Section V

WHAT IS THE STATUS OF THE ACADEMIC CURRICULUM?

The primary focus of school curriculum has always been what is to be taught in the core subject areas: English/language arts, mathematics, science, and social studies as well as supportive subjects like foreign language, art, music, and physical education. Depending on priorities set by the federal government, different core subjects become the focus of curriculum reform. For example, after Russia launched *Sputnik* in 1957, mathematics and science were the hot curriculum topics for reform—after all, we had to catch up with the Russian technology. When the curriculum movement was the "back to basics," courses in art and music disappeared from many school programs. Today, the push in public schools is about reading, literacy, and mathematics because these subjects are the prime target for "high stakes" testing. Science has been added at the elementary level, and social studies is currently under consideration.

However, concern for what should be taught in our schools should not be a function of the newest priority of government. Rather, curriculum reform should be driven by what is most important for today's students to learn in order to survive in a rapidly changing society.

The articles in this section of the reader examine curriculum issues in K–12 settings. The specific topics are reading, literacy, media literacy, social studies, mathematics, science, the arts, and music.

Children are typically taught to read in first grade. However, more and more schools are thinking about introducing reading in kindergarten to help the schools get a jump start on the reading problems of today's children. Bruce Joyce and his colleagues describe a kindergarten reading program that was implemented in Alberta, Canada. They followed these children through second grade and reported the results of their findings, which should be of interest to any teacher.

Technology has had an impact on what and how we teach in the schools. Some schools have developed special courses in technology to help students become efficient learners using the new technologies. But most schools do not have the luxury of offering separate technology

courses. Thus, integrating technology into the core curriculum of their schools is their goal. Scheibe explores how media literacy and core curriculum can be mutually beneficial.

There are many "topics" taught in the existing curriculum of a school, and most teachers are faced with how to teach some of these topics, which could be controversial. Too often, teachers will teach "just the facts" when dealing with these topics rather than engaging students in deeper discussions to promote better understanding of them. Noddings suggests the use of critical thinking skills to help students understand the complexity of war.

Mathematics is a field of study that has been constantly scrutinized and reformed since 1957. Young children are fascinated by mathematical content until grades 3 and 4, when they begin to study more about the rules of mathematics than the concepts. By the time students reach high school, most either have an intense dislike for mathematics or believe they cannot learn mathematics. Thus, teachers face a major motivational problem as they try to get students through the required mathematics courses in high school. To add to the misery of both students and teachers, there is a conflict in mathematics referred to as the "math wars"—the argument about the purpose and goals of mathematics. Alan Schoenfeld presents an excellent review of the math wars, including issues of standards, national curriculum, balanced curriculum, and democratic equality.

The science curriculum, much as the mathematics curriculum, has had its debates about which sciences ought to be taught to students and when they should be taught. Sheppard and Robbins look at the placement of science courses in the curriculum from the time of the Committee of Ten to present day.

As schools face curriculum reform demanded by legislation such as No Child Left Behind, the arts (drama, art, music, etc.) are frequently lost in the overall academic curriculum of the schools. "School Days" illustrate how the arts can be integrated in elementary and secondary curricula to the benefit of all students.

As you read this section think about the following:

- How you can build reading and literacy skills into your curriculum

- How you can enhance the "what" of your teaching through the use of technology

- How you can reach the visual or auditory learner through the use of art or music in your curriculum

- Your attitudes toward mathematics in school and what influenced those attitudes

- The sequence of science and mathematics courses you took in high school—did it make sense?

Article 14

LEARNING TO READ IN KINDERGARTEN

Has Curriculum Development Bypassed the Controversies?

BRUCE JOYCE

MARILYN HRYCAUK

EMILY CALHOUN

We'll begin with a simple proposition: Let's teach our kindergarten students to read. We already know how to do it, so why don't we?

Within schools and school districts, decisions about curriculum and instruction in literacy have to be made on the basis of present knowledge and judgment. Such decisions can't wait until all controversies have been resolved and all the evidence is in with regard to available options. In the case of kindergarten, decisions about curriculum are complicated by debates about whether there *should be* a formal curriculum in reading or whether the components of the kindergarten program should be designed to develop the dimensions of emergent literacy only. But research on how to teach beginning readers grows apace, and we believe that we should take advantage of it.

In the Northern Lights School Division in Alberta, Canada—a district of 20 schools and about 6,500 students—we decided to design a formal reading curriculum for kindergarten,

prepare the teachers to implement it, and conduct an action research study of student learning. Our decision stemmed from the judgment that research on beginning reading had reached the point where an effective, engaging, and multidimensional curriculum could be designed and implemented without placing our students at risk in the process. And if such a curriculum proved successful, it seemed likely that the much-publicized "learning gap" would be reduced.

Over the past five years in Northern Lights, we ("we" includes the superintendent, Ed Wittchen; the trustees; and representative teachers and administrators) had concentrated on the development of "safety nets" for low-achieving students at the second-grade level and in Grades 4 through 12.[1] We based the two curriculum designs on strands of research on beginning literacy for young children and for older struggling readers and writers.[2] Currently, in both safety net curricula, about three-fourths of the students are progressing well and narrowing the distance between themselves and the district's average students. The others are holding their own.

The need for the safety net programs and our observation of the frustration and hopelessness experienced by students who needed help caused us to consider the K–3 literacy curricula and to explore whether we could strengthen them and so reduce the need for the later safety nets. We take seriously the statement by Connie Juel, who, in reacting to the National Research Council report *Preventing Reading Difficulties in Young Children*, wrote that "children who struggle in vain with reading in the first grade soon decide that they neither like nor want to read."[3] Our teachers who work in the safety net programs confirm that their job is half instruction and half therapy.

For some decades, because of the concerns about not generating demands beyond the capabilities of the students or introducing students to reading in unpleasant ways, there has been a dearth of studies on formal reading programs for kindergarten. A few studies did suggest that formal reading programs in kindergarten could have positive effects that lasted throughout schooling.

For kindergarten interventions as such, though, we had to go back to Delores Durkin's work of 30 years ago. In building a kindergarten curriculum, we were not able to draw on a body of recent research on, say, alternative kindergarten reading programs or dimensions of learning to read at age 5. We drew on the literature relevant to learning to read in Grades 1 through 3 and above. Building greater literacy is a matter of considerable importance, and not damaging our students is of even greater importance. But it may be that the concerns about hurting students are based on images of brutal and primitive curricula rather than on humane and sophisticated approaches. Certainly those concerns are not based on reports of failed attempts.[4]

We made the decision that there would be no danger to the students if we proceeded deliberately and, particularly, if the teachers tracked the responses of the children carefully and were prepared to back off or change their approach if a student appeared to be stressed. Not to challenge students cognitively might be an even larger mistake than challenging them. In addition, we wanted the early experience to be not only effective but joyful—learning to read should be a delightful experience.

Our view of a nurturant curriculum appears to differ widely from the image that many people have of a reading curriculum for young children, and we believe it is that image that causes them to shy away from formal literacy instruction for kindergartners. We did *not* imagine students with workbooks, alphabet flash cards, or letter-by-letter phonics drills. Instead, we imagined an environment in which students would progress from their developed listening/speaking vocabularies to the reading of words, sentences, and longer text that they had created, where they would examine simple books in a relaxed atmosphere, where they would begin to write with scribbling and simple illustrations, where they would be read to regularly, and where comprehension strategies would be modeled for them through the reading and study of charming fiction and nonfiction books. If the work of childhood is play, we imagined the students playfully working their way into literacy.

PATHWAYS TO LITERACY: DESIGNING THE CURRICULUM

Our idea for a nurturing curriculum came from developments in the field of curriculum having to do with several of the emergent literacy processes. Most of the literature in this area presents ideas about and studies of students in Grades 1 through 6. We saw this literature as defining dimensions for early literacy that could be incorporated into components of a kindergarten curriculum. Essentially, we categorized dozens of studies around the several dimensions:

- *The development of sight vocabulary from the students' listening/speaking vocabulary and the study of words encountered through wide reading*.[5] Words are recognized in terms of their spelling, and, once a hundred or so are learned, the phonetic and structural categories are available to the students.

- *The need for wide reading at the developed level*. At the beginning, students can engage at the picture level and, gradually, can deal with books at the caption level as they learn how meaning is conveyed by the authors.[6]

- *The regular study of word patterns, including spelling*.[7] The students need to learn to classify words, seeking the phonetic and structural characteristics of words and seeing the language as comprehensible. For example, as the students study the beginnings and endings of words ("onsets" and "rimes"), they build concepts, such as "Words that begin with xxxx sounds often begin with xxxx letters," and they apply those concepts when they encounter unfamiliar words: "If it begins with xxxx letter(s), then it might sound like xxxx usually does."

- *The need for regular (several times daily) writing and the study of writing*.[8] Writing involves expressing ideas through the learned words and patterns—the essential connection between reading and writing. The attempt to write consolidates what is being learned through reading.

- *The study of comprehension strategies*.[9] Although most of the research on comprehension has been done with older students, the search for meaning begins early, and the modeling of comprehension strategies is important from the beginning.

- *The study, by both teacher and students, of weekly and monthly progress, including the levels of books the students can read, sight words learned, phonetic and structural analysis skills, information learned, and fluency in writing*.[10] For example, students can build their own files of words and can see what they are learning. Or students can record their classifications of words, can see that they have developed categories of words (e.g., these begin with . . .), and can add to them. Knowing what you know enables you to assess progress and to celebrate growth.

For our early literacy curriculum, we found that the Picture Word Inductive Model—derived from the tradition of "language experience" with the addition of concept formation and attainment models of teaching—was very important. The core of the language experience approach is the use of the students' developed listening/speaking vocabulary.[11] The students study topics and discuss them and dictate to the teacher. The dictated material becomes the source of their first sight words, and their first efforts to master the alphabetic principle come from their study of the structures of those words.

The Picture Word Inductive Model, as the name suggests, begins with photographs of scenes whose content is within the ability of the students to describe. For example, the photographs might show aspects of the local community. The students take turns identifying objects and actions in the picture. The teacher spells the words, drawing lines from the words to the elements in the picture to which they refer and so creates a picture dictionary. The students are given copies of the words, and they identify them using the picture dictionary. They proceed to classify the words, noting their similarities and differences. The teacher then selects some of the categories for extended study. Both phonetic features and structural characteristics are studied. The teacher models the creation of titles and sentences, and the students create some of their own by dictating them and learning to read the dictations. In the same fashion, the teacher

creates paragraphs, and the students gradually learn to assemble titles and sentences into paragraphs about the content of the picture. The picture word cycles (inquiries into the pictures) generally take from 3 to 5 weeks.

A major assumption underpinning this view of the curriculum is that students need to become inquirers into language, seeking to build their sight vocabularies and studying the characteristics of those words as they build generalizations about phonetic and structural characteristics.

The curriculum was designed to facilitate growth through each of its strands—building vocabulary, classifying, creating sentences and paragraphs, and reading—in an integrated fashion so that each strand will support the others. As indicated above, as sight words are learned, phonetic and structural concepts will be developed through the analysis of those words. Similarly, the construction of sentences and paragraphs will be related to the sight vocabularies that are being developed. As the children read, they will identify known words and attack new ones through the phonetic, structural, and comprehension skills they are developing.

PROVIDING STAFF DEVELOPMENT TO SUPPORT IMPLEMENTATION

Once we decided that such a curriculum was feasible, designing staff development was the next step. We needed a program that was oriented to help the teachers both implement the curriculum and become a positive learning community that would study student learning and take pleasure in colleagueship and inquiry. Eight teachers in three schools in the Grand Centre/Cold Lake area were involved in the initial effort. The school faculties had agreed formally to participate, and all eight kindergarten teachers had agreed as well. Two had taught reading in the primary grades in the past, but none had attempted a formal literacy curriculum in the kindergarten. Two were first-year teachers. The superintendent, cabinet, and board of trustees were supportive, and meetings explaining the

curriculum was held with parents in the spring and early fall.

The staff development included demonstrations, the study of early literacy, the analysis of practice, and the study of student learning, following the format developed by Bruce Joyce and Beverly Showers.[12] Peer coaching was embedded in the workplaces of the teachers.

THE ACTION RESEARCH INQUIRY

For the action research component of the initiative, the eight teachers and the district staff members were asked to focus on two questions: Did the multidimensional curriculum work? Did the students learn to read and to what degree, including the extent of their comfort with the process and their feelings about reading?

Informal observation was important, but the teachers were also provided with tools for the formal study of the students' learning of the alphabet, acquisition of vocabulary, general language development (including phonemic awareness), books studied or read, and development of the competence to manage unfamiliar books, including extended text, using the procedure developed by Thomas Gunning.[13] A team made up of district staff members and consultants administered the Gunning procedure in June in order to ensure standardization of the tricky process of measuring the reading competence of very young children.

To what extent is the variance in achievement explained by gender, by developed language competence as students entered kindergarten, and by class group—variables that occur repeatedly in the literature and are reported as factors in many studies? In the first year, all 141 kindergarten-age students in the three schools were enrolled and were included in the study. In all three schools, students came from a considerable variety of socioeconomic levels, and some 15 students came from First Nations reservations. Teacher judgment indicated that just one of the children entered kindergarten reading at any level. Just one student could recognize all the

letters of the alphabet (tested outside the context of words).

Throughout the year the data were collected, summarized, and interpreted with respect to the response of the students. Here we concentrate on the most salient aspects of the students' learning. All eight kindergarten classes followed similar patterns. Differences between the classes were small by comparison to the general effects. For us, this was very important. Had it been that only half of the teachers had been able to implement the curriculum successfully, we would have had to do some heavy thinking.

Recognition of letters of the alphabet. In early October, the mean number of letters recognized (out of 52 upper- and lower-case letters) was 31. In January, the mean was 46. In March, it reached 52. That is, all the students could recognize all the letters out of context. Letter recognition was associated with the acquisition of sight vocabulary, but one was not necessarily a function of the other. The learning of sight vocabulary appeared to pull letter recognition as much as the learning of the letters facilitated the acquisition of sight vocabulary.

Acquisition of sight vocabulary. Our inquiry focused both on how many words were being learned and on the students' ability to learn new words. The learning of words was studied in terms of the Picture Word cycles, which ranged from about 4 to 6 weeks in length. Both the number of words learned in the cycles and the increased efficiency developed by the students were of interest here. The data below are taken from one of the classes.

Cycle 1. Twenty-two words were "shaken out" of the picture. At the end of the first week, the average number of words identified in an out-of-context assessment was five. By the end of the fourth week, the average was 16, and one student knew all 22.

Cycle 2. Twenty-two words were shaken out. At the end of the first week, the average number that the students could identify out of context was 12, and by the end of the third week, the average number identified was 20.

Cycle 3. Twenty-eight words were shaken out. At the end of the first week, the mean number of words recognized out of context was 20, and at the end of the second week, the mean was 26, with just three students recognizing 24 and *none* recognizing fewer than 24.

All the students appeared to increase in efficiency so that, by the end of January, they were able to add to their sight vocabularies, within the first week or two, just about all the words shaken out of the picture. For all sections, the mean percentage of words recognized after 2 weeks of the first cycle was 30%. By the third cycle, the mean for 2 weeks had risen to 90%.

Retention of words. In May, random samples of six students in each class were tested with respect to out-of-context recognition of the words that had been shaken out through the year—for example, about 120 words in the class cited above. Mean retention was 110. In addition, words added through the generation of titles, sentences, and paragraphs were learned, many of them in the high-frequency "useful little words" category In the class used as an example, those additional words added up to over 100.

Had the students had difficulty developing a sight vocabulary or retaining it, we would have had a serious warning signal. But such a signal did not develop, and, more important, the increase in capability was a positive signal. By midwinter, the students were mastering words within 2 weeks that had taken them 4 or 5 weeks in the first cycle.

