

# Using Geography to Help Teach History: Dual-Encoding History Lesson Plans

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The authors would like to thank the Kansas Geographic Alliance for financial, editorial, and moral support.

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*Accepted on 1/14/12*

## Abstract

How can we teach more and better geography within the school system? Given the dominant role of history in the K-12 social studies curriculum, use of the psychological theory of dual-encoding to integrate geography and history lesson planning is one approach to bring more geography into the classroom. As part of the Kansas Geographic Alliance's programmatic activities, Kansas' geography and history standards were examined for development of dual-encoded educational units. Five units, each containing four lesson plans, were developed. Three workshops were delivered to share the newly developed materials. Attendees at the workshops provided assessment and feedback on the unit plans. Participant feedback indicates that dual-encoding is helpful, and, thus, the integration of history and geography using this method is likely to result in considerable progress for increased geography in students' education. Not only will the knowledge provided demonstrate the impact and significance of geography to history teachers and their students, but dual-encoded lessons might also advance teacher content and pedagogical knowledge. Most importantly, however, a dual-encoded approach to classroom teaching of geography and history will improve the learning of both subjects.

**Keywords:** Geography, history, education, dual-encoding, lesson planning, K-12 social studies curriculum

## Introduction

Over the past two decades, great concern has been expressed regarding the geographic literacy of American society. The welfare and security of our nation both today and in the future depend on a well-rounded international knowledge base and the ability to apply that information (National Research Council (NRC), 1997). Currently the population is greatly lacking in knowledge of geography (Roper Public Affairs, 2006). Because of these deficiencies, there has been a renewed focus on geographic education and its importance (Grosvenor, 1995). However, a true lack of the concept of what geography is and how it can be taught among K-12 social studies teachers has made this endeavor difficult, especially since existing education structures limit time available for geography content and educational methods.

In education, geography is frequently considered an umbrella discipline that bridges and relates to many other disciplines, such as history, anthropology, biology, and geology, because it engages student learning through an understanding of connections and relationships among most aspects in the world (Geography Education Standards Project, 1994; NRC, 1997). Greater geographic knowledge has the potential to improve human relationships and reduce environmental degradation as society begins to understand that geography is not just about the *what* and *where* of people and places, but *how* and *why*, including the cultural, religious, and historical connections that have occurred because of these relationships (Carr, 2005). If students do not gain a better geographic understanding, it is not likely that they will be able to understand and apply geographic concepts and perspectives that provide a basis for understanding patterns, associations, and inter-relationships through asking the questions: Where?, What?, Why?, and How? (Gersmehl & Gersmehl, 2007). These concepts and perspectives include understanding relationships between places, interpreting human-environment connections, identifying and deciphering spatial arrangement and interaction, and comprehending associated patterns and how they matter at the local, regional, and global scales (Golledge, 2002).

The educational connection between geography and history is clear. The history of people happens in locations which are relevant to understanding past events as they are played out on the “stage” of geography. Geography allows the dissection and analysis of the connections between places, people, and

their environments in which their history has occurred. Thus, the combination of geography and history is an ideal pairing, because as defined by region and era, geography and history together provide an integrated narrative by which to teach social studies (Wishart, 2004).

In Kansas, the vast majority of K-12 social studies classrooms are history-oriented (Thornton, 2005), and the assessed social studies standards are history-centered; this is evident from history's role in having the greatest number of tested social studies standards, as well as its dominant position in required course offerings for a social studies teacher's education. Given the comparative advantage of history in relation to other social studies subjects, one way to approach the requirements of history standards, while including the needed geography content, is to conjoin the teaching of the two subjects.

This research proposes to "conjoin" geography and history through application of the precepts of "Dual-encoding Theory" which is a powerful tool in education. Dual-encoding first appeared for explaining the roles of verbal and non-verbal influences on human memory; however, over time, this theory has been extended and applied in other areas, such as learning (Sadoski & Paivio, 2004).

