National Center for Research in Geography Education

NCRGE Building Capacity Improving Practice Supporting Collaborations Sharing Results

Building a Research Coordination Network for Geography Education

Priority Activity:

Thematic Research Conferences and Workshops Series
Report due: August 1, 2015

Committee: Sarah Bednarz, Audrey Mohan, Douglas Munski, and Rebecca Theobald (Chair)

This discussion considers how a research conference and workshop series might support the mission of the National Center for Research in Geography Education to catalyze transformative research in geography education and maximize capacity building efforts.

We recommend that funds be requested for 1. tiered workshops to build capacity by supporting exploratory ideas and supporting reporting on the research coming out of that research agenda; 2. travel grants for geography education researchers to attend national research conferences and to report their findings with the geography education community; and 3. mechanisms to foster collaborations on projects, such as funding communication tools, sharing grant announcements, and connecting individuals with similar research interests.

Our vision is to strengthen geography education research processes, and reputation by identifying important research questions, building the research capacity of individual geographers, and creating the space and opportunity for interdisciplinary conversations that produce sustainable research agendas and disseminate research results. This vision includes enhancing our efforts at multi-site, longitudinal research opportunities that can be shared and replicated across disciplinary boundaries.

Action items to achieve the vision:

- Take a tiered approach by beginning with small-scale workshops to develop capacity and ideas followed by larger conferences to disseminate the ideas.
- Invite leading education researchers to present on general and topic-specific methodology and approaches. Examples include:
  - General: What is scientific education research? - current quantitative and qualitative approaches
  - Topic Specific Examples
    - Spatial thinking: how to design items to capture spatial thinking at various ages
    - Lesson analysis: How to conduct research and professional development programs that integrate Lesson Analysis work.
    - Learning Progressions: Item design, item analysis, refine interview questions, research data collection analysis, iterative analysis, multiple choice question analysis
- Provide a competitive process for researchers to obtain travel grants to attend conferences, gain insights from other disciplines, and share knowledge that they learned at the conference with other geography educators. For example:
  - Support geography education researchers to apply to Institute of Education Sciences National Center for Education Statistics conferences and research trainings http://ies.ed.gov/whatsnew/conferences/

    - Support geography education researchers to apply to American Educational Research Association conferences and research trainings
      http://www.aera.net/EducationResearch/tabid/10065/Default.aspx
- Provide a continuous review of relevant educational research through workshops, e.g.:
    - Earth Educators Rendezvous
      http://serc.carleton.edu/earth_rendezvous/2015/program_table/index.html
      http://serc.carleton.edu/earth_rendezvous/2015/morning_workshops/w9/index.html
- Encourage geography education researchers to present their findings at geography conferences, including the annual and regional AAG meetings
- Participate in College and University Faculty Assembly (*CUFA*) at National Council for the Social Studies conference (http://cufa.socialstudies.org/home)
- Develop NCRGE Conferences so that they have a national reputation for excellence
    - http://www.aera.net/EducationResearch/BeyondAERA/tabid/10293/Default.aspx
- Collaborate with other aspects of the NCRGE, such as sharing resources and best practices

Questions

WHAT IS THE OPTIMAL COMBINATION AND TIMING OF LARGER CONFERENCES AND SMALLER WORKSHOPS?
HOW MIGHT THE OUTCOMES OF A CONFERENCE OR WORKSHOP BE SHARED WITH THE BROADER RESEARCH COORDINATION NETWORK?

Foundational Principles

- Recognize that funding will always be limited; workshops and conferences should take advantage of existing gatherings of geography educators (AAG national meeting, AAG regional meetings, NCGE, Alliance Network, AP Reading, etc.) for short workshops, follow-up to previous events, and planning meetings.
- Establish opportunities for mentoring relationships among early-career and master educators with similar interests and skills to develop sustainable lines of research.
- Ensure that all meetings are well-structured with clear goals focused on learning and dissemination and include good publicity within the geography education research community prior to, during, and following the events.
- Start with smaller, invited workshops to bring together people who have particular interests on a topic.
- Focus initial workshops on building capacity; maximize time spent together on increasing capacity and providing rigorous learning opportunities for participants.
- Host more extensive workshops in easy-to-reach locations with as inexpensive infrastructure as possible.
- Invite participation in larger workshops through multiple channels.
- Include experts from a variety of disciplines.
- Identify a plan for tiered meetings to build capacity.
    - Develop a regular incubator weekend conference prior to NCGE to explore research ideas during the summer
    - Create a research strand of sessions at the following AAG Annual Meeting based on the research ideas in the spring.
    - Rotate among the AAG regional meetings and present initial research on findings at the various conferences in the fall.
    - Repeat the process with new research strands while building on the existing research projects.

