US-China Education Review A 12 (2012) 1053-1060
Earlier title: US-China Education Review, ISSN 1548-6613

Integrating Reading, Science, and Social Studies: Using the Bogan Differentiated Instruction Model

Barry L. Bogan, Ethel King-McKenzie, Bongani D. Bantwini
Kennesaw State University, Kennesaw, USA

In the age of standardized testing, science and social studies are not given the same priority as mathematics and reading in the curriculum of United States schools. High stakes testing is viewed as having heavily biased schools toward teaching tested subjects and away from less frequently tested subjects. This paper is premised on the notion that all subjects are important and none should be neglected; and the general education classroom can be best described as a place for learning with inclusion as the focus. Essential is a model for integrating reading, science, and social studies to enhance inquiry, problem-solving, interest, critical thinking skills, and learning. To meet the standards of inclusion teachers need a model that helps to integrate the content standards, incorporates backward design philosophy, gives a standard format for lesson framework, and allows for differentiated instruction and flexible grouping to teach via inclusion of using taxonomies for adapted learning. Thus, the authors present and discuss the BDIM (Bogan Differentiated Instruction Model) which combines major teaching concepts to develop interdisciplinary teaching. This model addresses the concept of adding differentiated instruction to curriculum integration. In conclusion, a framework that ensures that the lesson objectives and essential questions are interrelated is presented.

Keywords: differentiated instruction, curriculum integration, elementary education, social studies, science, reading, teaching

Introduction

Over the past decades, there has been an outcry regarding the unsatisfactory attention given to the teaching and learning of both science education and social studies (Glenn, 2000; Honey, 2011). Many elementary teachers report that they simply do not have time to teach social studies, and therefore, it is often reduced to a place of minor importance (Kaplan, 2002; McCaIl, 2004; Van Fossen, 2005; Vogler, Lintner, Lipscomb, Knopf, & Heafner, 2007). Researchers have indicated that social studies is viewed as not important and is sometimes considered as an enrichment or second-ranked subject (Hinde, 2005; Houser, 1995; Thornton & Houser, 1996; Wade, 2002). Social studies instruction in the early childhood/elementary years, however, is the essential foundation for students to become active and responsible citizens in a diverse, interdependent, and democratic society. It is unlikely that teachers in middle and senior high schools will be successful in preparing effective citizens if social studies instruction is neglected in the earlier years. Similar observations have also been made

Barry L. Bogan, Ph.D., assistant professor, Bagwell College of Education, Kennesaw State University.
Ethel King-McKenzie, Ph.D., assistant professor, Bagwell College of Education, Kennesaw State University.
Bongani D. Bantwini, Ph.D., assistant professor, Bagwell College of Education, Kennesaw State University.

about science education.

According to Honey (2011), science is taught for less than three hours. She argued that the situation is worse in schools that have been identified as "in need of improvement" as science is entirely eclipsed by subjects that students will be tested on. Additionally, these are the very same schools that are likely to have higher levels of poor children and children of color. Various reasons have been proposed for this behavior, including lack of time and space, inadequate science background, lack of sufficient resources, and so on (Johnson, 2007; Moreno & Erdmann, 2010; Tilgner, 1990). Furthermore, high stakes testing is viewed as having heavily biased schools toward teaching tested subjects and away from less frequently tested subjects like science and social studies. A variety of other reasons have been cited as contributing to science and social studies left behind in the teaching and learning process including teacher lack of confidence in these subject areas (Appleton, 2005; Bybee & Fuchs, 2006; Johnson, 2007; Tyler, 2007). Teachers have often reported being uncomfortable teaching science due to their lack of content knowledge and having unsuitable texts or resources (Appleton, 2005; Kenny, 2012; Tyler, 2007). Furthermore, there is no incentive or reason to teach or for students to learn the material for it is generally not a part of state examinations and as presented does not show immediate relevance or application to their lives.

By truly integrating other content areas within the realm of social studies, teachers might solve their limited time problems (Christensen et al., 2001). Integration would also give students opportunities to see how social studies concepts fit into the entirety of human experience, including art, literature, politics, government, philosophy, and psychology (Cannon, 2002). Honey (2011) cautioned that it is time to acknowledge that there has been an unprecedented and precipitous decline in science teaching and learning. It is, therefore, the authors' beliefs that every means necessary should be used to teach social studies content to students and a good way to do this is to integrate it in reading and science.

