Historical Thinking Ability Among Talented Math and Science Students

by

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It may be tempting for educators to assume young people "gifted" in math or science are also especially capable in history or other academic domains. A recently completed study at the Belin-Blank International Center for Gifted Education and Talent Development at the University of Iowa indicates this probably is not the case. The study suggests, in the absence of specialized instruction, most gifted science students are not adept at employing skills historians routinely use to reconstruct the past. Such skills include the ability to interpret primary sources, assess documents for biases they may contain, and synthesize sources into a coherent historical narrative.

To know that gifted science students do not readily or necessarily comprehend historical documents has important implications for history instruction. It suggests that all students, whether identifiably talented or not, must have exposure to primary source materials in order to attain knowledge of how historians reconstruct the past.

Of course history teachers have long recognized the importance of primary sources for developing students' ability to think like historians. And, this recognition coheres with research showing that teachers can successfully employ primary sources to deepen students' historical understanding. VanSledright and Brophy (1992) and Levstik and Smith (1996:16-18), for example, have shown that seven-, eight- and nine-year-old children can use primary sources to raise significant historical questions, employ evidence to answer them, and weave the evidence into an "interpretive narrative" (Levstik and Smith, p. 18). From his research with children aged 9 to 11, Blake (1981) concluded that "work on historical documents gives children an understanding of the origin of information and brings home to them the real meaning of phrases in a textbook such as bad housing conditions or child labour" (p. 547). Blake further found that the "documentary approach" provides youngsters with "the beginnings of an understanding of the nature of historical evidence" (p. 548). Booth (1980 and 1993:105-106) and Shemilt (1980) showed that teachers can employ primary sources to teach students aged 14 to 16 to evaluate historical evidence and imaginatively use it to synthesize historical interpretations. And, Drake (1986) employed primary source material to teach high school students that historical evidence is open to interpretation and to recognize that some interpretations attain greater validity than others.

This study sought to find out whether talented math and science students possessed three aspects of historical understanding displayed by those expertly trained in history. We investigated whether they were able to: (a) assess primary source materials (e.g. old photographs, diary entries, etc.) for the variety of possible meanings they contained, (b) examine

historical artifacts for reliability or bias, and (c) tie several historical documents into a coherent interpretation or story using an overarching theme or generalization.

Subjects

The study examined the historical competence of 14 students, ages 16 through 18. At the time of the study (Summer 1995), subjects were attending a three-week enrichment program in engineering at the Belin-Blank Center for Gifted Education and Talent Development. The subjects had been identified by school counselors as especially talented in math and science. All subjects were Caucasian, from middle- or upper-middle class backgrounds, and travelled to the Belin-Blank Center from states in the Midwest. Each expected to pursue a career in engineering, medicine, or some other science-related occupation.

Research Procedure

To assess historical understanding, researchers presented to each subject five historical documents related to the topic of slavery in the United States[1]. Interviews with subjects about the documents elicited three aspects of historical understanding relevant to this study: 1) a subject's ability to interpret documents for the meanings they might contain, 2) the ability to evaluate documents for their reliability as evidence, and 3) a subject's capacity to synthesize the documents into a coherent narrative.

To assess depth of historical understanding, interviewers instructed each subject to examine the slavery documents and identify "what you think is interesting about each one." The interviewer told the subject that he/she would be asked, after studying the items, to tell a story to the interviewer "that ties all

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[1] The five documents were an etching from the 1700s illustrating a coffle of slaves in Africa marched under guard to the sea, a 1938 painting titled "Armistad" (based upon an actual event) depicting a slave revolt at sea, an excerpt from the 1852 Alabama Slave Code, an "actual" 1861 reward notice for an escaped slave, and a photograph (dated 1863 or 1864) of armed African Americans in Union Army uniform.

of the documents together." The interviewer encouraged subjects to take notes and make an outline of the story. The subject could then consult notes for assistance when relating the story to the interviewer.

Finally, to find out subjects' previous experience with primary sources, we asked if they had ever before participated in a similar activity. We wanted to know, for example, if they had previously encountered primary sources in Advanced Placement history courses or some other instructional setting.

