National Girls Collaborative Project

Summative Evaluation Report
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Executive Summary and Discussion

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Executive Summary

Background Information

Project Description

The National Girls Collaborative Project (NGCP) received five years of funding from the National Science Foundation (NSF) in 2006 to bring together programs and organizations throughout the United States that are committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).

NGCP established 19 Regional Collaborative sites serving 30 states, plus Washington D.C., to help connect local programs, organizations, and individuals involved in engaging girls in STEM, encouraging them to collaborate and share resources in order to more effectively engage girls in STEM. NGCP also disseminated resources and strategies at the national and regional level to build programs' capacity, focusing specifically on two areas: evaluation and assessment and informal learning. Partners on the grant were Assessing Women and Men in Engineering (AWE), providing evaluation and assessment resources and support, and the American Association of University Women (AAUW), providing connections to their network and resources including an AAUW member to serve on each Regional Leadership Team.

NGCP provided resources to the girl-serving STEM community on a national level, such as a content-rich project website, a Program Directory that enables programs to connect via their identified needs and resources, live and archived webcasts (many on research-based strategies), and a monthly e-newsletter (featuring information on national STEM activities and resources, program models, examples of collaboration, and information on research-based strategies and effective practices). The National Leadership Team also trained and supported Regional Collaborative Leads to implement the NGCP model, which included outreach efforts to disseminate project resources, in-person events to provide professional development and networking opportunities, and distribution of mini-grants, which provided funding for at least two programs to collaborate to implement a new project.

This summative report is the product of a study of NGCP conducted by Evaluation & Research Associates (ERA) from 2006 to 2011. Evaluation findings have been reported to project stakeholders on an ongoing basis to inform project decision-making, and in annual reports used to document progress to NSF.

Evaluation Methodology

The evaluation of NGCP looked at the effectiveness of the project by focusing on the implementation of the model, the outcomes of participation, and the potential impact on girl-serving STEM programs and girls in STEM. The methodology was guided by the project's evaluation questions which were closely related to the project's goals and investigated each level of stakeholders involved in the project. Evaluation tools included Regional Collaborative and AAUW Liaison quarterly reports on activities and resources; post-surveys after trainings, events, and webcasts; surveys to National Champions Board members; mini-grant recipient reports; annual surveys of girl-serving programs participating in NGCP; and interviews with the National Leadership Team and stakeholders.

In addition, a supplemental grant funded revisions and expansions to the evaluation, including enhancing outcomes, developing more specific evaluation questions aligned with the outcomes, revising the logic model, redesigning instruments to address the new evaluation questions, and conducting a case study which took an in-depth look at two Regional Collaborative sites through additional data analysis of regional data, interviews with Regional Leadership Team members and participating programs, and participant surveys administered to participants in mini-grant projects.

Limitations to the methodology included reliance on self-report measures to investigate the impact, the absence of a true comparison group to look at the effect of NGCP on participating STEM programs, the lack of longitudinal data to show effects of the project over time, and challenges related to measuring the impact of the end-users, the K-12 girls involved in programs served by NGCP.

Evaluation Findings

Project Implementation

Evaluation data show that the training and support offered to Regional Leadership Teams was effective in preparing and assisting them in their implementation of NGCP in their regions. Four Project Institutes were highly rated: attendees indicated they understood their role in the project, were familiar with NGCP components and activities, and aware of how to access resources to answer their questions. Aspects of the Project Institutes that were most valuable were meeting others involved in the project, learning about NGCP resources, and planning time within their Regional Collaborative. The National Leadership Team felt the training was effective in conveying the big picture of NGCP, what it was trying to accomplish, and how. As follow-up to the Project Institutes, and for other Regional Leadership Team members that did not attend a Project Institute, the National Leadership Team held online training webcasts, sent informational e-mails and updates, and held support calls with Regional Leadership Teams. Additionally, the resources provided to support their work, such as an online document sharing site, the public website, and a Replication Guide were frequently accessed and highly rated.

The support provided by AAUW Liaisons varied depending on the Regional Collaborative, but they were often involved with outreach efforts of the Regional Collaborative, distributing mini-grants, and sharing STEM-related resources or research.