Sample Timing for an Established Research Project

- Exploratory Conference at a Regional AAG Conference – Fall 2015
  - 15 invited participants, two days, emphasis on collecting preliminary data and analysis
- Alliance Network Annual Meeting – February 2016
  - Check in with any members of the research group who are attending the Alliance meeting
- Association of American Geographers Meeting – April 2016
  - Produce workshop to share updates on methodological challenges of research
- National Council for Geographic Education Meeting – August 2016
  - Discuss progress on engaging practitioners in research
  - Workshop on designing educative curriculum materials and professional development using data about student thinking
- Research Review Conference at Regional AAG Conference – Fall 2016
  - 15 participants return to present results of research, two days
  - Additional attendees solicited to attend from a variety of disciplines and areas
  - Discuss successful and unsuccessful approaches as well as next steps
  - Plan for publication and next round of research topics

Dissemination

- Use available NCRGE website and network to host articles and papers for easy access.
- Any researcher who receives funding from the NCRGE to attend a conference or workshop would be requested to present the knowledge gained during a session at AAG or NCGE.
- Both early-career and masters educators should be included to present their preliminary work derived from a previously suggested agenda, or a follow-up to the ideas presented in previous workshops to promote and support the kinds of research discussed.
- Once the series is underway, publication of conference proceedings or articles growing out of the research should be a goal of the conferences and workshops. For smaller meetings, an article or white paper to which all members contribute in some fashion setting forth plans to move research forward would be appropriate.
- Invite Research Coordination Network members to workshop presentations at national meetings.

Questions

WHAT RESEARCH THEMES SHOULD BE PRIORITIZED?
HOW MIGHT A CONFERENCE AND WORKSHOP SERIES ADVANCE THE ROAD MAP RESEARCH AGENDA?

Possible Themes

- Innovations in professional development: Lesson Analysis (http://bscs.org/stella) and Teaching Practices Inventory (http://www.cwsei.ubc.ca/resources/TeachingPracticesInventory.htm)
- Developments in Advanced Placement Human Geography / Advanced Placement GIS&T
- Learning progressions across the educational continuum from pre-K through high school, community colleges, four-year undergraduate and beyond (http://education.msu.edu/projects/leaps/)
- Recent developments in methodology and involvement of practitioners
- Education policy research implications, including diversity and broadening participation
- Student thinking about geography (e.g. misconceptions, partial ideas, stepping stones)
- Research in geospatial technology education (Baker et al.)
- Elementary and secondary teacher preparation
- Formal and informal settings
- Workforce development opportunities in geography and geospatial technology

Road Map Research Framework	Identified Topics in Road Map
1. How do geographic knowledge, skills, and practices develop across individuals, settings, and time?	1. Individual differences: gender, socioeconomic status, race, culture, opportunities 2. Formal vs. informal settings: service-learning, fieldwork 3. Time-related studies: working on multiple problems over time, sequences of instruction, cross-cutting concepts, preparation, life-span concepts
2. How do geographic knowledge, skills, and practices develop across different elements of geography?	1. Mapping: questions, strategies, content knowledge, size of learning space, learning progressions 2. Physical geography: geographic conceptions and misconceptions, problematic ideas, support activities 3. Human geography: standards- and content-based research 4. Interdisciplinary Learning: integration into math and literacy, connections among disciplines, transfer of skills
3. What supports or promotes the development of geographic knowledge, skills, and practices?	1. Problem-based learning: best topics, when to introduce, implementation 2. Collaborative learning: foster discourse, development argumentation, identify strong questions, teacher training 3. Geospatial technologies: how and under what conditions GIS can improve teaching and learning, measureable learning outcome, underrepresentation 4. Practices: formulating geographic questions, collecting and analyzing geographic data, developing geographic explanations and arguments
4. What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices?	1. Preservice preparation: level of disciplinary knowledge, preparation, early-career support 2. Inservice PD: pedagogical and content knowledge, coherence and sequencing, beliefs 3. Standards, frameworks, policy: inconsistency, comprehensiveness, role of education organizations

Below are three initial topics that are of interest and concern to the geography education community that could be the focus of the first research conference series.

Road Map Research Framework	Innovations in Professional Development
1. How do geographic knowledge, skills, and practices develop across individuals, settings, and time?	1. What is the pipeline for developing teachers of geography? How do teachers of geography develop and use pedagogical content knowledge? Are there locations that are successful in attracting teachers who reflect the changing demographics of the United States? How are those individuals being nurtured as inservice teachers? Do teachers of geography have career paths that are significantly different from other social studies or science teachers? What do teachers of geography need to learn in order to share it with their students? How could a teaching practices inventory support professional development? What role does experiencing field work play in translating that to a classroom setting?
2. How do geographic knowledge, skills, and practices develop across different elements of geography?	2. How are mapping strategies included in classroom instruction? What aspects of content knowledge are most confusing to teachers and students? Are there best practices for teaching that content (scale, distance, relationships)? What should a teacher of physical geography be expected to understand about human geography, and vice versa? How can geography teachers demonstrate a transfer of skills from geography to math and literacy? How are professional development programs incorporating standards and content-based research?