Classification of words. Once the words were shaken out, they were entered into the computer, and sets of words were given to each student. (The students could examine them and, if they did not recognize one, could use the picture dictionary to identify it.) Classifying the words was an important activity. The students were asked to sort their word cards according to the characteristics of the words. The teachers modeled classifications of various types throughout the year. In the first cycles, most students built categories on the presence of one or more letters. Later, more

complex categories emerged. The teachers selected categories for instructional emphasis and led the students to develop new words and unlock unfamiliar words by using the categories. For example, having dealt with *work, works, worked, worker*, and *working*, the students could hunt for other words from which derivatives could be made. Or, knowing *work* and encountering *working* in their reading, they could try to unlock it as they learned how the *-ing* suffix operates.

The teachers studied the categories that students were developing, keeping an eye on the phonetic and structural principles that were emerging. The results are too complex to summarize briefly, but, on the whole, about 30 phonetic and about 20 structural concepts were explored intensively.

Transition to reading books. Throughout the year, a profusion of books were available to the students. Books were carried home for "reading to and with," and little books generated from the Picture Word activities went home to be read to parents. As the students began to learn to read independently, books at their levels accompanied them home. Our records show that 80% of the students encountered 50 or more books in this fashion, in addition to any books from home or libraries.

The assessment of independent reading levels was built around the Gunning framework, in which the students attempted to read unfamiliar books at the following levels:

- Picture Level: single words on a page are illustrated

- Caption Level: phrases or sentences, most but not all illustrated

- Easy Sight Level: longer and more complex, mostly high-frequency words

- Beginning Reading: four levels, progressively longer passages, and less repetition and predictability

- Grade 2A: requires good-sized sight vocabulary and well-developed word-attack skills

When an assessment is administered, students read aloud books at each level, beginning with the simplest, and their deviations from print are noted. They are asked comprehension questions after the book has been read. Reaching fluency with total comprehension places a student at a particular level.

In the December assessment, all the students were able to deal with books at the Picture Level, and about one-fourth could manage Caption Level books comfortably. By February, about one-fourth had progressed to the Easy Sight Level, and a handful could manage books at a higher level.

In June, the independent test team administered the assessment using a specially assembled set of books from United Kingdom publishers to reduce the likelihood that the books would be familiar to the students. The aggregated results for the eight classes were indeed encouraging.

All eight classes apparently succeeded in bringing all the students to some level of print literacy. About 40% of the students appeared to be able to read extended text, and another 30% manifested emergent ability to read extended text. Indeed, 20% reached the Grade 2A level, which includes long and complex passages and requires the exercise of complex skills both to decode and to infer word meanings. All the students could manage at least the simplest level of books.

We felt it was very important that there were *no students* who had experienced abject failure. Even the student who enters first grade reading independently at the picture level is armed with skills in alphabet recognition, possesses a substantial storehouse of sight words, and owns an array of phonetic and structural concepts. However, a half dozen students will need to be watched closely because, even if they were able to handle books at the caption level, they labored at the task, manifesting difficulty either in recognizing relationships between text and graphics or in using their phonetic or structural generalizations to attack unfamiliar words.

We studied the data to determine whether gender or socioeconomic status influenced levels

of success, and they did not. The distributions of levels for boys and girls were almost identical, as were the distributions for students having or not having subsidized lunches.

Typically, in our district, about 20 kindergarten students would have been referred as having special needs in those eight schools. At the end of this year, just two students were referred, both for speech problems.

Comfort and satisfaction. During the year, parents voiced their opinions regularly, and in May, we prepared simple questionnaires for both the parents and the children. We asked the parents a series of questions about the progress of their children and whether they and the children believed they were developing satisfactorily. The children were asked only whether they were learning to read and how they felt about their progress. We were trying to determine whether there was any discomfort that we were not detecting. But in response to our survey, no student or parent manifested discomfort or dissatisfaction related to the curriculum. However, some parents were anxious at the beginning and remained worried at the end of the year. Some were concerned that we had not taken a "letter by letter" synthetic phonics approach and worried that future problems might develop as a consequence. But even these parents appeared to believe that their children were progressing well "so far."

A YEAR LATER: LEAVING FIRST GRADE

Throughout first grade, we followed the students, and, at the end of the year, we gave them the Gray Oral Reading Test,[14] administered by a team of external testers. The mean Grade Level Equivalent (GLE) was 3.5 (the average for students at the end of Grade 1 is 2.0). Five percent of the students were below 2.0, which is quite a distance from the 50% typical in our district in previous years.

In June 2003, 47 students, a randomly selected half of the 94 students still enrolled in the district,

were administered the Gray Oral as they exited Grade 2. Their average GLE was 5.0 (the national average of exiting Grade 4 students). The distributions of male and female scores were almost identical. Five students (10%) scored below the average of exiting second-grade students. Typically, 30% of the students in this district or nationally in the United States and Canada do so.

In subsequent years, we will continue to monitor the progress of the students from each year, and we will follow the lowest-achieving students most intensively.

INTERPRETATION

The problem that faced us was whether research on beginning literacy had reached the point that we could design multidimensional curricula to introduce young children to reading with comfort and satisfaction. In our efforts to learn how much an initiative in kindergarten curriculum might improve literacy learning, reduce the likelihood of failure by students thought to be at risk, and also benefit students not thought to be at risk, our first experience must be described as positive. We will follow the students through the grades, and we will continue to scrutinize the curriculum.

The teachers were all new to a formal kindergarten reading curriculum. In the first year, they were scrambling to master a considerable number of unfamiliar instructional models, particularly the Picture Word Inductive Model, and they spent considerable energy tracking the progress of the students and trying to figure out whether they were proceeding optimally and whether the tasks were well matched to them. With greater experience, they will no doubt provide many ideas for improvement.

The issues of "developmental readiness" become moot if the knowledge base permits us to design effective and humane kindergarten curricula in reading. The progress of the students in these eight classes equals the progress of students in average first-grade classrooms and surpasses

it in one very important way: No children failed, whereas one-third of the students in average first grades usually do. The half-dozen students who gained the least nonetheless arrived at first grade with substantial knowledge and skill.

In the next few years, we'll learn how these students do in the upper elementary grades, where similar efforts to change the curriculum are underway. Thus far, our results have been encouraging, but there are 400 students to follow now. We certainly want to continue the outstanding achievement we have seen so far, but we also hope to close the door on poor achievement and eliminate the need for the safety net programs. We'll see. Right now, our hypothesis is that a strong, multidimensional, formal reading program for kindergarten students can change the picture of achievement in the primary grades. Moreover, 5-year-old children, given a strong and humane curriculum, can learn to read at least as well as first-graders usually do, but without the high failure rates of so many first-grade classrooms.

We hope that our Northern Lights teachers, and all others in every venue, will set high standards and also treat their students affirmatively. We are bothered when states, provinces, and districts set goals at such a low level that they expect that 2% or 3% of the students will creep up to the next level of achievement any given year. Ninety-five percent is a better goal. Nearly all of our little second-grade graduates can now read with the best of upper-elementary-grade students. So could nearly all of the students in all school systems.

Discussion Questions

What do you think is an appropriate formal kindergarten curriculum?

If you are not a kindergarten teacher, what literacy skills did you read about that might assist you with the students you do teach?

Article 15

LITERACY EDUCATION AND READING PROGRAMS IN THE SECONDARY SCHOOL

Status, Problems, and Solutions

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The ability of students to read, write, and communicate (a set of skills that by tradition are collectively referred to as "literacy") stands among the most current concerns pertaining to academic achievement in public education. Because literacy is seen as crucial to scholastic success, a school district's choice of a reading program takes on paramount importance. In many cases, the success or failure of the reading program in a school hangs upon the principal's understanding of and support for the program. According to Bauman (1984), the presence of a strong instructional leader (i.e., the principal) is crucial to an effective reading

program. Principals are responsible for scheduling and staffing their schools' reading programs and placing them in context with all of the other programs in their schools. They must decide on the qualifications of the teachers who will be given primary responsibility for reading. Should the school employ a "reading specialist," or should all teachers be required to include literacy skills in their courses? Will the school provide time in the schedule for reading, or will teachers be required to make time in their own class schedules to include reading practice? These and other administrative decisions will significantly affect a school's reading program. Although many secondary-school principals have little or no training in the teaching of reading, they are held accountable for the development, implementation, and evaluation of reading programs in their schools.

And those programs are in trouble. According to many critical observers, U.S. secondary schools have been failing in a number of areas, especially reading and literacy. Farr and Tone (1998) indicated that students experience a declining interest in reading through the secondary school years. According to the National Assessment of Educational Progress reading report card (Donahue, Voelkl, Campbell, & Mazzeo, 1999), only 40% of high school seniors in the United States were proficient or better in reading skills (where proficiency is defined as demonstrated competency over challenging subject matter). Binkley and Williams (1996) concurred with this negative outlook, indicating that nearly 30% of high school graduates failed to demonstrate basic literacy skills.

SURVEY METHOD

To determine the views of principals concerning the reading programs in their schools, we surveyed 46 principals from the Savannah–Chatham County School District. The principals attended an administrative staff meeting at which a reading workshop was presented. As part of this workshop,

the principals were surveyed about their perceptions of the school system's reading program. Respondents included 7 secondary school principals, 11 middle school principals, and 28 elementary principals. The data presented in this article focus on the responses provided by the secondary school principals.

Regional Demographics

The Savannah–Chatham County School District is located in a mixed urban and suburban setting on the northeastern coast of Georgia. Although the 2000 U.S. Census (U.S. Census Bureau, 2002) indicated that the community is 40.5% Black and 55.3% White, 64% of the public schools' students are Black and 31.3% are White. According to the National Center for Education Statistics, White students nationwide averaged higher reading scores than Black, Hispanic, and American Indian students (Donahue et al., 1999). Therefore, the disproportionately large Black student population in the Savannah–Chatham County schools is a critical consideration for their reading programs. Socioeconomic status also plays a role in how well students develop literacy skills. Donahue et al. found that students eligible for the free or reduced-price lunch program had lower average reading scores than students who were not eligible for such programs. Savannah–Chatham County schools reported that 50.3% of their students were eligible for free or reduced-price lunches in the 1999–2000 school year (Georgia Department of Education, 2001).

According to the 1999–2000 Georgia Public Education Report Card, only 62% of Grade 11 students in Chatham County passed all components on the Georgia High School Graduation Test on the first administration (Georgia Department of Education, 2001). The statistic for the 1999–2000 cohort was revised the following year to 59%, and in 2000–2001 the number of Grade 11 students passing the test fell to 54% (Georgia Department of Education, 2002); it appears that the Savannah–Chatham County schools need to take action to address their deficiencies.

SURVEY FINDINGS

Among survey participants, the average length of service as a principal was 4.8 years; the range was from 1 year to 14 years. The survey population had an average of 25.5 years of overall experience in education. None of the principals surveyed had an undergraduate degree in reading.

When asked where they received their training in reading education, principals had various responses, including "from recent workshops," "a personal desire to read and learn," "an undergraduate class," or "graduate class in reading." Although the principals reported varying degrees of knowledge about reading instruction, they universally agreed as to its importance. One principal stated, "Reading is a basic element for all learning. It is a foundation which must be secure before advanced concepts can be attained."

The perception of the secondary principals polled in this survey concurred with critical assessments of literacy among U.S. secondary-school students. Fifty-seven percent of the respondents indicated that they believed that students today are poorer readers than students were in past years. More troubling yet is that only half of the principals surveyed believed the teachers in their buildings were prepared to address reading problems or plan instruction to foster reading development.

PROBLEMS IDENTIFIED IN LITERATURE AND SURVEY

If literacy skills in secondary schools are in fact poorer today than they once were, what has caused this decline? Goodlad (1984) suggested that part of the problem might be the lack of time devoted to reading instruction. He maintained that reading occupies only about 2% of class time in high school. This view was shared by Donahue et al. (1999), who reported that one-third of Grade 12 students read fewer than five pages each day for both school and homework. Horkay (1999) pointed out that students who

read for fun daily scored higher on national reading tests than their peers who read for fun less frequently. Horkay also stated that there was no significant change between 1992 and 2000 in the percentage of students reading for fun on a daily basis. Students appear to have insufficient time in school to do independent reading, which adversely affects poor readers who may not read independently outside of school. The amount of time watching television may be one factor involved in the amount of reading students accomplish. Donahue et al. related that 69% of high school seniors report watching 2 or more hours of television each day. And Pfordresher (1991) suggested that as students get older their interest in reading declines and they spend less of their free time reading.

In addition, Bean (1997) pointed out that poor readers use a narrower range of strategies to guide their own reading than good readers. More specifically, many students have difficulty with tasks that require interpretations of what they have read. These problems exist in conjunction with the lack of direct reading instruction and discussion within high school level classrooms.

It is possible that many teachers in other areas see themselves as specialists in their disciplines and assume that teaching reading, writing, and communication is the responsibilities of the English teacher. In high schools, reading is often limited to text materials, and students rarely read aloud in class. In many classrooms, reading is assigned as homework, and little or no class time is spent on this task. Apparently, many high school teachers assume—falsely—that students learned to read in elementary school and come to their classes with sufficient literacy skills to get the information they need from their textbooks. When content area teachers become aware of their students' lack of literacy skills, however, they feel unprepared to teach these skills in their classrooms. To better prepare secondary teachers to address this issue, Bean indicated that preservice teachers need to learn specific teaching strategies that will enable them to teach vocabulary development and reading comprehension skills.

One reason high school teachers might wish to avoid teaching reading is a belief that it would require them to teach phonics and other skills not related to their subject areas. The principals in our survey tended to concur with this false assumption, as 80% of them responded that they thought phonics instruction should be used in their schools' reading programs. The principals also indicated that they thought their teachers believed that phonics instruction was necessary at the high school level. Shannon (1991) suggested that false assumptions like these result from narrow definitions of literacy that reduce reading to phonics, writing to spelling and grammar, and language skills to English.

Ironically, the increasing emphasis in education on accountability—with its dependence on standardized testing by state boards and by NAEP—is having a damaging effect on the teaching of reading (Pfordresher, 1991). The time required to prepare students to take these standardized tests cuts down on the valuable time allowed for reading instruction and independent reading by students. Although all of the principals in the survey indicated that the daily schedule should include time for independent reading, teachers find themselves focusing on a narrow list of skills and the mechanics of reading that are typically covered on the tests. This discourages students from reading and may even decrease the pleasure good readers find in the pursuit.

This pressure to require "high stakes" testing in all realms of education has now reached kindergarten classes, where students generally receive their first pencil and paper test to gauge their "reading readiness." The results of this test can determine if a child is promoted or retained. However, according to Shepard (1987), there is little evidence that reading readiness scores correlate with reading success. The stress associated with reading tests appears to demoralize both students and teachers. With new educational standards based on test scores, control of reading programs has been shifted from schools to the state level, where decision makers are far removed from actual students. This makes it more difficult for teachers and principals to address the specific needs of their schools and students (Hoffman, Assaf, & Paris, 2001).

Although all of the principals in our survey agreed that reading is an issue that should be addressed by educators from pre-K through Grade 12, none of them felt that reading development is an issue that should be the sole responsibility of the school. Jensen, Strauser, and Worley (2001) asserted that reading is a common responsibility and that teachers and administrators should join forces with parents, staff, and the surrounding community to promote reading literacy among students and adults. Schools should demonstrate that reading is viewed as an important aspect of the curriculum as well as the nonacademic program.

It would be difficult to overstate the importance of reading that students do at home in the development of their literacy skills. Horkay (1999) reported that students who had more types of reading materials in their homes (including books, magazines, newspapers, and encyclopedias) tended to score higher on reading tests than those with fewer types of such materials. Horkay also observed that while the scores of higher-performing students have improved over time, those of lower-performing students have declined. The concept that "the rich get richer, and the poor get poorer" appears to apply to literacy education.

