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Preview of Award 1560862 - Final Project Report

Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1560862
Project Title:	RCN: Transformative Research in Geography Education
PD/PI Name:	Michael N Solem, Principal Investigator Richard G Boehm, Co-Principal Investigator
Recipient Organization:	Association of American Geographers
Project/Grant Period:	06/01/2016 - 05/31/2022
Reporting Period:	06/01/2021 - 05/31/2022
Submitting Official (if other than PD\PI):	Michael N Solem Principal Investigator
Submission Date:	08/31/2022
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	Michael N Solem

Accomplishments

* What are the major goals of the project?

This RCN project had six major goals:

1. Catalyze research planning with strong potential to result in transformative research projects in geography education.
2. Facilitate collaborative research among geographers and STEM education researchers.
3. Attract more diverse cohorts of graduate students to Ph.D. programs in Geography Education.
4. Increase research productivity and the knowledge base in geography education.
5. Secure the long-term growth and stability of the RCN.
6. Promote the use of research to improve practice in geography education.

The primary mechanism for pursuing the goals under this project was a grant program administered by the National Center for Research in Geography Education (NCRGE). This grant program was designed to catalyze the formation of research groups working in different thematic areas of geography education research. Their research planning activities were intended to position them for long-term work connected to the Road Map Project's agenda for transformative research. Through this program, NCRGE aspires to strengthen geography education research processes and promote the growth of sustainable, and potentially transformative, lines of research.

* What was accomplished under these goals and objectives (you must provide information for at least one of the 4 categories below)?

Major Activities:

1. Catalyze research planning with strong potential to result in transformative research projects in geography education.

During the period of NSF RCN funding for this award, NCRGE invited proposals from RCN members to catalyze research planning and networking activities that have significant promise to result in potentially transformative research. RCN funds supported the formation of research groups in twelve areas: 1) project-based learning, 2) spatial thinking assessment, 3) learning progressions, 4) pedagogical content knowledge, 5) GIS professional development, 6) geography college and career pathways, 7) geo-computation, 8) geography and civics education, 9) international curriculum research, 10) geography and GIS learning in libraries, 11) Powerful Geography, and 12) national and international educational assessment research. Full details about these projects are available in the annual reports submitted for this award.

2. Facilitate collaborative research among geographers and STEM education researchers.

Many of the RCN groups included researchers from the STEM education community with expertise in spatial cognition, learning progressions, teacher education, computer science, and psychometrics/educational measurement. These individuals are identified in the annual reports submitted for this award.

3. Attract more diverse cohorts of graduate students to Ph.D. programs in Geography Education.

This RCN award was leveraged to support the launch of a 100% online PhD program in Geographic Education in fall 2020. RCN publications, resources, data, and other deliverables are being used for graduate student instruction and advising in this program. There are currently 14 doctoral students in the program, the majority of whom are women and three of whom are from underrepresented minority groups.

4. Increase research productivity and the knowledge base in geography education.

The outcomes of RCN group activities have appeared in the following journals: Annals of the American Association of Geographers, Research in Geographic Education, Geographical Education, Journal of Geography, Journal of Geography in Higher Education, and International Research in Geographical and Environmental Education.

5. Secure the long-term growth and stability of the RCN.

NCRGE co-director Dr Michael Solem was awarded tenure at Texas State University effective September 1, 2022. The university provides a one-semester teaching load reduction to support Dr Solem's ongoing research and activities involving RCN members. New funding opportunities are opened for RCN members as additional resources are obtained. For example, recent NSF grants have provided support for RCN members working in the groups for geo-computation, Powerful Geography, and the NAEP Geography assessment.

6. Promote the use of research to improve practice in geography education.

RCN activities were regularly shared with the full membership of the American Association of Geographers through newsletters, social media, and sessions organized for the AAG Annual Meeting.

Specific Objectives:

Significant Results:

Key outcomes or Other achievements:

* What opportunities for training and professional development has the project provided?

The RCN has provided opportunities for undergraduate and graduate students, teachers, and other education stakeholders to participate in the work of the various research groups. The individuals who received this training and professional development were identified in the annual reports submitted for this award.

* Have the results been disseminated to communities of interest? If so, please provide details.

RCN funding has created a new infrastructure to support geography education research. That infrastructure consists of over 200 geographers, STEM education researchers, cognitive psychologists, and scholars from the learning sciences affiliated with more than 50 U.S. universities and research organizations. International collaborators from Asia, Latin America, Europe, and Africa are also active in the RCN. RCN members continue to receive results of RCN activities through NCRGE media and they continue to share this information through their own professional networks.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
Slayton and Benner_RGE_23.2.pdf	Report for the "Libraries" RCN group.	Michael Solem	08/30/2022

Products

Books

Book Chapters

Michael Solem (2022). The National Assessment of Educational Progress (NAEP): A Closer Look at US Gaps and Trends in Geography Achievement. *Assessment in Geographical Education* Theresa Bourke. Springer. . Status = PUBLISHED; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