Analysis

Each subject's interview was analyzed to determine whether he or she displayed three signposts of historical understanding:

First, we determined whether a subject interpreted documents for the historical meaning or significance they contained. For example, a subject might perceive that the contemporary photograph (1863 or 1864) of uniformed, black union soldiers indicated African Americans participated in fighting to end slavery.

Second, we assessed each subject's story to see whether they used an overarching theme or generalization to tie together the documents into a coherent narrative. For example, a subject could, after reading the five documents, offer the generalization that slavery was an inhumane economic system from which African Americans suffered a great deal. He/she could then use various documents as evidence to support this theme about what slavery was like.

Third, we analyzed interviews to determine whether subjects read documents with a critical eye. We wanted to discern if a subject could distinguish one document(s) as a more reliable source of evidence about slavery than others. For example, one "document" showed a mural painted in 1938. It depicted the famous 1839 Amistad slave revolt. The artist's representation clearly celebrates the slaves taking control of the ship. Since the mural is an artist's rendition of what happened and is dated

1938, a subject might regard this piece of evidence with skepticism.

Results

The results of taped interviews showed that virtually all subjects (13 of 14 or 96%) were able to interpret the historical documents. In other words, subjects were able to recognize that, for example, the 1852 Alabama slave codes revealed that slaves' lives were severely circumscribed.

The subjects' levels of interpretive competence, however, varied significantly. Most of the study's participants offered only one possible interpretation of what some of the documents indicated about slavery. Fewer than one third showed the ability to derive meaning from most or all of the sources. Fewer still generated more than one possible interpretation for each of thedocuments.

Only 2 of the 14 of subjects (14%) identified an overarching theme for their story which linked primary sources into a coherent account of the slave experience. Four additional participants successfully produced a story suggested by the documents. These subjects, however, failed to identify a forceful unifying theme to tie the sources together. The remaining eight subjects (57%) simply placed the documents into a chronology and/or discussed them one by one. In sum, a large majority (86%) of subjects were unable to establish a generalization to connect the documents.

Finally, half the subjects displayed a weak understanding that some documents are less accurate or reliable sources of historical information than others. This was suggested foremost by the failure of half the subjects to turn over the document to see where it was from or when it was produced. When questioned about various documents' reliability as evidence about the past, 55% chose an artistic representation of the slave experience. In other words, over half selected as most reliable an artist's rendition rather than primary source materials from ante bellum America. It is worth noting in this regard that only two

subjects clearly made a distinction between primary and secondary sources.

Discussion and Implications

A large majority of the talented math and science students who participated in this study did not possess the basic skills necessary to practice the historian's craft. They did not offer robust interpretations of historical documents, read them with a critical eye, identify themes or generalizations, or tie evidence together into a thoughtful narrative. This suggests strongly that, to students identified as especially talented and to those without extraordinary abilities, history educators must provide many opportunities to interpret, analyze, synthesize and critically evaluate primary source materials. Teachers must position students to ponder a variety of documentary evidence and wrestle with the ambiguities and biases they contain. Further, students must have practice weaving these sources into narratives that reconstruct the past. Such exposures lead students to comprehend history as a human construction based on conversation and debate about what happened and why. All students, whether especially "talented" or not, deserve to share in this challenging and enriching intellectual enterprise.

REFERENCES

Blake, David W. (1981). Observing children learning history. The History Teacher, 14(4), 533-549.

Booth, Martin. (1980). A modern world history course and the thinking of adolescent pupils. Educational Review, 32(3), 245-257.

Booth, Martin. (1993). Students' historical thinking and the national history curriculum in England. Theory and Research in Social Education, 21(2), 105-127.

Drake, Frederick D. (1986). Using primary sources and historians interpretations in the classroom. Teaching History, 11(2), 50-61.

Levstik, Linda & Smith, Dehea. (1996, April). I've never done this before: Building a community of historical inquiry in a third grade classroom. Paper presented at the annual meeting of the American Educational Research Association, New York, NY.

Shemilt, Denis. (1980). Evaluation study: Schools Council History 13-16 Project. Edinburgh: Homes McDougall.

Wineburg, Samuel S. (1991). On the reading of historical texts: Notes on the breach between school and the academy. American Educational Research Journal, 28(3), 495-519.

VanSledright, Bruce A. & Brophy, Jere. (1992). Storytelling, imagination, and elaboration in children's historical reconstructions. American Education Research Journal, 29(4), 837-859.

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