 An ongoing challenge of Regional Collaborative Leads was managing the Regional Leadership Teams, raising funds for the Regional Collaborative, engaging their Champions Board, and issues related to sustainability and time or scheduling. To improve support, suggestions were made to increase opportunities for Regional Leadership Teams to interact and learn from each other, further clarify the role of Regional Leadership Team members and Champions Board members, and fund additional Regional Leadership Team members from each site to attend a Project Institute.

Participating in a Regional Leadership Team affected team members in many ways. Their involvement allowed them to spend time and resources meeting others involved in STEM throughout the state, increasing the reach and visibility of their organizations, and they met others they could partner with to enhance their programs. They also gained professional skills, such as leadership and effective collaboration. Respondents to the 2011 Regional Leadership Team member survey rated their current levels of understanding or knowledge in ten areas related to NGCP and

their level prior to participating in NGCP. There was significant change in all ten areas, especially in their awareness of resources related to engaging girls in STEM, knowledge of activities, programs and efforts in STEM in their region, and knowledge of research-based strategies. Regional Leadership Team members were very committed to gender equity in STEM prior to joining the Regional Collaborative, but there was still a large increase in their levels of commitment.

National Champions Board members supported the project by informing, promoting and connecting the project at a national level. In post-meeting surveys, Champions Board members rated their contributions highly in expanding the network, disseminating events and resources, looking for collaboration and funding opportunities, and helping with strategic planning.

Programs, organizations, and other individuals interested in supporting girls in STEM could participate in NGCP through the website (an average of 202,004 page views per month), e-newsletter (23,334 subscribers), the Program Directory (2,659 entries), webcasts (attended by 1,753 people), or in person through events (attended by 4,688 people) or mini-grants (3,473 staff or volunteers participated in projects funded by mini-grants). Event attendees were most commonly k-12 teachers or staff, from community-based organizations, or from higher education.

Access to Shared Resources

NGCP helped programs make efficient use of resources available through components such as the in-person events and NGCP Program Directory where programs could gather, share, or exchange resources with other programs involved in engaging girls in STEM. Entries in the Program Directory specified needs programs were looking to fill and resources they had available to share with others. Information or practices related to informal learning and curriculum and speakers were the most frequently shared resources through NGCP. Most frequently accessed through the directory were information or practices related to informal learning and curriculum and evaluation and assessment (specified in the 2011 Annual Survey). Thirty-six percent of 2011 Annual Survey respondents indicated they had searched the Program Directory to identify programs with specific resources available to share, and 47% of those indicated they had found a program offering the resource they were seeking, including partners for mini-grants, presentations, evaluation tools, curriculum, speakers, and volunteers or mentors.

As a result of NGCP, 64% of 2011 Annual Survey respondents agreed that they were more likely to share resources with another program and 62% agreed they were more likely to seek resources from others. Mean ratings of awareness of resources related to engaging girls in STEM significantly increased from before their participation in the project (2.68) to their current levels (3.76, p<.001). Respondents were significantly more likely to agree with these statements if they participated in NGCP activities, such as by attending at least one NGCP event or webcast or submitting a mini-grant proposal. Mini-grantees frequently collaborated by sharing resources, most commonly providing resources to their partner (55% of projects) or contributing resources (73%). They indicated these resources affected their program by building their program's capacity (selected by 42% of respondents) and making their programs more efficient (37%).

Knowledge and Use of Research Based Strategies

NGCP disseminates information on research-based strategies to build the capacity of girl-serving STEM programs through the NGCP website, the e-newsletter, webcasts, in-person events, and mini-

grant projects (which are required to incorporate a research-based strategy). A 5-item rubric is used by the National Leadership Team to determine whether a practice is research-based. One of the resources disseminated was the assessment toolkit from AWE, the Assessing Women and Men in Engineering Project, a NGCP partner.

The case study showed how Regional Leadership Teams valued the national support in identifying and making available the research-based strategies. A project stakeholder felt that making practitioners aware of high-quality resources that met certain standards is an important role of NGCP and many NGCP participants mentioned they valued that the resources highlighted by NGCP were "vetted."

