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The Grosvenor Center for Geographic Education and National Center for Research in Geography Education propose a new framework for geography called Powerful Geography, which revolutionizes the traditional notion of standards in geography education. Combining Amartya Sen and Martha Nussbaum’s principles of human capabilities, Michael Young’s theory of powerful disciplinary knowledge, and Wesley Null’s concept of a liberating curriculum, Powerful Geography offers a new conceptual approach to professional development for teachers. The approach aims to help teachers model geographic knowledge and skills that offer a diverse group of students the best preparation needed to attain personal and career goals and aspirations. This article argues the logic and value of Powerful Geography, sets up the rationale for Powerful Geography, describes how it builds on prior research, and presents a multiyear research and development plan involving social studies teachers.

KEYWORDS
Liberating curriculum; GeoCapabilities; geography standards; Powerful Geography

Introduction

Geography education in grades K–12 in America’s schools has not fared well over the last two decades. Figure 1 shows overall scores on the geography portion of the National Assessment of Educational Progress (NAEP). Essentially, there has been no gain in geography learning in schools as a whole, and scores for underrepresented groups, while up slightly, are not statistically significant increases. We also know that there has been no gain in the number of states that require a stand-alone geography course for high school graduation across the schools of America. For example, in 2009 six states required a stand-alone geography course, while in 2017 that number remained at six states requiring a stand-alone geography course (Grosvenor Center for Geographic Education, 2009; Zadrozny, 2017).

There are many possible reasons for this; perhaps most prominently is the clear emphasis by the federal government and state education agencies on teaching and learning in the STEM (science, technology, engineering, and mathematics) subject areas. One can look at this unequal emphasis from the perspective of federal appropriations by subject area from 2002 to 2012 (Figure 2). Geography has been left out in the face of competition from STEM subjects, but also English Language Arts (ELA), history, the arts, and foreign language subject areas.

Other factors also may be considered. A significant dichotomy has existed between university and school geography, with university geography departments emphasizing process-oriented physical geography and geospatial technology, while in the schools geography continues to be part of the social studies (Boehm, 2015). Poor pre-service teacher education in geography continues to plague the subject area in schools. In 2006 in a survey of 1,106 geography teachers in the Dallas–Fort Worth Metroplex area, 92% had three hours or less of university-level geography courses in their certification programs (Boehm, Brysch, Mohan, & Backler, 2012).

We believe that a serious handicap to sensible and dynamic geography education in America’s schools is the widespread difficulties of Geography Education Standards Project, (1994), Heffron and Downs, (2012) to guide the geography component of the social studies standards at the state and local school district level.
This disconnect may be seen as one of the major reasons for a failed alignment between national standards and assessment and curricular protocols at the state level, a clear problem in identifying the geography that is of greatest importance to teachers and students.

We believe that the time has come for a new approach to geography education that will produce academically rigorous national and state standards in geography that address the goals/aspirations of each individual student. Present “top-down,” one-size-fits-all standards, such as Geography for Life, have failed to serve the educational needs of students in our nation’s schools, from rural America to our largest urban school districts. We need to model geographic knowledge for the overwhelming number of teachers who are non-specialists so that the subject is understandable and of great utility to all of their students. Powerful Geography will do this while capturing the imagination and ambitions of individual students, a learning group displaying very diverse social, economic, racial, and ethnic backgrounds.

We begin with a historical survey of geography in American education since the mid-1980s, a period that represents the modern reform era of the discipline in schools. Our review highlights the major initiatives that have occurred in geography curricula and teacher education, the good that came out of those developments, and a frank discussion of their shortcomings. With that as context, we introduce a new framework for geography teacher education that, we believe, is necessary to carry the subject forward well into the future. We explain how the Powerful Geography framework and approach, by threading together Amartya Sen and Martha Nussbaum’s principles of human capabilities, Michael Young’s theory of powerful disciplinary knowledge, and Wesley Null’s concept of a liberating curriculum, is attuned to the professional development needs of teachers and the educational needs of students in all of America’s diverse schools and communities.
The reform movement in U.S. geography education