Why Learning Area Integration?

The integrated curriculum is not a new concept. It has been around since the 1800s and was put forth by Dewey (1954), who stated:

> … old subject centered system subdivides each topic into studies; each study into lessons; each lesson into specific facts and formulae… emphasis is put upon the logical subdivisions and consecutions of the subject matter… subject matter furnishes the end and it determines method. The child is simply the immature being who is to be matured; he is the superficial being who is to be deepened; his narrow experience which is to be widened. It is his to receive, to accept. His part is fulfilled when he is ductile and docile. (pp. 12-13)

Dewey has always contended that the curriculum that divides children's learning into separate discrete disciplines does an injustice to the child. The school he believed, in the formative years of education should be an extension of what happens at home where the child learns and moves between disciplines without a conscious break or the sound of a bell.

Dewey (1954) summed this up as follows:

> … the child's life is an integral, total one. He passes readily and quickly from one topic to another, as from one spot to another, but is not conscious of transition or break. There is no conscious isolation, hardly conscious distinction… He goes to school, and various studies divide and fractionize the world for him. (p. 9)

Clark (1997) explained how, in the technological worldview, isolated facts came to assume undeserved

importance from a systemic, ecological perspective, and that the purpose of education is not to pile up facts but to cultivate inquiry, meaningful understanding, and direct personal engagement. Surveying the political scene at this time Clark (1997) concluded that such goals are vital to the survival of democratic citizenship. Like Dewey, Clark (1997) believed that the integrated curriculum enables students to address their world with imagination, creativity, inquiry, and purpose, rather than make them passive consumers of textbook and media-packaged information.

Teachers and schools are constantly under attack for not teaching basic skills students will need for the 21st century. Drake (1993) contended that children are dropping out of school at an alarming rate and those who remain are not prepared well enough to compete in a global economy and maintain a high standard of living. Children who drop out of school perceive little or no relevance to school life as learning and education as offered become drudgery. Integration connects subjects to ways that reflect the real world and include the interests and inquiry of children. When the authors integrate curriculum in the context of the lived experience, it begins to make sense to students. Higher level thinking and problem-solving skills become a necessity as students begin to grapple with real life issues and problems that transcend the boundaries of disciplines.

According to Pass and Moseley (2009), subject integration provides an opportunity for students to make natural and meaningful connections between and among multiple content areas. Both the NCSS (National Council of Social Studies) (1994) and the National Science Teachers Association (NRC, 1996) have long supported the integration of social studies and science with other content areas in order for students to make meaningful connections and develop significant understandings of important concepts. Literature identifies science and reading as disciplines that share common goals that are also reflected in the NSES (National Science Education Standards) (NRC, 1996) and the Standards for the English Language Arts (NCTE (National Council of Teachers of English)/IRA (International Reading Association), 1996). According to NCTE and IRA, the purposes of reading are “first, to acquire new information; second, to respond to the needs and demands of society and the workplace; and thirdly, for personal fulfillment”. This goal is quite similar to the goals for science education enumerated by the NSES. Clearly, the goals of reading and science education are similar. They prepare students to acquire information and use that information personally and globally.

In today’s dynamic global economy, centered on the development and exchange of knowledge and information, individuals prosper who are fluent in several disciplines and comfortable moving among them. Creativity, adaptability, critical reasoning, and collaboration are highly valued skills. When it comes to fostering those skills in the classroom, integrated study is an extremely effective approach, helping students develop multifaceted expertise and grasping the important role interrelationships can play in the real world. Kain (1993) found that many students felt that integrated curricula were more relevant to the real world, due to real world problems being of an interdisciplinary nature, and this increased both their learning and motivation. The human brain does not separate knowledge into discrete partitions but creates a complex web of information that recognizes patterns. Integrating curriculum is a way to capitalize on the existing features of the human brain and work with it rather than counter to its natural function (Caine, 1991). In an age when the authors are reading so much about the need to make the curriculum meaningful for students, it seems important to look at the possibility that curriculum integration might provide answers to many of the problems faced by educators. This paper proposes a way and gives a model for how reading, science and social studies can be integrated to

enhance inquiry, problem-solving, interest, critical thinking skills, and learning.

