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A *Road Map for 21st Century Geography Education: Geography Education Research*

[by Bednarz S., Heffron S. and Huynh N.T. (Eds.), Washington, DC, Association of American Geographers, 2013]

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1. Introduction

Improving the status of geography education in the United States, whether as a stand alone subject or within the social studies curriculum as an integrated subject, will depend upon the type and quality of research. Increasingly the United States federal and state governments are basing educational policy on research evidence regarding reading and mathematics (Feuer, Towne and Shavelson, 2002). Research that investigates the learning progressions of students studying geography, the spatial thinking that is conducive to using maps and other graphics, and the content and methods used by successful teachers of geography are all researchable topics. The *Road Map for 21st Century Geography Education* includes three volumes: Research; Curriculum Materials and Professional Development; and Assessment in Geography. The Geography Education Research report is reviewed here. The research topics suggested in the report are considered to be necessary underpinning information for charting a new and improved pathway for education in geography, particularly in the United States.

The *Road Map for 21st Century Geography Education: Geography Education Research* proposes a research agenda over the next several decades. The report begins by setting the context for geography within U.S. education with a short update on its status. Dismal news from the past is reiterated, mainly that the majority of American students are geographically illiterate. The lack of geographic knowledge is verified by student performance on several geography assessments, both national and international. The report then turns its focus to the future and the ways that a well planned research agenda could provide improvements in teaching and learning geography, as well as enhanced recognition for the discipline in the school curriculum (Bednarz, Heffron and Huynh, 2013).

The initiative for a major project on teaching geography began with a memo recommending that federal agencies "work with external partners with experience in geographic education to improve geography teaching, training, and researching in our Nation's schools" (U.S. House of Representatives, 2009, p. 767). The recommendation being made at the national level of policy making, the U.S. Congress was viewed as an invitation to address

the issue. In response, four national geography organizations (NGS, AAG, AGS and NCGE[1]) collaborated to respond to the suggestion by proposing that a project be funded that would provide specific suggestions for research in geography, education, cognitive science and science education and would in turn impact the teaching of geography. The *Road Map for 21st Century Geography Education Project* (referred to as the Road Map Project) was conceptualized to provide specific suggestions for research on teaching and learning geography.

The participants in the Road Map Project who compiled the research report included geographers, geography educators, science educators, cognitive scientists, psychologists, and social science educators. The project began with two compelling questions:

1. What areas of research will be most effective in improving geography education on a large scale; and
2. What strategies and methodologies are relevant to research communities and that can be developed and adopted to maximize the cumulative impact of education in geography (Bednarz, Heffron and Huynh, 2013).

2. The Road Map Report

The report on research in geography education includes an executive summary, five chapters, an appendix and references. Chapter 1 presents a rationale for and discusses the contexts of geography education largely from a U.S. perspective. Chapter 2 examines and discusses one of two major questions presented by the report. The first question is: What areas of research will be most effective in improving geography education at a large scale? The report suggests two ways to address the question. The first way is the careful examination of educational research in related fields and the second is the development of a research framework for geography education. Chapter 3 presents a comprehensive review of geography education research that examines, often critically, the traditions of the discipline associated with educational research. Chapter 4 addresses the second major question presented within the report: What strategies and methodologies can relevant research communities develop and adopt to maximize the cumulative impact of education research in geography? This question has numerous implications due to the relatively small community of geographers who are engaged in educational research. The solution is to link the research they do with the broader community of researchers in education, cognitive science, and closely related subjects. A critical mass of research projects and endeavors, along with forward momentum in presenting their results will be necessary to gain recognition and have an impact on other research, teaching, and policies that influence geography education.