3. What supports or promotes the development of geographic knowledge, skills, and practices?	3. How could lesson analysis support teachers in teaching challenging topics in geography? What role can geographic topics play in problem based or collaborative learning to foster discourse, development argumentation, and help students identify strong geographic questions? How do inservice and preservice teachers learn geospatial technology? How do they learn strategies for improving teaching and learning with GIS? Are there lesson analysis procedures that could focus on teaching with technology?
4. What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices?	4. How is the knowledge base of teachers of geography ascertained? How are preservice teachers prepared to use spatial thinking analysis in their classrooms? What types of credentials are important to secondary and elementary teachers? How do professional development providers balance pedagogical and content knowledge? Do state standards in geography affect professional development program content? How has educational policy influenced the education and support provided to geography teachers? How have non-governmental organizations and corporations influenced federal, state, and local decision-makers? Where is the focus of education policy?

Road Map Research Framework	Research Questions: AP Human Geography
1. How do geographic knowledge, skills, and practices develop across individuals, settings, and time?	1. How do students learn the knowledge, skills, and practices encompassed in APHG? And how do they translate that to success on the examination? What are the learning progressions to acquire geographic knowledge and skills? What roles do course organization, field or lab experiences, and uses of geospatial technologies play in student achievement? Is there a 'better' or 'best' way to arrange the sequencing of concepts or to structure the course for maximum effect? What are the interactions between individual students, their educational settings, and time spent in learning? Are there particular pedagogic strategies that are effective with 9th and 10th graders that will close the age/performance gap?
2. How do geographic knowledge, skills, and practices develop across different elements of geography?	2. What are the unique aspects of APHG which confound students, the conceptions they have that prevent them from grasping accurately concepts and principles of geography? Are these erroneous conceptions related to innate naïve understandings or are these perpetuated by non-specialist teachers?
3. What supports or promotes the development of geographic knowledge, skills, and practices?	3. What are the characteristics of APHG teachers? What kinds of professional development best support APHG teachers? What role does social media play in supporting APHG teachers and how could that be made more effective? What effect does individual differences in teachers such as age, years or experience, background in geography and so on play in their preparation and student success? Since geography is a unique discipline, how do teachers familiar with more traditional social studies subjects like history and civics learn geographic perspectives? Dede (2014) suggests STEM teachers engage in "unlearning" to acquire new teaching practices and that by "mirroring" master teachers in online communities they find the models they need. Is that the process for APHG teachers becoming subject specialists?
4. What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices.	4. What is the impact on the discipline of geography of APHG? Anecdotally we believe we are seeing a slow increase in freshman geography majors. What is the evidence? How have we in higher education capitalized on the phenomena of APHG? Are there implications for dual credit classes?

Road Map Research Framework	Research Questions: Learning Progressions
1. How do geographic knowledge, skills, and practices develop across individuals, settings, and time?	1. How do students learn the knowledge, skills, and practices encompassed in elementary geography? middle school geography? high school geography? What are the learning progressions to acquire geographic knowledge and skills? What roles do course organization, field or lab experiences, and uses of geospatial technologies play in student achievement? Is there a 'better' or 'best' way to arrange the sequencing of concepts? In what disciplines have learning progressions changed approaches to teaching or professional development? In what settings have learning progressions been most successful?
2. How do geographic knowledge, skills, and practices develop across different elements of geography?	2. What strategies do teachers undertake to correct misconceptions of students that prevent them from grasping concepts and principles of geography? How can learning progressions address those misconceptions? What mapping strategies and content knowledge are required for a strong class in geography? How can learning progressions address the interdisciplinary nature of geography (human, physical, environment and society, technical) without becoming unwieldy?
3. What supports or promotes the development of geographic knowledge, skills, and practices?	3. What learning progression approaches work best with field work and problem-based learning? What learning progressions have been successful in computer science and could be applied to geospatial technology? Are there materials used in professional development and Colleges of Education that identify learning progressions for geography? How are geographic questions formulated as part of the learning progressions process?
4. What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices.	4. How could the development of learning progressions in geography open doors to additional support for professional development and preservice instruction? Should there be a comprehensive development of learning progressions to support the Geography for Life standards? Are learning progressions required for national or international collaboration?