Differentiation

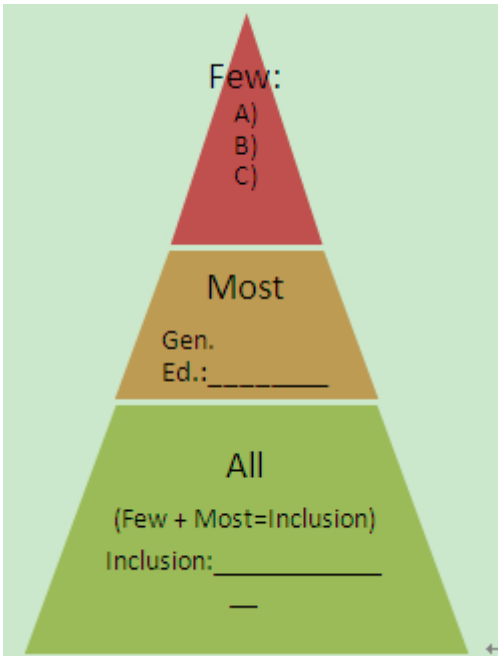
Children need persistent and concentrated learning opportunities to read with different texts as well as curriculum to support interdisciplinary teaching (Snow, Burns, & Griffin, 1998). Teachers do not have a clear model to develop interdisciplinary teaching from their local district, or state department of education (Jacobs, 1997). In addition, book publishers have not devoted much effort to interdisciplinary teaching for it to become a mainstay of the K-12 classrooms. Thus, teachers are left in a void without much assistance toward the implementation of an interdisciplinary curriculum (Jacobs, 1989/1990).

This article provides a lesson framework (guide) that promotes interdisciplinary teaching with differentiated instruction as the hallmark for learning. The guide provides pre-service teachers, in-service teachers, professional development trainers, and curriculum developers a prototype to design interdisciplinary (integrated) lessons. The lesson framework is called the BDIM (Bogan Differentiated Instruction Model). Schumm, Vaughn, and Leavell (1994) developed a lesson planning format that teachers use for planning instruction for diverse students. The model has a structure that allows teachers to differentiate instructions based on the need of the students. C. D. Mercer and A. R. Mercer (2005) suggested that the model be used as a graphic organizer to help the teacher with planning and instructions to support advance level learning for all students. In addition, the model has embedded subgroups to ensure that each student receives what he/she needs regarding content and instructional methodology. The subgroups that make up the classroom are defined for the model as “few”, “most”, and “all”, whereas a teacher must determine “how” to best teach the students and adjust the curriculum for learning. The ability to assign work to the subgroups under the same essential question and lesson objectives substantiate differentiated instruction (Heacox, 2002; Tomlinson, 2001). The teacher actually adapts the students’ content, process, and product to match the objectives being taught based on the students’ need. However, the various types of curriculum integration models that exist today hardly address differentiated instruction as part of the curriculum integration process to improve learning (Mustafa, 2011). The BDIM addresses the concept of adding differentiated instruction to curriculum integration. Jacobs (1989/1990) introduced six design options to be used for curriculum integration, such as discipline-based and parallel disciplines, multidisciplinary, interdisciplinary, integrated day, and complete program. The approach selected by this model is interdisciplinary.

The interdisciplinary curriculum is important to this model because it improves education by requiring the teacher to ensure that foundational knowledge in each discipline is acquired. The teacher has the flexibility to design and edit the curriculum to meet the needs of the students (Bintz, 2010). Classroom schedules that are using the block format have short-time frames (45 minutes) and the interdisciplinary curriculum provides a means to add more content with analysis to make better use of time. The model removes the impediment/thinking that subject areas are separate bodies of knowledge that lack connections (Kinniburgh & Byrd, 2008). In addition, the model improves relevancy, removes lesson fracturing, and creates student to teacher interface for a more stimulating learning experience (Jacobs, 1998/1990). By using an interdisciplinary curriculum, teachers are afforded the opportunity to develop engaging and meaningful lessons that demonstrate higher-order thinking and facilitate learning to meet mandates proposed by local education agencies (Hinde, 2005).

