POLAR LEARNING AND RESPONDING: PoLAR CLIMATE CHANGE EDUCATION PARTNERSHIP FORMATIVE AND SUMMATIVE EVALUATION PLAN

Goodman Research Group, Inc. (GRG), an evaluation research firm in Cambridge, MA that specializes in the evaluation of educational programs, materials, and services, will conduct formative and summative evaluation of CCEP II: Polar Learning and Responding: PoLAR Climate Change Education Partnership. With prior experience in evaluating climate change education projects, including the Franklin Institute’s Urban Climate Change Education Partnership and Brown University’s NSF-funded Seasons of Change project, GRG is uniquely qualified to carry out evaluation of the PoLAR project. The PoLAR project aims to leverage fascination with the changing Polar Regions and novel educational approaches to engage adult learners and inform public understanding and response to climate change. The project is a partnership of institutions, organizations, and personnel currently engaged in the Phase I PoLAR Climate Partnership, who were selected from both formal and informal educational venues for their expertise in game and educational technology and polar, climate, learning and decision sciences.

During the first and second years of this five-year project, GRG will conduct formative evaluation of the PoLAR activities with the aim of informing the project team about the likely effectiveness of the products and the modifications required to attain the intended audience impacts. During years 3, 4, and 5, GRG will focus on two components of summative evaluation: (1) we will assess the project’s audience impacts; and (2) we will evaluate the project’s communication efforts (i.e., radio programs and website). Throughout the five years, we will continue monitoring the PoLAR partnership itself, as we have done during CCEP Phase I. In addition, GRG will participate in the data gathering activities associated with CCEP program-wide evaluation conducted by the Climate Change Education Partnership Alliance. GRG will also assist the PoLAR team in collecting data for any additional research questions as developed by the partnership.

EVALUATION QUESTIONS

GRG’s evaluation activities will focus on the following overall research questions, which are based on the expected impacts of the project:

- **PoLAR Partnership**
  - Are the partners meeting their individual and partnership goals for Phase II?
  - Does the partnership demonstrate characteristics of a successful collaboration?

- **Projects (Games and Resources)**
  - To what extent do the projects demonstrate the potential for successful implementation and achieving target audience outcomes?
  - To what extent do the projects increase learners’ awareness, understanding, and knowledge of climate change (fundamental processes, role of and implications for human systems) and improve learners’ attitudes about climate change?

- **PoLAR Communication**
  - To what extent is the project successful at achieving its goal of developing an agile, responsive, and proactive PoLAR website?
**Evaluation Design**

The proposed evaluation features a mixed method approach, combining quantitative and qualitative elements. We have selected a mixed method design to enable triangulation of the results and increase the likelihood of their acceptance and use by the study’s diverse stakeholders. Data collection methods include the following:

**Partner Focus Groups**

During Year 1, GRG will conduct an in-person focus group with the core PoLAR team members to evaluate the project start-up process and to assess the partners’ ideas about the success of the partnership. The focus group will be repeated in Year 3 to evaluate the functioning of the partnership as the project moves from the development to the implementation phase. A final focus group will be conducted during Year 5. Questions will assess the overall impression of the partners about the success of the partnership and the lessons learned. All of these focus groups will be conducted during the annual partnership meetings.

**Measures:** Three different focus group protocols will be developed based on the theoretical framework provided by Gajda (2004) to evaluate the functioning of the partnership.

**Sample:** About eight to nine core members in the team PoLAR will be identified by the PI and will serve as the sample for this evaluation activity.

**End-of-year Partnership Survey**

At the end of every year, GRG will administer an online survey to all the partners in the PoLAR partnership to assess their impressions of the functioning and growth of the partnership during the year. The PoLAR team’s efforts for the dissemination of the projects will also be tracked through these surveys.

**Measure:** An online survey instrument will be developed based on the theoretical framework provided by Gajda (2004) to evaluate the functioning of the partnership. The survey instrument will be modified each year if required.

**Sample:** The entire team of the PoLAR partners (N = about 30) will serve as the sample for this evaluation activity.

**Formative Focus Groups**

As the PoLAR projects get ready for pilot testing, during Years 1 and 2, GRG will conduct multiple focus groups (either online or in-person) with target audiences to assess their initial reactions to the games and the educational technology.

**Measures:** Multiple Focus Group protocols will be developed for this data collection activity. The theoretical framework of key characteristics of a learning game developed provided by Schaller (2005) will serve as an overall model for evaluation. GRG will work with each project lead to identify a framework that is most relevant to the specific project and will use the framework as a guide to develop the focus group questions.

**Samples:** Ten to twelve members of the target audiences will be recruited for each focus group. The number of focus groups will depend on implementation of the project.
Embedded Assessments

As the games and the educational technology are launched by the PoLAR team during the third year, GRG will begin its summative evaluation. This will continue through Year 5 and will include embedding audience impact assessments into the games and the technology. These assessments will measure changes in audience awareness, understanding, knowledge, and attitudes about climate change.

**Measures:** GRG will work with each game designer individually to develop an assessment tool that can be embedded into the user experience of the game.

**Samples:** A conveniently selected sample from the target audience population will be recruited for each game. The sample size will depend on implementation of the project.

