Appendix E

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Chief Science Officer Program Evaluation Plan
NSF DRL Award #1615209

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Introduction:
Launching in 2015, the Chief Science Officer Program (CSO)
(http://www.chiefscienceofficers.org/) quickly developed focused goals and has a strong desire for
success. The overarching goals of the program are to:
1. Give students a voice in STEM conversations at both the local and national levels;
2. Increase and enhance the employable skills of student CSOs;
3. Cultivate a pipeline of diverse STEM leaders;
4. Enrich middle and high school STEM culture and career awareness;
5. Increase the engagement of STEM professionals and community partners with STEM
   education; and
6. Build a national coalition of schools engaged in the CSO initiative.

The SWECA Inc. evaluation team will provide a comprehensive assessment of the program's
advancement toward these goals. The results of this ongoing evaluation will aid the CSO
program's leadership team in further developing the program, increase active participation and
student leadership in STEM discussions within their community, and produce a model for
replication as the program expands nationally.

Evaluation Design:
As part of the NSF DRL award, an evaluation plan was designed to define and assess the CSO
program. Using a mixed-method approach, evaluators are collecting and analyzing both
quantitative and qualitative data. Quantitative data includes closed-ended information such as
that collected through attitude, behavior, and performance instruments, checklists, and surveys.
The qualitative data consists of open-ended information that the evaluation team is gathering
through observation, interviews, focus groups, reports, artifacts, and notes. Skills and knowledge
development; CSO leadership and participation in activities/events; and investments in CSOs,
their schools, and peers are also being measured.

The purpose is to determine the impact the CSO Program has on participating students (CSOs),
their school(s) (e.g. culture, other students, educators), STEM-related business and industries,
and the community. It is conceived as central to project development and tracking, along with
the refinement of research methodologies, outcomes, and theories as they relate to the CSO
effort. This approach will inform each task that aims to advance the CSO Program's goals.

1. <u>Are the Chief Science Officers a diverse group of STEM leaders?</u>
   **The program seeks to represent all genders, ethnicities, ages, and a variety of
   economic backgrounds.** The evaluation will investigate whether the CSO program helps
   create a pipeline of diverse STEM leaders. It will do so by assessing the demographics of
   the CSOs (i.e., gender, Free and Reduced Lunch eligibility, grade level, and ethnicity).
   These demographics will determine if the CSOs represent a diverse population.

The program enables CSOs to think of themselves as STEM leaders and to be viewed as such by both their school and community. The evaluation will study if CSOs identify themselves, and are identified by others, as STEM leaders. It will use personal reflections, logs capturing participation in CSO activities and responsibilities, the development and implementation of an Action Plan, and an election survey. Surveys of parents, educators, and local STEM businesses and industry professionals, as well as focus discussions, will be used to assess the effectiveness of CSO leadership.

The program's training curriculum is designed to ensure that students are able to carry out their responsibilities as STEM leaders. The evaluation will determine if the CSO Leadership Training Institute curriculum successfully prepares CSOs to do this. Evaluations will use pre and post Institute surveys; logs of CSO participation in events; a survey regarding career interest; assessment of STEM literacy, attitude, and awareness; a collection of artifacts regarding topics of discussions and ideas shared among CSOs; personal reflections; and an assessment of Action Plans and their impact.

2. Do the Chief Science Officers work together to promote student voices in STEM?
   Student STEM leaders (i.e. CSOs) work together to give students a voice in discussions about STEM at all levels of the community, including local STEM-related businesses and industries, their school, their districts, their cities, their states, and nationally. The evaluation will study the extent to which the CSOs work together to advance STEM career awareness and student voice in their school and community. It will do so by assessing CSO Action Plans for collaboration, post-event reflections, and CSO activity participation logs. The collection of data regarding what they plan to do, what they actually do, the types of STEM events in which they participate, and the audiences they reach will determine if the students are able to accomplish the advancement of STEM career awareness and integration of student voice in broader conversations.

3. Have the Chief Science Officers enriched the school STEM culture and career awareness of their peers?
   The support of teachers, school administrators, and other points of contact determines if peers embrace the CSO and if the CSO is able to enrich the school's attitudes toward STEM fields. The evaluation will determine if participating schools embrace the CSO role and responsibilities as an important component of the school structure and culture. Through an assessment of the students' Action Plans and personal reflections, the evaluators will discern what attempts the CSOs have made toward enriching their schools' awareness of STEM culture and influencing student interest in STEM-related careers. Surveys and interviews of teachers, school administrators, and other points of contact will be conducted to determine the CSOs' impact on peer engagement and STEM awareness.

   The CSO program strives to enable CSOs to build a STEM-positive culture within their schools and the community. Evaluation will ascertain if the CSOs have been effective in creating a unified STEM culture. Using the previous year's interest level as a baseline, the evaluation will collect data regarding the election and implementation of the program and educators' perception of the CSOs via surveys. Evaluators will also collect artifacts from CSO discussions and ideas shared, conduct educator and STEM-industry focus groups,

assess the CSOs' Action Plans, and consider their personal reflections to determine the extent that to which CSOs were able to build a unified STEM culture.

4. <u>Has there been an increase in student voice in STEM conversations within the community?</u> **Community support for CSOs and the CSO program from STEM-related business and industries, higher education, civic and nonprofit organizations, and STEM professionals, as well as peer engagement in K–12 education [edit okay?], is identified as an important facet of the program.** The evaluation will study the increase in community support for CSOs and the CSO program. Quantitative data will be collected by surveying adults in the community who have interacted with the CSOs regarding STEM matters, surveying STEM-related business and industry professionals who have engaged with CSOs or engaged with schools participating in the program, and collecting a log of their inquiries into the CSO program. Evaluators will also conduct focus groups and interviews with STEM professionals who have interacted with the CSOs and schools to collect qualitative data regarding their perception of the students as STEM leaders and the CSO program's influence on their perception of student voice in STEM conversations.

   Promoting the voices of CSOs in STEM discussions in their local community and at the state and national levels is a primary goal of the program. The evaluation will study the extent to which CSOs are making an impact in their community and at state and national levels. It will do so by categorizing the events in which CSOs participated, the size of their audience, and the impact on the audience at the school, city, state, and national level. Evaluators will collect event, presentation, interaction, and post-engagement surveys, and they will assess the CSO ambassadors' school STEM culture. Artifacts of topics discussed and ideas shared by the CSOs, along with documentation of publications, readership, viewership, or mention of the CSOs in the media, will also be documented.