SUGGESTED SOLUTIONS

Administrators and teachers need to recognize that reading is an ongoing developmental process. All of the principals surveyed indicated that they considered themselves lifelong readers. They tried to model their belief in the importance of reading by reading for pleasure on a daily basis in addition to their professional reading. Seventy percent of the principals believed that their teachers also demonstrated that they valued reading in the same manner. We tend to make time for skills that we value; if teachers and administrators truly value reading as an important skill, it must be practiced in all classes.

To improve reading instruction in non-English/language arts courses, teachers in those subjects

should be provided with inservice opportunities to acquire skills in reading instruction. Of the principals surveyed, 65% indicated that they had found this an effective way to learn about reading instruction. Another effective strategy, according to Beane (1993), is to encourage integration of the school curriculum. Reading becomes more meaningful to students when it is seen as a critical part of all courses rather than as an isolated skill in one. It is also important for educators to model reading for pleasure; all the principals surveyed indicated that this was something that they and their teachers tried to do. Students watch what instructors do more than they listen to what they say.

Process skills, especially reading and writing, can be taught concurrently with content. By providing instruction in the processes necessary to acquire content, teachers help students learn how to acquire knowledge effectively rather than just accumulate bits and pieces of information (Stevenson & Carr, 1993). Teachers need to provide guidance in all aspects of the instructional process rather than be one dimensional.

All language processes, not just reading, need to be used to help students learn from texts. Writing, listening, and speaking are interrelated and become additional tools to teach more content. Donahue et al. (1999) reported that students who read more pages daily in school and for homework tended to score higher on reading tests. Students who were required more frequently to write long answers on tests or assignments involving reading had higher test scores, as well.

The use of small groups enhances learning. When students are encouraged to work collaboratively with peers, productivity and achievement are increased. This is a result of what Ormrod (1999) calls the "zone of proximal development." This zone is a range of tasks that students cannot perform independently but can accomplish with the help and guidance of others. In addition to encouraging social development, this maximizes cognitive growth. Students also learn from knowledge and strategies used by others.

Integrating technology into the instructional process promotes an increase in learning from texts. A person must be able to use computers and other multimedia tools to be considered literate in the 21st century. Teachers who fail to use available technology in their instruction shortchange their students. Teachers must assist students by providing instructional and technical support to facilitate success (Curran, 1997).

All modes of learning need to be addressed. Teachers should use the multiple-intelligences approach in reading instruction. In addition, Whitin (1996) promoted the strategy of using symbols, pictures, and other nonlinguistic signs to represent ideas from reading.

Content teachers must become catalysts for learning by helping students in their efforts to read and learn from texts. Educators' focus must change from "learning to read" to "reading to learn." Principals can make literacy skills a priority by creating a climate that says to teachers (in professional ways) and students (in practical ways) that "We value reading in this school!"

Discussion Questions

How do you feel about the idea that secondary teachers will need to teach literacy skill across all subject areas?

How do accountability and high-stakes testing affect literacy concerns in secondary schools?

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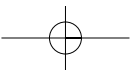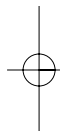
Article 16

A DEEPER SENSE OF LITERACY

Curriculum-Driven Approaches to Media Literacy in the K–12 Classroom

CYNTHIA L. SCHEIBE

One hundred elementary school students are chattering loudly as they walk back up the snowy hill to their school, coming from the local movie theater, where they have just been treated to a special holiday showing of the movie *Antz.* The children are not just excited about seeing the movie; they have spent the past 2 weeks in their science class learning about ants and other insects, and now they are calling out examples of ways in which the movie misrepresented true ants. "Ants don't have teeth!" calls one boy. "Who were all those boy ants?" a girl asks. "I thought almost all ants were girls!" Her teacher nods and confirms that nearly all soldier and worker ants are sterile females.

Back in their classrooms, the students and teachers list the ways in which the ants were portrayed correctly (with six legs, three body segments, living in tunneled communities, carrying large loads) and incorrectly (talking, wearing clothes, with white eyes, etc.). The teachers take time to correct any misperceptions and to reinforce accurate information and then lead a discussion about why the moviemakers showed ants in ways that were not true. "Because they didn't know any better?" proposes one girl. "Because they wanted them to look like people!" suggests another. "It would be boring if they couldn't talk and just ran around like ants!"

This type of curriculum-driven approach to media literacy is at the heart of our work with K–12 teachers at Project Look Sharp, a collaborative initiative of the teacher education, psychology, and communications programs at Ithaca College. As many theorists have noted (e.g., Hobbs, 1997), media literacy is a logical extension of traditional literacy: learning to "read" visual and audiovisual messages as well as text-based

ones, recognizing the basic "language" used in each media form, being able to judge the credibility and accuracy of information presented in different formats, evaluating the "author's" intent and meaning, appreciating the techniques used to persuade and convey emotion, and being able to communicate effectively through different media forms. Media literacy, then, incorporates many elements from multiple literacies that are already central to today's education, including information literacy, computer literacy, scientific literacy, and cultural literacy. In addition, media literacy builds critical-thinking, communication, and technology skills and is an effective way to address different learning styles and an appreciation for multiple perspectives.

Before building media literacy into a curriculum unit, it is essential for teachers to have some basic training in media literacy theory and analysis (through staff development workshops and trainings). Project Look Sharp encourages teachers to weave the core elements of media literacy into their teaching practice early in the school year (see Best Practices below). We then work directly with individual teachers (or teams of teachers) to develop unique media literacy lessons that will help teach core content required by their districts and the state. We always start with core content (rather than the media literacy aspects), keeping in mind the teachers' own goals and needs, with a focus on basic learning standards for their grade and curriculum area.

Sometimes we are asked by school administrators to develop a series of lessons or resources to address a particular issue or need. For example, the second-grade social studies curriculum in New York State includes teaching about rural, urban, and suburban communities, and teachers were having a hard time conveying those concepts to 7- and 8-year-old children. Working with the teachers, we developed a series of lessons based on collective reading of historical pictures and short clips from television shows reflecting the three types of communities. Students from rural, urban, and suburban elementary schools then produced digital videos about their own communities and shared them with classes from the other schools. Students were surprised to find that there were many similarities in their videos (they all included fire stations, for example), and that some of the stereotypes they held about different types of communities were not true. Although this was a great deal of work, the unit went far beyond simply teaching the desired social studies and media literacy lessons by building (or reinforcing) a host of other social and organizational skills.

This approach has been surprisingly effective, not just in increasing the students' interest in a particular topic but also in deepening their understanding of the information itself. Teachers who gave a test about insects following the *Antz* movie found that students performed best on questions that related to the discussion of accuracy in the movie (e.g., the physical characteristics of insects), and that even 6 months later—at the end of the school year—most students remembered that information accurately.

By emphasizing media literacy as a pedagogical approach rather than a separate content or skill area, we have been able to help teachers multitask. We have also found that once teachers have developed an awareness themselves of the basic concepts and practices of media literacy, they begin to see opportunities for incorporating media literacy into their classrooms on an ongoing basis. For example, teachers whose classes were going to see *Antz* took a few minutes to explain the concept of "product placements" and told the students that they would be seeing some product placements in the film. When the first bottle of Pepsi appeared in the scene of Insectopia, there was a shout from the children in the audience—"Product placement!"—and students continued to identify product placements in videos and other media for the remainder of the school year.

In using a curriculum-driven approach, teachers sometimes take a narrow focus for a particular topic or lesson (e.g., linking current advertising appeals to a sixth-grade unit on Greek myths) or weave media literacy into ongoing activities in their classrooms (e.g., in a weekly discussion of current events). Sometimes

media literacy is used to link several different parts of the curriculum together (e.g., investigating local history and literature through examining original documents at a local museum). And sometimes the production aspect of media literacy is used creatively to convey information to parents and administrators (e.g., fourth-grade students' producing a video to illustrate a typical school day for their parents to watch at open house).

This, of course, is not the only way to approach media literacy education. Students benefit greatly from specific lessons or courses focusing solely on media literacy, media production, and other media-related issues. But our experience has shown that this is rarely possible in the public school system, especially with the increasing focus on tests and a "back to basics" approach. For many teachers, finding even a few days to devote to media literacy is problematic; they are already swamped with core-content requirements they must teach. Even with a growing emphasis on technology skills and critical thinking, there are still only seven states that mandate media literacy as a separate strand in their states (Baker, 2004), and even those states have had difficulty grappling with how to assess media literacy as part of standardized state testing.

Kubey and Baker (2000) have noted, however, that nearly all states do refer to aspects of media literacy education as part of the mandated state standards, although they do not typically use the phrase *media literacy*. In New York, for example, media literacy is clearly reflected in requirements that students "evaluate importance, reliability and credibility of evidence" (Social Studies Standard 1, No. 4) and "comprehend, interpret and critique texts in every medium" (English Standard 2, No. 1). In California, social studies standards for Grades 9 through 12 specifically refer to evaluating "the role of electronic, broadcast, print media, and the Internet as means of communication in American politics" and "how public officials use the media to communicate with the citizenry and to shape public opinion" (Kubey & Baker, 2000, p. 9). Many states include specific references to media issues in their health standards, especially related to tobacco and alcohol use, nutrition, and body image.

In taking a curriculum-driven approach to media literacy integration, it is crucial to explicitly lay out these connections between media literacy and state or district learning standards. Teachers then feel more comfortable about taking class time to teach the basics of media literacy and to weave a media literacy approach into their overall teaching practice. Media literacy can also be used to develop "parallel tasks" for students to build and practice their skills in analyzing information from different sources, listening and taking notes, and supporting their opinions with evidence in written essays—all of which are key components in standardized testing.

BEST PRACTICES FOR USING MEDIA LITERACY IN THE K–12 CLASSROOM

Various writers have described key concepts of media literacy (e.g., Hobbs, 1997) and basic questions to ask about any media message (e.g., Thoman, 1999). We have found the following set of questions to work well with students from elementary school through college:

1. Who made—and who sponsored—this message, and what is their purpose?

2. Who is the target audience, and how is the message specifically tailored to that audience?

3. What are the different techniques used to inform, persuade, entertain, and attract attention?

4. What messages are communicated (and/or implied) about certain people, places, events, behaviors, lifestyles, and so forth?

5. How current, accurate, and credible is the information in this message?

6. What is left out of this message that might be important to know?

Introducing these questions at the beginning of the school year as standard practice for evaluating any information or image that is part of the

classroom experience promotes general critical-thinking and analysis skills. Other best practices include the following:

- Beginning the school year or the exploration of a new unit by developing an *information plan* in consultation with the students. What types of media and other information sources will the class be using? Where could students go for information on a particular topic, and what might be the strengths and weaknesses of each source? This overlays media literacy questions on the typical K-W-L pedagogical approach to teaching a new topic: What do you already *know* about this topic and where did you learn about it? What do you *want* to know, and where could you find out about it? Reflecting back at the end of the unit, what did you *learn*, and what sources were most (and least) useful?

- Encouraging students to pay attention to both print and visual elements in media sources, noting information that can be learned from the images themselves. This includes, of course, attending to the images in their textbooks.

- For any media source (including textbooks, videos, and Web sites), making sure the students know who wrote or produced it and when it was produced or published. If appropriate, discuss the implications for its usefulness in your current exploration. (What perspectives might be included or left out? What information might be out of date?)

- Training students to learn from videos (and other traditionally entertaining forms of media) in the same way that they learn from teachers, books, and other sources. When showing videos or films in the classroom, show only short segments at a time rather than the full film without interruption, leaving the lights on—if possible—to facilitate active viewing and discussion. Before showing a video, let the students know what things they should be looking and listening for. If appropriate, encourage students to take notes and to raise their hands during a video if they do not understand something they saw or heard.

- Building elements of media production into the classroom experience by

    encouraging students to scan or download images into reports and term papers, making sure that they use images as part of the research process by including captions and citing the appropriate sources

    providing options for individual or small group presentations such as using PowerPoint, audio- or videotape, or desktop publishing

    emphasizing an awareness of the six media literacy questions as part of the production process (e.g., What is *your* purpose? Who is *your* target audience? What information will *you* leave out, and how will that bias *your* message?)

BASIC PRINCIPLES FOR CURRICULUM INTEGRATION

In working with a range of teachers and curriculum areas, we have also developed 12 basic principles for integrating media literacy and critical thinking into the K–12 curriculum (Scheibe & Rogow, 2004). Discussions of four of these principles follow.

Identify erroneous beliefs about a topic fostered by media content. This is particularly relevant to curricular areas that emphasize "facts," such as science and social studies. Even young students bring existing assumptions and expectations to the classroom situation, and it is critical to examine those assumptions with the students to correct misperceptions and identify the media sources involved. Many adults, for example, believe that tarantulas are deadly or that lemmings follow each other blindly and commit mass suicide by jumping off cliffs into the sea. Both of these erroneous beliefs have been reinforced by the media, such as the 1957 Disney movie *White Wilderness,* which showed lemmings falling off cliffs into the sea (they were actually herded off the cliffs by the production crew off camera; see www.snopes.com/disney/films/lemmings.htm).

Develop an awareness of issues of credibility and bias in the media. This is critical in evaluating how any information is presented and has increased in importance with the rise of the

Internet as the dominant source of information students now use in preparing papers and reports. It also applies to math, especially with respect to media reports of statistics (particularly in misleading graphs in advertisements). Although math teachers already emphasize the importance of having both the *x*-axis and *y*-axis correctly labeled, for example, a media literacy approach would go beyond that to ask why those producing the graph (or reporting the statistics) would leave out such important information.

Compare the ways different media present information about a topic. Many English/language arts teachers have students compare the same story or play when presented in different media formats or by different directors. Approaching this from a media literacy perspective, the teacher might ask the basic six questions about each presentation, comparing the purposes and target audiences of each and identifying what is left out—and what is added—in each case and why. The same principle can be applied easily to the study of current events at nearly any grade level. Instead of having students cut out newspaper articles reporting three different events, for example, a teacher could have students identify *one* event that is reported in three different sources (e.g., English language versions of newspapers from different countries). The resulting report about the event would then draw from all three sources and could include an analysis of how the three sources differed and why.

Use media as an assessment tool. There are a number of ways to use media as part of authentic assessment at the end of a curriculum unit. For example, students can be shown an advertisement, a news article, or a short video clip and asked to identify information that is accurate (or inaccurate) in what they see (e.g., showing a clip from the movie *Twister* following a unit on tornadoes or a news report on the results of a political poll following a unit on statistics). Students can also work in small groups to produce their own media messages (e.g., a newspaper article, an advertisement, a digital video) illustrating their knowledge and/or opinion on a topic.

RESOURCES AND CURRICULUM MATERIALS

There are many excellent media literacy resources and materials that can be used within the context of teaching core content in K–12 education. Some media literacy curricula are designed with clear links to many subject areas, such as *Assignment: Media Literacy,* which was developed in line with Maryland state learning standards and features connections to language arts, social studies, math, health, and the arts (Hobbs, 2000). Other materials are excellent resources when using a media literacy approach to a specific subject area, such as *Past Imperfect: History According to the Movies* (Carnes, 1995). There are several good Web analysis resources. The two we have found most useful for teachers and librarians are both online: Canada's Web-awareness site (http://www.mediaawareness.ca/englishl/special_initiatives/webawareness/) and Alan November's site (http://www.anovember .com/infolit/index.html). One outstanding resource for curriculum-driven media literacy lesson plans and ideas is Frank Baker's *Media Literacy Clearinghouse* Web site (http://www.med.sc .edu:1081/).

Project Look Sharp has recently begun developing a series of media literacy kits that take a curriculum-driven approach. The first of these kits, *Media Construction of War: A Critical Reading of History* (Sperry, 2003), uses slides, print, and video materials to teach core historical information about the Vietnam War, the Gulf War of 1991, and the War in Afghanistan following Sept. 11, 2001. After students read short histories of each war, teachers lead collective readings of each image, discussing the overt and implied messages in each and relating the images back to core content that is part of their history curriculum.

