

**G**OODMAN RESEARCH GROUP, INC.  
*Program Evaluation • Consultation • Market Research*

**POLAR LEARNING AND RESPONDING:  
POLAR**

**PHASE 2, YEAR 5:  
EVALUATIVE SUMMARY**

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## BACKGROUND

Since September 2012, Goodman Research Group, Inc. (GRG) has been working with the Columbia Climate Center (CCC) on the evaluation of *Polar Learning and Responding: PoLAR Climate Change Education Partnership (PoLAR CCEP)*. PoLAR was a five-year Phase II CCEP project awarded to the CCC by the National Science Foundation Climate Change Education (CCE) program. Prior to the current grant, GRG evaluated the PoLAR Phase I grant (2010-2012).

The PoLAR project aimed 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 was a partnership of approximately 18 personnel from institutions and organizations in New York, New Hampshire, California, Alaska, and Calgary, most of which were engaged in the Phase I PoLAR Climate Partnership and were selected from both formal and informal educational venues for their expertise in games and educational technology, and polar, climate, learning, and decision sciences.

GRG conducted formative and summative evaluation in order to monitor progress and evaluate effectiveness of the partnership experience as well as the nine resources the partners planned to develop and disseminate to the public. Summative evaluation of PoLAR products focused on examination of learning and performance goals including increasing users' engagement and interest in climate, increasing awareness, understanding and knowledge of climate change, and enhancing overall capacity to make informed decisions related to climate change.

Over the course of five years of evaluation, GRG has observed and participated in phone, video, and in-person meetings with the PoLAR CCEP partners. As external evaluators, GRG felt included as partners in the group -- invited to make substantive contributions to discussions and decisions about the project and related research and evaluation. The following is an evaluative summary of the five-year PoLAR CCEP implementation project. Areas summarized below begin with a focus on the partnership, including communication and collaboration, evolution of the partnership, and professional benefits gained. This is followed by reflection on the accomplishments of the work including the resources developed and disseminated and the related research and evaluation. Finally we present our observations of the partners' experience of being a part of the CCEP Alliance and partners' recommendations to the NSF for future similar collaborative projects.

## COMMUNICATION AND COLLABORATION

In the same way that GRG felt valued for our role as evaluators, we observed and collected similar feedback from the partners about their own rewarding experiences as project contributors. Evidence of group buy-in and commitment was clear from the start of the five-year project. Monthly meetings were consistently well-attended and featured active discussion, with conversations facilitated in a way that allowed room for all partners to engage. The management team set a new meeting time for each academic semester to accommodate the partners' changing schedules. Prior to each call they communicated the monthly agenda and reminded partners of the date and time. Annual meetings were also well-attended, and partners reported feeling energized by the enthusiasm, camaraderie, and shared interest in developing and sharing innovative ideas with one another about how to educate the public on climate change issues.

PoLAR partners were always eager to help one another, share ideas and lessons learned, and problem-solve collaboratively. Partners were highly responsive to one another's requests for thoughts and ideas, providing prompt input to requests for feedback about a topic, study, article, etc.

From the start of the partnership, the CCC management team recognized that PoLAR partners were interested and capable of collective brainstorming and helping each other think through a challenge as needed. The management team described their own role as building on individual partners' commitment to PoLAR and helping them to realize their goals by providing informational support and networking opportunities within and beyond the partnership. Discussions that included some disagreement were debated professionally and until satisfactory resolution was reached.

Notably, the large majority of conversations consisted of partners sharing individual project updates with the entire team and communicating lessons learned. From observing these conversations it was clear to GRG that partners from different disciplines were comfortable reframing the question or concern at hand, and given their own experience were often able to share novel insights and/or recommendations for partners of different disciplines.

The management team deliberately worked to tailor communication for individual partners, given the many different perspectives and disciplines, and worked to find the best approach for each individual. One leader described the balance, working to provide the right amount of support--not contacting partners too frequently yet staying abreast of progress so as to provide support when needed. By the end Year 5, the management team perceived the lines between partners were blurred and all roles and responsibilities were highly collaborative. For example, the project manager expressed a confidence in pushing project leads, including the PI, if something needed more attention than it was receiving. The PI emphasized using the "*whole person*," acknowledging and honoring partners' different styles, preferences, and perspectives.

## EVOLUTION OF THE PARTNERSHIP

Over the course of the five years, some partners left and new partners joined the project. New partners were always welcomed and brought up to speed quickly by existing partners and the management team. Interviews and survey data revealed that new members appreciated the warm acceptance of their presence and ideas. Longer term partners, in turn, appreciated the perspectives brought in by newer members; the group consistently worked together to leverage these ideas to enhance the existing body of work.