In ratings of their knowledge of research-based strategies to engage girls in STEM prior to participating in NGCP and after participating, Annual Survey respondents in 2011 showed a significant increase from a mean of 2.60 to 3.43, on a scale from *Low* (1) to *High* (5). The percentage indicating a 4 or 5 increased from 24% before the project to 52% after participating in NGCP. The mean increase was significantly higher if respondents had attended at least one NGCP event, webcast, if they were a mini-grant recipient, or if they had been listed in the Program Directory for at least three years.

In addition, mean ratings of 2011 respondents' knowledge and ability in evaluation and assessment and informal learning were higher in all areas for respondents who had attended at least one NGCP in-person event or webcast, or if they received a mini-grant. The means typically increased from Annual Survey responses from 2008 to 2011, though it was a different group of respondents each year. Respondents rated their abilities in these two areas higher than their knowledge each year. Ratings related to knowledge and ability in informal learning were always higher than ratings of evaluation and assessment.

Event attendees were very likely to agree that practices and strategies disseminated at events were relevant and useful. Webcast attendees were likely to apply what they learned to their work or program, with 55% of 2011 Annual Survey respondents indicating they had applied information from a webcast. Information from the website has also proven to be useful for many participants. In one example, a program representative was interested in evaluating her program as she was considering replication and wanted to know the impact it was having. She found resources on evaluation and assessment on the NGCP website and is now administering a pre-post survey with participants and plans to use the data when looking for funding. Despite these areas of growth, a large percentage of Annual Survey respondents had not accessed NGCP resources in informal learning (39% in 2011) and evaluation and assessment resources (55%).

Each mini-grant project put a research-based strategy in assessment/evaluation or informal learning into practice, including hands-on learning opportunities, providing role models, developing measureable objectives, or doing participant interviews. Mini-grant data show the projects to be very successful and surveys from participants showed that they had high enjoyment of the program and its activities, and would recommend it to a friend. However, participants were not likely to show career-related effects, such as increased knowledge of what a scientist or engineer does or increased interest in pursuing these fields from the mini-grant activities, which were typically short in duration.

Twenty-nine percent of Annual Survey respondents in 2011 indicated their program had been "moderately" or "greatly strengthened" by informal learning resources provided by NGCP and 16% of respondents indicated their program was "moderately" or "greatly strengthened" in evaluation and assessment. Those who attended at least one in-person NGCP event or webcast or who received a mini-grant were significantly more likely to have higher knowledge about effective informal learning and evaluation strategies and were more likely to indicate their programs were strengthened by NGCP resources in research-based strategies in each of the areas of focus. They indicated that the exposure to research-based strategies from NGCP built their program's capacity (selected by 21% of respondents), increased the efficiency of their program (15%), and helped them recruit participants (12%).

The majority of respondents (between 50% and 60%) indicated they were "Neutral" (3) (neither disagreed nor agreed) in response to statements that the research-based strategies helped their work be more effective, efficient, or if their program was strengthened. However, they were significantly more likely to agree with these statements if they had attended at least one NGCP event, at least one NGCP webcast, or if they received a mini-grant.

Increased Collaboration

NGCP created a network of girl-serving STEM programs and provided the means, opportunity, and motivation for them to become more aware of each other through the NGCP online Program Directory, in-person events, and mini-grants. Regional Leadership Team members believed NGCP affected the level of collaboration in the region by providing opportunities for networking and connecting like-minded individuals and organizations with similar missions. Seventy-four percent of 2011 Annual Survey respondents indicated they were more aware of STEM programs, activities, and efforts as a result of NGCP, and 58% agreed that their professional network had increased as a result of their participation in NGCP. Mean levels of agreement to these statements were significantly higher if respondents attended at least one in person event, at least one webcast, or if they had received mini-grant funding. The case study showed that increasing the awareness of programs in their area, the potential partners, and resources to access was one of the biggest benefits of the Regional Collaborative for participants.