EVALUATION AND ASSESSMENT

Project Look Sharp has begun conducting empirical studies of the effectiveness of media literacy integration using this type of curriculum-driven approach (reported elsewhere). Some of these

studies involve pretest/posttest designs collecting data directly from the students, and some involve assessments of student-produced work. From a program evaluation standpoint, however, we have found it most useful to solicit qualitative feedback from the teachers themselves. They repeatedly say that media literacy lessons evoke active participation on the part of students, especially students who are nontraditional learners or disenfranchised for other reasons. Teachers also report that after adopting a media literacy approach to teach specific core content, they gradually find themselves weaving media literacy into other aspects of their pedagogy. As one teacher put it, "Oh, I see. You're trying to get us to change teaching practice!"

We also sometimes send home questionnaires to parents of students who have participated in a media literacy lesson or unit to assess what we call the "trickle up" effect—when students come home and talk about what they have learned and even change their behaviors related to media issues. Some parents have said that the "media literacy stuff" is the only thing their child has talked about related to school all year; many say their children raise media literacy questions when they are watching television or reading newspapers at home.

We believe that it is this ability for media literacy to empower students in so many ways that, in the end, will lead to its growth and stability in K–12 education. By meeting the needs of teachers and administrators, of parents, and of the students themselves, we can indeed foster a deeper sense of literacy in our children.

Discussion Questions

How do you define media literacy?

How do you integrate media literacy into your curriculum?

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Article 17

WAR, CRITICAL THINKING, AND SELF-UNDERSTANDING

NEL NODDINGS

C an students learn to think critically if they are not asked to engage with critical issues? Fostering critical thinking is frequently stated as a fundamental aim of education,[1] and yet many teachers report that they have been forbidden to discuss such critical issues as current wars, religion, and cultural differences in styles of parenting.

Critical thinkers raise questions about claims and about the motives of those who make them, they identify logical flaws in arguments, they evaluate the premises from which arguments are launched, they search for evidence to support claims, and they explore the likely consequences of proposed actions. Critical thinkers are also reflective in the important sense that they regularly turn their analyses and questions on their own thinking and practices. Thus critical thinking, as I am using the term here, addresses issues that are significant in the lives of those who engage in the practice. Moreover, teachers may need to help students come to understand that certain issues they have not yet considered are indeed significant in their lives.

The study of formal and informal logic, reflection on past events, and simulation of conflicts all contribute to the development of critical thinking.[2] But the failure to confront issues critical to the present lives of students when we seek to teach critical thought sends a contradictory message: *Think critically—but not about really controversial issues! Or do it on your own time! School is not the place for analysis and discussion of critical issues.* As a result, students who end their formal schooling with high school may never encounter important and fascinating debates on war, religion, or parenting. And they may or may not learn to think critically.

Here I wish to present possible topics for a critical exploration of just one of these issues:

war. War is already a major strand in the social studies curriculum, but the discussion is usually confined to political causes, leaders, battles, and the resulting rearrangement of national boundaries. I wish to address psychological issues related to war that should concern all citizens, especially the young who might join the military right out of high school. The main question I address is this: How can critical thinking help us to understand ourselves better and come to terms with our attitudes toward war?

THE ATTRACTIONS OF WAR

"No one wants war" was a claim heard repeatedly as the U.S. and Great Britain prepared to invade Iraq. Were the political leaders who said this lying, or were they trying to reassure their citizens that *they* did not want war and would avoid it if at all possible? This question seems to be unanswerable, so I'll set it aside. Let's also set aside the obvious fact that some people make a great deal of money from war and its aftermath, and, although they deny it, they do want war. The questions that we must help young people to explore are these: Are there people, other than the greedy, who want war? Why? Are you such a person?

Anthony Swofford, a young marine, has written about the desperate attractions of war. He notes that stories and films that disgust "Mr. and Mrs. Johnson in Omaha or San Francisco or Manhattan"—films that threaten to convert many of us to pacifism—have a very different effect on military men. Swofford writes:

> [They] watch the same films and are excited by them, because the magic brutality of the films celebrates the terrible and despicable beauty of their fighting skills. Fight, rape, war, pillage, burn. Filmic images of death and carnage are pornography for the military man.[3]

The rest of Swofford's paragraph is too obscene to reprint here, but his story is a familiar one. Many men are attracted to war and mayhem.[4]

As students are confronted with some of these stories, they should be asked to consider whether the young men described by Swofford, Lawrence Le Shan, and many other writers are really attracted to war or are simply too insecure in their manhood to admit that they are not. This is not a question that can be answered definitively. It should lead to research and introspection. Surely, there are men who have loved war, and there are many who have feared it but feared dishonor and the accusation of cowardice even more. But there are also those who have hated war and have fought both bravely and reluctantly.[5] And there are those who have had the courage to refuse to participate in war against their own convictions.[6]

The question that needs closest examination is the one usually avoided: What makes war so attractive? It is not honest to cover this over with layers of propaganda extolling the virtues of "our heroes" who sacrifice willingly for "our freedom." Such sacrifice is indeed part of the story, and it should not be denied or mocked. But simply acknowledging sacrifice does not face up to the fact that many people—both soldiers and civilians—are excited by war. Chris Hedges has described war as a force that gives us meaning: "Even with its destruction and carnage it gives us what we all long for in life. It gives us purpose, meaning, a reason for living."[7] William James, too, noted that war calls forth sacrifice, that "war is a school of strenuous life and heroism." Deploring war as a "wholesale organization of irrationality and crime," James asks us to seek "the moral equivalent of war: something heroic that will speak to men as universally as war does, and yet will be as compatible with their spiritual selves as war has proved itself to be incompatible."[8] Can such an equivalent be found? Must each of us find his or her own "something heroic" to make life meaningful? Is it credible that ordinary lives are so empty and boring that war represents the only path to meaning?

A discussion of what makes war attractive should lead to a critical examination of gender and violence. Many peace activists argue that peace is not simply the absence of war but, more significantly, a condition of life in which no one

suffers from violence or the threat of violence.[9] Rape and brutality seem to be part of a faulty vision of masculinity, one that supports both war and a "rape culture."[10]

THE GENDER CONNECTION

The relation of gender to violence is a broad and fascinating topic that should include at least three large subtopics: masculinity and war, rape and brutality, and violence as a way of expressing anger. On this last, educators should be aware that unhealthy visions of masculinity motivate much school violence. Almost all of the multiple killings committed in schools in recent years have been the acts of angry boys. Jessie Klein and Lynn Chancer, completing a study of these boys, remark, "When boys feel weak, sad, scared, anxious, lonely, or depressed, the negative experience is unnecessarily magnified when they feel this also indicates a lapse in the 'tough disposition' manhood demands."[11] Surely, critical thinking brought to bear on questions of masculinity is something schools should encourage.

Women, perhaps more often than men, have been outspoken opponents of war. Several women writers have traced this opposition to motherhood and women's bodily understanding of the "cost of human flesh."[12] Women organized peace campaigns during and after WWI, and the Women's International League for Peace and Freedom has worked steadily for peace since 1915. Indeed, if the suggestions made by the WILPF in 1919 had been heeded by the Paris Peace Conference, WWII and other conflicts might have been avoided.[13]

For present purposes, because we are interested primarily in the psychological causes and effects of war, it is worth noting that the women's recommendations in 1919 were rejected—at least in part—because they were made *by women.* This observation underscores the need for attention to matters of gender. To what degree are women's opinions on war and peace ignored even today?

Teachers must be careful, however, not to convey the idea that all men are pro-war and all women antiwar. Many, perhaps most, women have supported war. Sara Ruddick notes: "War is exciting; women, like men, are prey to the excitements of violence and community sacrifice it promises."[14] If men sometimes welcome war as a means of escaping the boredom of everyday life, it is reasonable to assume that women— long held to even more constrained and boring lives—would often find war attractive. Thus women are attracted to men in uniform, with whom they share the excitement. Both masculinity and femininity, as traditionally defined, are at fault. As Virginia Woolf put it, "No, I don't see what's to be done about war. It's manliness; and manliness breeds womanliness—both so hateful."[15] What Woolf alludes to, of course, is "manliness" that is defined by the warrior and patriarch and "womanliness" that admires and supports "strong" men—even when that strength is used to dominate women.

Where should these matters be discussed? Surely, they are relevant topics for study in social studies, literature, and science. But with a curriculum already groaning under the demands of high-stakes testing, how can we add still more? My answer is to get rid of the trivia and spend time on topics that really matter.

ART AND SOCIALIZATION

Woolf and, after her, Susan Sontag both name gender as an important contributor to the continuance of war. Both, however, explore the possibility that art—especially visual art—might make war so repugnant to viewers that many would actively oppose war.[16] Perhaps something like this is already happening, for the world has never seen so many participants in antiwar activities as in the case of the recent war in Iraq. Still, this impressive opposition had little effect, and it was strongly influenced on the domestic scene by the deeply socialized admonition to "support our troops." This admonition is enormously powerful, and students should be encouraged to analyze its effects on patriotism, on conformity, and on the preservation of traditional attitudes

toward war and warriors. Can one be against a war and still support the troops? Must patriots provide such support? What else is supported when we give way to this pressure?

The idea (or hope) that vivid images of horrible events might make war less attractive has been shared by both women and men. Sontag cites the work of Ernst Friedrich in *Krieg dem Kriege!* (*War Against War!*) as an early (published in 1924) and dramatic example.[17] Despite government and patriotic opposition to the publication of this book, it eventually sold widely. Still, even more destructive wars lay ahead. Sontag notes: "It seems that the appetite for pictures showing bodies in pain is as keen, almost, as the desire for ones that show bodies naked."[18] As we have already noted, Swofford and his companions agree. The brutality of war has its own erotic magic. Critical thinkers should ask, "Am I the sort of person who looks forward to war? What justifies my attitude? How did I get this way?"

To ask the question "Am I this sort of person?" is to invite a study of how we are socialized. Indeed, a critical study of how we are socialized may be the single most important function of education. The task is not simply to encourage people to resist socialization but rather to help them understand the process—and then to decide (as nearly as anyone can) what to affirm, what to resist, and what to accept without wasting further energy.[19] Some socialized behaviors can be safely accepted with a shrug of indifference. Young people—with their first whiff of the possibilities of resistance—often resist rules and customs that are relatively innocuous. One job of the critical thinker is to make these distinctions and to engage in what Neil Postman and Charles Weingartner called "crap detecting"—uncovering "misconceptions, faulty assumptions, superstitions, and even outright lies."[20] This is hard intellectual work that should be applied to critical issues.

A full treatment of socialization is much too large a task to undertake here, but one aspect of it must he addressed. How do we come to the attitudes we take toward war? Our aim should be to increase self-understanding, not to convert students to a particular view. I think it would be

wrong, for example, to overemphasize the wrongdoing of our own nation, but it would be equally wrong to neglect it entirely. It is the job of teachers to confront students with the strongest (not the most extreme) arguments on all sides of an issue and to help them to arrive at and defend a view to which they can commit themselves.[21]

Students should certainly be made aware of how attitudes are manipulated by slogans and propaganda of all sorts. How does it happen, for example, that members of the military are often scorned and ignored during peace time and are suddenly transformed into "heroes" when war occurs?[22] Often, it is the students who are least academically inclined who fill the enlisted ranks of the military, and the public assumes that these kids need to "shape up" and "find themselves." Then war breaks out, and these same kids are suddenly credited with the virtues of warriors; they are now "our boys" who deserve our support. What accounts for the dramatic change in public attitude toward the military?

What forces shape the attitudes of the warrior and of the anti-warrior? How is it that some young men are drawn to the brutality of warfare, some so hate it that they become pacifists, and others accept it reluctantly as necessary? Do art, music, and literature influence our attitudes? Why do people disagree even on this? If literature is not powerful in shaping attitudes, why are some works banned from schools? Why were governments so outraged by Friedrich's *Krieg dem Kriege!*?

An important question for young people to consider is whether events can be so powerful that the people swept up in them lose all sense of themselves as moral agents. How is it that good people, brought up reasonably well, do horrible things in war?

ATROCITIES

Almost everyone has heard of the systematic murder and cruelty organized by Hitler, Stalin, Pol Pot, Idi Amin, and Saddam Hussein. But few Americans are as aware that cruel and disgusting

acts have been committed by individual soldiers of all nations. Jonathan Glover has presented a comprehensive summary of the dreadful atrocities of the 20th century. His purpose is to encourage a psychological study of war and cruelty. He writes, "We need to look hard and clearly at some monsters inside us. But this is part of the project of caging and taming them."[23]

Students should read the words Glover quotes from a Soviet soldier who served in Afghanistan: "We're invited to speak in schools, but what can we tell them? Not what war is really like, that's for sure. . . . I can't very well tell the school kids about collections of dried ears and other trophies of war, can I?"[24] Yet this is exactly what students should hear, and they should know that identical stories—right down to the collections of human ears—could be told by American veterans of Vietnam. But they should also hear that some soldiers kept their moral resources intact and rejected the temptation to engage in vicious practices. How did they manage it?

Journalists have documented their own practice of withholding unwelcome news from their audiences. Glover writes, "People committed to a war do not want to hear things which call into question its justification, its success, or its methods."[25] They want the world sorted into "good guys and bad guys."

But even WWII—the so-called good war—produced atrocities on the part of the "good guys." Hatred for the Japanese was a strong motivating factor in the war in the Pacific.

American soldiers in WWII rarely knew much about the enemy they so despised. Would it have made a difference if they had heard the words of the Japanese philosopher Kitaro Nishida? "Love is the deepest knowledge of things. Analytical, inferential knowledge is a superficial knowledge, and it cannot grasp reality. We can reach reality only through love. Love is the culmination of knowledge."[26] Critical thinking must be applied even to love, lest it be misplaced or distorted. And we need to read many stories if we are to cultivate love and commitment. Critical thinking alone may not induce commitment and may even encourage a "spectator" attitude toward the world's problems.[27]

One work that high school students often read, *The Iliad*,[28] can be used to launch critical thinking about the ways in which warriors can lose their moral anchors. The pages retelling Achilles' merciless killing of Priam's son, Lykaon, are both dramatic and horrendous. Even though the young man was helpless and begged for his life, Achilles mocked and slew him. Then he threw his body into a stream.

Nor was this incident unusual. The volume is filled with such scenes and with comrades taunting one another with the shame of cowardice. In Achilles, we see a warrior enraged by grief, the desire for vengeance, and guilt. Similar stories have been told again and again over the centuries.

When students read *The Iliad,* they should also read at least part of Simone Weil's essay on it.[29] A powerful indictment of what war does to men, it starts this way: "The true hero, the real subject, the core of *The Iliad,* is might [or "force"]. That might which is wielded by men rules over them, and before it man's flesh cringes."[30] War (i.e., "might") changes human beings into *things*. Some, Weil notes, recover; others "become things for the rest of their lives."[31] "These men," she says, "are another species, a compromise between a man and a corpse."[32] At the end of her essay, Weil expresses the hope that, from the genius of *The Iliad,* people will "learn how to accept the fact that nothing is sheltered from fate, how never to admire might, or hate the enemy, or to despise sufferers. It is doubtful if this will happen soon."[33] Her essay was published in 1940.

Questions for students to ask themselves: Would I kill mercilessly if I had seen my dearest comrade slain in battle? Or if I saw my home city destroyed? Or if my comrades were engaged in such behavior? Or if I were ordered to do so?

UNDERSTANDING AND COMPASSION

How should we feel toward those who commit horrible crimes against human beings? It is not only natural to feel outrage but morally right to condemn such acts. But students should consider the possibility that responsibility for wartime

atrocities is shared. Erich Maria Remarque's description of a guard at a Nazi concentration camp provides a dramatic introduction:

> Schulte was . . . twenty-three. . . . He had been a member of the Hitler youth group even before the seizure of power and that was where he had been educated. He learned that there were superhumans and subhumans, and he firmly believed it. . . . Killing [subhumans] was like killing vermin. Schulte had a completely calm conscience. . . . He was a reliable friend, loved music and poetry and considered torture an indispensable method of extracting information from prisoners, since all enemies of the Party were liars. . . . He was in love with the daughter of a provincial court councilor and wrote her charming, rather romantic letters. In his free time he liked to sing. He had a pleasant tenor voice.[34]

The point of juxtaposing descriptions of atrocious acts with those of pleasant personal characteristics is to remind readers that ordinary people, in the heat of battle or through faulty education, can come to believe ridiculous things, some of which can lead them to perform terrible and immoral acts. Understanding what contributed to their evil acts does not mean excusing the perpetrators. Our purpose in trying to understand is to prevent future horrors. Notice how we recoil with horror at the Nazi idea of subhumans, but we cover over or excuse the attitude of our own soldiers toward the Japanese in WWII.

