Geography in an Interdisciplinary Environment: Developing Research Paths

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Abstract

A tantalizing theme winds its way through the history of modern geographic thought in the United States–the idea that geography as a discipline possesses the methods and content that enable it to act in an interdisciplinary role and integrate thought among the various physical and social sciences. Unfortunately, geography has failed to live up to this lofty potential. Ideas for accomplishing this goal span a variety of environments, including the research community, K-12 education, university education, informal education, and public awareness messaging. The focus of this paper is on geography's place in K-12 education, with specific consideration of interdisciplinary interactions between the subject of geography and 1) the rest of the school curriculum, 2) teaching practice, and 3) school administration. The purpose of this paper is to identify and briefly develop ideas for conducting research that will increase our knowledge and understanding of these interdisciplinary interactions. The paper considers research paths across the spectrum of K-12 education and within both elementary and secondary education.

Key words: geography education, interdisciplinary, synthesis, integrative, research, geography

Introduction

A tantalizing theme winds its way through the history of modern geographic thought in the United States–the idea that geography as a discipline possesses the methods and content that enable it to act in an interdisciplinary role and integrate thought among the various physical and social sciences. In a seminal article, Fred Schaefer (1953, p. 227) noted the presence of this theme throughout the first half of the 20th century, and he observed that some "exuberant characterizations" had promoted geography as "*the* 'integrating science'" (emphasis in original). In 1995, Kevin Archer (1995) echoed these thoughts and noted that the theme of geography as an integrative and interdisciplinary field of learning continued through the latter half of the 20th century. He went on to state that geography's combination of physical and human perspectives had the potential to position the discipline at the "cutting edge of interdisciplinary science" (Archer, 1995, p. 404).

Unfortunately, geography has failed to live up to this lofty potential, and both Schaefer and Archer, among others (Haggett, 1990; Ford, 1984), have expressed concern over this failing. These authors suggest that much of the reason that geography has not adequately implemented the vision for integrating knowledge and understanding from varied disciplines involves the ineffective means geographers have used in attempts to accomplish the task. In addition, they argue that the ways in which geography has communicated its efforts to serve as a discipline of integration have been incomplete and counter-productive. Yet the desire to employ geography as a force to integrate and synthesize knowledge from diverse disciplines remains, and new ideas for accomplishing this difficult task have emerged (Abler, 1992; Gober, 2000; Turner, 2002). These ideas consider geography's place in a variety of environments, including the research community, K-12 education, university education, informal education, and public awareness messaging.

The focus of this paper is on geography's place in K-12 education, with specific consideration of interdisciplinary interactions between the subject of geography and (1) the rest of the school curriculum, (2) teaching practice, and (3) school administration. The purpose of this paper is to identify and briefly develop ideas for conducting research that will increase our knowledge and understanding of these interdisciplinary interactions. One intended outcome of such a discussion is to spur research that will improve geography's ability

to serve an interdisciplinary role and integrate thought among the various physical and social sciences. A second outcome is that such research may highlight and strengthen the presence of geography in K-12 education, a necessary task considering the paradoxical place geography currently occupies. As stated by Malcolm Douglass:

> The strange fact of the matter is that the role of geography in the school curriculum is at once anomalous and ubiquitous. Geography lacks a clear identity. . . Nonetheless, by its very nature, geography is integral to all human inquiry. It is difficult, or even impossible, to separate what is geographic from what is not. In this sense, then, geography is everywhere in the school curriculum. The major problem, both for geographers and geographic educators, and for all curriculum planners and teachers, is to find ways to acknowledge and act on this reality (Douglass 1998, p. 143).

A final intended outcome of this paper is to contribute to improving the level of knowledge and understanding of geography possessed by young people in the United States. Various studies (USDOE, 2001; RoperASW, p. 2002) have demonstrated the need for such improvement, and the research paths discussed in this paper can play a role. Recent educational reform efforts emphasize the important role that research should play in directing educational practices, insisting that choice of educational practice should be based upon effectiveness that has been demonstrated by "rigorous scientific evidence" (Whitehurst, 2003). Consequently, a strong research base is crucial for implementing the educational practices that can lead to greater high-quality geography teaching and learning. This paper focuses on discussing research paths that can improve the effectiveness of the means that geographers and geography educators use to provide this improved learning in an interdisciplinary environment in K-12 education.

Research Paths that Span the K-12 Continuum

Substantial differences exist across the various grades in K-12 education, differences related to childhood and adolescent developmental stages and the school structures and processes that have evolved at these various stages. Nonetheless, commonalities exist across the full spectrum of K-12 education, and the research questions and paths presented in this section apply across this broad range.

First, if we seek to improve the level of student knowledge and understanding of geography, what kind of balance needs to be maintained between the teaching of geography as a separate class/subject and the integration of geography into other subjects? Anecdotally, many geography teachers contend that when geography is integrated into other classes with titles such as World History and Geography, or U.S. History and Geography, the geography is diluted to unacceptable levels. There is a need for empirical research that examines this contention. In addition, research of a more theoretical nature could attempt to define the extent to which the learning of geography may be reduced or enhanced by incorporation with other subjects. Along with these concerns, researchers could also study models for integrating geography with other subjects (cf. Boehm & Saxe, 2001). Certainly, the combined history/geography class is one model that exists, but what other models exist? What connections exist between geography and science courses? More importantly, what, if any, are the optimal models for such integration, and are these models more or less effective in developing geographically literate students than a stand alone geography class?