Inventions

Journals or Juried Conference Papers

Michael Solem (2022). The NAEP Data Explorer: Digging Deeper into K12 Geography Achievement and Why It Matters.. *The Geography Teacher.*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: https://doi.org/10.1080/19338341.2021.1895864

Michael Solem, Texas State University Coline C. Dony, American Association of Geographers Thomas Herman, San Diego State University Kelly León, Sweetwater Union High School District Amr Magdy, University of California-Riverside Atsushi Nara, San Diego State University Waverly Ray, San Diego Mesa College Sergio Rey, University of California-Riverside Rachel Russell, San Diego Mesa College (2022). Building Educational Capacity for Inclusive Geocomputation: A Research-Practice Partnership in Southern California. *Journal of Geography*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Licenses

Other Conference Presentations / Papers

Other Products

Other Publications

Patent Applications

Technologies or Techniques

Thesis/Dissertations

Websites or Other Internet Sites

National Center for Research in Geography Education
http://www.ncrge.org

Official website for the National Center for Research in Geography Education.

Powerful Geography
https://powerfulgeography.org

Website for the Powerful Geography initiative.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
NCRGE_logo_vert.pdf	NCRGE logo	Michael Solem	08/30/2022
rcn_map_120817.pdf	Map of NCRGE RCN.	Michael Solem	08/30/2022
Bowlick et al_RGE_23.2.pdf	Report for the "Geocomputation" RCN group.	Michael Solem	08/31/2022

| RCN_Impacts.pdf | RCN Goals, Outcomes, Impacts | Michael Solem | 08/31/2022 |

Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Solem, Michael	PD/PI	1
Boehm, Richard	Co PD/PI	1
Zadrozny, Joanna	Graduate Student (research assistant)	1

Full details of individuals who have worked on the project:

Michael N Solem
Email: msolem@txstate.edu
Most Senior Project Role: PD/PI
Nearest Person Month Worked: 1

Contribution to the Project: PI

Funding Support: American Association of Geographers & Texas State University.

Change in active other support: No

International Collaboration: No
International Travel: No

Richard G Boehm
Email: rb03@txstate.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 1

Contribution to the Project: Co-PI

Funding Support: Jessie Jones Chair for Geographic Education

Change in active other support: No

International Collaboration: No
International Travel: No

Joanna Zadrozny
Email: J_z37@txstate.edu
Most Senior Project Role: Graduate Student (research assistant)

Nearest Person Month Worked: 1

Contribution to the Project: Provided research assistance to the project directors.

Funding Support: Grosvenor Center for Geographic Education, Texas State University.

International Collaboration: No
International Travel: No

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
American Association of Geographers	Other Nonprofits	Washington DC

Full details of organizations that have been involved as partners:

American Association of Geographers

Organization Type: Other Nonprofits
Organization Location: Washington DC

Partner's Contribution to the Project:
In-Kind Support
Collaborative Research

More Detail on Partner and Contribution:

Were other collaborators or contacts involved? If so, please provide details.
Nothing to report

Impacts

What is the impact on the development of the principal discipline(s) of the project?

Each of the research groups supported with RCN funds pursued activities that have significant potential to
have transformative impacts on geography education, including new theories of geography learning and approaches to
curriculum development, teacher education, and assessment practices.

It is too early to tell whether the work supported under this award will eventually lead to discoveries that radically transform
our knowledge, theories, and practices in geography education. While that certainly is the driving philosophy of the RCN,
what matters now is the fact that people are even thinking in these terms. This situation augurs well for the future of
geography education. Unlike in the past, we now have the infrastructure, in the form of the RCN, to plan and carry out
ambitious, rigorous, and replicable studies across the nation and internationally.

Refer to the attached PDF with a summary of the research planning and networking activities supported by this award, and
the potential longer-term impact of these activities.

What is the impact on other disciplines?

This RCN is forging research collaborations between geographers and STEM educational researchers, thereby opening opportunities for interdisciplinary insights on critical educational research questions and challenges. Additional details are provided in the attached PDF.

What is the impact on the development of human resources?

RCN projects engage students and practitioners in research training activities. NCRGE will extend the work of the RCN by sponsoring additional research workshops and conferences for early career scholars and graduate students.

What was the impact on teaching and educational experiences?

The RCN aims to apply research findings from the NAEP Geography assessment in a manner that supports development of new approaches (e.g., Powerful Geography) for achieveing educational equity in school geography. Additional details are provided in the attached PDF.

What is the impact on physical resources that form infrastructure?
Nothing to report.

What is the impact on institutional resources that form infrastructure?
Nothing to report.

What is the impact on information resources that form infrastructure?
Nothing to report.

What is the impact on technology transfer?
Nothing to report.

What is the impact on society beyond science and technology?
Nothing to report.

What percentage of the award's budget was spent in a foreign country?
Nothing to report.

Changes/Problems

Changes in approach and reason for change
Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them
Nothing to report.

Changes that have a significant impact on expenditures
Nothing to report.

Significant changes in use or care of human subjects
Nothing to report.

Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards
Nothing to report.

Change in primary performance site location
Nothing to report.