Approximately 1,500,000 teachers may be responsible for teaching geography in the United States, either as part of social studies in grades K–6, as a stand-alone or combined course in Grades 7–8, or as a stand-alone or combined course in Grades 9–12 (GENIP, 2004). Allowing for variations in certification requirements across states and by grade level, most teachers will only take one or two geography courses during their teacher education program. Typically, these courses are introductory-level, aimed at either a general education audience or intended as a first course in a major. Because of this brief and often inadequate preparation, teachers have long found it difficult to teach geography in a manner that is consistent with the intentions of national and state curriculum standards (Anderson & Leinhardt, 2002; Bednarz, 2003; Chiodo, 1993; Diem, 1982; Reinfried, 2006; Schell, Roth, & Mohan, 2013; Segall & Helfenbein 2008).

It is widely acknowledged that the modern national reform movement in geography education began with the publication of the Guidelines for Geographic Education: Elementary and Secondary Schools (Joint Commission on Geographic Education, 1984). Instructional guidelines were organized around five fundamental themes (location, place, relationships within places, movement, and regions) and keyed to a traditional social studies curricular structure for grades K–6. For secondary schools, geography was identified as a traditional stand-alone subject, strengthened by a set of skills having to do with acquiring, analyzing, and presenting geographic information.

The five themes quickly became the content focus for K–12 teachers, a situation strengthened enormously by the organization and rapid expansion of the National Geographic Society-sponsored Alliance program. National Geographic’s Network of Geographic Alliances consisted of state-based partnerships between university professors and schoolteachers to, as Gilbert M. Grosvenor stated, “return geography to its rightful place in America’s schools.” Eight Alliance states were designated in 1985, and seven more were added each year after that. Hundreds of workshops and summer institutes followed to improve in-service teachers’ knowledge of geography and to help them pass this knowledge on to their students. The five themes quickly became the content structure followed by the Alliance program.

Further authentication for the five themes emerged when they blended so effortlessly into the National Council for the Social Studies (NCSS) curriculum standards, Expectations of Excellence, (NCSS, 1994), seeming to correlate effectively with the Bradley Commission-authored Building a History Curriculum (Bradley Commission, 1988) while also informing the first edition of Geography for Life: National Geography Standards (Geography Education Standards Project, 1994). While the five themes were seen by many as a teaching framework, they clearly formed the basis for a national curriculum in geography, and to some extent the social studies. Over 30 years since their publication, many teachers continue to use the five themes as a framework for their lesson plans and teaching strategies.

Geography, as a discipline, has evolved significantly since the five themes were adopted so widely. University geography has tilted heavily toward process-oriented physical geography and geospatial technology, paradigms that can be quite unfamiliar to social studies teachers (Boehm, 2015). This dichotomy is clearly visible in the 2012 edition of Geography for Life, which shows heavy emphasis on spatial analysis, geospatial technology, and physical geography. These matters are quite important at the university level in Departments of Geography but have difficulty finding their way into the teacher education programs serving future social studies teachers, even though the content of geography courses in middle schools and high schools often include topics related to earth science and human impacts on the environment.

Standards work in geography has now had more than two decades to seep into state social studies curriculum frameworks. This journey has been very uneven (Bednarz, 2003; Munroe & Smith, 1998; Munroe & Smith, 2000), with states writing their own standards resulting in vastly different geography requirements across the nation. As we indicated earlier, the U.S. National Assessment of Educational Progress (NAEP) has repeatedly reminded us since 1994 that students at the 4th, 8th, and 12th grades have made very little gains in proficiency in geography (GAO, 2015; NAEP, 2015). NAEP data show that majorities of students have failed to advance their knowledge of geography ever since the standards were introduced in 1994, with barely any upward trajectory in exam scores, despite the efforts of teachers and the
heavy investments of time, leadership, and money by the National Geographic Society-supported state-based Alliance program. Indeed, 8th graders have never collectively scored at the Proficient level on the NAEP Geography assessment (defined as solid academic performance), with Hispanic and Black students as a whole barely performing at the Basic level (defined as partial mastery of subject matter).