Forty-three percent of 2011 respondents believed their program benefited from being listed in the NGCP Program Directory due to opportunities for networking and collaboration (25%) and increased exposure of their program (22%). At events, the networking activities were consistently mentioned as the most valuable aspect of the event. Of those attending a NGCP event in 2011, 81% followed-up with somebody they met there, most commonly to discuss ideas for collaboration (53% of respondents), to form a professional relationship (45%), or to share or exchange resources (44%). Mini-grants were awarded to at least two collaborating programs working together. A large percentage of partners had worked together previous to receiving the mini-grant.

Fifty-five percent of Annual Survey respondents in 2011 were more likely to consider collaborating with another program or organization because of NGCP, and the percentage of those was significantly higher if they had attended at least one NGCP in-person event, at least one webcast, or if they had received mini-grant funding. Recipients rated the success of the collaborations very highly and mentioned the benefits of working with a partner and gaining access to their network, resources, areas of expertise, and the opportunity to learn from one another.

Data from a collaboration rubric where respondents identified the degree to which they had worked with different organization types showed that 2011 Annual Survey respondents were most likely to have the highest levels of collaboration with higher education faculty, K-12 teachers, and informal education/community-based organizations. Those who attended at least one in-person NGCP event were significantly more likely to have higher mean levels of collaboration with other types of organizations, rated the impact of NGCP on their collaboration more highly, and had more knowledge and likelihood of collaborating with others.

Of those indicating NGCP had a "moderate" or "high" impact on their collaboration, just over 75% "agreed" or "strongly agreed" that their program more effectively served girls due to increased levels of collaboration and that increased collaboration improved their program's sustainability. More than 60% of respondents agreed with the other two items: that NGCP reduced feelings of organizational isolation and made their work more efficient. They mentioned their circle of contacts being widened, new partnerships they had formed through NGCP, increased opportunities to collaborate, and using tools to help them collaborate. Additionally, the knowledge and ability of how to collaborate increased due to NGCP and respondents were more likely to see the value of collaboration. About half of all 2011 Annual Survey respondents believed that, due to NGCP, they better understood the benefits of collaboration and 40% agreed they knew how to collaborate more effectively. One person stated, *"After being involved with the NGCP, I would never again think of running a program without some form of collaboration with another business or organization."*

Areas of Consideration

A number of areas were identified from the evaluation as areas to consider for furthering the impact of NGCP and strengthening the evaluation of the project. Examples include increasing the training and support for Regional Leads to help them manage their Leadership Team and Champions Boards and to help them with sustainability efforts to continue the work of the Regional Collaborative; better advertising the existence of project resources; increasing the participation of representatives from sectors such as industry, government, and research; targeting those who are not yet committed to gender equity in STEM to build awareness of the issue and strategies to address it; building participants' understanding of the benefits of collaboration and how to collaborate effectively. Areas identified for further study include investigating the impact of mini-grant projects on participants, exploring the long-term effects of mini-grant projects, and examining the sustainability efforts of Regional Leadership Teams.

Summary

Results from the evaluation data shows progress toward NGCP goals of maximizing access to shared resources, strengthening the capacity of programs by sharing promising practice research, and creating the tipping point for gender equity in STEM through a network or collaboration of girl-serving STEM programs. According to NGCP participants, the project has effectively raised the awareness of the underrepresentation of girls in STEM. Many participants also felt that NGCP validated the work they were doing. Participant ratings indicated they were significantly more aware of issues related to the involvement of girls in STEM and significantly more committed to

engaging girls in STEM due to NGCP. They felt less isolated in their work due to NGCP and re-energized after attending events.

The evaluation findings show the effectiveness of the project components such as the training and support of Regional Leadership Teams, online tools and resources, in-person events, mini-grant funding in increasing access to shared resources, building knowledge of research-based strategies to engage girls in STEM, and increasing collaboration among those interested in increasing the involvement of girls in STEM. Through NGCP, Regional Collaboratives became connected to new and existing STEM initiatives and efforts at different levels. Additionally, national, high-level partnerships have expanded the reach and impact and contributed to the success of the project.