Online Surveys for Evaluation of PoLAR Communication

GRG’s summative evaluation will include the assessment of the PoLAR website through an online survey. The audience reactions to the presentation and the content of the website will be assessed. The summative evaluation will also include the assessment of the audience reactions to the PoLAR radio programming through an online survey. This assessment will also focus on the radio program’s contribution to learners’ changing awareness, understanding, knowledge, and attitudes about climate change.

**Measures:** Two online surveys will be developed for the assessment of the PoLAR website and the PoLAR radio programs. The website survey will be hosted on the PoLAR website.

**Samples:** The website survey will be available on the website for any user to take. A conveniently selected sample from the target audience population will be recruited for the evaluation of the radio program. The sample size will depend on implementation of the project.

DATA ANALYSIS AND DELIVERABLES

GRG will communicate with the PoLAR team throughout the five years of the project. Regular communication will include phone calls, emails, and attendance at the annual in-person meetings. GRG will work with the PoLAR management team throughout the project period to secure the approval of the Institutional Review Board (IRB) for the use of all proposed data collection instruments.

GRG will provide immediate verbal feedback at the end of every data collection activity. At the end of each year, GRG will provide a report that summarizes all our activities during that year. If applicable, the data collected through the above evaluation activities will also be analyzed and synthesized in these yearly reports. A final written report will be submitted to the project team at the end of the project. Descriptive statistics will be used to create a profile of program audiences. Statistical tests will be computed to explore group differences. Wherever appropriate, advanced statistical procedures will be used to draw inferences. Qualitative data from open-ended survey questions will be coded for common themes, and direct quotes will be used to elaborate on quantitative findings.

The final project report submitted to the PoLAR team will include:

- An executive summary,
- Copies of evaluation instruments,
- Details about the evaluation methods,
- Key short- and longer-term findings in a narrative form, with charts and other graphic representations of the results,
- Representative quotes from respondents, and
- Conclusions and recommendations for future similar projects.

GRG-developed evaluation instruments, participant recruitment protocols, analysis rubrics, and project findings will be available to inform continued studies of the data from Polar Learning and Responding: PoLAR Climate Change Education Partnership beyond the grant award. GRG will work with the project team on any efforts undertaken to disseminate the data and findings (e.g., conference presentations or publications).

**Budget**

The budget for the summative evaluation is $312,006.

**Evaluation Timeline**

Presented below is a proposed generalized timeline for formative and summative evaluation activities. Adherence to this timeline by GRG is contingent upon timely completion of project activities and access project participants. GRG will submit refined “Scope of Work” documents for each year at the commencement of each project year.

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<th>Sept 2012</th>
<th>CCEP II: Polar Learning and Responding: PoLAR Climate Change Education Partnership project is launched.</th>
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| Sept 2012 – Aug 2013 | Ongoing communication with the PoLAR team  
| | Begin evaluation of the partnership  
| | Begin formative evaluation as described above |
| Aug 2013 | End of year 1 report |
| Sept 2013 – Aug 2014 | Ongoing communication with the PoLAR team  
| | Continue evaluation of the partnership  
| | Continue formative evaluation |
| Aug 2014 | End of year 2 report |
| Sept 2014 – Aug 2015 | Ongoing communication with the PoLAR team  
| | Continue evaluation of the partnership  
| | Begin summative evaluation (embedded assessments and online surveys) |
| Aug 2015 | End of year 3 report |
| Sept 2015 – Aug 2016 | Ongoing communication with the PoLAR team  
| | Continue evaluation of the partnership  
| | Continue summative evaluation (embedded assessments and online surveys) |
| Aug 2016 | End of year 4 report |
| Sept 2016 – Aug 2017 | Ongoing communication with the PoLAR team  
| | Continue and complete evaluation of the partnership  
| | Continue and complete summative evaluation (embedded assessments and online surveys) |
| Aug 2017 | Final project report |
Goodman Research Group, Inc. (GRG) is highly qualified to carry out the proposed formative and summative evaluation of the Polar Learning and Responding: PoLAR Climate Change Education Partnership. GRG, with its office in Cambridge, MA, is a research firm specializing in evaluation of educational programs, materials, and services. Now in its 23rd year, GRG was founded by its president, Irene F. Goodman, Ed.D. We are certified by the Massachusetts State Office of Minority and Women Business Assistance as a woman-owned business enterprise.

Dr. Goodman leads a staff of more than a dozen full-time and part-time employees who bring their interdisciplinary insights and approaches to evaluation within a variety of settings. The core of GRG’s business has been designing and implementing evaluation research. GRG uses both quantitative methods (e.g., traditional and web-based surveys, questionnaires, and embedded assessments) and qualitative methods (e.g., interviews, focus groups, and on-site observations), and carries out advanced sampling and data analytic techniques, depending on the objectives of the study.


GRG has considerable expertise conducting formative and summative evaluations of both formal and informal science education materials/programs. Such programs and products have included youth and community education programs, citizen science programs, media (including film, television, radio), technology (including interactive web sites, educational games), museum exhibits (traveling and permanent), afterschool curriculum, and educator and non-educator professional development. Such science-based projects have often provided a range of types of learning experiences (e.g., authentic learning, self-directed, web-based, multi-media, and interactive) that aim to influence awareness, knowledge, attitudes, interest, and behavior of participants. GRG has considerable experience evaluating informal science education programs that have professional development components and which involve museums and community-based organizations. Moreover, several of our evaluations have also focused on the collaborations among and within informal science education organizations.