The brain perceives, recognizes, interprets, comprehends, and remembers experiences that are verbal and non-verbal, and learns from both. Connections between verbal and non-verbal information within the brain's memory allows for retrieval and use of knowledge at a later time, thus increasing student-memory of classroom experiences (Paivio, 2006). Therefore, the bridging of verbal information from geography, for example from using maps depicting the spatial characteristics of the setting, with the non-verbal information and textual nature of history, necessitates dual-encoding. This process of integrating geography and history in student-memory makes available a greater possibility for cross-curricular themes as well as providing an opportunity for new curriculum to be built having the potential to be empowering and socially transformative.

The goals of this study were to further geography education in Kansas through the creation of curricular materials to be offered through professional development workshops that focused on providing a rigorous background in geographical and pedagogical content knowledge (Ormrod & Cole, 1996). The prospect for increased geography content knowledge was enabled by employing the processes involved with dual-encoding history lesson plans on tested state standards with strong geographical content for grades seven and eight. This information was used in three ways: 1) to demonstrate how dual-encoded history and geography education has the potential to increase student learning, especially in geography content; 2) to demonstrate to teachers that

geography is not an isolated subject but can be taught in conjunction with other disciplines; and, 3) to facilitate improved education practices in teaching geography and history in Kansas' schools. The findings from this study have immediate and broad implications for geography education. This research first contributes to progress being made across the disciplines of geography, history, and education, and overtime, should dual-encoding be adopted by teachers, this approach has the potential to improve student learning of geography as well as serving as an innovative teaching technique for geography education (Bednarz, 1997).

The research objectives addressed with this study were: 1) determine appropriate history standards that can be enhanced with geographical content; 2) prepare a teachable rationale for dual-encoding, 3) create lesson plans that can be used to demonstrate the value of dual-encoding tested history standards with geography content; 4) deliver lesson plans at three professional development in-service and pre-service workshops; and 5) assess teacher response to the practice of dual-encoding and the lesson plan material.

### Dual Coding Theory and Cognition

As introduced above, dual coding or dual-encoding is best defined as a theory proposing that the human brain processes verbal and non-verbal information differently, and that both travel along distinct pathways in the brain. Dual-encoding suggests that the brain creates separate codes for the information processed in each pathway and links the two representations. The verbal and non-verbal codes for representing information are then used to organize external information into knowledge that can be utilized, kept, and retrieved for future use (Sadoski & Paivio, 2004). According to this theory, student learning is improved when more than one pathway of learning and memory is being stimulated, and with the use of dual-encoding, an increase in learning is achieved (Paivio, 2006). The learning process and pathways of the "Dual Coding Theory of General Cognition" are illustrated in Figure 1: the globe represents verbal information while the book, non-verbal information. The figure also shows how the two connect with each other after being absorbed by the sensory system.

Dual-encoding can be used to integrate various social science education disciplines and appears to be a highly efficient way to increase the amount of geography taught in the classroom setting. This is especially salient given that history is a subject closely aligned with geography (Binko & Neubert, 1996). The connection between history and geography is stated well in Downs,

