change, raise awareness, and reach out to critical populations. These resources are frequently cited by national media outlets and widely distributed through outreach events and members’ networks.

**NCWIT unites:** NCWIT develops programs for members to achieve goals focused on policy reform, image change, outreach to underrepresented groups, and more. These programs unify change leaders in an action-oriented movement to create national change.

Before NCWIT

With NCWIT

NCWIT THEORY OF CHANGE

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NECESSARY CONDITIONS: AWARENESS, KNOWLEDGE, MOTIVATION

The NCWIT Theory of Change describes the pre-conditions necessary for change leaders to take action: awareness, knowledge, and motivation. The NCWIT Three-pronged Strategy facilitates these conditions through resources, outreach, the NCWIT Summit, and NCWIT awards, campaigns, and programs.

RESOURCES

More than 160 NCWIT research-based resources raise awareness, increase knowledge, and build capacity for individuals and organizations to reach out to critical populations and to implement systemic change. NCWIT provides resources for reform at every level – K-12 through postsecondary education, as well as in industry.

OUTREACH

NCWIT has established a reputation as a trusted source of information about women’s participation in computing, reaching a large number of people in a variety of influential roles:

- **Social media** keeps NCWIT in touch with the broader community of more than 52,400 fans and followers on Facebook, Instagram, LinkedIn, Pinterest, and Twitter with an estimated reach of nearly 875,000 in 2016.
- **Websites** provide access to free multimedia resources, news highlights of women in tech, program descriptions and announcements, event calendars, blogs, and more. In 2015, NCWIT’s website drew close to 180,000 unique visitors, a figure that increases 10 percent annually.
- **More than 10,000 individuals** (members and non-members) received NCWIT e-newsletters in 2016.
- **Staff contact with the media** results in featured articles, commentary, and facts about NCWIT research and member activities. NCWIT was mentioned in 266 different articles in 2015, including articles in BBC News, CNET, Huffington Post, The New York Times, and The Wall Street Journal.

NCWIT THEORY OF CHANGE

NCWIT SUMMIT

Nearly 900 computing organizations are represented at the annual NCWIT Summit, the acknowledged destination of change leaders focused on addressing underrepresentation in computing through research-based approaches. Educators, entrepreneurs, corporate executives, and social scientists from across industries and disciplines (both men and women) participate in this one-of-a-kind event. The Summit sets the stage for NCWIT member representatives, notable field experts, and renowned guests to present and learn about leading-edge practices, to network and form partnerships, and to provide encouragement and inspiration for one another.

Past speakers include Andrea Jung, Barack Obama, Benjamin Jealous, Carol Dweck, Craig Barrett, Dave Filoni, Ed Lazowska, Freada Kapor-Klein, Hadi Partovi, Maggie Neal, Mayim Bialik, Melissa Harris-Perry, Michael Kimmel, Ray Ozzie, and Russlynn Ali.

- Nearly 100 percent of attendees find the Summit to be valuable overall and report that they are likely to attend another Summit.
- Seventy-five percent of attendees report learning new information at the Summit.
- In 2016, there were more than 2,700 total livestream views and the #NCWITSummit hashtag trended at #2 on Twitter.

I always learn from both presenters and other attendees — either a new perspective on something I’m struggling with or a new idea about how to tackle different challenges. (NCWIT encourages) me to think differently and act differently... It’s also a very engaging conference; we don’t just sit back and listen, we work.

~ Summit Attendee

NCWIT AWARDS, CAMPAIGNS, AND PROGRAMS

NCWIT awards, campaigns, and programs involve thousands of diverse technical girls and women, as well as their influencers — educators, family members, industry professionals, curriculum developers, administrators, and educational policymakers — who are interested in changing societal systems that disadvantage women. These platforms serve all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, Guam, and all U.S. overseas military bases.