While the ongoing flat performance is certainly disappointing, we suppose the fact that the NAEP data depict no regression in student performance over two decades can be viewed as a silver lining of sorts. In any case, we cannot afford another 20 years of NAEP telling us the same old story about young people and geography. The time has come for new thinking.

**Powerful geographic knowledge for a liberating curriculum**

From 2013 to 2017 the Grosvenor Center for Geographic Education and the National Center for Research in Geography Education have been engaged in research to generate a new thoughtful and effective pathway for students to learn geography in K–12 education. Such a framework must begin with acknowledgment of geography’s central role and place in the social studies curriculum but also its cross-cutting concepts and practices with science, math, and technology.

The next section discusses the principles underlying the Powerful Geography curriculum framework and how it is designed to build on prior reform efforts, such as the Guidelines for Geographic Education (Five Themes) and Geography for Life (National Geography Standards). Powerful Geography envisions a 5- to 7-year research project in which the design of the framework is based on the expansion and practical application of the principles of human capabilities and powerful geographic knowledge, using contemporary workforce data to illustrate these principles for teachers and students.

Powerful Geography has its roots in an international research collaboration known as GeoCapabilities (Lambert & Solem, 2017). The GeoCapabilities project originated in 2012 with a grant from the National Science Foundation to support a new transatlantic collaboration between the United States, England, and Finland (Solem, Lambert, & Tani, 2013). Since that time, the project has attracted additional funding from the European Union and has inspired a robust and extensive international dialogue about the potential and significance of powerful geographic knowledge in the lives of young people.

GeoCapabilities research has attempted, with a target group of geography educators in different countries, to define those elements of geography that have high value, both to an individual’s well-being and to society as a whole. Inspired by Amartya Sen and Martha Nussbaum’s principles of human capability development (Nussbaum, 2013; Nussbaum & Sen, 1993), GeoCapabilities “is concerned with the essential contribution geographical knowledge makes to the education of all young people (or, put another way, how weak geographical knowledge acquisition in school contributes in a particular way to the deprivation of individual capabilities)” (Lambert, Solem, & Tani, 2015, p. 730). In this view, young people stand to gain substantive freedoms in life when they are taught principles of powerful knowledge in school, enabling them to think geographically about the myriad social and environmental problems defining modern times. This capability afforded by geography education is an argument for ensuring all students have an opportunity to learn geography.

GeoCapabilities has produced a collection of teacher-training resources that frame the goals of geography education in terms of Sen and Nussbaum’s principles of human development. This conceptual framework is designed to provide teachers with an orientation to teaching geography that emphasizes the characteristics of geographic knowledge that expand opportunities and freedoms of all people to achieve well-being. This special type of knowledge is referred to as “powerful knowledge” and means understanding and interpreting the world by using information and concepts derived from academic disciplines (Young, 2008). A curriculum based on powerful knowledge encourages productive, rigorous, and critical thought as developed in subject specialist communities, such as geography. Because powerful knowledge is often theoretical, abstract, contested, and highly specialized, it is unlikely to be acquired or learned incidentally through everyday life experiences. For this reason, young people are unlikely to encounter powerful knowledge unless it is taught—an especially daunting responsibility for the vast majority of American geography teachers with little academic preparation in the subject.
Some of our colleagues in geography education believe that the most productive approach to addressing the present challenges in our nation’s geography education system might be to issue a third major edition of the national geography standards and research ways of facilitating their adaptation and implementation in each state. Prior editions published in 1994 and 2012, in their own ways, represent a form of powerful knowledge. Any field of science probably benefits from having a series of subject standards that set challenging and ambitious academic goals for K–12 students. But over 20 years of experience has shown that in most schools the curriculum envisioned by the geography standards is rarely enacted as intended (Bednarz, Heffron, & Solem, 2014).

Because of the limited time available to teach geography in most U.S. schools, we argue for a “bottom-up” approach that fits the unique curricular contexts and requirements of each state, while maintaining a clear focus on the educational needs of all young people and why geography is worth teaching in the first place. This is something that a set of national standards cannot do in and of themselves. Powerful geographic knowledge depends on teachers as curriculum leaders, but it should also be a guiding principle for curriculum framework preparers. Lambert et al. state: “... national jurisdictions have attempted to lay down the standards for the school curriculum, including its geographical component ... they are blunt and often fail to take account of the nuances of context” (p. 731).