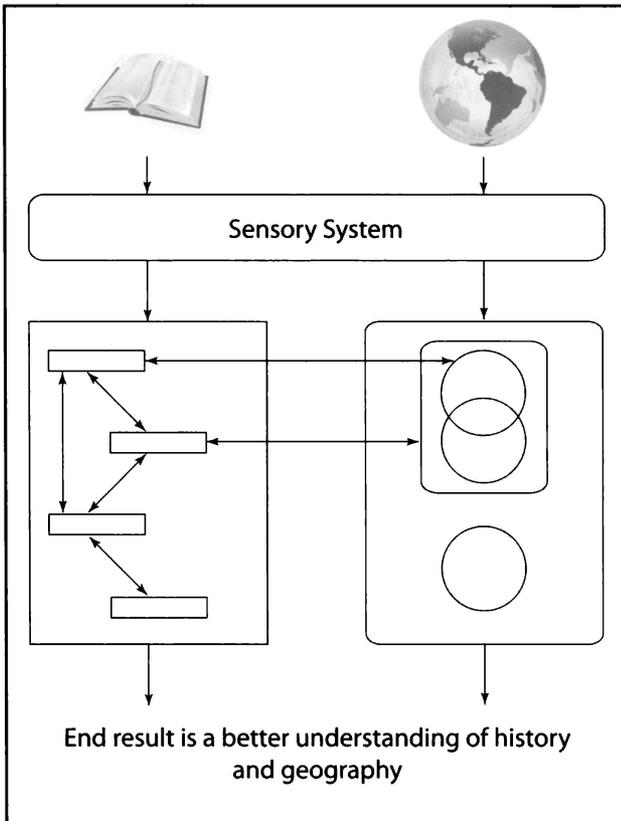


Figure 1. Model of Dual Coding Theory  
(Source: Modified from Sadoski & Pavio 2004).

Liben, and Daggs (1988), “facts as such have little value, just as dates have little value in history. But dates well correlated tell the history of the world in the same way geographical facts are the background for world knowledge and understanding” (p. 681).

Maps are exceptionally critical to a child’s learning and development throughout the school years. The distinct contribution of graphical communication is hard to quantify and fit into formulas; however, despite this difficulty, the use of graphics in the classroom is crucial (Balchin & Coleman, 1965). Graphics, including maps, offer assistance for interpretation and better understanding of a concept, through graphic design and composition, for instance, by the use of color, pattern, design, texture, and balance. Further, graphics and maps are important tools for communicating patterns and

identifying limitations and relationships. Through a better understanding of spatial relationships and the ability to identify, ask, and answer place-based questions, students will not only have a better grasp of the history they are learning, but through the use of both verbal and non-verbal information that geography and history provide, the students will have a better chance of remembering and being able to use both the historical and geographical information again (Paivio, 2006). Accordingly, maps provide a non-verbal accompaniment to historical texts for achieving dual-encoding. The ability to provide greater student comprehension offers a teachable rationale for the use of dual-encoding to teach history using geography.

### Dual-Encoding History and Geography

Prior research in dual-encoding provides teachers with an integrated approach to teaching history through the use of geographical concepts and skills for an enhanced learning experience. Such an experience is pertinent for a higher level of spatial thinking through spatial learning. *Spatial learning* involves part of the individual's visual learning style that utilizes images, pictures, colors, and maps to organize and communicate information, such as map patterns, distances, and connections, while *spatial thinking* involves the process of thinking about locations, conditions, and connections (Gersmehl, 2005; NRC, 2006). Geography uses *spatial learning* to promote and teach *spatial thinking* skills.

Spatial thinking and learning are applicable in the history classroom but they are not a primary concern for K-12 history teachers. Nevertheless, by integrating history with geography, social studies teachers have the potential to become better equipped with more effective ways to teach both geography and history than with traditional methods. Fallace (2009) reinforces this concept by stating, "effective history teachers draw upon techniques and understandings unique to the discipline, not upon a generic set of instructional tools . . ." (p. 1). Thus, all of these elements combined provide a better approach to the teacher's understanding of geography's confluence with history. Geography helps frame history with a greater sense of setting, environment, and cultural landscape for the development of human society over time (Binko & Neubert, 1996).

Over time, the offering of professional development workshops in conjunction with the availability of dual-encoded lesson plans is expected to help shape and improve instruction in Kansas classrooms by making history and geography education more accessible. Teachers are largely unfamiliar

with how to teach geography, much less, how to deal with the vast amount of material that it encompasses. The findings from this study provide a justification and opportunity for teachers to incorporate geography into their teaching patterns and practices.

## Methods

The basic research design called for the development of five history units dual encoded with geographical concepts and skills; each unit contained four lesson plans. Three groups of workshop participants examined a selected unit and provided an in-depth assessment. A qualitative analysis of the assessments provided feedback and efficacy of dual-encoding.

The study focused specifically on the State of Kansas' educational system. Many factors were taken into consideration, including: the system of teacher preparation, methods for certification, existing use of in-service learning, and teacher professional development, as well as, the implementation of curriculum. Existence of state-tested standards and their value in the Kansas education system were also significant. The objectives, methods, assessment, and results all related directly to the procedures set forth in Kansas' education policy.