Changes in partnership composition did not detract, but rather benefited the functioning of the partnership. Partners were successful, regardless of when they joined, because they all shared a common interest in the primary question of how to educate adults about climate change using novel and innovative tools. The management team observed this as well, and expressed the belief that it is critical to find people who are interested and enthusiastic about the question at hand, more so than simply focusing on fulfilling the grant-required disciplinary expertise. More often than not, partners were multifaceted and brought many skills beyond those expected. The project PI mindfully gave partners the freedom to select projects of interest to them, with the intent of increasing partners' buy-in and sustained interest over time.

## PROFESSIONAL BENEFITS

Beginning early in the project, all partners consistently reported professional benefits from their PoLAR participation. Partners believed the exposure to others with diverse disciplinary backgrounds and skills added value to their own learning as well as to the project itself. GRG observed partners' growing confidence in their own skills and recognition of the value of their personal contribution to the work. Over time, with developing understanding of one another's interests and views, partners presented their own ideas more clearly and with minimal discipline-specific jargon, helping all partners understand and participate in regular discourse. As a result of participation in the PoLAR partnership, partners have explicitly considered the value of reaching out to the public in a variety of innovative ways to educate adults about climate change. Further, all partners have come away from the collaboration with new colleagues and contacts across roughly a dozen different institutions.

## POLAR PRODUCT AND RESOURCE DEVELOPMENT

By the end of the fifth year, all nine novel educational resources originally envisioned and outlined for the PoLAR Phase II Implementation Period have been developed. These include:

- The PoLAR Hub Website
- EcoChains: Arctic Crisis
- Polar Explorer: Sea Level
- PoLAR Voices
- Reaching Arctic Communities Facing Climate Change (ReAC)
- Online Professional Development for Teachers: Climate Change
- SMARTIC (Strategic Management of Resources in Times of Change)
- The Greenify Network
- FutureCoast

Beyond those products and ongoing PoLAR research, additional related resources have been produced (e.g., different versions of EcoChains: Arctic Crisis—with fewer cards and Antarctic focus, and a range of ReAC professional development activities for Alaskan Natives). While the ultimate timing of completion and dissemination of some resources was delayed, no project was abandoned.

The management team was intimately involved in the timelines and development efforts of each individual project. Partners reported appreciating the internal deadlines set by the leadership team, which were reasonable, realistic, and kept partners accountable. The leadership team remained flexible, as they worked with the project partners to adapt and modify the original product visions; when delays occurred they kept the resource development moving forward. The management team gave autonomy to PoLAR project leads, stepping in when needed to ensure continued progress.

Having multiple products simultaneously under development was advantageous for the partnership. When one resource was unexpectedly delayed, partners were comforted knowing other projects led by other partners continued to advance. Some projects were ready for dissemination within the first two years, while others were modified and refined throughout the five years, and completed by the final year. Relevant modifications to products and plans were communicated well during monthly partnership calls so that all partners were kept apprised.

The project PI described that despite an original interest in substantial scale-up by the end of the grant period, there was great value in the decision to focus on research, refinement, and dissemination of products and findings. Ultimately, partners felt supported in their development efforts and PoLAR leadership felt the partnership was able to show, through quantitative and qualitative means, the value of novel education approaches.

## RESEARCH AND EVALUATION

During the first year of the project, a fair amount of discourse focused on fleshing out the distinctions and intersections between learning research and evaluation. GRG's input was encouraged and valued as we worked jointly with the learning research team at Center for Research on Environmental Decisions (CRED) to develop collaboration plans and procedures. The working relationship remained collegial and highly productive throughout the course of the project. Over the years, GRG and CRED researchers shared literature review findings, survey questions, and data analysis plans. Together, we co-designed research and evaluation plans that addressed the key questions of interest to project leads.

Across the partnership, GRG observed varying levels of prior experience and comfort with evaluation. For many partners, evaluation was the proposal requirement with which they were least familiar. Over time, as GRG reiterated evaluation goals and shared early evaluation findings, partners showed increasing interest in incorporating evaluation into their own product development.

Toward the end of the five years, partners reflected on components of the partnership that worked well, and in particular expressed appreciation for evaluation of the resources. They came to see evaluation as a beneficial tool for identifying and framing questions of interest and communicating key findings and potential impacts of the products developed. Partners explained that evaluation provided them with feedback from study participants that they may not have otherwise received about their resource. Similarly, the management team valued evaluation for its ability to help frame development and dissemination plans while keeping partners accountable; it was beneficial for everyone to think more explicitly about the product impact and research questions during the development lifecycle.