Bogan Differentiated Instruction Model

The BDIM combines major teaching concepts to develop interdisciplinary teaching. First, the model requires the teacher to select a common core standard for reading, science, and social studies. The teacher must ensure that the standards selected for each content area can be connected for contextual teaching. Thus, the formulation of the big idea, essential question, and lesson objectives are synthesized for interdisciplinary teaching of the content. Next, the teacher must build a lesson from the framework (see Figure 1), in which the introduction, model, guided practice, independent practice, assessment, technology integration, and homework are created to support a research based lesson for learning.

<table>
<tr><td colspan="2">Teacher:</td><td>Date(s):</td><td>Class:</td><td>Unit:</td><td>Bloom’s taxonomy</td></tr>
<tr><td colspan="5">Big idea:</td><td></td></tr>
<tr><td colspan="5">Concept planning: Content area(s) 1_____ 2_____ 3_____</td><td rowspan="6">Evaluation
Synthesis
Analysis
Application
Comprehension
Knowledge</td></tr>
<tr><td colspan="5">Common core standard(s) for:
Content 1:
Content 2:
Content 3:</td></tr>
<tr><td>Essential Question(s):</td><td colspan="4"></td></tr>
<tr><td>Lesson Objectives:</td><td colspan="4"></td></tr>
<tr><td colspan="5">Lesson framework</td></tr>
<tr><td colspan="2">Introduction/Motivation:</td><td colspan="2" rowspan="8">Differentiated instruction
 

Pyramid for differentiation (Adapted from: Schumm, Vaughn, & Leavell, 1994)</td><td>Differentiation cont’d</td></tr>
<tr><td colspan="2">Model:</td><td rowspan="7">Content
Process
Product</td></tr>
<tr><td colspan="2">Guided practice:</td></tr>
<tr><td colspan="2">Independent practice:</td></tr>
<tr><td colspan="2">Assessment:</td></tr>
<tr><td colspan="2">Technology integration:</td></tr>
<tr><td colspan="2">Homework:</td></tr>
<tr><td colspan="2">Differentiation using pyramid planning</td></tr>
<tr><td>Flexible grouping
Readiness
Interest
Instruction
Learning profile/Preference</td><td>Notes:</td></tr>
</table>

Figure 1. BDIM.

The BDIM requires the primary foundation for differentiated instruction, such as flexible grouping, readiness, interest, instruction, and learning profile be embedded. Using differentiated instruction to reinforce

learning has research support that demonstrates improved student learning, greater student engagement, and teaching that is delivered at the student's level of learning (Huebner, 2010). In conclusion, the six levels of Bloom's Taxonomy (1956) are integrated into the model for the teacher to manage higher-order thinking skills and ensure that the lesson objectives and essential questions are interrelated.

Lesson Implementation

The lesson implementation is as follows:

Step 1: Develop a theme/big idea to organize your subject areas to connect the content areas. By big idea, we mean the most essential and critical information that the teacher wants the students to learn;

Step 2: Select which common core standards will be designated to support the integration;

Step 3: Construct the essential questions and lesson objectives to ensure scope and sequence are met to examine the content in an interdisciplinary manner for relativity and order. Note that essential questions should be questions that revolve around the theme of the lesson and that tend to target the learning outcomes expected by the students by the end of the lesson;

Step 4: Fill in the lesson framework to engage the students using higher order thinking skills and activities to foster critical and creative applications;

Step 5: Start examining and assigning students to the sub-groups (i.e., few: (a) special Ed.; (b) gifted talented; and (c) English speakers of other languages) for differentiated instructions; ensure that the objectives developed match the common core standards;

Step 6: (a) Initialize differentiation by assigning students to flexible groups, and check the readiness, interest, instructions, and learning profile for the groups; and (b) Assign the skills to be taught from the lesson objectives or lesson plan to the subgroups of "few", "most", and "all";

Step 7: Review and edit differentiated instruction by checking the content-process-product boxes for verification, ensuring that each area as it is found is taught in the class;

Step 8: Select which level of the lesson supports Bloom's taxonomy for higher-order learning by reviewing the lesson objectives.