These capacity-building initiatives encourage persistence; celebrate contributions; provide hands-on, research-based instruction and professional development; challenge stereotypes; present strategic approaches to systemic reform; and promote culture change and more inclusive environments.

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ncwit.org
NCWIT RESOURCE CREATION AND DISTRIBUTION

More than 160 NCWIT research-based resources raise awareness, increase knowledge, and build capacity for individuals and organizations to reach out to critical populations and implement systemic change. NCWIT provides resources for reform at every level — K-12, postsecondary, industry — that are attractive, easy-to-use, free, and available in both electronic and print formats.

With NCWIT resources, change leaders are less likely to reinvent the wheel, recycle practices that do not work or that exacerbate problems, or move forward based on faulty assumptions.

RESOURCES CREATION PROCESS

Resources are developed through a rigorous, investigative process:

- NCWIT social scientists conduct original research, monitor relevant publications, review articles, and attend conferences to identify and produce informative and actionable resources that reflect the latest social science research.
- The NCWIT Social Science Advisory Board (SSAB), a group of social scientists from preeminent institutions nationwide, provides advice, based on their knowledge of research and theory at the intersections of gender and computing.
- NCWIT Alliance member representatives serve on resource committees and project teams to help NCWIT understand emergent trends and issues most important to change leaders.

RESOURCES EVALUATION

NCWIT conducts both formative and summative evaluation:

- tracking hardcopy and web resource distribution
- assessing the appeal and usability of resources based on established metrics through surveying, interviewing, or observing recipients and monitoring visitor website navigation
- regularly sharing findings with staff to inform internal strategies and resource development
- supporting the strong culture of evaluation that guides NCWIT staff and Alliance members’ decision-making

BREADTH OF RESOURCE DISTRIBUTION

- In 2016, more than 270,943 hardcopy resources were distributed at conferences, workshops, and events.
- Increased marketing of resources through social media campaigns continues to boost website views and downloads:
  - NCWIT regularly shares resources through social media campaigns, like “Resource of the Week,” “NCWIT Resource Month,” and #CSEdWeek. In 2016, for example, more than 400 posts contained resources. Of these posts, more than one million followers were reached, and more than 5,000 were actively engaged (i.e., shared, liked, commented, etc.).
  - In 2016, resource views and downloads accounted for more than one-quarter of all NCWIT website hits; more than 200,000 resources were visited, a number that has increased every year.

IMPACT OF RESOURCES

In 2015, veteran and newcomer Alliance members reported important resource outcomes.

82 percent said that they had shared or recommended ideas from at least one NCWIT resource.
75 percent reported that they had learned something new from NCWIT resources.
50 percent indicated that they had used new strategies based on information in NCWIT resources.

NCWIT THEORY OF CHANGE

NCWIT

Necessary Conditions: Awareness, Action, Impact

NCWIT is the go-to resource! Credible, easily accessible, and downloadable...all of the materials are extremely professional – PRICELESS. Thank you. Indispensable. Absolutely needed – now more than ever!

~ Alliance Member
NCWIT Aspirations in Computing (AiC) provides technical girls and women with ongoing engagement, visibility, and encouragement for their computing-related interests and achievements from high school through college and into the workforce.

ENCOURAGING PERSISTENCE INTO COMPUTING EDUCATION AND CAREERS

AiC Community members are supported by their peers, volunteers, and NCWIT Alliance member organizations who offer exclusive access to scholarships, internships, and professional work. Community members also give back to others by planning and leading coding experiences for middle school girls and high school women. These opportunities allow women of the Community to strengthen their leadership, technical, and entrepreneurial skills, further preparing and motivating them to participate in the computing workforce.

IDENTIFYING AND HONORING TECHNICAL WOMEN AND THEIR INFLUENCERS

NCWIT AspireIT connects high school and college women with K-12 girls to create and enhance interest in computing. Using a near-peer model, program leaders teach fundamentals in programming and computational thinking in fun, creative environments.