The second research path relates to the teaching practices and materials used to integrate geography with other subjects. What kinds of teaching practices do teachers currently employ in their classrooms with respect to integrating geography with other subjects? How can research inform the improvement of materials to be used for integrating geography into other subjects? What improvements could be made in teacher preparation for the use of integrated geography materials and/or the teaching of an integrated class? Although these questions are appropriate across the K-12 spectrum, they seem particularly applicable to the elementary level where students receive instruction in all content areas from one teacher.

A third research path relates to integrating geography into the core subjects of math and reading. This is especially important under the current emphasis that federal and state governments are placing on math and literacy. Some studies have indicated that this emphasis has marginalized other subjects (including geography) and negatively impacted the education that students are receiving in these subjects (von Zastrow, 2004). Are there ways to improve the learning of math and literacy without marginalizing other subjects? In what ways is student learning of math and literacy maintained and/or enhanced when such learning is conducted in the context of a subject like geography? Early evidence seems to suggest that student achievement in math is actually improved when math instruction is presented within the context of geography education rather than in a stand alone math class that has

no applied context (Douglass, Dorn, Ekiss, Trapido-Lurie, Comeaux, Mings, Eden, Davis, Hinde, & Ramakrishna. (in print); Rutherford, 2005). How can research contribute to maintaining a broad education that incorporates many important subjects in the sciences and humanities rather than narrowing the curriculum to simply math and literacy? What connections exist between geography and math and literacy?

A brief example of a possible connection that could be explored begins with the common practice of introducing students to the concepts of plot, place, and character when teaching literacy, especially at the elementary level. Place is a fundamental concept in geography, and geographers have an extensive and longstanding literature related to place (Lowenthal, 1961, 1962; Relph, 1970; Tuan, 1971; Buttimer, 1974; Meinig, 1979). Moreover, geographic concepts such as "sense of place" are emphasized by literature scholars and authors (c.f. Welty, 1957; Ford, & Kreyling, 1998). Is it not possible that student long-term retention of the concept of place in literature could be improved by incorporating educationally appropriate materials and instruction that draw from the extensive knowledge and understanding of place that geographers have produced? Conversely, is it not also possible that student learning of the geographic concept of place could be improved if it were taught synergistically with literacy instruction?

Finally, two additional research paths remain. First, a number of vehicles exist to advance geography's potential to serve as a central integrating core for a multitude of subjects (especially science, history, economics). These vehicles include geographic information systems (GIS), field work, and virtual field studies. Little research has explored the educational characteristics that could facilitate using these vehicles to both increase interdisciplinary learning and improve the overall level of geographic knowledge and understanding that K-12 students obtain (Sui, 1995). A second research path relates to the important qualities of a geographic education that are not easily measurable, such as, a need to examine the affective impact of geography on students. For instance, have students internalized greater connectedness to peoples and cultures different from their own? Questions such as this are important but not easily quantifiable.

Research Paths with Particular Relevance to the Early Grades (Elementary Education)

One important difference that exists between elementary and secondary education is the number of subject areas for which a teacher is responsible.

While elementary and some middle school teachers teach multiple subject areas, many secondary teachers (both middle school and high school) teach within only one discipline. The multiple-subject teaching environment of the elementary level would seem to be ideal for studying geography as an integrative discipline. Yet, the potential for using geography as the core of integrated instruction has largely been unrealized. The neglect of geography as an integrative discipline for elementary school instruction deserves research attention.

A second important consideration in elementary education is the substantial differences that exist in childhood development through the early grades. Many educators recognize "grade bands" within the early grades that represent general developmental stages. These bands include Pre-K, K-2, 3-5, and 6-8. How can research contribute to greater understanding of the role that geography may be able to play in the interdisciplinary environments that already exist in each of these early grade bands? How can research contribute to verifying and advancing the perceived role that geography may be able to play in integrating instruction across a variety of subjects in these same grade bands? Such research could start by determining the degree to which teachers are already integrating geography with other subjects including math, science, and literacy as well as the social studies. To what extent are teachers across the United States using geography as central theme to focus teaching of any or all of these other subjects?

A second research path could develop formal curricular models for geography in the early grade bands. Such research could emerge from the empirical data resulting from the research path described above, but in addition, theoretical research could match geographic learning to the cognitive psychology for each grade band. The goal would be to first develop, seek, find, and synthesize models for improved teaching and learning of geography in the early grades, and then test these models to determine their effectiveness. The models could focus on geography learning by itself as well as integrating the teaching and learning of geography across subjects that range from math, science, and literacy as well as the social studies.