An attitude that is at once realistic and challenging for educators is expressed by Primo Levi, himself a survivor of a Nazi camp:

> [We] are asked by the young who our "torturers" were, of what cloth were they made. The term *torturers* allude to our ex-guardians, the SS, and is in my opinion inappropriate: it brings to mind twisted individuals, ill-born, sadists, afflicted by an original flaw. Instead, they were made of the same cloth as we, they were average human beings, averagely intelligent, averagely wicked: save the exceptions, they were not monsters, they had our faces, but they were reared badly. . . . All of them had been subjected to the terrifying miseducation provided for and imposed by the schools created in accordance with the wishes of Hitler and his collaborators.[35]

This is a complex topic and presents a difficult challenge for educators. Many writers today put great emphasis on remembering the victims of 20th-century atrocities. Whole museums are dedicated to the effort. Quite naturally, some of these writers object strenuously to any attempt to understand the perpetrators of such crimes.[36] They fear that understanding may lead to sympathy, which can lead, in turn, to forgiving the unforgivable. Others of us think that understanding is essential if our purpose is prevention. Precisely because we care deeply for all children, we want them to be neither victims nor perpetrators. They must not become the victims of miseducation.

The study of atrocities and the psychological factors involved in committing them might include discussion of opposing philosophical/psychological theories of human nature. Are we completely shaped by our environments? What follows from such a belief? Or are we always—inevitably and tragically—psychologically free to choose and thus responsible for our choices? Or does the truth lie somewhere in between?

A topic such as this one demands critical thinking, and one product of that thinking might be a greater tolerance for ambiguity. Can we, without moral loss, commit ourselves to both the remembrance of victims and the understanding of perpetrators? Perhaps remembrance should be disconnected from hatred and hooked more reliably to a vigorous commitment to a better future.

Just recently writers have begun to describe and analyze the suffering of Germans during and after WWII. It took 50 years for this discussion to achieve legitimacy, and even now there are those who object—as though compassion were a zero-sum game.

Students should know that innocent Germans were killed by Soviet troops whose hatred demanded vengeance for the destruction of Russian cities and civilians. Germans were also the victims of ethnic cleansing after the war.[37] W. G. Sebald has speculated on the lack of genuine first-person accounts of such incidents as the fire-bombing of Dresden.[38] He notes that existing reports use such conventional wording that their authenticity should be doubted. He doesn't

mean by this that the accounts are dishonest—simply that the narrators were so traumatized by both national guilt and the events themselves that they could find no language adequate to the experience. The true nature of the horror has yet to be depicted. Günter Grass, whose anti-Nazism cannot be doubted, has also begun to speak out on the suffering of the German people. How many Americans have heard of the sinking of the *Wilhelm Gustloff* by a Soviet submarine? With the loss of some 9,000 lives, many of them children, it is probably the worst sea disaster of all time.[39]

The great worry in inviting this discussion (or any others of this nature) is that the long-suppressed memory of suffering, once aroused, might induce a new round of hatred. But it may be, as Grass strongly suggests, that the suppression of discussion is far more dangerous than its encouragement. Grass's *Crabwalk* is the story of such suppressed memory bursting forth in violence and miseducated hero worship. It is one function of critical thinking to get things out in the open, connected to feeling and moral commitment. The object is to avoid the polarization, anger, hatred, repression, and resultant youthful search for a great leader to rescue us. The alternative to open discussion is a world in which patriotic fervor and hatred arise again and again.

In the words with which Grass ends *Crabwalk*: "It doesn't end. Never will it end."[40] It is the job of education to make it more likely that such cycles will end.

A FINAL WORD

Educators today are besieged by a movement that demands higher and higher scores on standardized tests. Anyone who has looked carefully at these tests knows that they are loaded with trivia—questions that most successful adults cannot answer and would indeed scorn to answer. Our children are being fed intellectual junk food, and we would do well to insist on a healthier educational diet.

The material I've suggested here represents a genuine raising of the bar. Although it is challenging, I think high school juniors and seniors are capable of reading and discussing it. Indeed, I think they are eager to do so.

But perhaps political leaders everywhere would prefer that the majority of our young people not engage in critical thinking and remain ignorant of these matters. This preference is one that seems to have endured for centuries. Like the fanatical search for a great leader, it seems never to end. But perhaps we can change that.

Discussion Questions

Looking at the subject areas you teach, what are the most controversial issues in your curriculum?

How do you handle the teaching of these controversial issues in your classroom?

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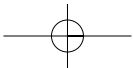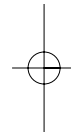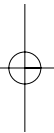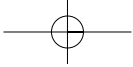
Article 18

THE MATH WARS

ALAN H. SCHOENFELD

HISTORICAL BACKGROUND AND CONTEXT

The counterpoint to the mathematics-is-independent-of-culture perspective is that knowledge of any type, but specifically mathematical knowledge, is a powerful vehicle for social access and social mobility. Hence, lack of access to mathematics is a barrier—a barrier that leaves people socially and economically disenfranchised.

Who gets to learn mathematics, and the nature of the mathematics that is learned, are matters of consequence. This fact is one of the underpinnings of the math wars. It has been true for more than a century.

The 20th century can be viewed as the century of democratization of schooling in the United States. In 1890, fewer than 7% of the 14-year-olds in the United States were enrolled in high school, with roughly half of those going on to graduate (Stanic, 1987, p. 150). High school and beyond were reserved for the elite, with fewer students graduating from high school back then than earn master's and Ph.D. degrees today. In short, "education for the masses" meant elementary school. In line with the ideas of the social efficiency educators, an elementary school education often meant instruction in the very, very basics. For example, one set of instructions from a school district in the 1890s instructed teachers that their students were to learn no more mathematics than would enable them to serve as clerks in local shops (Resnick, L. B., personal communication, January 10, 1987). In contrast, the high school curriculum was quite rigorous.

By the beginning of World War II, almost three-fourths of the children aged 14 to 17 attended high school, and 49% of the 17-year-olds graduated (Stanic 1987, p. 150). This expanding population put pressure on the system. Broadly speaking, the curriculum remained unchanged, whereas the student body facing it was much more diverse and ill prepared than heretofore.

In the 1940s it became something of a public scandal that army recruits knew so little math that the army itself had to provide training in the arithmetic needed for basic bookkeeping and gunnery. Admiral Nimitz complained of mathematical deficiencies of would-be officer candidates and navy

volunteers. The basic skills of these military personnel should have been learned in the public schools but were not. (Klein, 2003, Historical Outline: 1920 to 1980, para. 14)

The truth be told, however, there was not a huge amount of change in the actual curriculum, before or after these complaints.

The next major crisis did affect curricula, at least temporarily. In October 1957, the Soviet Union caught the United States off guard with its successful launch of the satellite *Sputnik*. That event came amidst the cold war and Soviet threats of world domination. *Sputnik* spurred the American scientific community into action. With support from the National Science Foundation (NSF), a range of curricula with "modern" content was developed in mathematics and the sciences. Collectively, the mathematics curricula became known as the new math. For the first time, some of the content really was new: Aspects of set theory, modular arithmetic, and symbolic logic were embedded in the curriculum.

The full story of the new math should be told (though not here); it shows clearly how curricular issues can become social issues. Specifically, it provides a cautionary tale for reform. One of the morals of the experience with the new math is that for a curriculum to succeed, it needs to be made accessible to various constituencies and stakeholders. If teachers feel uncomfortable with the curriculum they have not been prepared to implement, they will either shy away from it or bastardize it. If parents feel disenfranchised because they do not feel competent to help their children and they do not recognize what is in the curriculum as being of significant value, they will ultimately demand change.

In a reaction to what were seen as the excesses of the new math, the nation's mathematics classrooms went "back to basics"—the theme of the 1970s. There are various opinions about the level of standards and rigor demanded of students—some will argue that less was being asked of students than before, and some will disagree—but in broad outline, the curricula of the 1970s resembled those of the pre-*Sputnik*

years. In compensation for the "excesses" of the 1960s, however, the back-to-basics curricula focused largely on skills and procedures.

By 1980, the results of a decade of such instruction were in. Not surprisingly, students showed little ability at problem solving—after all, curricula had not emphasized aspects of mathematics beyond mastery of core mathematical procedures. But performance on the "basics" had not improved either. Whether this was due to back-to-basics curricula being watered-down versions of their pre-*Sputnik* counterparts, to a different social climate after the 1960s where schooling (and discipline) were deemphasized, or because it is difficult for students to remember and implement abstract symbolic manipulations in the absence of conceptual understanding, was (and is) hotly debated. What was not debated, however, is that the mathematical performance of U.S. students was not what it should have been.

In response, the NCTM [National Council of Teachers of Mathematics] (1980) published *An Agenda for Action.* NCTM proposed that an exclusive focus on basics was wrongheaded and that a primary goal of mathematics curricula should be to have students develop problem-solving skills. Back to basics was to be replaced by "problem solving."

From the jaundiced perspective of a researcher in mathematical thinking and problem solving, what passed for problem solving in the 1980s was a travesty. Although research on problem solving had begun to flow, the deeper findings about the nature of thinking and problem solving were not generally known or understood. As a result, the problem-solving "movement" was superficial. In the early 1980s, problem solving was typically taken to mean having students solve simple word problems instead of (or in addition to) performing computation. Thus a sheet of exercises that looked like this:

$$7 - 4 = ?$$

might be replaced by a sheet of exercises that looked like this:

John had 7 apples. He gave 4 apples to Mary. How many apples does John have left?

But otherwise, things remained much the same.

CONDITIONS IN THE 1980S— THE BACKDROP FOR THE *STANDARDS*

It is important to understand the context that made the *Curriculum and Evaluation Standards for School Mathematics* (the *Standards*) (and their impact) possible.

Yet Another Crisis

In the 1980s, the crisis was economic rather than military, but major nonetheless. Japanese and other Asian economies waxed as the American economy waned. The national deficit soared, and the nation felt besieged and vulnerable. In 1981, U.S. Secretary of Education T. H. Bell appointed the National Commission on Excellence in Education, which produced the very influential report *A Nation at Risk.* The National Commission on Excellence in Education (1983) report began as follows:

> Our Nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world. . . . The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. . . .
>
> If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves. We have even squandered the gains in student achievement made in the wake of the Sputnik challenge. Moreover, we have dismantled essential support systems which helped make those gains possible. We have, in effect, been committing an act of unthinking, unilateral educational disarmament. (p. 1)

In mathematics specifically, the very poor showing of U.S. students on the Second International Mathematics Study (McKnight et al., 1987; McKnight, Travers, Crosswhite, & Swafford, 1985; McKnight, Travers, & Dossey, 1985) gave license for change—although what direction that change might take was anybody's guess.

The (Non)role of the NSF

The NSF had played a significant role in supporting postcurricula in mathematics and other fields, but it could not play such a role in direct response to *A Nation at Risk* and the sentiments it reflected. The tide regarding federal funding of innovative education efforts had turned, thanks to a political controversy over an NSF-supported elementary school science and social science curriculum called Man: A Course of Study (MACOS). MACOS met with initial success, and then a strong political backlash:

> The first sign of impending trouble appeared in Lake City, a small market town in northern Florida (population 10,000), in the fall of 1970. Shortly after school opened in September, Reverend Don Glenn, a Baptist minister who had recently moved to Lake City visited his daughter's sixth-grade class. . . . The school was under a court ordered integration plan. The teachers had chosen the materials because they felt they might help ease racial tensions. However, when Reverend Glenn saw the materials he formed a study group to examine MACOS in detail. Glenn claimed that the materials advocated sex education, evolution, a "hippie-yippee philosophy," pornography, gun control, and Communism. With support of a local radio station he broadcast four hour-long programs criticizing MACOS. He read excerpts from the student and teacher materials and warned that MACOS was a threat to democracy. This set off a growing series of attacks on MACOS over several years that led to a full scale Congressional debate of MACOS in both houses in 1975. NSF launched an internal review of its Education Directorate activities including an audit of the fiscal management of the project at EDC. While the audit revealed little to complain about, the damage in a sense was done. Dow quotes the former acting assistant director for

science education, Harvey Averch, "It was the worst political crisis in NSF history." (Lappan, 1997, The MACOS Materials: How Success Can Go Awry section, para. 3)

In the 1980s, the NSF did not dare to engage in the support of what might be seen as a potential national curriculum. To do so would risk the wrath of Congress.

This story is important for at least two reasons. First, it establishes the context for private action by the NCTM. Had there been a federal presence in the reform arena, NCTM might or might not have gotten involved. But there was a clear perception of crisis in mathematics education and an absence of leadership in dealing with it. Thus the stage was set. Second, the MACOS affair shows how strongly politics can intervene in matters of curriculum. A well-organized group with no curricular expertise can get members of Congress to take up its cause, resulting in "the worst political crisis in NSF history."

The National Curriculum Context and the Role of Publishers

One of the American myths (in the anthropological sense of master narrative) related to "states rights" is that every one of the 50 states is educationally autonomous and can do as it sees fit with regard to educational goals and standards.

The reality was otherwise. There was indeed a free market, but market forces and the fact that teaching tended to be textbook driven constrained district choices to the point where the United States had a de facto national curriculum in mathematics, and one that changed slowly at that. Three states—California, Texas, and New York—were "textbook adoption states" in which mathematics curricula were specified and books meeting the curricular goals were identified. In California, for example, it is true that any school district could buy any books it wanted to. However, the district was reimbursed by the state for its textbook purchases only if the books purchased were listed on the state-approved textbook adoption list. Thus, although independence was theoretically available, the price was steep.

Relatively few districts were willing to bear the cost.

As a result, the major publishers' textbook series were all designed to meet California, Texas, and New York's textbook adoption criteria.

Cognitive and Epistemological Revolutions

The naïve view is that mathematical competence is directly related to what one "knows" (facts, procedures, conceptual understandings) and that knowledge accumulates with study and practice. This is hard to argue with, as far as it goes. It is, however, dramatically incomplete. Studies of expert mathematicians show that there are other, equally critical aspects of mathematical competence. The mark of powerful learning is the ability to solve problems in new contexts or to solve problems that differ from the ones one has been trained to solve. Competent mathematicians have access to a wide range of problem-solving strategies. They use these strategies to make sense of new problem contexts or to make progress toward the solution of problems when they do not have ready access to solution methods for them. Research shows that students often fail to solve problems because they use the resources at their disposal (including time and what they do know) inefficiently.

Mathematical competence was shown to depend on a number of factors:

- Having a strong knowledge base

- Having access to productive problem-solving strategies

- Making effective use of the knowledge one has (this is known as *metacognition*)

- Having a set of productive beliefs about oneself and the mathematical enterprise (which position in the individual to act in mathematically appropriate ways)

Research indicates that classroom instruction, which tends to focus almost exclusively on the knowledge base, deprives students of problem-solving knowledge. It gives them little experience

grappling with tough challenges and fosters the development of numerous unproductive beliefs.

Demographics and National Context

In 1985, the National Research Council (NRC) established the Mathematical Sciences Education Board as a mechanism for devoting sustained attention to issues of mathematics instruction. The NRC produced a series of reports, including *Everybody Counts* (NRC, 1989) and *A Challenge of Numbers* (Madison & Hart, 1990), which documented some of the more troubling demographics surrounding the traditional curriculum and set the stage for something new (although not specifying what it might be).