The NCWIT Award for Aspirations in Computing honors high school women who are active and interested in computing and encourages them to pursue their passions. The Award includes both national and local recognition in 75 regions.

The NCWIT Aspirations in Computing Educator Award publicly celebrates educators — teachers, counselors, administrators, mentors, and other influencers — who encourage high school women’s interest and ability in computing.

The NCWIT Collegiate Award honors women undergraduate and graduate students whose technical contributions to projects demonstrate a high level of creativity and potential impact.

AIC IMPACT BY THE NUMBERS

- The AiC Community, the largest network of its kind, includes more than 7,000 women.
- Ninety-one percent of past Award for AiC recipients report a major or minor in a STEM field while in college — 77 percent in computer science or engineering.
- Since 2013, more than 5,300 girls have received an estimated 200,000 instruction hours through 235 AspireIT programs in 36 states.
- Fifty-one percent of 2016 Award for AiC applicants identified as a person of color.
- More than 250 AiC Educator Award winners have received more than $136,000 for professional development.
- NCWIT Collegiate Award winners often receive national media attention for their mobile applications, devices, visualization tools, and more.
- More than 1,500 industry volunteers nationwide are engaged with the AiC program each year.

When asked to describe the impact of the high school Award for AiC, recipients consistently report greater confidence, awareness of computing fields, motivation to persist, less anxiety, and less uncertainty about computing skills:

“I really enjoy the NCWIT community! It’s so inspiring to see so many women doing awesome things in technology. Because of NCWIT, I’m not afraid to try new things, and I’m excited for a future in CS.”

~ Award Recipient

“This has to be the best program I have seen to recognize students... NCWIT goes very far in helping [young women] see the benefits of a tech career.”

~ Educator

THE THEORY OF CHANGE IN ACTION

The AiC program reflects the NCWIT Theory of Change. It unites NCWIT members across Alliances in actively increasing the engagement of women in computing. NCWIT provides regional teams with information, resources, and infrastructure to enable member organizations to encourage and support K-20 students. By raising awareness within member organizations, recruiting women into computing pathways, and providing ongoing community support, the AiC program makes a long-term impact on women’s participation in computing.

The NCWIT Aspirations in Computing program is supported nationally by Apple, AT&T, Bank of America, Google, Hewlett Packard Enterprise, Intel, Microsoft, Motorola Solutions Foundation, Northrop Grumman, Qualcomm, and the Symantec Corporation.

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ncwit.org
NCWIT INDUSTRY SYSTEMIC CHANGE MODEL

The NCWIT Industry Systemic Change Model identifies the key focus areas for creating more inclusive and productive environments. NCWIT uses the Systemic Change Model to support Alliance members in taking a holistic approach to developing inclusive workplace cultures. It includes three foundational steps that help to ensure the success of subsequent efforts: 1) enlisting top leadership support, 2) educating managers, and 3) collecting appropriate data. The Systemic Change Model also helps Alliance members understand the different elements that should be part of a larger strategic plan for reform, such as examining processes and policies (e.g., in recruitment or performance evaluation) that deter women’s participation.

INDUSTRY GOALS FOR SUSTAINABILITY

- Grow Alliance membership so more organizations have access to change-making practices, programs, and networks.
- Encourage sustained culture change to make workplaces more diverse, inclusive, and welcoming for all employees.
- Provide self-assessment tools usable by various organizational types to help them understand what to change and how to measure it.
- Continue the Pacesetters program to accelerate sustained change with EA and WA members.
- Expand the work of male and other majority-group allies in creating inclusive workplaces.

NCWIT INDUSTRY GOALS FOR THEORY OF CHANGE

The NCWIT Entrepreneurial Alliance (EA) and the NCWIT Workforce Alliance (WA) include more than 125 accelerators, corporations, incubators, and growing companies. The WA/EA focuses on creating more inclusive company cultures and increasing the participation of women and other underrepresented groups, resulting in stronger technical teams that enhance innovation. Additionally, the Affinity Alliance includes affinity groups, foundations, and professional associations that provide support, networking, and professional development for more than 100,000 technical women and men. Together, these Alliances work to better recruit, retain, and advance technical women in the workforce in order to drive the economy and solve some of the world’s most pressing problems.