The authors further argue this point by stating that “a national curriculum or nationally agreed standards for geography, although useful, in themselves achieve comparatively little, not least from the learner’s perceptive. The words on the page require interpretation and application into a coherent teaching program” (2015, p. 731). Thus, teacher leadership requires teachers to become the curriculum arbiter. We would go a step further and ask that the teachers provide the context for powerful geographic knowledge and that creative application be flexible enough to fit each student and thus provide a useful means of learning the geography that is capable of uplifting each individual.

GeoCapabilities is consistent philosophically with curriculum theory advanced in the work of Wesley Null, Professor of Curriculum Foundations of Education at Baylor University. Lambert et al. argue that powerful geographic knowledge, carefully sifted and delivered in an educational environment, will likely yield “some specific emancipatory educational outcomes.” It has the ability of “developing human potential expressed through growing individual autonomy and agency” (2015, p. 731). Compare this curriculum thinking with Null’s notion of a liberating curriculum:

A liberating curriculum transforms students internally so that they can lead lives of reason, reflection, and deliberation. A liberating curriculum also is a course of study that draws upon all of the talents and abilities of students to make them more humane and compassionate. A liberating curriculum connects students with the traditions that provide the foundational knowledge necessary for understanding social and political life. It also prepares students to deliberate wisely, extend the best aspects of tradition, and lead communities towards the ideas they uphold (Null, 2017, p. 8).

Examples of resources for teachers

How exactly can geographic knowledge liberate the minds of young people? Let’s consider a brief example related to one of the most pressing environmental challenges of our times: climate change. Every time a new climate treaty is proposed, the question arises, “Who is responsible and who is going to pay?” In the ensuing debate, it is quite common for policymakers to display a chart similar to the one depicted in Figure 3, which ranks nations on the basis of their total carbon dioxide emissions from fuel combustion. internal carbon emissions from energy consumption.

At first glance it seems obvious that countries like China are polluting more than countries like the United Kingdom; thus, the Chinese should be expected to pay a greater share of the costs of curbing carbon emissions. This may seem fair and comforting if you happen to live somewhere other than China, but is this a reasonable interpretation from a geographic perspective? What the chart does not show are the many ways the countries are interconnected in a global economy. China exports goods to countries all over the world, while many foreign-owned multinational corporations manufacture goods within China’s borders. Investors across Europe and the Americas hold stock in these companies, while their national economies shift from secondary manufacturing to more service-oriented and knowledge economies. All of these economic transformations
contribute to higher levels of internal carbon emissions in some places and lower levels in others, while implicating everyone in a process of global environmental change.

Having this geographic understanding about the workings of the world economy would enable any student to participate more effectively as autonomous citizens in debates about climate change. They gain a capacity to think geographically about data, such as the emissions chart in Figure 3, leading them to more informed and reasoned judgments than they would otherwise have based simply on taking the chart at face value. This climate vignette is one small but powerful example of the many ways geographic knowledge advances human capability in an era of massive global change.

Readers of this article whose interest is piqued are encouraged to visit the GeoCapabilities Web site (www.geocapabilities.org) for additional vignettes of powerful geographic knowledge developed for teacher training in a wide array of nations. The vignettes were developed through a research process involving teachers and teacher educators, and all are published on a Web-based “story map” powered by ArcGIS online technology.

Social studies educators can find additional U.S.-based examples of powerful geographic knowledge on the GeoCapabilities story map. One U.S. vignette focuses on the topic of environmental justice (Solem, 2018). This example draws on the pioneering research of Dr. Andrew Szasz and Dr. Michael R. Meuser of the University of California at Santa Cruz, who investigated accusations of environmental injustice in Santa Clara County, CA, an area that includes the city of San Jose and Silicon Valley (Figure 4).