## Creating the Units and Lessons

The history units covered a major theme in Kansas history, for example, settlement. Complete unit plans included a cover page, table of contents, concept map, four individual dual-encoded lesson plans, and an appendix containing all of the required resources to implement the lessons in the classroom. The primary textbook used as a resource for the units was *The Kansas Journey* (Chinn, 2005), a textbook written specifically for seventh grade Kansas social studies classes. Additional texts used as references include: *Environment and Man in Kansas* by Huber Self (1978) and the *Historical Atlas of Kansas* by Homer E. Socolofsky and Huber Self (1992).

Each unit's theme was created purposely to fit and incorporate the seventh and eighth grade Kansas history standards, with an emphasis on the tested standards, in collaboration with the fourth through eighth grade geography standards presented in *Geography for Life* (Geography Education Standards Project, 1994). The selected history standards were subdivided into five categories and the corresponding unit themes were: 1) Kansas in the Civil

War; 2) Native Americans in Kansas; 3) Westward Expansion; 4) Settlement and Transportation; and 5) Settlement and Migration. The dual-encoding that related to the curricular development process in creating the units and their individual lessons consisted largely of additions of map-based and other non-verbal activities, such as photos, charts, and graphic organizers. These activities stimulate the use of geography-centered skills and their application, such as the ability to interpret, understand, and make maps, as well as visualize the connection between space and time. An example of corresponding geography and history standards, from the “Native Americans in Kansas” unit may be seen in Table 1; the standards listed are State of Kansas standards. Other related activities emphasized the increased use of the geographic approach; Gersmehl and Gersmehl’s (2007) eight modes of spatial thinking (comparisons, auras, regions, hierarchies, transitions, analogies, patterns, and associations), as well as, the *Five Themes of Geography* (movement, region, human-environment interaction, location, and place), were also widely used to help incorporate geographical concepts and skills (Joint Committee on Geographic Education, 1984).

The lesson plans were written using a modified version of “backwards design” by Wiggins and McTighe (1998). Backwards design is best known for its format of placing the material to be assessed at the beginning of each lesson. The creators of backwards design agree and cater to the idea that teachers and students will learn more if the students know what their learning goals are from the beginning.

Four items were central to the structural development of the dual-encoded lesson plans: 1) identification of the usefulness of dual-encoding for educational purposes; 2) the use of Bloom’s taxonomy (Bloom, 1956); 3) Fink’s taxonomy (Fink, 2003) for more reflective lessons; and, 4) the modification of backwards

**Table 1.**  
*Corresponding Kansas geography and history standards in the “Native Americans in Kansas” unit.*

<b>Standard Number</b>	<b>Standard Description</b>
History standard (Grade 7: History. Benchmark 1: Standard 4)	Analyses the impact of the Indian Removal Act of 1830 on the way life for emigrant Indian tribes relocated to Kansas; loss of land and customary resources, disease and starvation, assimilation, inter-tribal conflict.
Geography standard (Grade 7: Geography. Benchmark 4: Standard 2)	Explains how the spread of cultural elements results in distinctive cultural landscapes (e.g., religion, language, customs, ethnic neighborhoods, foods).

design. Bloom's taxonomy (1956) is a series of ever-more complex steps for learning, beginning with knowledge and increasing in cognitive complexity through comprehension, application, analysis, synthesis, and evaluation. Fink's Taxonomy (2003) is a wheel of significant learning components which includes integration, application, human dimensions, caring, learning to learn, and foundational knowledge.

Following the completion of a first draft of each unit plan, a Kansas Geographic Alliance Teacher Consultant provided constructive feedback on the lessons. The review suggestions were vital to the improvement of the overall effort. These unit plans were specifically designed to accommodate any seventh or eighth grade classroom. Collectively, the five unit plans provided over 30 class periods of materials with each lasting 45 minutes (for a sample lesson plan outline see Figure 2; the standards listed in the outline are Kansas history standards). All unit plans may be downloaded from <http://www.k-state.edu/kga/dualencodedunitplans.html>, with complete appendices of all needed materials listed.