The report implies that geography education in the United States is caught in a time warp between the 20th century and the scientific geography of the 21st century. Initially the Road Map reflects on the conceptual nature of and fundamental themes that have persisted in the discipline over the decades. At times in the past there have been initiatives that have boosted the visibility of geography as a school subject (Geography Education Standards Project, 1994; Joint Committee on Geographic Education of the National Council for Geographic Education and the Association of American Geographers, 1984). The result was a very successful attention to and reemergence of geography within the social studies curriculum. However, there remained an "understand gap" between where geography had been and where it was going, and this served as a source of resistance to change within geography education (Bednarz, Heffron and Huynh, 2013). A small, but dedicated community of geographers and educators has been engaged in an ongoing struggle to promote the multi-faceted nature of geography as perspectives, skills, and content. The nature of geography as an evolving discipline gives rise to addressing a balanced and integrated view of the discipline. That balance must include the learning of essential place names, locations, and terminology to complement powerful geographic

[1] NSG: National Geographic Society; AAG: Association of American Geographers; AGS: American Geographical Society; NCGE: National Council for Geographic Education.

concepts, critical thinking, spatially reasoning, and dispositions towards geography as an essential source of knowledge and skills. The spirit of that movement is captured in the report.

The report also gives attention to the scientific inquiry and problem-solving that are the practice of academic geography. Those traits must be transferred to "thinking geographically" and "doing geography" within elementary, secondary, and general education university level geography courses. As the basis of the transition to inquiry and problem-solving are three important geography skills: formulating geographic questions; acquiring, organizing, and analyzing geographic information; and explaining and communicating geographic patterns and processes.

The Report suggests a pathway to improve geography education research that will be scalable to the regional or national level? While there has been considerable research by individual scholars, there are relative few large scale research projects, inclusive of large populations, that examined the theories and practices of geography education. There are studies from other disciplines, such as psychology and education that are somewhat related to geography education, but did not often make their way into the research literature of geography education. Several of those studies are citied in the references (Feuer, Towne and Shavelson, 2002; National Research Council, 2002).

The Road Map makes two suggestions to address this misalignment between convenient research and scalable research. The first is to draw on education research in related fields, such as the research methodology used in science education. Science education research has been very influential in the development and testing of learning processes, including materials and classroom methodologies. Research in mathematics education also presents applicable models, such as those devoted to learning trajectories and progressions of cognition that are complemented by carefully designed instructional strategies. The Road Map suggests that those studies be examined as models for planning comparable research in geography education.

The second suggestion from the Road Map promotes the idea that scholars need to identify educational practices and theories that have considerable reach in the field and formulate research questions to pursue either as individuals or as a member of a collaborative project. Within that suggestion the Road Map identifies four research questions that are considered a priority to the students, teachers, the discipline and the practices of geography education. The questions are presented below. Each question is further divided into one or more recommendations regarding the topic or type of research that would answer, at least in part, the research question. The questions are designed to assist the researcher in identifying, but without necessarily recommending the scales of research projects that would be necessary. It is left to the researcher's judgment regarding the scale of the research.

Question 1:

How do geographic knowledge, skills, and practices develop across individuals, settings, and time?

Recommendation 1:

The Committee recommends that geography education researchers engage in systematic efforts to identify learning progressions in geography both within and across grade bands (e.g., K–4, 5-8, 9-12). The goal of developing learning progressions is to establish core geographic ideas that are coupled with using knowledge, skills, and practices.

Question 2:

How do geographic knowledge, skills, and practices develop across the different elements of geography?

Recommendation 2:

The Committee recommends research that examines the components and characteristics of exemplary geography curricula. This should include curricula that are in use within geography education as well as newly designed experimental curricula.

Question 3:

What supports or promotes the development of geographic knowledge, skills, and practices?

Recommendation 3:

The Committee recommends research to investigate the characteristics of effective geography teaching. Geography teaching may be both formal and informal and each is subject to research regarding it effectiveness and transferability to a broad scale of implementation.

Recommendation 4:

The Committee recommends research about fieldwork and its impact on learning geography knowledge, skills, and practices. Direct engagement with geographic observation, data collection and observations outside the classroom may have significant enduring effects on student knowledge and values that do not occur with classroom experiences.

Question 4:

What is necessary to support the effective and broad implementation of the development of geographic knowledge, skills, and practices?

Recommendation 5:

The Committee recommends that research about teacher preparation in geography be conducted with the goal of determining the scholarship, pedagogical, and induction experiences preservice education students need to both understand and teach for student mastery in the content and practices of geography. Research based strategies and methodologies are necessary to maximize the cumulative impact of a geography education both at the classroom and at the curricular levels.