The management team found evaluation findings and results helpful when networking about and promoting PoLAR products. For example, when speaking with non-PoLAR partners (i.e., at conferences and meetings) about innovative learning tools for adult climate change education, the message seemed to gain a level of legitimacy when research and evaluation findings were incorporated into the conversation. With the partnership's current focus on publishing, many manuscripts are built upon research and evaluation study findings. The management team believes new audiences will be more inclined to take the PoLAR products seriously when supported by research. Together, GRG and PoLAR partners have contributed to the advancement of research and information about the greater field of adult climate change education.

## CLIMATE CHANGE EDUCATION PARTNERSHIP (CCEP)

Based on correspondence over the years, the management team perceived that the PoLAR CCEP was known and respected among the CCEP Alliance. As a "*visible and capable partner*" and with the vast range of topics included in the PoLAR portfolio, the project was often a "*go-to*" for other CCEP Alliance partners. Beyond their novel education resources, PoLAR organized and participated in quite a few

outreach activities, developed resources specifically focused on indigenous populations, and offered online courses for educators, giving them knowledge and experiences to share with others in the Alliance.

From their perspective as a partner within the Alliance, PoLAR management shared their thoughts about the value of an organization responsible for communicating and sharing out to various interdisciplinary partnerships (i.e., the CCEP Alliance Office). They believed the optimal timing for such an organization was toward the end of the project period, when it could facilitate sharing of knowledge between the partnerships and help synthesize experiences and lessons learned.

## RECOMMENDATIONS FOR FUTURE NSF PARTNERSHIPS

During the final PoLAR partnership meeting, GRG facilitated discussion with partners about their recommendations to NSF regarding future collaborative partnerships based on the CCEP model.

Both partners and the management team cited notable value in the interdisciplinary focus required for these projects. The focus was helpful in breaking down science that is “*often siloed*.” By collaborating across disciplines, partners believe the work helped to break through barriers, and ultimately to reach more of the general public than would be accomplished if the same efforts were pursued within a single discipline.

The specific focus on gamification was a highlight mentioned by nearly every partner at some point throughout the course of the project. Partners described the value they now see in implementing a game-focused approach into anything they teach and present to others. Through the collaboration, they have learned best practices for implementing such an approach. For example, PoLAR partners who did not originally have such experience have facilitated Game Jams (i.e., people come together for a set period of time, create a game, and compete against other teams) in a range of settings from conferences to classrooms. These events are seen as an engaging and effective model for education and outreach that can be used nearly anywhere and facilitated by anyone.

The creation and integration of subgroups within the larger partnership was suggested as a useful addition to this model of collaboration in the future. While the PoLAR partnership was manageable in size for conference calls and in-person meetings, the creation of subgroups could effectively strengthen even more connections within the partnership. Smaller group meetings can allow for specific sharing across two or three resources, and ideas and/or lessons learned in those groups can then be translated to the larger group leading to additional new ideas and innovations for resource development and for dissemination. Working more directly with one or two others could also enhance overall understanding of project goals as a whole, allowing for deeper dialogue and exploration of an idea.

PoLAR management was in agreement about subgroups and subgroup meetings. They noted it would be wise not to create such groups too soon. Particularly with a five year project, it is beneficial for partners to get to know one another and to build some level of understanding of the projects as well each other’s backgrounds, preferences, and expertise before breaking into smaller groups.

## EVALUATOR CONCLUSIONS

Throughout the partnership, frequent and respectful communication between partners and the management team led to successful collaboration and idea sharing. The partnership remained dynamic and effective because at its core all partners were engaged and stimulated by the key question of interest. The autonomy encouraged by the management team allowed partners to commit and often contribute more than they may have originally envisioned based on their own background expertise. The model afforded significant professional development opportunities due to the interdisciplinary range of the partners, the duration of the project, and the flexible and attentive management style of the CCC team.

Partners' growing receptivity to research and evaluation allowed them to identify and clarify research questions and conceptualize dissemination plans with evidence and feedback from users that they may not have otherwise have received. Partners and the management team alike agreed that PoLAR was successful because of the interdisciplinary requirement and common interests and goals among partners. Evaluators conclude that the project effectively met its goals in terms of professional growth for partners as well as the development and dissemination of successful resources to contribute to the growing field of climate change education for the public.