### Delivering and Assessing the Material

Two participant groups, pre-service and in-service teachers, participated in one and two-hour workshops; all workshops were given similar forms of assessment. The first workshop focused on professional development for current teachers and was held in conjunction with the 2010 Kansas Geographic Bee. The second workshop was given for pre-service education majors in a social studies methods course at Kansas State University. The third workshop was held for pre-service education majors and education professors at Fort Hays State University. Each participant group was asked to fill out a feedback assessment sheet at the end of their session. The assessment sheets followed the same format, but did vary slightly between workshops for current teachers and pre-service teachers.

The workshop presentations were designed for each specific audience, work space, and time frame. The content of the workshops included an overview of the significance of geography education, definition, discussion, and an in-depth look at the process of using dual-encoding of history and geography in social studies education, an examination and demonstration of a designated unit plan, and a conclusion with the feedback assessment sheet. Each workshop incorporated one of the unit themes and all participants received a copy of the complete unit plan that they examined. The workshops were very interactive, with frequent input from the group. Participant contributions

**Lesson Plan One**  
**Where Would You Go?**

**Grade Level:** 7-8

**Standard(s) Addressed:** (Grade: Benchmark: Indicator), \* is tested standard

- Analyzes the effect of rural depopulation and increased *urbanization* and suburbanization on Kansas (7:6:4)
- Analyzes the development of nativism as a reaction to waves of Irish and German immigrants (8:1:8)
- Compares and contrasts the experiences of immigrants in urban versus rural settings (8:3:7)

**Unit Essential Question(s):** How did migration affect settlement arrangement in Kansas?

**Overview:** Students will identify push and pull factors of why people move in, out, and around Kansas. They will create their own “towns” and track their movement.

**Concepts:** Migration, immigration, rural, urban, suburban, depopulation, nativism

**Purpose:** To have students understand the reasons that individual people and groups move and the influence that their movement has on location.

**Lesson Essential Questions:**

Students should be able to discuss the following:

- What is migration?
- What push and pull factors influence migration in, out, and around Kansas?
- How has migration changed over time? How have the factors changed?
- Who migrates?
- What impact has migration had on Kansas over time?

**Time:** Two to four 45 minute class periods.

**Materials:**

- [The Kansas Journey](#) by Jennie Chinn, pages 120-139
- Population in Kansas 1970
- Decade of Maximum Population in Kansas 1970
- Population Map of Kansas Census 2000
- Population Growth in Kansas 1860-1970
- Population Density in Kansas 1970

**Procedure:**

1. Introduce the unit essential question, concept, and lesson essential questions.
2. Read or summarize for class selected portions from textbook pages 120-139.
3. First, identify push-pull factors and the differences in the word migration and immigration for the class.

Figure 2. Lesson plan outline from the “Settlement and Migration” unit. (Source: Created by author).

included examples of what they did, or planned to do, in their own classrooms. Those ideas were then modified with discussion about the application of dual-encoding, and molded into new ideas about teaching the selected learning outcomes.

## Results

A feedback assessment was given to all workshop participants at the end of each workshop. The results of this study were acquired through a qualitative analysis of the assessments. The first part of the assessment asked each participant for basic demographic/general information: their gender, number of years teaching or year in school, grade and subject they taught or wanted to teach, and whether they taught or wanted to teach in a rural or urban setting. The second section asked for: the reason they were attending the workshop, what they knew about dual-encoding, whether the workshop helped in understanding dual-encoding, whether they would be comfortable using it in their teaching, whether they would be willing to share the materials with others in their districts, the level of effectiveness of the lesson plans, whether they felt the knowledge gained from the workshop would affect their teaching, and whether the approach generated enthusiasm for geography and history education (Table 2).

