

Teaching the Tool of the Trade: Understanding Teachers' Beliefs, Knowledge, and Practices about Map Skills

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INTRODUCTION

Map learning is one of the most researched areas of geography education. Despite considerable research in map learning, few studies address instructional practices. The few that do confirm the advantages of even small amounts of instruction on map use, but also correctly imply that it is unknown if instruction in reading and interpreting maps takes place. Additionally, it is unknown whether educators have the requisite knowledge and skills to instruct students effectively about maps.

The following questions are addressed in this research:

- (1a) What are teachers' beliefs¹ about map use and understanding; and,
- (1b) What knowledge² about map use and understanding do teachers possess?
- (2) To what extent do teachers understand the curricular requirements about map skills?
- (3) What are teachers' practices³, that is, what, when, and how are map skills currently taught in geography/social studies courses?

The goal of this study is to understand teachers' beliefs, knowledge, and practices regarding map skills.

RELATED LITERATURE

Research pertaining to map use⁴ and understanding is relatively plentiful. It is clear that:

- Children can use simple maps at a young age for way-finding purposes (Bluestone and Acredolo 1979; Blades and Spencer 1990);
- Children are able to read simple maps (Trifonoff 1995; Wiegand and Stiell 1996); and,
- As map complexity increases, both children and adults have difficulty using maps (Downs and Liben 1991; Gregg 1997).

A small number of studies suggest that instruction improves map understanding (Atkins 1981; Saku 1992; Gregg 1997). This research suggests that some instruction is better than no instruction. Additional research asserts that map use and understanding can be improved with instruction (Downs and Liben 1991). And, yet, it remains unclear how map skills are taught.

METHODOLOGY

Due to the goals of this study, multiple data collection methods (qualitative and quantitative measures) are used. Quantitative measures provide general, baseline data about teachers' beliefs, knowledge, and practices, while qualitative methods provide a deeper understanding of these issues. The study is conducted in three stages: a survey, interviews, and observations.

Sample Selection

The sample selection for this study is purposeful: teacher-members from the Texas Alliance for Geographic Education (TAGE). The state mandated curriculum, the Texas Essential Knowledge and Skills (TEKS), include a solid geography strand as part of the social studies curriculum throughout all grade levels. Map skills are found throughout the geography strand. Accordingly, social studies teachers in Texas should be teaching map skills at all grade levels.

The Survey

A twenty-one-item survey, developed by this researcher, is used to determine the role of maps in the classroom. Survey items address the three research questions of this study. Item format is both open-ended and multiple choice. Open-ended questions allow respondents to write their answers freely. By using such a format, respondents are less likely to be guided toward a particular choice, and the format allowed for a variety of responses. For multiple-choice questions, a limited number of responses were expected, and it seemed appropriate to guide respondents' answers. By using both open-ended and multiple-choice questions in the survey, a compromise between convenience (multiple choice) and richness of answers (open ended) is sought.

The survey was distributed to approximately 600 geography and social studies teacher-members of TAGE during the Spring of 2002. The sample comprises 10 percent of the approximately 6000 TAGE members. The sample was selected using simple random sampling from the TAGE database.

Interviews

The purpose of the interview is to gather in-depth data regarding teachers' beliefs and practices, as well as determine what they know about geography

generally and maps specifically. Interviews are commonly used when trying to capture teacher beliefs and knowledge (Smith and Shepard 1988).

Three teachers each from elementary, middle, and high school levels are selected, drawn from the pool of survey respondents. They are identified based on three criteria: (1) willingness to participate, (2) geographic location, and (3) level of expertise. The first two criteria are self-explanatory. Teachers' level of expertise is assessed along a map skills continuum, based on survey responses.

Each survey was categorized according to a continuum adapted by this researcher from the National Assessment of Educational Progress (NAEP) geography proficiency standards (Weiss et al. 2002), the National Geography Standards, and the TEKS. The continuum, following the NAEP framework provides three levels of mastery (basic, proficient, and advanced) at three grade levels (elementary, middle, and high school).

The categories of basic, proficient, and advanced build on one another, so that a student with proficient skills can perform the basic tasks as well as the proficient ones; grade levels build on one another, so that a high school student at the basic level can accomplish the basic tasks outlined at elementary and middle as well. For students to meet these standards, they must be taught both *about* maps and *with* maps (Acheson and Bednarz, 2003, forthcoming). In the former, students are equipped with the requisite skills in order to read, interpret, and produce maps; in the latter, students can use maps to understand and explain geographic concepts and relationships.

The continuum is organized along a 10-point scale from basic (1) to advanced (10). The scale allows for greater distinction among survey respondents; the three terms coupled with a number rating permits greater distinction between respondents, and a more accurate categorization of teachers' expertise. For example, some teachers could be categorized as "highly basic" or "lowly proficient." Each respondent is categorized as advanced, proficient, basic, and below basic⁵ for his or her grade level. In identifying interviewees, a range of expertise is sought at each grade level.

This continuum is also used to determine what topics are reportedly taught by educators in this sample. Are certain topics of this continuum regularly taught? Are certain topics rarely taught? The continuum provides the focus of map skills lessons by survey participants.

A standard interview protocol is used during each (approximately) hour-long interview. The protocol questions are organized according to the research questions. Interview data are coded along the map skills continuum. In addition, data are displayed in matrices in order to effectively describe what is "going on" in the research setting and then explain "why things occur as they do" (Miles and Huberman 1994, 90). Drawing conclusions, or interpreting, the data

follows the tactics outlined by Miles and Huberman (1994, 245-287).

Observation

Classroom observation occurs to further understand teacher practices, and coincide with interviews. Observations last for approximately three hours. While this period is limited, it provides a glimpse of teaching style and approach to geography and are viewed as a piece of confirming (or, disconfirming) evidence about teachers' practices.

Additional Sources of Data

Additional sources of data are collected to supplement the primary data (as described above). Lesson plans used for map instruction are collected from interview participants. Textbooks and other resources used to teach map skills are examined as well as any school mandated curriculum that is used. Further insight about teachers' beliefs, understanding, and practices can be gained through the collection of additional sources of data.

CONTRIBUTIONS AND IMPLICATIONS

This study is meant to provide baseline data about how teachers understand maps, and consequently teach them. This study is initial, but hopefully will provide groundwork for further research upon which to build. Currently, there is little research that considers teacher practices with regards to maps. The "traditional" map teaching described in studies by Atkins (1981) and Saku (1992) offer a rather bleak picture of map skills instruction: students are given maps to study independently, without any real instruction occurring.

This study is meant to provide some understanding about the link between educational standards and curricula with teacher practices. If there is a gap between what standards say should be done, and what teachers are in fact doing, then that gap must be identified. Standards hold little value if they are not implemented. By understanding what teachers are thinking and doing with maps, evaluation of current methods can occur, models can be created, and student learning can be determined. The results should benefit teachers, curriculum planners, geographers, and most importantly, students.

NOTES

1. Beliefs are what an individual holds to be true (Smith and Shepard 1988, 308).
2. Knowledge is that which is learned through experience or study.
3. Practices are actions taken (Smith and Shepard 1988, 309).
4. Herein, "map use" will refer to the varied skills involved in reading, inter-

preting, analyzing, and making decisions based on information derived from cartographic maps.

5. Teachers who do not meet the basic criteria at their grade level are categorized at *below basic*.

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