A Challenge of Numbers shows that the attrition rate from mathematics, from ninth grade on, was roughly 50% per year; worse still, the attrition rate for Latinos and African Americans was significantly larger. For example, African Americans composed 12% of the populations of 8th graders, 11% of 12th graders, and 5% of those earning a bachelor's degree in mathematics, and 2% of those earning master's and Ph.D. degrees in mathematics. Madison & Hart (1990) also noted that "in the new-doctoral-degree populations . . . the fraction of U.S. citizens had tumbled from four-fifths to less than one-half" (p. 36). A major point of the volume was that the nation's preeminence in mathematics and science was in jeopardy because of declining numbers and interest.

The NRC's *Everybody Counts* took a broader perspective, also pressing the urgency of the situation.

Released in the spring of 1989, *Everybody Counts* set the stage for the release of the NCTM *Standards* that fall.

THE STANDARDS

In 1986, the NCTM's board of directors established the Commission on Standards for School Mathematics, chaired by Thomas Romberg. The following year, NCTM president John Dossey appointed a team of 24 writers to produce *Standards.*

The goal of the writers (including in commission) was to "create a coherent vision of what it means to be mathematically literate" in a rapidly changing world and to "create a set of standards to guide the revision of the school mathematics curriculum" (NCTM, 1989, p. 1). The definition of *standard* given by the authors was as follows: "*Standard.* A standard is a statement that can be used to judge the quality of mathematics curriculum or methods of evaluation. Thus, standards are statements about what is valued" (NCTM, 1989, p. 2). That is, the *Standards* were intended to be a "scope-and-sequence" document (a blueprint for curriculum development); nor were they intended to be a set of specifications for examinations that would say whether students "met the standard."

The NCTM's *Standards* focused on new goals for society at large and for students in particular: "New social goals for education include (1) mathematically literate workers, (2) lifelong learning, (3) opportunity for all, and (4) an informed electorate" (p. 3). The *Standards* were oriented toward

Five general goals for all students: (1) that they learn to value mathematics, (2) that they become confident in their ability to do mathematics, (3) that they become mathematical problem solvers, (4) that they learn to communicate mathematically, and (5) that they learn to reason mathematically. (NCTM, 1989, p. 5)

They were grounded in assumptions about learning being an active process rather than one of memorization and practice:

This constructive, active view of the learning process must be reflected in the way much of mathematics is taught. Thus, instruction should vary and include opportunities for:

—appropriate project work;

—group and individual assignments;

—discussion between teacher and students and among students;

—practice on mathematical methods;

—exposition by the teacher. (p. 10)

The document was divided into four sections, three devoted to defining content and process standards for three grade bands (kindergarten through grade 4; grades 5 through 8; grades 9 through 12) and a fourth for defining standards for student and program evaluation. Much of the controversy has focused on content and process standards.

In many ways, the *Standards* was both a radical and a conservative document. On the conservative side, the document was written for the broad NCTM constituency: mathematics teachers across the nation. It represented a consensus among the writers as to what was possible—and thus fell far short (as it should have) of what some visionaries might have thought possible. The cost of consensus was precision: Michael Apple (1992) called the *Standards* a "slogan system" encompassing "a penumbra of vagueness so that powerful groups or individuals who would otherwise disagree can fit under the umbrella" (p. 413). Indeed, some years later, one state assessment system would assess students' mathematical competency via portfolios containing the students' work on extended projects, whereas another state would employ multiple-choice tests that focused on basic skills. Both did so in the name of the *Standards.*

On the radical side, the *Standards* challenged (or was seen as challenging) many of the assumptions underlying the traditional curriculum. As noted above, the traditional curriculum bore the recognizable traces of its elitist ancestry: The high school curriculum was designed for those who intended to pursue higher education. Yes, it is true that half the students dropped out of the mathematics pipeline each year after Grade 9—but as some see it, this is because honest-to-goodness mathematics is hard. The 50% annual attrition rate was taken by some as confirmation of the difficulty of mathematics. For them, there was the suspicion that the curriculum would have to be dumbed down for more students to succeed. That is, only a bastardized curriculum (a lowering of real standards) could result in greater success rates. These fears were exacerbated by, among other things, the "increased

attention/decreased attention" charts in the *Standards.* Topics to receive decreased attention included the following: complex paper-and-pencil computations, long division, rote practice, rote memorization of rules, teaching by telling, relying on outside authority (teacher or an answer key), memorizing rules and algorithms, manipulating symbols, memorizing facts and relationships, the use of factoring to solve equations, geometry from a synthetic viewpoint, two-column proofs, the verification of complex trigonometric identities, and the graphing of functions by hand using tables of values. These can be seen as the meat and potatoes of the traditional curriculum.

The *Standards*, buttressed by NCTM's call for "mathematics for all" and the equity agenda in *Everybody Counts*, clearly sat in the education-for-democratic-equality and education-for-social-mobility camps. In contrast, whatever the intention may have been, the reality was that the traditional curriculum was a vehicle for social efficiency and the perpetuation of privilege. Statistically speaking, the rich stayed rich and the poor got disenfranchised. There is a long history of data indicating that race and socioeconomic status correlate with mathematics performance, with dropout rates, and with economic opportunity (Kozol, 1992; National Action Committee for Minorities in Engineering, 1997; NSF, 2000). Thus the *Standards* could be seen as a threat to the current social order.

Epistemologically, with its focus on process, the *Standards* could be seen as a challenge to the "content-oriented" view of mathematics that predominated for more than a century. Each of the three grade bands began with the following four standards: mathematics as problem solving, mathematics as communication, mathematics as reasoning, and mathematical connections. Only after these four process standards were described did the *Standards* turn to what has traditionally been called mathematical content.

In short, the seeds for battle were sown—not that anyone at the time could predict that the *Standards* would have much impact or that the battle would rage. The *Standards* were vague.

This was part of their genius and part of what caused so much trouble. Because of their vagueness, they served as a Rorschach test of sorts—people tended to read much more into them than was there. (For many years, people would claim this or that was in the *Standards,* when a close examination showed it was not.) The genius is that the *Standards* set in motion a highly creative design process during the following decade, far transcending what the authors of the *Standards* could have produced in 1989. Because it was in essence a vision statement rather than a set of design specs, it proved remarkably enfranchising: During the coming years, different groups produced very different sets of materials "in the spirit of the *Standards.*" And there is the rub. Some of the materials produced would be considered pretty flaky. Some of the classroom practices employed in the name of the *Standards* would appear pretty dubious. And the *Standards* would be blamed for all of them.

THE REACTION, PART 1: THE FIRST FEW POST-*STANDARDS* YEARS

We are now about to turn to the origins of the math wars themselves, in California. One thing that must be understood as we do is that a decade of battle was conducted in the absence of any real data. Here is the chronology. The *Standards* were published in 1989 by the NCTM, and the California Department of Education (1992) published the *Mathematical Framework for California Public Schools, Kindergarten Through Grade 12* (the *Frameworks*, which took the *Standards* somewhat further along the lines of reform). In the early 1990s, NSF released its curriculum requests for proposals. Spurred on by the *Frameworks*, some mainstream textbook publishers made reform texts available for textbook adoptions in 1993 and 1994. No large-scale data were gathered on the effectiveness of these curricula. Many of the NSF-supported reform curricula were in either alpha or beta testing at that point; it was not until the mid-1990s that they

became widely available, and testing data on those curricula tended to use "home-grown" measures. It was not until the late 1990s that full cohorts of students had worked their way through the entire reform curricula. Only at the turn of the 21st century did large-scale data evaluating the impact of those curricula begin to become available. As it happens, the evidence at this point is unambiguously in favor of reform (see, e.g., ARC Center, 2003; Senk & Thompson, 2003). But such data turn out to be largely irrelevant to the story of math wars. When things turn political, data really do not matter.

WAR(S)!

Before the math wars in California, there were reading wars (see Pearson, 2004, for substance and details).

As noted above, the *Standards* and the *Frameworks* were "vision statements" (or "slogan systems" if you prefer the pejorative) regarding the substance and character of instruction rather than the blueprints for it. The up side of such documents is that they permit significant creativity, allowing designers to create innovative materials beyond the imagination of the *Standards'* and the *Frameworks'* authors themselves. But there is a significant down side as well. As Rosen (2000) noted,

> the new textbooks were radically different from the traditional texts' orderly, sequential presentation of formulas and pages of practice problems familiar to parents. New texts featured colorful illustrations, assignments with lively, fun names and sidebars discussing topics from the environment to Yoruba mathematics (prompting critics to dub new programs with names such as "Rainforest Algebra" and "MTV Math"). (p. 61)

In their alien appearance and inaccessibility to parents, the texts repeated some of the mistakes of the new math. Once the rhetorical battle heated up, they were easily caricatured as the "new-new math."

Moreover, reform called for new teaching practices. Teachers who had themselves been taught in traditional ways were now being asked to teach in new ways and not given much support in doing it.

To cut to the chase, new materials and new practices raised concerns among some parents, some of whom enlisted outside help (from mathematicians, legislators, etc.) in combating the new practices and materials.

Amid all this, advocates of reform committed some mistakes that were the public relations equivalent of handing the traditionalists a gun and saying "shoot me." For example, the California Learning Assessment System released a sample mathematics test item in 1994 in which students were asked to arrive at an answer and then write a memo justifying it. The sample response from a student who got the right answer but failed to write a coherent memo was given a low score, whereas a sample student response that contained a computation error but a coherent explanation was given a high score. Editorial comments raked the California Learning Assessment System (and reform in general) over the coals, saying that in the new, "fuzzy" math, being able to write baloney counted more than getting the right answer.

With some speed, what started out as a collection of local oppositional movements became a statewide movement—with the support of conservatives such as Governor Pete Wilson and California assemblyman Steve Baldwin, who, as chairman of the Assembly Education Committee, held public hearings on the *Frameworks* in 1995 and 1996. Ultimately the conservatives prevailed: State Board of Education president Yvonne Larson and state superintendent of Public Instruction Delaine Eastin agreed to convene a new mathematics *Frameworks* writing team ahead of schedule. The state legislature enacted Assembly Bill 170, which according to the official legislative summary,

> requires the State Board of Education to ensure that the basic instructional materials it adopts for reading and mathematics in grades 1 to 8, inclusive, are based on the fundamental skills required by

these subjects, including, but not limited to, systematic, explicit phonics, spelling, and basic computational skills. (see http://www.cde.ca.gov/board/readingfirst/exhibit-i.pdf)

As a step toward a new framework, the state appointed a committee to produce mathematics content standards, which were ultimately adopted in December 1997 and which served as the content foundation for the framework. This process by which the document was adopted was unprecedented. Here is how it was described by David Klein (1998), an antireform activist:

> Question: What would happen if California adopted the best grade-by-grade mathematics achievement standards in the nation for its public schools?

> Answer: The education establishment would do everything in its power to make them disappear.

> In December 1997, the State Board of Education surprised the world by not accepting extremely bad "fuzzy" math standards written by one of its advisory committees, the Academic Standards Commission. Instead, in a few short weeks and with the help of four Stanford University math professors, the state board developed and adopted a set to world-class mathematics standards of unprecedented quality for California's public schools. (p. 15)

Note the rhetoric, both in tone and language: The draft standards submitted to the board were "extremely bad" and "fuzzy," and truly high standards would be challenged by "the education establishment." This kind of rhetoric had become common. *San Francisco Chronicle* columnist Debra Saunders (1995a, 1995b), for example, titled some of her columns "New-New Math: Boot Licking 101" and "Creatures From the New-New Math Lagoon." Maureen DiMarco, California state secretary of child development and education, and one-time candidate for superintendent of public instruction, referred to the new curricula as "fuzzy crap."

To return to Klein's 2003 discussion of the rewriting of the California Mathematics Standards: The truth is, shall we say, more complex than Klein made it out to be. The draft standards had

been a year and a half in development and although far from perfect had undergone significant public review and comment. They reflected current research—but not the perspective of the conservative majority of the state board. The board summarily rejected the draft, rewrote much of the elementary grades section itself, and commissioned mathematics faculty from Stanford (who had negligible experience with K–12 classrooms or curricula) to rewrite comments from notables such as Hyman Bass, research mathematician and director of the NRC's Mathematical Sciences Education Board, and William Schmidt, who had conducted curriculum content analyses for the Third International Mathematics and Science Study, to the effect that the draft standards were of high caliber and that the alternative was not. In his letter to the board, Bass also commented on the tone of the debate:

> The tragedy of the current debate in California is that political forces and agendas, and the belligerent and scoffing rhetoric they employ, have usurped the stage for the kind of honest, probing, and multidisciplinary discourse which is now so desperately needed. (personal communication, November 13, 1997)

For examples of extremism in public discourse, readers may wish to look at the thesaurus of derogatory terms for reform curricula and texts on the Mathematically Correct Web site: http://www.mathematicallycorrect.com/glossary.htm. For examples of extreme and intemperate dialogue from both sides of the math wars, follow the threads of math-wars or standards discussions in the amte, math-learn, and math-teach discussion groups at the Mathematics Forum, http://mathforum.org/discussions/.

The gloves were off, and those who held power did not hesitate to use them. The revision of the *Standards* was one example; the late-1996 composition of the curriculum framework and criteria committee another. Appointments are made by the state board. The established process for creating such committees is for the board to solicit recommendations for membership from its curriculum commission—in this case the

commission that had earlier recommended the approval of reform-oriented texts.

> However, newly appointed board member Janet Nicholas led a successful campaign to overturn the Commission's recommendations for the Framework Committee and replace them with a new group containing leaders of the tradition campaign. . . . The California Mathematics Council and several allied groups loudly protested this move, decrying the Board's disregard for an established process and the expertise of its own commissioners. (Rosen, 2000, pp. 64–65)

Not only did the complaints fail, but Governor Wilson also went on to appoint another arch-traditionalist, Marion Joseph, to the board (Joseph had been a leader of the anti–whole language campaign).

By all reports, the discussion within the Curriculum Framework and Criteria Committee, and its interactions with the state board, were highly contentious. A series of "minority reports" by Bill Jacob (Becker & Jacob, 2000; Jacob, 1999, 2001; Jacob & Akers, 2003), a reform-oriented member of the committee, provide the gory details. I shall skip over most of those details, which make interesting reading but focus on one highly public and controversial set of actions by the state board.

California law requires that state-adopted instructional materials "incorporate principles of instruction reflective of current and confirmed research" (CA Education Code 60200c-3). But even in such an apparently noncontroversial area, California has opened new categories of dispute. For example, the state board invited E. D. Hirsch, Jr., to speak on this issue in April 1997. In the written version of his comments, Hirsch ridiculed "mainstream educational research," as found in "journals such as the *Educational Researcher*," explicitly stating, "This is a situation that is reminiscent of what happened to biology in the Soviet Union under the domination of Lysenkoism, which is a theory that bears similarities to constructivism. . . ."

Citing math education experts John Anderson, David Geary, and Robert Siegler on

the matter of what research shows that math students need, he goes on,

> "They would tell you that only through intelligently directed and repeated practice, leading to fast automatic recall of math facts, and facility in computation and algebraic manipulation, can one do well at real-world problem solving." Hirsch received a standing ovation from the state board, and then the board moved forward in line with his recommendations. (Becker & Jacob, 2000, p. 535)

With all due respect, Hirsch's claim about Lysenkoism is unmitigated nonsense, indicating his total misunderstanding of and disregard for serious educational research. His claim about real-world problem solving is a dubious extrapolation from work that is not at all central to the problem-solving literature (my own area of expertise).