The study's sample size was approximately equal between male and female participants. More teachers worked or wanted to work in a rural setting, which coincided with the distribution of schools in the state of Kansas. The participants predominantly taught, or wanted to teach middle school (6th - 9th grade), so it was beneficial that the unit plans developed for this research met the 7th and 8th grade history and geography standards. The majority of the participants either currently taught or anticipated teaching history as one of their subjects.

The collective assessment from all three workshops strongly suggested a favorable outcome for this study (Table 2). Responses indicated that social studies teachers (N = 29) were both willing to consider and seek new knowledge about geography education. Dual-encoding was not well known but participants felt that it could be taught through in-service professional development with positive results and would have an immediate impact on teachers. The unit plans created, shared, and distributed for the purpose of this study were deemed effective. Higher order thinking skills were emphasized and the workshops demonstrated ways to bring the skills to the classroom via the cross-curricular units. Lastly, though certainly not because of its level of importance, this study and its methods were beneficial in generating enthusiasm in teachers for dual-encoded geography and history education.

Table 2.

*Overall assessment feedback (N=29).*

Sample Questions from Assessment	Answers from Participants
What, if anything, did you know about dual-encoding prior to this workshop?	54% Did not know the concept 46% Know the concept, but not the name
Did this workshop help you to better understand the value of dual-encoding?	95% Yes, it helped 5% Already use it, but it helped
And are you now comfortable with the concept of dual-encoding so that you might use it in your teaching?	71% Will use it 16% Might use it 13% Already use it
How effective do you believe the specific lesson plans and materials provided will be in your teaching?	73% Very effective 10% Effective 17% Moderately Effective
Do you feel that any of the information gained in this workshop will influence the way you approach teaching?	87% Yes 8% Maybe 5% No
Was enthusiasm for integrated geography and history education generated?	96% Yes 4% Somewhat

### Summary and Discussion

There is a significant level of concern regarding the poor status of geographic literacy in the United States (Roper Public Affairs, 2006). More and better geography education is needed to remedy the situation with a greater emphasis on K-12 geography, history, and social studies education being part of the answer to this problem. Grades K-12 are considered to be the ideal time to teach and cultivate spatial learning and spatial thinking skills, as well as, promoting the global perspective and life skills that a geography education provides (Downs et al., 1988; Geography Education Standards Project, 1994). Advances in cognitive psychology, including dual-encoding, have the potential to revolutionize and give K-12 education the major boost it needs.

Because geography is a holistic subject, it can be readily integrated and taught in conjunction with another subject very easily (NRC, 1997). The ability to link geography with other subjects that receive more classroom time, such as history, is a viable approach to teaching more geography in the K-12 classroom as well as ensuring that students learn, understand, and are able to use the geographic approach.

The workshop participants were introduced to the process of dual-encoding and instructed on how it applied to lesson planning as a new way to systematically and efficiently share information. Through the workshops, teachers were provided a greater foundational and pedagogical content knowledge of geography. Giving workshops to a variety of educators--college professors, practicing teachers, and pre-service teachers was purposeful, as each group provided a unique perspective on the material. Teachers are the face of education across the country and make the everyday difference in students' lives. It is important to get teachers active, involved, and up-to-date on available teaching strategies and methods. Further, involving pre-service teachers provides them with a greater perspective and knowledge on the importance of geography in the classroom and ways to incorporate geography in their teaching from the beginning of their education career. Future research calls for bringing the created lessons into the classroom to obtain student feedback and progress.

Outcomes of the workshop data analysis documents the value of dual-encoding in geography and history education and reinforce the benefits of professional development workshops for teachers. It was observed that teachers wanted to know more about how to teach and use the principles of geography in their classroom; they agreed that dual-encoding is a viable and proven channel for bringing more geography into the predominantly history-driven social studies classroom. The newly developed units disseminated in a workshop setting, generated excitement for geography and history education; teachers reported that the information they gained will influence their teaching of these subjects. Based on the interactions with teachers in Kansas through this research, we conclude that a dual-encoded approach incorporated into teaching materials and disseminated through professional development activities will benefit both history and geography education.

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