A third research path relates to the "expanding horizons" model for teaching geography in the early grades. Based on work by Piaget (1928) and Dewey (1938), this common model starts geographic study with the young learner's home, then neighborhood, and expands to larger spatial categories such as the city, country, continent, and world. While this model has been common in the United States, it may contain a cultural bias focused on the individual. Anecdotal evidence indicates that other cultures, especially Asian, may prefer a "global first" model in which the overall context is presented

first along with emphasis upon duty to broader social structures followed by more localized perspectives that ultimately reach that of the individual.

Additional cultural issues are also involved in a fourth research path. Anecdotal evidence exists that underrepresented minority populations may obtain higher educational achievement when spatial tasks are involved rather than a singular focus on reading and writing. How can research contribute to determining the extent to which spatial skills can be used to advance the learning of other subjects?

A final research path focuses on the teacher. Subject matter knowledge is one important characteristic of a highly qualified teacher, and research could examine the extent to which elementary teachers possess accurate and current geographic knowledge. In addition to subject matter knowledge, what affective qualities support the effective integration of teaching across subjects? What roles do qualities such as enthusiasm, openness, etc. play in improving interdisciplinary teaching, especially related to geographic learning?

Research Paths with Particular Relevance to Secondary Education (Single Subject Instruction)

Secondary education is characterized by single-subject instruction where teachers specialize in a single subject and students move from class to class, each class focused on a different subject. This traditional design dictates separate and distinct disciplines, a model that "views the curriculum through a periscope, offering one sighting at a time: one directed focus on a single discipline" (Fogarty, 1991, p. 61). This model has been criticized as creating learning that is wasteful and ineffective due to a lack of unity and coherence (Britzman, 1991; Mills & Lehman, 1996), a trait particularly noticed in the education of minority students (Lucas, Heinze, & Donato, 1990). How can geography contribute to reducing this compartmentalization and fragmentation that seems to exist in secondary education? Geography's interdisciplinary perspective would seem to have much potential in this regard, but research on the question is needed if the potential is to be realized.

As discussed earlier, geography has an innate affinity with other disciplines, and natural links seem to exist for integrating geography with the teaching of subjects such as history, economics, government, physical science, and reading/literature, links that would be relevant in secondary as well as elementary education. In addition, connections between geography and math seem clear at the elementary level. However, is it possible to establish links between geography and more advanced courses in mathematics? Such links seem difficult to establish, but research efforts could be made in this direction.

Conclusion

The purpose of this paper was to identify and briefly discuss ideas for conducting research that can serve to increase our knowledge and understanding of interactions between geography and other subjects in an interdisciplinary environment in K-12 education. A number of potential research paths were suggested that span all levels of K-12 education. Pursuit of any of these research paths could serve the broader goals of strengthening and infusing the presence of geography across K-12 education and improving the level of geographic knowledge possessed by young people in the United States.

Any research project that seeks to study geography in an interdisciplinary environment in K-12 education should begin with thorough grounding in two relevant bodies of literature. The first of these, of course, is the geography education literature. The second is the large body of literature related to interdisciplinary education (e.g., Davis, 1995; Bess, 2000). This interdisciplinary education literature contains substantial knowledge about integration across disciplines in both educational and research settings, and it provides crucial theoretical foundations for contextualizing research on geography in the interdisciplinary environment. Such theoretical foundations provide the basic knowledge necessary to advance research related to geography as an interdisciplinary field of study, and these theories have not been adequately utilized by geographic educators. In addition, to employing these theoretical foundations in research, geography educators can also advance this body of theory and make important contributions to the overall project of interdisciplinarity. In addition to the interdisciplinary literature, connections should also be made, when relevant, to the growing body of literature that links literacy and math with other subject areas (Parsons, 2002).

A final goal of conducting research on geography in an interdisciplinary environment is to reposition geography so that it assumes a more central role within the broader academic enterprise. Numerous authors have emphasized not only the important contributions that geography offers science and society but also the need to buttress the discipline of geography against threats from larger disciplines that exercise power across academia (Rediscovering Geography Committee, 1997; Cutter, 2001; Cutter, Golledge, & Graf, 2002). Staeheli & Mitchell (2005, p. 366) specifically discuss the concept of disciplinary "centrality" and the unique nature of geography

among the disciplines, a nature that gives it integrative power as it "spans the range of academic disciplines." Staeheli and Mitchell also emphasize the important role that education plays in solidifying the institutional position of geography and assuring the survival of a geographic perspective that is crucial to understanding and solving the complex problems of the contemporary world.

Patricia Gober nicely summarized the problem and the need that geography faces as an academic discipline:

> We have positioned ourselves publicly as a synthetic discipline operating at the triple junction of science, social science, and the humanities. . . I assert that we have these components in our discipline, but that they operate largely in isolation from one another, more akin to a confederation of feudal fiefdoms than to a union of mutually interdependent states. . . This strategy may have served us well in the past, but it seriously hinders our ability to capitalize on current and future opportunities (Gober, 2000, p. 3).

Research in geography education can and should serve to fulfill the potential that the geographic perspective provides in advancing synthetic understanding across fields of knowledge. This paper has discussed research paths to improve interdisciplinary connections, but Gober's statement brings a reminder that such research can also serve to improve intra-disciplinary connections within geography itself.

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