The math wars had grown to national scale by 1998. Diane Ravitch, Chester Finn, and Lynne Cheney among others had weighed in against fuzzy, new-new math in the national media. The dispute was so vitriolic that Secretary of Education Richard Riley pleaded for civility in his 1998 address to the joint mathematics societies. Klein (2003) wrote about the events that followed:

> In October 1999, the U.S. Department of Education recommended to the nation's 15,000 school districts a list of math books, including several that had been sharply criticized my mathematicians and parents of school children across the country for much of the preceding decade. Within a month of that release, 200 university mathematicians added their names to an open letter to Secretary Riley calling upon his department to withdraw those recommendations. The list of signatories included seven Nobel laureates and winners of the Fields Medal, the highest international award in mathematics, as well as math department chairs of many of the top universities in the country, and several state and national education leaders. By the end of the year 1999, the U.S. Secretary of Education had himself become embroiled in the nation's math wars. (Introduction, para. 1)

What Klein neglects to mention is that his was the first signature on the letter and that the powerful antireform network in which he plays a central role had orchestrated the signature gathering. The signature gathering was a highly political act.

By the late 1990s, the antireform movement had reached a level of organization and efficiency that enabled it to quickly mount high-profile, large-scale efforts as the one described above. Antireform Web sites promise quick help for those who find their own school districts "threatened" by reform.

As noted above, tactics employed in the math wars can be rather nasty. Robert Megginson has noted a strong similarity between the tactics used by some antireformers and the antievolution tactics used by "creations scientists." Referring to Michael Shermer's (2002) discussion of what might be called the "creation wars," Megginson asked:

> Has anyone noticed that the more extreme members of Mathematically Correct have taken their strategy and tactics, almost line for line, straight out of the creation scientists' playbook? In particular—
>
> 1. Number one tactic—Go after the boards in the big states, particularly California and Texas, that evaluate and approve textbooks. If you can get the books with your point of view at the top of the playlists, you are in great shape.
>
> 2. Number two tactic—Plant fear in the minds of well-meaning parents, who genuinely and understandably want the best for their children, that the schools are subjecting their children to unproven theories that may result in their not getting into heaven or Berkeley.
>
> 3. Number three tactic—Constantly demand proof of their positions (which you never intend to accept) from those who disagree with you, attempting to create the impression that they do not really have much. When they offer any evidence, poke and prod hard at every facet and in every crevice of it until something is found that seems not fully justified or a bit controversial or counterintuitive, and use that to discard the entire piece of evidence.
>
> 4. Above all, treat any disagreement among your opponents, or modification in position due to new evidence ("even so-and-so doesn't believe in her former position on this

anymore") as an indication that your oppo-
nents have it wrong, and therefore (!) that
you have it right. (personal communica-
tions, July 5, 2003)

Generally speaking, those on the reform side
of the wars have been slow to develop effective
techniques to counter the most extreme attacks of
the antireformers. Some (e.g., Jacob, 1999, 2001)
have tried to provide public documentation of
abuses of process. Some (e.g., Susan Ohanian;
see http://www.susanohanian.org/) raise loud
voices of protest. Some (e.g., Mathematically
Sane; see http://mathematicallysane.com/home
.asp) seek to provide both evidence and countert-
errorist tools. Major reform organizations have
gotten smarter about dotting their i's and crossing
their t's in public documents. The most signifi-
cant reform document since the 1989 *Standards*
is its successor, NCTM's (2000) *Principles and
Standards for School Mathematics.* It was clear
from the beginning that this document would be
controversial and that the only hope for it to get a
fair reception was to involve all the relevant con-
stituencies from the very beginning—asking for
their input and then taking it seriously. NCTM
created a series of association review groups that
were asked for ongoing input and commentary.
NCTM distributed thousands of copies of a draft
version of the document (roughly 30,000 hard-
copy versions of the draft were distributed, and
roughly 50,000 copies were downloaded from
NCTM's Web site). It commissioned the NRC to
review the process by which it responded to the
thousands upon thousands of comments it
received. A result was a commendation by the
NRC for the integrity of its process and an
unprecedented "Letter of Appreciation"
from the chief officers of 15 major mathematical
societies.

Will it work? Will civil, disciplined, and prob-
ing discourse prevail, and will there be a return
to balance? That remains to be seen.

REFLECTIONS

To a disinterested outsider, aspects of the reading
wars and the math wars just make no sense.

Consider the controversy of phonics versus
whole language, for example. Of course children
need to learn to sound out words—a healthy dose
of phonics at the right time is salutary. Of course
children need to make sense of what they are
reading—learning to use context is an essential
skill and motivational as well. Any sensible
person would realize that children need both
phonics and reading for understanding. Either of
the two perspectives, taken to extremes, is non-
sensical. The polarization that resulted in a "win-
ner take all" battle between the two extremes is
equally nonsensical. The same is the case in
mathematics. An exclusive focus on basics
leaves students without the understandings that
enable them to use mathematics effectively. A
focus on "process" without attention to skills
deprives students of the tools they need for fluid,
competent performance. The extremes are unten-
able. So, why have so many people taken
extreme positions, and why are things as polar-
ized as they are? More important, what might be
done about it?

Even though the wars rage, partly because
there are some true believers on both sides and
partly because some stand to profit from the con-
flict, I remain convinced that there is a large
middle ground. I believe that the vocal extremes,
partly by screaming for attention and partly by
claiming the middle ground ("it's the other camp
that is extreme"), have exerted far more influ-
ence than their numbers should dictate.

One way to reclaim the middle ground,
suggested by Phil Daro (2003), is to define it
clearly—to specify a set of propositions that will
call from some degree of compromise from
reformers and traditionalists alike. That middle
ground would be broadly encompassing, contain-
ing propositions that most people would find rea-
sonable (or at least livable). Daro offered a draft,
"Math Wars Peace Treaty" (or perhaps "Math
Wars Disarmament Treaty"), that includes the fol-
lowing stipulations:

We have among ourselves various agreements and
disagreements. But about these things we agree:

• The status quo is unacceptable. Its defend-
ers are wrong, mathematics instruction must
improve.

- Teachers, especially K–8 teachers, should learn more mathematics throughout their careers.
- No students should be denied a fair chance to learn mathematics because they have been assigned unqualified mathematics teachers.
- All students should have a copy of the basic instructional materials (textbooks, handouts, etc.) to take home.
- Research and evidence should be used whenever it is available to inform decisions.

We also agree that students should learn to:

add, subtract, multiply, and divide single-digit numbers automatically and accurately;

add, subtract, multiply, and divide integers, decimals, and fractions accurately, efficiently, and flexibly without calculators;

understand the mathematics they study and use;

use the mathematics they know to solve problems with calculators and computers;

be fluent with the symbolic language of algebra and understand how to use the basic laws of algebra when solving mathematics problems;

explain and justify their reasoning and understand the reasoning of others;

reason with increasing rigor and mathematical maturity as they advance through the curriculum; [and much more]. (pp. 1–2)

The hope is that if such a list is put together well, most people will feel comfortable with most of it and be willing to part with a few things they would rather keep in the interests of making peace and working together in the interest of our children. If so, those who refuse to sign on will reveal themselves for the extremists they are.

It is not clear how optimistic one should be. There already exist documents that appear to have some consensus behind them (e.g., Conference Board of the Mathematical Sciences, 2001; NCTM, 2000; NRC, 2001). The tactic of the extremists has been to ignore such volumes and to attack what they can attack. To date, they have been fairly successful. Not only have some of the major state boards (Texas and California, for example) made the traditional choice, but current federal legislation (e.g., the No Child Left Behind Act of 2001) puts substantial force behind rather narrow and traditional assessments as well. Moreover, much of the public, ill served by media that seek to profit from conflict, sees curriculum choice as dichotomous—it is either traditional or reform. At the same time, there are grounds for some optimism. At the college level, "calculus reform" stimulated a great deal of controversy but then settled in as part of the mainstream. The same may well happen with regard to standards-based mathematics. One cannot simply turn the clock back; too much is known about mathematical thinking and learning. Despite extremist proposals (and mandates), there is a rational middle ground, and many teachers seek it. The short-term goal, however, must be to capture the middle ground for the majority. Efforts must be made publicly to identify the extremists for what they are and to marginalize them. The math wars have casualties—our children, who do not receive the kind of robust mathematics education they should.

Discussion Questions

What are the curricular issues discussed in the "math wars"?

How does this article serve as a case study for disagreements over curriculum in the subject area(s) you teach?

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Article 19

CHEMISTRY, THE CENTRAL SCIENCE?

The History of the High School Science Sequence

KEITH SHEPPARD

DENNIS M. ROBBINS

A trademark of U.S. science education is the teaching of high school science in the fixed order: biology, then chemistry, and finally physics (B-C-P).[1] Somewhat baffling to non-Americans, this B-C-P sequence is found in more than 99% of high schools and is unique to the United States. Much recent debate, particularly in the physics-education community has questioned the educational wisdom of the B-C-P order, and many are calling for physics to be taught earlier in the sequence—the "Physics First" movement,[2] which notes that while chemistry was considered to be the *central science*, physics was considered to be the *foundational science.* The relative merits of the Physics First or the traditional "Biology First" notwithstanding, an important first step in understanding these issues is to determine how the present B-C-P course order was established. Specifically, how and why did chemistry become the central high school science—that is, the course taught between biology and physics—and in general what impact did this placement have on the development of high school chemistry? Some answers to these questions can be found by considering educational decisions made between 1890 and 1930.

CHEMISTRY EDUCATION IN SECONDARY SCHOOLS BEFORE 1890

Chemistry as a subject was introduced into American secondary schools in the first quarter of the 19th century,[3] and it soon became firmly established in the curricula of many schools.[4,5] The subject at the time was taught exclusively by lecturing, with the textbook as the principal resource. It was not until the last quarter of that century that demonstrations and laboratory work were added.[6,7] Despite the inroads chemistry made into a classics-dominated course of studies, it was generally viewed as having only limited educational value. Even by 1870, chemistry was not necessary for admission to any college,[8] and students who had taken chemistry in high school were often required to repeat the subject.[9] The quality of chemistry taught in high schools was understandably varied. Many science teachers had limited chemistry backgrounds—it was the normal practice for chemistry teachers to have taken only one general chemistry class in college.[6]

Before 1890, there was no specific high school science sequence, and chemistry could be taught in any grade. The only discernible pattern was that in schools that offered both physics and chemistry, the physics class usually preceded the chemistry class.[10] A lack of standardization was not confined to chemistry but was common for all other subjects and led to the creation of a national committee to address the issue. This committee, commissioned by the National Educational Association, the premier educational association of the time, became popularly known as the Committee of Ten (CoT). The CoT is often credited with establishing the B-C-P sequence, but this is an oversimplification.

THE COMMITTEE OF TEN

In 1892, the National Educational Association organized a committee of ten individuals who were charged with determining what should be taught in high school so students from different schools would have a more uniform preparation for college. The CoT organized nine subcommittees, each devoted to a different academic subject area and included Latin, Greek, English, modern languages, mathematics, and history. There were three science subcommittees: one for physical science (physics, chemistry, and astronomy), another for natural history (botany, zoology, and physiology), and a third for geography (physical geography, geology, and meteorology). All of the subcommittees were given the same questions to answer: How much time should be devoted to each subject? When and how should they be taught and assessed? What were the best methods for teaching each subject? What content should be included? Should the subject be different for college-bound students?

The physical science subcommittee included distinguished scientists and educators of the day. This subcommittee in answering the questions made 22 recommendations to the full committee. The recommendations that were pertinent to chemistry included the following:

- That the study of chemistry should precede that of physics in high school work

- That the study of physics be pursued the last year of the high school course

- That the study of chemistry be introduced into the secondary schools in the year preceding that in which physics is taken up

- That at least 200 hours be given to the study of chemistry in the high school

- That both physics and chemistry be required for admission to college

- That there should be no difference in the treatment of physics, chemistry, and astronomy for those going to college or scientific school and those going to neither

- That in secondary schools physics and chemistry be taught by a combination of laboratory work, textbook, and thorough didactic instruction carried on conjointly and that at least one-half of the time devoted to these subjects be given to laboratory work

- That in the instruction in physics and chemistry it should not be the aim of the students to make a so-called rediscovery of the laws of these sciences

In justifying their position on the relative placement of physics and chemistry, the majority of the subcommittee wrote:

> The order recommended for the study of chemistry and physics is *plainly not the logical one* [italics added], but all members with one exception . . . felt that the pupils should have as much mathematical knowledge as possible to enable them to deal satisfactorily with physics, while they could profitably rake up elementary chemistry at an earlier stage.[11a]

While agreeing to the placement of chemistry before physics, they did not articulate why they considered a chemistry–physics sequence to be illogical, nor did they state any evidence to support their recommendation. In dissenting, Waggener, a professor at the University of Colorado, gave the minority opinion and argued that chemistry, being more abstract, should follow physics.

The subcommittees of all the subjects presented their recommendations to the full CoT, who then combined and coordinated them into plans for high school education. In the first stage, the CoT simply compiled the various subcommittee recommendations and included the majority recommendation that chemistry be placed in the 11th grade and physics in the 12th grade. In the second stage, the CoT "slightly modified" the offerings for the sciences. As none of the science subcommittees had recommended a science for the 9th grade, the CoT placed geography in the 9th grade and physiography and meteorology in the 12th grade. They also swapped the positions of physics and chemistry so that "the subject of physics may precede meteorology and physiography."[11b] In the third and final stage, further amendments were made and the CoT outlined what a high school curriculum might look like and suggested four "specific programs." The science classes and the order they proposed are shown in Table 1.

At first glance, Table 1 appears confusing for its unfamiliar pattern of course offerings. The

Table 19.1   Science Classes Proposed for High Schools by the Committee of Ten

	Type of High School Program[a]			
Year	*Classical*	*Latin-Scientific*	*Modern Languages*	*English*
1	**Physical Geography**	Physical Geography	Physical Geography	Physical Geography
2	**Physics**	**Physics** (Botany or Zoology)[b]	**Physics** (Botany or Zoology)	**Physics** (Botany or Zoology)
3	_____	(Astronomy, Meteorology)	(Astronomy, Meteorology)	(Astronomy, Meteorology)
4	**Chemistry**	**Chemistry** (Geology or Physiography and Anatomy, Physiology and Hygiene)	**Chemistry** (Geology or Physiography and Anatomy, Physiology and Hygiene)	**Chemistry** (Geology or Physiography and Anatomy, Physiology and Hygiene)

[a]High school programs were organized by language requirements: Classical—three foreign languages, one modern; Latin-Scientific—two foreign languages, one modern; Modern Languages—two foreign languages, both modern; English—one foreign language, ancient or modern.

[b]Parentheses indicate courses with half-year sequences.

classics dominated the high school programs at the time. The organizing principle for the proposed courses of study was the number of languages that students would take. Although course offerings were mostly uniform in science, according to these recommendations students might take more than one science in a school year. Parentheses show that students could take half-year sequences—for instance, in the junior year students would take a half-year course in astronomy and a half-year of meteorology in the Latin-Scientific, Modern Languages, and English programs. The CoT finally recommended that physics be taught in the 10th grade and chemistry in the senior year, a P-C sequence. They rationalized this choice of science sequence by noting that, because many students did not complete high school at this time:

> The Committee thought it important to select the study of the first two years in such a way that . . . scientific subjects should all be properly represented. Natural history being represented by physical geography, the Committee wished physics to represent the inorganic sciences of precision.[11c]

While the CoT is often cited as being the originator of the B-C-P sequence, it can be seen in each of the suggested courses of study that chemistry was placed after physics. Note also that a course in biology was absent from the table as it did not exist as a distinct subject at the time, although there were separate courses in botany, zoology, anatomy, and physiology.

Interestingly, the CoT and its subcommittees offered three different rationales for the suggested placement of physics and chemistry. First, physics should be in the 12th grade and chemistry in 11th grade because of the mathematical maturity needed to study physics. Second, physics should be in 11th grade and chemistry in 12th grade, due to physics being a prerequisite for studying other sciences. Third, physics should be in 10th grade and chemistry in 12th grade so that all students might be exposed to physics before leaving school.