Discussion

Findings from the evaluation data collected for NGCP from 2006 to 2011 show the effectiveness of the various components of the NGCP model in building the capacity of girl-serving STEM programs by increasing collaboration, sharing resources, and increasing awareness and use of research-based strategies. Impacts of the project were experienced at every level of the project and this discussion looks at the impact on the target of most activities and resources: the participating programs, organizations, and individuals interested in better serving girls in STEM. This discussion also looks at the more minimal data collected on how changes in these programs and organizations affect how girls are engaged in STEM. Finally, we will look at the effects of NGCP on Regional Leadership Team members and the larger impacts of the project on the gender equity movement regionally and nationally.

Impact on Participating Programs

The most recent Annual Survey responses in June 2011 from 328 programs listed in the NGCP Program Directory show how participation in NGCP activities is related to increased impact of the project. Program representatives that attended at least one event, at least one webcast, or applied for a mini-grant proposal were statistically more likely to:
- agree their network of professional contacts increased due to NGCP;
- be more likely to share and seek resources from other programs;
- have higher mean levels of collaboration with different sectors;
- rate the impact of NGCP on their collaboration levels more highly;
- understand the benefits of collaboration and how to collaborate effectively;
- have higher ratings of knowledge in informal learning and evaluation and assessment;
- agree that they were strengthened by NGCP resources in informal learning and evaluation and assessment, including making their work more effective, and efficient; and
- have reduced feelings of organizational isolation.

The National Leadership Team commented that a strength of the project was the availability for different levels of engagement, for participants in that they could decide what components and resources were most relevant to assist them in their work. Regional events were identified by multiple levels of stakeholders to be critical in providing opportunities to meet in-person, network, and identify potential areas and partners for collaborating. Event attendees were most likely to agree that their professional network had increased as a result of NGCP.

The Program Directory was also considered to be a valuable tool to aid programs in finding shared resources and partners. It also allowed them to increase the exposure of their program and potentially increase their reach. Mini-grants were identified as "*needed funding*" that motivated partners to create collaborative projects and utilize research-based strategies. Both the collaboration experience and the implementation of research-based strategies were capacity-building opportunities for mini-grant

recipients. They gained from the skills of their partners and through implementation of effective practices in areas such as evaluation and assessment. One recipient wrote about how they could use the data from their mini-grant project to secure additional funding, *"Data collected as a result of this [NGCP mini-]grant will allow us to share successes and challenges of the program with our other funding sources. We also hope to use the data to convince potential funders to support the program."*

The information on research-based strategies was not otherwise well-known or frequently accessed by NGCP participants, except perhaps through webcasts. However, those who had accessed the research-based strategies appreciated that the information was vetted and reliable and there were a number of examples of the strategies being utilized to improve programs. Though mean ratings of knowledge and ability have increased over time and with involvement in NGCP activities, there is still room for growth. The increased access to shared resources was more frequently taken advantage of by NGCP participants who conducted searches in the Program Directory or identified resources at events that would assist their work, such as curriculum, speakers and role models, program models, and activities. They felt these resources built their program's capacity and increased their efficiency. From the perspective of the National Leadership Team, sharing resources and looking to collaborate with others required a shift in the way many programs and staff operated. Rather than developing new tools and activities or being competitive in trying to have the best program, representatives were more likely to look for existing resources and help other programs succeed due to NGCP, all in the better interest of serving girls in STEM.

Impact on Girls

Since girls are not the main target of NGCP activities, there was limited data collection and analysis on how they have been impacted by the project. The increased capacity of STEM programs through the connections and resources they have access to through NGCP should directly benefit the girls they serve, as described by an Annual Survey respondent: "*Having a large network gives each individual/local organization or program more leverage, so the more we (STEM programs) collaborate and present our ideas as one entity, the more students benefit."*

Mini-grant project leads frequently commented on the effect of their program on the girls participating. The STEM opportunities they were able to provide through the partnerships were of higher quality than what either partner could do alone. One mini-grant recipient wrote about how the involvement of professional women and colleges enhanced the experiences of their girls and raised their awareness and interest in pursuing STEM educational and career opportunities, *"We very much enjoyed the opportunity to collaborate with several professional women in our community … The girls we reached through this program indicated an increased awareness and interest in a variety of STEM careers and came away with a better understanding of some of the educational requirements needed to pursue these vocations. They were exposed to several local colleges and the programs available to them in the future."*