INDUSTRY AWARDS, CAMPAIGNS, AND PROGRAMS

NCWIT provides several corporate platforms for moving Alliance members into action. These platforms help members raise awareness of systemic barriers, plan for systemic organizational change, increase the involvement of men in these change efforts, and progress towards greater public accountability as they track and release diversity data. Projects include:

- **NCWIT Male Influencer Research and Resources**, such as the “Male Advocates and Allies” Toolkit and the “Top 10 Ways to Be a Male Advocate for Technical Women,” help men (and other majority-group allies) better advocate for and participate in diversity initiatives.

- **NCWIT Pacesetters**, sponsored by NSF and Qualcomm, is a unique, fast-track program in which Academic, Entrepreneurial, and Workforce Alliance members work together to accelerate their organizations’ number of technical women. Pacesetters select bold, measurable goals that challenge stereotypes, shape positive behaviors, improve internal processes, and advance technical innovation.

- **Sit With Me**, sponsored by Emeco with creative support from BBMG, is a fun, creative national advocacy campaign that uses an iconic red chair to symbolize the critical need for women’s technical contributions. Events are held to acknowledge and celebrate these valuable contributions, reinforcing that all individuals can sit in support and solidarity for technical women.

- **The NCWIT Symons Innovator Award**, sponsored by OpenView, promotes women’s participation in information technology and entrepreneurship by honoring an outstanding woman who has successfully launched and led an IT business.

- **The Tech Inclusion Pledge**, launched with CODE2040, addresses the full spectrum of diversity (gender, ethnicity, age, sexuality, and more), across industries and computing disciplines, within companies at all stages of growth. Leaders who sign the pledge commit to three essential actions: 1) annually publish data and progress metrics, 2) implement and publish company-specific goals, and 3) invest in partnerships to build a diverse pipeline of technology talent.

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WHAT THE MEMBERS SURVEY SAYS

• 85 percent of Entrepreneurial Alliance (EA) members and 92 percent of Workforce Alliance (WA) members report that NCWIT helped them build allies or advocates for diversity in their organizations.

WHAT ENTREPRENEURIAL AND WORKFORCE ALLIANCE REPRESENTATIVE S SAY

More than 7 in 10 said that information they learned through NCWIT helped them take action:

“We implemented Gender Neutral Job Descriptions Guidelines, majorly impacted by NCWIT materials.”

A WA member said they “made adjustments to recruiting processes; developed male advocacy program; and expanded internal employee resource group initiatives.”

“[We] hired more summer interns than the previous year — all were Aspirations winners/runners-up.”

“The University Relations team that I manage set some very specific gender-hiring goals. We added some women’s colleges to our recruitment calendar and are targeting women student groups at our other targeted universities.”

“We are currently working to roll out an unconscious bias training with the assistance of NCWIT.”

NCWIT AWARDS, CAMPAIGNS, AND PROGRAMS

• NCWIT Pacesetters have added more than 3,000 women to the U.S. computing talent pool. Additionally, Pacesetters continue to incubate new national initiatives for the broader computing community, such as the “Transforming Technical Job Ads” toolkit and the Sit With Me advocacy campaign.

• More than 3,000 photos and more than 160 stories of Sit With Me (SWM) events from around the world have been uploaded. Notable public figures have participated, including Mayim Bialik, Shaquille O’Neal, and Sheryl Sandberg. Companies and postsecondary institutions such as Eastman Chemical, Indiana University, Microsoft, and Oregon State University have produced SWM events or multimedia.