Szasz and Meuser’s mapping supported claims that the presence of environmental toxins was much higher in low income, African American and Hispanic neighborhoods. However, questions remained about the underlying causes of the observed patterns. Indeed, Szasz and Meuser’s maps were just the start of a detailed analysis of the historical geography of industrial siting, residential development, and other processes that produced environmental inequity in Santa Clara County. This historical-geographical approach found that the environmental inequalities observed in 1990 were not the result of intentional siting decisions. Rather, they were the result of rising real estate costs, unregulated development, and uneven mobility stemming from racial and ethnic differences in education, occupation, and income.

This environmental justice vignette illustrates the importance of knowledge of historical geography for interpreting maps of industrial pollution and inner-city ethnic neighborhoods. Without this knowledge, people are prone to misinterpret the...
Data that maps depict. One-off studies that examine social and industrial geographies at a single point in time tell us little about the processes that generate unequal risks of exposure to contamination, even when these studies find a significant relationship between race and/or class and proximity to toxic materials. While a map depicting these correlations might suggest bias, by itself it is inconclusive. Knowledge of historical geography is “powerful” because it uncovers layers of information that are not immediately observable on maps, such as those depicted in Figure 4.

Nationalism is the topic of another U.S.-based vignette on the GeoCapabilities story map (Klein & Solem, 2018). This example is situated in the Dakotas, an area of the United States that the Lakota Sioux view as their ancestral homeland (Figure 5). The vignette communicates the “power” of geographic concepts, such as nation, identity, and place for interpreting political movements, such as the Lakota Sioux and other American Indian tribal claims to sovereignty and self-determination in certain regions of the country. These geographic ideas give students a way of thinking systematically about ethnic nationalism and political developments in other countries, including the creation of the Nunavut territory by the native Inuit peoples of northern Canada, territorial conflicts between Sunni and Shi’a Muslims within Syria and Iraq whose boundaries were defined by European colonial powers, and separatist movements in Canada, Spain, Ukraine, Nigeria, the former Yugoslavia, and Northern Ireland.

Other topics and themes currently featured in the GeoCapabilities story map include vignettes on national park conservation, coastal geomorphology, earthquakes, world biomes, and urban change. Like the climate, environmental justice, and nationalism examples, each of these vignettes provides a teacher with an example of a geographic concept or idea in the context of a social or environmental issue, followed by a discussion of what makes that geographic concept or idea “powerful” taught by the lesson. The

Figure 4. Environmental Justice Vignette: Presence of Environmental Toxins in Santa Clara County. (Source: Szasz and Meuser, 2000).
goal is to help teachers quickly grasp the significance of geographic knowledge for developing the capabilities of all students to participate in debates about the global challenges of our times.

**A pragmatic geography framework for teaching and learning**

Our goal in Powerful Geography is to adapt the capabilities approach to fit the unique arena of geography and the social studies in U.S. education and the myriad teacher education challenges that entails. We see Powerful Geography as the secret to attaining a liberating curriculum for all students and a new way of teaching for all teachers. Powerful Geography will rely on a research-based identification of the most important content and skills state by state. This work will create the conditions necessary to transfer powerful geographic knowledge from a set of national standards into aligned state-level curricula, assessments, and teacher education programs. Students will benefit from such a curriculum and will develop a greater potential to fulfill their individual goals and ambitions, enter the workforce, and engage and improve the society in which they will live.

A liberating curriculum such as Powerful Geography must begin with a simplified content framework. Harkening back to the memorable structure of the Five Themes, the content of the Powerful Geography framework consists of four domains (human geography, physical geography, environment and society, places and regions) (Figure 6). Limiting the framework to four overarching synergistic content areas will enhance the likelihood that members of both the academic and educational community understand it and agree to its disciplinary relevance to schools and society.
The Powerful Geography framework avoids a shortcoming of the five themes by emphasizing the integrative nature of the discipline across the content areas (Rutherford, 2005). No one aspect of geography exists in splendid isolation from the rest. One cannot study "places" or "regions" without some sense of how environment and society interact. "Location" may be an absolute measurement or a characteristic of "place" or "region."