Recommendation 6:

The Committee recommends interdisciplinary and multidisciplinary approaches, drawing on relevant research results. Geography is a significant aspect of scholarship in its own right, but a second significant role is the integrating and complementary nature of the discipline and its importance to other school subjects. Concepts and skills, such as mapping with Geographic Information Systems, are commonly used in courses in government, history, economics and earth science. The important geography concepts of location, pattern, spatial relationship and other concepts and the manner in which they complement other disciplines are not widely researched in geography education.

Recommendation 7:

The Committee recommends that geography education researchers follow established principles for scientific research in education (National Research Council, 2002) and that they collect data scientifically from large samples of students in schools, other natural learning environments, and laboratory settings.

Recommendation 8:

The Committee recommends researchers develop and study exemplary programs, curricula, tasks, measures, and assessments to build the body of knowledge about effective geography teaching and learning. Models regarding the progressions in which students develop geographic skills as part of instruction and the applications of skills used informally outside of school are important research needs. Both in school and out of school experiences are a means to acquire and apply knowledge. Models that reveal the relationships among the formal and informal educational experiences in learning geography are necessary.

Recommendation 9:

The Committee recommends building partnerships with formal and informal educators to conduct research in a range of learning contexts and to share findings among the community of geography education researchers. Partnerships will enable geographers to participate in large scale research to provider results that are generalizable. The value of geography education research will likely gain greater recognition for its quality and have greater acceptance by practitioners through high quality partnering to answer common research questions.

Recommendation 10:

The Committee recommends the creation or designation of an institution to coordinate the implementation, dissemination, and knowledge transfer of research results. The establishment of a national or international clearing house for research in geography education and the support of a national center or laboratory for research on geographic learning.

Recommendation 11:

The Committee recommends development of "learning research" opportunities. Pre- and post-doctoral training programs, similar to NSF's Fostering Interdisciplinary Research on Education (FIRE), can prepare participants for a range of career opportunities that will promote and disseminate geography education research. Research traditions and new paradigms for research are important in moving the research agendas of individuals and collaborative groups forward. Geography education is located at the interplay of the physical and social sciences. As a synthesizing discipline, the educational aspects of geography have much to gain through interdisciplinary research collaboration. In addition to advancing the field, it will also bring greater attention from scholars, policy makers, and funders regarding the significant role that geography plays in both formal and informal education.

Recommendation 12:

The Committee recommends the development and publication of a handbook that includes online tools and exemplars and that suggests areas in need of additional research. A formal Handbook for Research in Geography Education that encompasses the breadth of the discipline and its potentials within the educational process is needed. Such handbooks are published in social studies, language arts, mathematics, and other curricular subjects. An online Handbook could be updated frequently, would provide research assistance for early career researchers, and would be available to the general research community to demonstrate the progress on research in geography education.

Recommendation 13:

The Committee recommends that the National Assessment of Educational Progress (NAEP) Geography assessment be conducted at more frequent and regular intervals and that more funding for greater analysis of the test results be provided. The NAEP is the only national measure of geography education. The data are an invaluable source of research information regarding the level of proficiency in geography exhibited by U.S. students. The NAEP would permit the analysis of large samples of students and the changes that are occurring with samples of individuals following their formal schooling (Gallagher and Downs, 2012, pp. 56-61).

3. Conclusions

A *Road Map for 21st Century Geography Education: Geography Education Research* was completed principally for an audience of potential researchers in the United States. However, it seems the report has a considerable reach into the international community of geography educators. In most countries there is concern that the visibility and prestige of geography education be maintained in academic and professional education. One means to accomplish that end is to present a strong, well designed and relevant research agenda that presents the benefits and advances as well as convinces policy makers of the merits and national and international advantages students exhibit as a result of a powerful foundation in geography, spatial thinking, and environmental decision making. Second, the prestige of geography education as a research oriented, academic field will also be enhanced if there is a well reasoned approach to the impact of research. Fields such as mathematics and reading have benefited from very specific step wise research that builds on prior research through replication and the evolution of additional research questions. Third, the beneficiaries of research should be the students and teachers of geography and social studies. Research that will help them be more effective learners and teachers will have a significant reach for geography into the professional education field.

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