Conclusions

One of the main objectives of teachers and administrators is to deliver instructional methodology to students for academic growth. The concept of using an integrated curriculum provides an avenue in which pedagogy can be expanded across content areas to meet such an objective. Research notes that the integrated approach yields academic gains when a teacher is knowledgeable regarding content and has pedagogical skills that are effective (Hinde, 2005). However, teachers who are not well versed in the content and lack effective teaching procedures might fail to produce the students' achievement results education agencies are mandating. The BDIM is a pedagogical tool that has been developed to harness the best benefits of using an integrated curriculum. The model affords teachers a simple approach to formulating teaching across content areas in which the students' learning is the primary focus for academic growth. When teachers can plan and develop lessons that are interrelated from different contents and develop instructional methodology that supports performance based objectives then teaching is given an opportunity to compete with the lofty standards the education system demands.

References

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. USA: Bradford Publishing.

Appleton, K. (2005). *Elementary science teacher education: International perspectives on contemporary issues and practice*. London: Routledge.

Bantwini, B. D. (2010). How teachers perceive the new curriculum reform: Lessons from a school district in the Eastern Cape Province, South Africa. *International Journal of Educational Development, 30*(1), 83-90.

Bintz, W. P. (2010). Fibbin with poems across the curriculum. *The Reading Teacher, 63*(6), 509-513.

Bloom, B. S. (1956). Taxonomy of educational objectives. In *Handbook I: The cognitive domain*. New York: David McKay Co. Inc..

Bybee, R. W., & Fuchs, B. (2006). Preparing the 21st century workforce: A new reform in science and technology education. *Journal of Research in Science Teaching, 43*(4), 349-352.

Caine, R. (1991). *Making connections: Teaching and the human brain*. Alexandria, V. A.: Association for Supervision and Curriculum Development.

Cannon, M. W. (2002). Concepts and themes: A learning Odyssey. *Gifted Child Today Magazine, 25*(3), 24-30.

Christensen, L. M., Wilson, E. K., Anders, S. K., Dennis, M. B., Kirkland, L., Beacham, M., & Warren, E. P. (2001). Teachers reflection on their practice of social studies. *Social Studies, 92*(5), 205-208.

Clark, E. T. (1997). *Designing and implementing an integrated curriculum: A student-centered approach*. Holistic Education Press.

Dewey, J. (1954). *The child and the curriculum*. Chicago: The University of Chicago Press.

Drake, S. M. (1993). *Planning integrated curriculum: The call to adventure*. Corwin Press.

Educational Research Service. (2004). *Differentiating instruction: To help all students meet standards*. Retrieved November 10, 2011, from http://www.edreadysearch.org

Glenn, J. (2000). *Before it's too late: A report to the nation from the National Commission on Mathematics and Science Teaching for the 21st century*. Washington, D. C.: US Department of Education.

Haager, D., & Klinger, J. K. (2005). *Differentiating instruction in inclusive classrooms: The special educator's guide*. Boston, M. A.: Pearson Education Inc..

Hawbaker, B. W., Balong, M., Buckwalter, S., & Runyon, S. (2001). Building a strong base of support for all students through co-planning. *Teaching Exceptional Children, 33*(4), 24-30.

Heacox, D. (2002). *Differentiating instruction in the regular classroom: How to reach and teach all learners, grades 3-12*. Minneapolis, M. N.: Free Spirit Publishing.

Hinde, E. R. (2005). Revisiting curriculum integration: A fresh look at an old idea. *The Social Studies, 96*(3), 105-111.

Honey, M. (2011). *America is losing another generation to science illiteracy*. Retrieved from http://www.reutersreprints.com

Houser, N. (1995). Social studies on the back burner: Views from the field. *Theory and Research in Social Education, 23*(2), 147-168.

Huebner, T. A. (2010). Differentiated instruction. *Educational Leadership*, 79-81.

Jacobs, H. H. (1989/1990). *Interdisciplinary curriculum: Design and implementation*. Alexandria, V. A.: Association for Supervision and Curriculum Development.

Jacobs, H. H. (1997). *Mapping the big picture: Integrating curriculum and assessment k-12*. Alexandria, V. A.: Association for Supervision and Curriculum Development.

Johnson, C. C. (2007). Technical, political and cultural barriers to science education reforms. *International Journal of Leadership in Education, 10*(2), 171-190.

Kain, D. L. (1993). Cabbages and kings: Research directions in an integrated/interdisciplinary curriculum. *The Journal of Education Thought, 27*(3), 312-331.

Kaplan, S. N. (2002). Awakening and elaborating: Differentiation in social studies content and instruction. *Gifted Child Today Magazine, 25*(3), 18-23.