Companies Use Diversity Data Strategically

In the past two years, NCWIT has noted a significant increase in industry members’ attention to making their own work environments more inclusive. More than half of members publicly release their diversity data, while others are taking active steps to do so. Members are increasingly working toward more systemic, research-based change efforts and using NCWIT resources, such as the “Data Collection and Strategic Planning Guide,” to develop an ecosystem approach and strategically implement the NCWIT Industry Change Model. NCWIT is currently working in-depth with several companies to develop, evaluate, and conduct research on their approaches to change using the model.
INCREASING YOUNG WOMEN’S PARTICIPATION IN K-12 COMPUTING

The NCWIT K-12 Alliance is dedicated to creating access to authentic, inclusive computer science education for every girl, everywhere in the U.S. The K-12 Alliance leverages the diversity of its 216 national and local member organizations — girl-serving organizations, professional educator associations, academic institutions, and businesses — to potentially reach the vast majority of girls and their influencers nationwide.

NCWIT K-12 SYSTEMIC CHANGE MODEL

The NCWIT K-12 Systemic Change Model identifies several key social and structural factors that influence girls’ participation in computing, often deterring them from choosing education or careers in technology. NCWIT uses the Systemic Change Model with Alliance members to heighten awareness and knowledge about how young women’s perceptions, interests, confidence, and career decisions are shaped by society and the local environments in which they learn about computing and technology. The Systemic Change Model helps Alliance members explore the different ways they can make change.

K-12 GOALS FOR SUSTAINABILITY

- Develop resources, tool kits, and interactive activities that can be plugged into stakeholders’ existing programs (e.g., training modules for K-12 computer science teacher professional development)
- Encourage local and national K-12 computer science collective impact efforts to utilize NCWIT resources and programs.

NCWIT provides several K-12 platforms to move Alliance members into action for increasing the recruitment and retention of girls through inspiring and encouraging them in computing and technology:

**NCWIT Aspirations in Computing (AiC)** provides technical girls and women with ongoing engagement, visibility, and encouragement for their computing-related interests and achievements from high school through college and into the workforce. The AiC program also publicly celebrates teachers, counselors, administrators, mentors, and other influencers who encourage girls’ and women’s aspirations in computing.

The AiC program is supported nationally by Apple, AT&T, Bank of America, Google, Hewlett Packard Enterprise, Intel, Microsoft, Motorola Solutions Foundation, Northrop Grumman, Qualcomm, and the Symantec Corporation.

**NCWIT Counselors for Computing (C4C)** provides professional school counselors with information and resources they can use to support ALL students as they explore computer science education and careers.

The C4C program is sponsored by Apple, the Coca-Cola Foundation, and Merck.

**TECHNOLOchicas** raises awareness among young Latinas and their families about opportunities and careers in technology. Powerful stories highlight the lives of Latinas from diverse backgrounds and environments who are in technology fields and recognize the power of innovation to change the world. These stories are promoted through several communication channels, including broadcast television, local events, social media, and online videos.

TECHNOLOchicas is co-produced by NCWIT and the Televisa Foundation with support from Apple, the Computing Alliance of Hispanic Serving Institutions (CAHSI), EMC, Google, Qualcomm, Microsoft, Sphero, and Univision.

Additionally, NCWIT participates in initiatives for making formal and informal computing education accessible to all students, including CSforAll and CSEdWeek.

K-12 AWARDS, CAMPAIGNS, AND PROGRAMS

NCWIT THEORY OF CHANGE

National Center for Women & Information Technology (NCWIT)

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WHAT THE MEMBERS SURVEY SAYS

• In 2015, 79 percent of K-12 Alliance members reported presenting or publishing on women in computing.

• More than 83 percent of K-12 Alliance members distributed NCWIT materials or resources.

WHAT K-12 ALLIANCE MEMBER REPRESENTATIVES SAY

“We are continuing to develop our statewide Aspirations program; also, [I’ve received] knowledge about new resources, which I can use in workshops and sessions that I run in my state and elsewhere. The networking with other like-minded individuals at the Summit is essential to our efforts in our state to deal with underrepresented minorities, both women and ethnic minorities. This networking has also allowed us to enhance our own conferences.”