The lack of recognition of the synthesizing nature of geography was not only a weakness of the five themes but also somewhat limited the usefulness of the "six essential elements" of the two editions of Geography for Life. Two of those elements (The World in Spatial Terms and The Uses of Geography) featured process standards for spatial thinking and applied geography that were presented as stand-alone standards from the content standards in the other four elements (Human Systems, Physical Systems, Places and Regions, Environment and Society). Separating cognitive processes and geographic practices from geographic knowledge in this manner tends to result in one of two outcomes: (a) an experience of geography as the rote learning of trivial facts or (b) a geography lesson featuring adventurous and active pedagogies but treats geographic knowledge as arbitrary.

The Powerful Geography framework seeks to avoid these outcomes by integrating geography’s "meta-concepts" for thinking geographically, such as space, place, region, interconnection, and globalization, within each of the four content domains. Similarly, the Powerful Geography framework illustrates how geospatial technologies and geographic skills to gather, analyze, and present geographical information are cross-cutting with the four content areas. This integrative aspect of the discipline will be modeled for teachers and students through the use of workforce data aligned with state standards in each content area.

Future work

The Powerful Geography project now enters a 5- to 7-year research plan that will yield data-based curriculum guidelines and standards in every state, thus offering a new and vastly more accessible pathway to learning in geography. The Powerful Geography framework will be the first of its kind to align powerful geographic knowledge with state standards, aided by data collected from surveys and interviews with academic geographers, employers, and geography graduates in every state. This new approach to curriculum thinking is sensitive to variable state requirements and goals for geography in schools. Every state sets different expectations for what students should know and be able to do in geography. Although many states share goals for content knowledge about contemporary issues, such as global climate change, state standards also specify geographic content that is unique to particular states.

For example, the concept of precision agriculture, that is, farming with the assistance of geospatial technology, will likely be of greater interest and of greater workplace value in states like Nebraska and Indiana than in Connecticut and New Jersey. This variation is also reflected in the content standards for geography that states prescribe. Why not, then, focus geography instruction on teaching Nebraska’s and Indiana’s children powerful geographic concepts and skills that enable them to think geographically about agriculture, while focusing instruction on urban issues and other topics as called for in the standards of the northeastern states?

For a practical example of learning materials using the Powerful Geography approach visit www.geoteach.org for a collection of modules that teachers can use for professional development in geography. Currently, there are four modules (precision agriculture, urban heat islands, tornado alley, and water resources), which include lesson plans, videos, and content enhancements that reflect on the powerful geographic knowledge of each module and how students can think about careers in each field. For example, students in Indiana can learn about precision agriculture and the various career options in agriculture provided by geographic information systems that were not there ten years ago. The module on urban heat islands, a
growing environmental threat in large cities, discusses the jobs available for students in urban planning, engineering, and green-specific jobs based on the powerful geographic knowledge covered in the lesson. The modules include videos of geography teachers discussing how they would present this information to their students during a geography/social studies class.

We are not suggesting that youth in our nation’s cities should never learn about agriculture, or rural students should not know how to reduce heat vulnerability, but simply that the notion of learning a “bushel basket” of geography is not addressing the needs of these young people, nor is it focusing on the realities that presently limit the amount of geography education in schools. We can better serve teachers and their students by tailoring geography instruction to the content of standards at the state level, focusing teacher preparation in those states on that content, and orienting teachers on the characteristics of geographic knowledge that make it powerful for understanding that content.

Conclusions

The Gilbert M. Grosvenor Center for Geographic Education and the National Center for Research in Geography Education have jointly proposed a new curriculum framework for K–12 geography. The content framework has evolved from the “five themes” to the “six essential elements” to the new paradigm called Powerful Geography, which offers ease of understanding of a fairly complicated subject matter and changes the teaching and learning perspective from top-down to bottom-up. Powerful Geography emanates from a vigorous research foundation in GeoCapabilities. GeoCapabilities tells us that geography, by focusing on powerful disciplinary knowledge, offers a pathway for students’ intellectual growth, college and career preparation, and personal satisfaction.

GeoCapabilities, as a fundamental approach to curriculum thinking, is validated by education theory and the concept of a liberating curriculum where teaching and learning focus on the individual student and his/her personal goals, ambitions, and life aspirations.

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