Surveys administered in a sample of mini-grant projects as part of a case study showed that girls enjoyed their experiences in mini-grant activities, but that they did not necessarily make many

significant gains in their confidence in math and science or their interest in pursuing these fields. However, in some of the projects, the percentage of participants indicating an interest in STEM was already high before they started in the project. The mini-grant participant data did show statistically significant gains in their ratings of whether they could get good grades in math and that they could build something mechanical that works. The mini-grants were typically short in duration and could have more of an impact if the time that participants were engaged in activities was increased.

Impact on Regional Leadership Team Members

Regional Leadership Team members learned from the training and support offered from NGCP, as well as through their experiences and people they met while implementing the project. They became very knowledgeable about the STEM-related programs and activities in their region, which made them a valuable resource to assist others and also frequently benefited their other work. There were significant increases in Regional Leadership Team members' levels of understanding or knowledge of ten items related to NGCP, with the most change in their:

- awareness of resources related to engaging girls in STEM;
- knowledge of activities, programs, and efforts in STEM in their region;
- knowledge of research-based strategies to engage girls in STEM; and
- ability to disseminate resources and research-based strategies to programs and organizations within their region.

Through their experiences, Regional Leadership Team members felt more convinced about the value of collaboration and the importance of engaging girls in STEM, though most team members were already involved and committed to gender equity work.

Additional and Larger-scale Impacts of NGCP

There was widespread agreement that NGCP was effective at raising awareness about the issue of the underrepresentation of girls in STEM. NGCP also provided girl-serving STEM supporters already committed to gender equity in STEM with opportunities and tools to connect with each other. Being part of NGCP identified them as part of this movement and provided credibility to their programs.

In many states served by Regional Collaboratives, NGCP is part of other efforts working toward gender equity in STEM. A case study example showed how the project could be easily integrated and leveraged to partner with regional and government-sponsored initiatives to bring people together and gather momentum to affect change in getting girls engaged in STEM. As one Annual Survey respondent stated: "*Every event, whether it's NGCP or other STEM-related function, has provided the opportunity to raise awareness about females and STEM, and more and more teachers, counselors, schools and service organizations are involved in addressing gender equity. There are several avenues for addressing STEM in [my state], and the results are synergistic.*"

The creation of the NGCP network led to outcomes that were possibly unintended at the start of the grant. The collection of girl-serving STEM programs and contacts in the Program Directory, the national and regional e-newsletters, or the Regional Leadership Teams and their knowledge of local programs could be leveraged by projects and organizations looking to reach a diverse audience related to serving girls in STEM. For example, a representative from a large corporation could talk to one person who could provide access to hundreds of programs and girls fitting specific criteria. NGCP became a partner on a number of "network projects" that capitalized on the structure of the project. It is a powerful partner, with its set-up of Regional Leadership Teams, a number dissemination channels, and contact information for people and programs engaged in efforts to engage girls in STEM across the country.

The partners in this grant benefited from their involvement in the project. The AWE project received funding to revise evaluation tools targeted to a K-12 audience, extended their reach, and were provided with a venue for sharing their findings. AAUW benefited from the training provided to Liaisons, a new method of volunteering for the organization, modes for disseminating their research, and increased visibility in the STEM equity movement.

The National Leadership Team has found the NGCP model of promoting collaboration and providing professional development opportunities as "transferable" to other content areas. For example, the Computer Science Collaboration Project effectively utilizes many of the components of the model to help increase the participation of Hispanic/Latino youth and youth with disabilities in computer science.

The National Leadership Team also believes there is still ample room for expansion of NGCP in terms of its geographical spread, but also in concentrating on reaching new groups such as K-12 counselors and librarians, or focusing on new areas of research-based strategies. A more recent grant from Gender in Science and Engineering Extension Services will allow them to pursue this work and maintain efforts to build the capacity of girl-serving STEM organizations.