“We ensure that all advisory committees include someone whose primary focus is evaluation of curriculum, professional development in terms of equity. We ensure that any professional development leader who is not aligned with holding equity in a central regard is dismissed.”

One K-12 Alliance member “dedicated an entire conference to the subject of STEM and STEAM.”

NCWIT AWARDS, CAMPAIGNS, AND PROGRAMS

• NCWIT Award for Aspirations in Computing (AiC) recipients consistently report greater confidence, awareness of computing fields, motivation to persist, as well as less anxiety and uncertainty about computing skills when asked to describe the impact of the award.

• More than 95 percent of Counselors for Computing (C4C) participants surveyed report having a better understanding of computing, a broader sense of who is right for computing, and greater confidence to guide students toward computing classes and careers.

• TECHNOLOchicas have participated in more than 50 outreach events nationwide, including appearances at local schools and public housing communities, conference presentations, CSEdWeek events, as well as events hosted by major tech corporations, including Apple and Microsoft.

Roundtables on Black and Native American Students

In 2016, NCWIT co-hosted the Black Women and Girls in Computing Roundtable with Google and Collaborating to Grow the Pathway of Native Americans in STEM with Intel. Both roundtables convened key leaders in education, industry, policy, and non-profit government to discuss the current state of affairs, identify gaps, and create actionable steps for increasing the participation of Black and Native American students in computing.

For example, as a result of the Black Women and Girls in Computing Roundtable, participants are leveraging “Hidden Figures” as an opportunity to highlight Black technical women as role models and to engage Black girls in computing. NCWIT is supporting and collaborating on members’ and partners’ movie-related initiatives (e.g., resources, movie screenings, and Twitter chats), including the Anita Borg Institute, Black Girls Code, the CSforAll Consortium, the University of Colorado Boulder BOLD Center, Google, and Intel.
NCWIT POSTSECONDARY SYSTEMIC CHANGE MODEL

The NCWIT Postsecondary Systemic Change Model outlines a strategic, sustainable approach for attracting and retaining women that focuses on revising educational systems to create an inclusive experience for all students. NCWIT uses the Systemic Change Model with Alliance members to create awareness and knowledge about systemic change, as women often switch out of computing majors because they feel alienated, not because of their ability or suitability for the career. The Systemic Change Model helps Alliance majors because they feel alienated, not because of their ability or suitability for the career.

NCWIT Postsecondary Systemic Change Model

Institutional Policies & Support

Pedagogy

Curriculum

Evaluation & Tracking System

Recruiting Strategic Plan

Student Support

POSTSECONDARY GOALS FOR SUSTAINABILITY

• Grow AA membership so more institutions have access to change-making practices, programs, and networks.
• Encourage sustained culture change to make computing departments more diverse, inclusive, and welcoming for all students and faculty.
• Recognize and adapt to current institutional challenges, such as enrollment increases.
• Continue Pacesetters program to accelerate sustained change with AA members.

NCWIT POSTSECONDARY AWARDS, CAMPAIGNS, AND PROGRAMS

NCWIT provides several postsecondary platforms to move Alliance members into action for increasing the recruitment, retention, and advancement of women in computing and technology studies and careers, as well as increasing diversity and inclusion in their computing departments and programs:

• The NCWIT Academic Alliance Seed Fund, sponsored by Microsoft Research, awards faculty of AA members with start-up funds to develop and implement recruiting and retention initiatives.
• EngageCS4Ed., sponsored by Google, fosters diversity in introductory computer science courses with thousands of unique course materials — including lecture notes, homework assignments, and projects — submitted by faculty nationwide and peer-reviewed by CS educators and experts in student engagement.
• NCWIT Extension Services for Undergraduate Programs, sponsored by NSF, Google.org, Johnson & Johnson, and Women in Technology and Entrepreneurship in New York (WITNY), helps computing departments develop high-impact strategies for recruiting and retaining more women students with advice that is customized to local needs and conditions.
• The NCWIT Harrold and Netkin Research and Graduate Mentoring Award, sponsored by the NCWIT Board of Directors, recognizes faculty members who combine outstanding research accomplishments with excellence in graduate mentoring, as well as those who advocate for recruiting, encouraging, and promoting women and minorities in computing fields at a local or national level.
• NCWIT Pacesetters, sponsored by NSF and Qualcomm, is a unique, fast-track program in which Academic, Entrepreneurial, and Workforce Alliance members work together to accelerate their organizations’ number of technical women. Pacesetters select bold, measurable goals that challenge stereotypes, shape positive behaviors, improve internal processes, and advance technical innovation.
• The NCWIT Student Seed Fund, sponsored by Google.org with support by ACM-W, offers financial awards for Women in Computing (WIC) groups at different stages of development and varied institutional sizes.
• The NCWIT Tracking Tool helps academicians evaluate their recruiting and retention efforts. Members supply a wide range of data, including applications, acceptances, enrollments, and graduations. The online tool automatically calculates trends over time, including comparisons to AA members and two national data sources.
• The NCWIT Undergraduate Research Mentoring Award recognizes AA member representatives for their outstanding mentorship, high-quality research opportunities, recruitment of women and minority students, and efforts to encourage and advance undergraduates in computing-related fields.

AA membership includes:

• 169 research/doctoral-granting universities, 115 master’s-granting colleges and universities, 69 baccalaureate-granting colleges, and 50 community colleges
• 34 Hispanic-serving institutions, 23 Historically Black Colleges and Universities, and 3 Tribal Colleges and Universities

The NCWIT Academic Alliance (AA) focuses on changing the local conditions that create barriers to attracting and graduating women in postsecondary computing by adopting and contributing research-based practices. The AA brings together more than 1,500 distinguished representatives from more than 475 colleges and universities nationwide (18 non-academic institutions, and 460 academic colleges and universities).
WHAT ACADEMIC ALLIANCE MEMBER REPRESENTATIVES SAY

“We brought a lot of NCWIT information into our most recent hirings; six faculty over the last three years have been hired. We’ve been very focused on creating a diverse applicant pool, and our efforts resulted in the third year’s pool being much more diverse than the first year’s pool.”

“We streamlined the evaluation of master’s degree admission applications to make them less male-biased.”

“Through the NCWIT Extension Services for Undergraduates, we worked closely with our assigned consultant. She helped us to create a comprehensive, data driven strategic plan. We have used this plan as a guide and it has been extremely effective and fruitful. Our organization has hired four professionals for women in engineering, increased funding for new programs and activities, and has top-down (Dean level) support.”

“We increased the extent of our Teaching Assistant training to cover more material, including information related to diversity issues. The training is also now required of undergraduates that support teaching activities, along with the graduate teaching assistants.”

NCWIT AWARDS, CAMPAIGNS, AND PROGRAMS

• **Academic Alliance** members, particularly those with more than two years of membership, are associated with a higher average female CS graduation rate in comparison to non-members (p<.05).

• In 2016, 96 percent of a sample of EngageCSEdu faculty users said they would recommend the site to their colleagues.

• Through the **Academic Alliance Seed Fund**, members have reached nearly 12,000 K-12 and postsecondary students since 2007.

• Through the **Student Seed Fund**, more than 3,000 K-12 and postsecondary students have participated in or become aware of computing-related opportunities.

During the 2010-2015 academic years, ES-UP provided customized consultation to 47 computing departments. Collectively, these departments have seen positive results:

• The annual growth rate for women computing majors was 18 percent, compared to 10 percent for men.

• Bachelor’s degrees awarded to women increased from 13 percent to 16 percent.