Kenny, J. D. (2012). University-school partnerships: Pre-service and in-service teachers working together to teach primary science. *Australian Journal of Teacher Education, 37*(3), 56-82. Retrieved from http://ro.ecu.edu.au/ajte/vol37/iss3/6

Kinniburgh, L. H., & Byrd, K. (2008). Ten black dots and September 11: Integrating social studies and mathematics through children's literature. *Social Studies*.

Lake, K. (1994). *Integrated curriculum*. Retrieved from http://www.nwrel.org/scpd/sirs/8/c016.html

Levy, H. M. (2008). Meeting the needs of all students through differentiated instruction: Helping every child reach and exceed standards. *Journal of Educational Strategies, Issues and Ideas, 81*(4), 161-164.

Madinabeitia, S. C. (2007). The integrated curriculum, CLIL and constructivism. *Volumen Monografico*, 55-65.

McCall, A. L. (2004). Using poetry in social studies classes to teach about cultural diversity and social justice. *Social Studies, 95*(4), 172-176.

Mercer, C. D., & Mercer, A. R. (2005). *Teaching students with learning problems*. Upper Saddle River, N. J.: Pearson Education Inc..

Miller, S. P. (2002). *Validated practices for teaching students with diverse needs and abilities*. Boston, M. A.: Pearson Education Co..

Moreno, N. P., & Erdmann, D. B. (2010). Addressing science teachers' needs. *Science, 327*(1), 1589-1590. Retrieved from http://www.sciencemag.org/content/327/5973/1589.full.pdf

Mustafa, J. (2011). Proposing a model for integration of social issues in school curriculum. *International Journal of Academic Research, 3*(1), 925-931.

NCSS (National Council for Social Studies). (1994). *Curriculum standards for social studies: Expectations of excellence*. NCSS Bulletin.

NRC (National Research Council). (1996). *National science education standards*. Washington, D. C.: National Academy Press.

National Right to Read Foundation. (2001). Retrieved November 2, 2011, from http://www.nrrf.org20-10.htm

Pass, S., & Moseley, C. (2009). Making natural connections. *Green Teacher, 85*.

Penden, W. (Ed.). (1954). *Notes on the state of Virginia*. N. C.: University of North Carolina Press.

Schumm, J. S., Vaughn, S., & Leavell, A. G. (1994). Planning pyramid: A framework for planning for diverse student needs during content area instruction. *The Reading Teacher, 46*, 608-615.

Shoemaker, B. J. (1989). Integrative curriculum: A curriculum for the twenty-first century. *OSSC Bulletin, 33*(2). O. R.: Oregon School of Study.

Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. Washington, D. C.: National Academy Press.

Thorton, S. J., & Houser, N. O. (1996). *The status of elementary social studies in Delaware: Views from the field*. ERIC Clearinghouse.

Tilgner, P. J. (1990). Avoiding science in the elementary school. *Science Education, 74*(4), 421-431.

Tomlinson, C. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, V. A.: The Association for Supervision and Curriculum Development.

Tomlinson, C. (2001). *How to differentiate instruction in mixed-ability classrooms*. Upper Saddle River, N. J.: Pearson Education Inc..

Tompkins, G. E. (2008). *Literacy for the 21st century: A balanced approach* (5th ed.). Boston, M. A.: Allyn & Bacon Publishing.

Tyler, R. (2007). Re-imaging science education: Engaging students in science for Australia's future. In *Australian Education Review*. Retrieved from http://www.acer.edu.au/documents/AER51_Reimagining ScieEduc.pdf

Van Fossen, P. (2005). Reading and math take so much time: An overview of social studies instruction in elementary classrooms in Indiana. *Theory and Research in Social Education, 33*(3), 376-403.

Vars, G. F. (2002). Viewpoint with Gordon F. Vars. *Curriculum Technology Quarterly, 11*, 1-8.

Vogler, K., Lintner, T., Lipscomb, G., Knopf, H., & Heafner, T. (2007). Getting off the back burner: Impact of testing elementary social studies as part of state-mandated accountability program. *Journal of Social Studies Research, 37*(2), 20-34.

Wade, R. (2002). *Status of social studies in South Dakota elementary schools: Status report*. ERIC Document Reproduction Service No. ED 314341.