AFTER THE COMMITTEE OF TEN

The Committee on College Entrance Requirements (CCER) was convened by the National Educational Association in 1896 to discuss how to implement the findings of the CoT. The committee followed the CoT proposals about sequencing and recommended that chemistry be taught after physics.[12] For college admission they proposed that students complete 16 units of study: 4 in languages, 2 in English, 2 in math, 1 in history, *1 in science,* and 6 units of electives. These units of study would later come to be known as Carnegie Units. An assumption made by the CCER was that several of the electives taken would be in the sciences. The CoT had recommended that both physics and chemistry be required for college admission; however, the CCER with its proposal of *only 1 year* of science for graduation, coupled with the subjects' late appearance in the sequence, essentially made chemistry and physics electives in high school.

Many states eventually followed the CCER recommendations, and so for high school students only one year of science became required for graduation. This would remain true in most states throughout most of the 20th century. Furthermore, the CoT and CCER recommendations led to another effect, unique to U.S. science education—that is, individual sciences became 1-year courses, not taught over multiple years. There was some debate about offering chemistry continuously through high school, but lack of suitably qualified chemistry teachers and appropriate laboratory facilities made such proposals untenable.[13] In contrast, high school chemistry in virtually all other countries in the world historically came to he taught over several years.[13,14]

In the late 1800s and early 1900s, major demographic changes were occurring in the United States. Most notably in high schools the number of students was increasing rapidly. In 1890 approximately 200,000 students were enrolled in high schools, by 1900 this population had more than doubled to over 500,000, and by 1920 there were more than 2 million students in

high school.[15] Woodhull, in an address to the New York Chemistry Teachers' Club in 1917, illustrated the phenomenal growth: "we have several high schools in New York City now that have more pupils than all the United States had when I began to teach."[16]

The courses of study endorsed by the CoT had targeted college-bound students, but with the burgeoning high school population a smaller percentage of students were going on to college. Consequently, the courses proposed started to be viewed as unsuitable for the majority of students. This led to several important curricular developments, which would affect the science sequence.

Between 1900 and 1920 two new courses were created. General science was introduced and rapidly became the most frequently taken science subject, as it met the needs of students for whom it would be a terminal science course, and it was seen as a necessary introduction to another new course—general biology.[17,18] The separate courses in botany, zoology, anatomy, and physiology were amalgamated into a general biology course. Given the more descriptive natures of both general science and general biology, they were universally placed in the early years of high school before chemistry or physics.[19]

In 1920, The Committee on Reorganization of Science in Secondary Schools, commissioned by the National Education Association as part of the Commission on the Reorganization of Secondary Education, included general science and general biology in their proposed 4-year science sequence. The committee recommended that every high school should provide biology, chemistry, and physics courses. With regard to the sequence, they recommended that general science and biology should he offered in 9th and 10th grades respectively, with chemistry and physics either in the 11th or 12th grade. The committee approved the practice in small high schools of alternating physics and chemistry in successive years.[20] The general practice in the majority of schools at this time was still to offer physics before chemistry.[21]

By 1930 there was still no established order for physics and chemistry,[22] though biology had become firmly established as first in the sequence. Over the next few decades, recommendations were made by other committees[23] about the sequence of the sciences in high school. With the exception of the majority of the physical science section of the CoT, by World War II no committee had actually recommended that chemistry be placed before physics. But in the schools between 1890 and 1945, chemistry would find a definite position before physics.

SCIENCE COURSES OFFERED IN HIGH SCHOOLS

Surprisingly, the recommendations of the various committees seemed to have little effect on the practice in schools.

Over the next few decades, Hunter conducted a series of surveys across the country, investigating the order in which the sciences were being taught in the high schools.[21,22,24,25] Over these decades, physics and chemistry swapped positions in the course order. At the beginning of the century, fewer chemistry courses were offered in the junior year than in the senior year. Physics had the opposite pattern. By the early 1930s physics became more frequently offered in the 12th grade and chemistry more frequently offered as an 11th-grade course. Unlike biology, which was recommended as the first course in the science order by virtually all committees, the relative placement of chemistry and physics was left unspecified. The swapping of the order of chemistry and physics was not the result of any specific educational, scientific, or historical decision. No committee proposed placing chemistry before physics, nor was there any discussion of the relative merits of various sequences by these committees, though, according to the Hunter studies it was the practice that evolved in the schools over this time period. Indeed, the changeover was

slow and erratic and different states adopted different practices, as Hunter noted in 1931:

> In Pennsylvania, Michigan, Indiana, Massachusetts, Ohio, California, Wisconsin, Washington, and Oregon there is a definite tendency toward chemistry in 11th and physics in the 12th year. In Connecticut, New Jersey, New York, Illinois, Iowa, Missouri, Colorado, and Montana there seems to be fairly well established the reverse sequence of physics in the 11th and chemistry in the 12th year.[22a]

To confirm the results of his survey, Hunter visited "important schools" in 22 states and reported that "there is no agreement among supervisors as well as among teachers as to the proper sequence of high school chemistry and physics."[22b]

Some insight into the thinking of the time can be gleaned from the writings of the American Chemical Society's Committee on Chemical Education. Chemists were mindful of the issue of the placement of chemistry in high school and its significance for the status and development of chemistry as a subject. In 1924, the ACS Committee on Chemical Education met to discuss the content of the high school chemistry curriculum.[26] They advised chemistry teachers, "to encourage chemistry being placed in the fourth year of high school after the students have had a year of general science, and a year of biological science or physics, or preferably both." This represented the prevalent attitude of the day that seniors were more mature than juniors and so more material could be covered by them. The argument was similar to that made by the majority of the physical science subcommittee of the CoT in recommending that physics be placed in the final year. Clearly, in the 1920s, the science class closest to college held the most prestige. Despite this advice, the B-C-P sequence slowly gained ground so that by the late 1940s it had become the status quo.

Not unsurprisingly, given the seemingly arbitrary sequencing of physics and chemistry, the logic of the B-C-P order has been continuously challenged.[2,27–31] The primary criticisms being that the sequence fails to represent the structure of modern science and that it is pedagogically inappropriate. The development of the sequence did have a major impact on the student enrollment in these high school courses.

ENROLLMENT IN THE SCIENCES

The CoT had recommended that all students take chemistry and physics. The changing nature of the population in high schools, the setting up of an elective system, and a credit system as well as the development of biology and general science as subjects were potential factors affecting science enrollment. Enrollments in biology, physics, and chemistry changed from the 1890s to the 1980s.

An enrollment of 25% approximates to complete enrollment; that is, all students would take the subject at some point in their high school career. While the percentage of students enrolled in physics showed a dramatic decline, the percentage enrolled in chemistry remained approximately constant at slightly less than 10% of the population. For most of the 20th century less than 40% of U.S. students graduated high school with a credit in chemistry. Biology after its formation rapidly became the most taken science. By the 1930s more students took biology than physics and chemistry combined, clearly an outcome of its placement in the science sequence. After 1930 the relative enrollments of the subjects changed only slightly: Biology continued to grow, physics continued to decline, and chemistry stayed approximately constant.

After the publication of *A Nation at Risk*[32] in 1983, enrollment in the sciences started to rise. The report had called for an increase in the graduation requirement to 3 years of science. At the time of *A Nation at Risk,* 36 states still only required 1 year of science for graduation, as the CCER had recommended. By 1992 more than 40 states were requiring at least 2 years of science with some states in the process of moving to a 3-year requirement.[33] At present, biology is approaching universal enrollment in U.S. high schools, and the percentage of students completing chemistry has almost doubled in the last

20 years. While it is possible to take other sciences (e.g., earth science, physical science) to meet high school graduation requirements, these classes are predominantly organized around the B-C-P sequence. Due to chemistry's central position in the sequence, further increases in state science requirements will inevitably raise enrollment in chemistry.

DISCUSSION

Chemistry became the "central science" in U.S. high schools by accident, not by design. There were three important historical factors that influenced how high school science came to be sequenced, and these factors had a major impact on the development of U.S. science education.

First, decisions made before 1900 established individual sciences as 1-year courses. Inevitably, the sciences would have to be taught in a specific order. Chemistry, however, is not a static subject. The stunning growth of chemical knowledge in the 20th century with the development of atomic theory, bonding, acid–base theories, and so forth has naturally led to an increase in the quantity of material in introductory chemistry. This increase in material has not been accompanied by an increase in time allocation for chemistry but instead has been fitted into the preexisting timeframe. Chemistry has remained a single-year course with the same curricular time allocation; consequently, the introductory chemistry course has become overpacked with content. The CoT recommendation of 200 hours of study for each high school science was made before much of present day chemistry had been developed. Today, U.S. high school chemistry attempts to cover in one short year, as evidenced by the encyclopedic texts, what students in most other countries take several years to cover. It should be hardly surprising that chemistry developed an "obsession with content"[34] and is still on "the killer course list."[35] High school chemistry teachers need more curricular time, not to cover more material, but to do what they are actually being asked to do.

Secondly, the science courses became sequenced. By the 1920s, due largely to its descriptive nature at the time, biology had consolidated its position as the first specialized science taught in high school, with most schools offering physics next and finally chemistry. By the 1930s the relative positions of chemistry and physics had changed and the B-C-P order had been established. No committee made this decision; it was simply the practice that was adopted in the schools. Both the physics and chemistry communities were vying for their subjects to be taught last in the sequence. By the late 1940s the B-C-P sequence had become the status quo. The sciences were taught as distinct, unrelated courses in this specific order. Robinson has argued that the B-C-P sequence is strictly not a sequence, as biology is not a prerequisite for chemistry, nor chemistry a prerequisite for physics.[36] Haber-Schaim[37] supported this view by analyzing the concepts included in high school science texts and showed that from a conceptual point of view a physics-chemistry-biology order was more logical. A cursory glance at any introductory biology text or curriculum shows that it contains a wealth of chemistry, and consequently much elementary chemistry is understandably being taught by biology teachers. While physicists are calling for Physics First,[38] biologists could convincingly argue for Biology Last, if high school science is to be taught in a fixed order. More than 200 schools, including whole school districts (e.g., San Diego), have already moved to a physics-first order.[39] It seems likely that this number will continue to grow, even though such a change faces significant hurdles. In other countries, a B-C-P sequence did not develop, and chemistry is usually taught over multiple years and is more coordinated with the other sciences.

The third factor relates to the implications of changing state science graduation requirements. As science is taught in a specific order, any increase in overall requirements significantly increases enrollment of the later offered sciences. This has had a major impact on chemistry education. With most states initially having only

a 1-year science graduation requirement, chemistry was an elective, taken by a fraction of the students. When the majority of states moved to a 2-year requirement in the 1980s, enrollment for all sciences increased, biology essentially became a requirement, and the percentage of students taking high school chemistry doubled. Today, most high school students graduate with a chemistry credit.[40] With a significant number of states moving to a 3-year requirement, chemistry will become a requirement in these states. It would appear that the belief that all students should take chemistry is being achieved through legislation.

The impact of having a fixed high school science sequence on the U.S. science education system has largely been overlooked. If the United States is to develop a world-class science education system for the 21st century, then it is time to reconsider not only what chemistry is taught but also when it is taught and how much time should be devoted to it. We would suggest that re-answering the questions set by the CoT in 1892 would be a good place to start.

Discussion Questions

Why is the scope and sequence in your subject area designed in its current format?

Do you believe that your students would learn more effectively if the curriculum scope and sequence were redesigned for the subject you teach? Why or why not, and what suggestions would you make for restructuring?

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Article 20

SCHOOL DAYS (HAIL, HAIL ROCK 'N' ROLL!)

RICK MITCHELL

I am usually impressed when teachers tell me that they've always known they wanted to be teachers, and that they've never had another job. I am one of those who took a more circuitous route to this profession. In fact, I might have been voted "least likely to become a teacher" among the class of 1970 by the administration of Katella High School in Orange County, Calif., which suggested that I unceremoniously depart midway through my senior year.

In college, I thought I found my calling as a journalist. Instead, I became a professional rock critic, which is sort of like being a journalist except that you never have to grow up. Perhaps no career besides that of professional athlete or musician affords such an opportunity for supposedly mature individuals to extend their adolescent passions so deep into adulthood. For 20-odd years, through countless mainstream newspapers and alternative magazines, seedy dives and concert halls, I soldiered on with my appointed duty,

until I finally outgrew the mysterious joy and pride I once had found in telling people that the music they enjoyed actually sucked. Only then, in a desperate epiphany cleverly disguised as altruism, did I decide that education was my true calling. I now teach English, history, and philosophy at a private international school in Houston.

So how does my past life as an opinionated and erudite pop-culture snob influence what I do in the present as a kind and caring adult who is routinely interrupted and ignored by teenagers?

Well, I still listen to a lot of music, new and old, for my own enjoyment. The fact that I am far more conversant in hip-hop than the average middle-aged white guy gives me a semi-secret code for relating to certain students who otherwise might be difficult to reach. I also try to stay current with trends in rock, R&B, jazz, various regional styles, and music from around the world. As a result, a few of my more musically astute students seem to think I'm pretty cool for

an old fart and ask to borrow obscure stuff from my collection or want to know my opinion of their favorite new CDs.

Most of my students, on the other hand, couldn't care less what music I listen to on my own time. What is relevant to them, and to the purposes of this article, is the music we listen to together in class. I regularly incorporate music into lesson plans for all three of the subjects I teach, from thematic connections between song lyrics and poetry in English, to the epistemological implications of aesthetics as a philosophical area of knowledge. I also give an 8-week series of guest lectures on the history of jazz for the advanced music classes.

What I want to focus on here, however, is the integral role music plays in the curriculum for my ninth-grade U.S. history class. Although I sometimes have to remind students that listening to music in class is not an invitation to start the party before the bell rings, the music lessons are treated as special events by most students, and, like historically based films, they serve to augment and enliven the lecture/discussion cycle that necessarily takes up the bulk of the class periods.

RACE IN AMERICAN MUSIC

One of the central themes of my history course is that America is a nation of great contradictions. The history of American music provides an excellent means for illuminating perhaps the most basic contradiction of all in U.S. society, that of race. How could the author of the Declaration of Independence, which declares that "all men are created equal" and possess an "inalienable right to life, liberty, and the pursuit of happiness," have been a slave owner? How could the founding fathers be inspired by the example of limited government set by the Iroquois nations yet engage in a policy of genocide when indigenous tribes interfered with westward expansion?

American music—jazz, rock, rap, R&B, gospel, country—has been the most alive and innovative musical tradition in the world for at least the last century. All these forms come out of the gumbo pot of African, European, and Native American sources that characterizes the musical heritage of both North and South America. Yet, in the United States, Black artists typically have done the lion's share of the innovating, while White artists (and White-owned record labels) have reaped the lion's share of the financial rewards. Furthermore, our cultural elites still overwhelmingly look to Europe to validate American "high" culture, when what makes us unique is the unprecedented cultural crossbreeding that has taken place here. Compare the corporate and government support for "classical" forms such as the symphony, opera, and ballet to what's afforded to jazz, which should be considered the classical expression of American vernacular music. It is impossible to seriously study the history of 20th-century American music, from ragtime to rap, without also studying the history of racism.

Yet American music is also the story of gradual and sometimes spectacular triumphs over racism and class discrimination, of self-taught geniuses and bootstrap capitalists who neither asked for nor received public subsidies, and whose musical creations, for better and worse, have captured the imagination of the world for the past half-century. As trumpeter/educator Wynton Marsalis frequently has commented, jazz music can be seen as the ultimate artistic expression of American democracy, in its emphasis on individual expression within a cohesive group context.

My ninth-grade U.S. history course syllabus begins with the European conquest of the Americas and the disastrous consequences that followed for the Native American population and enslaved Africans. During the first week of class, as the class is doing homework assignments from the text about European conquest and colonization, I devote the better part of two 50-minute periods to demonstrating how Native American, African, and European elements came together and evolved into all the myriad forms of American music. I use recordings that reflect the traditional roots of the music, while explaining that all musical forms evolve over time and that

20th-century recordings inevitably have introduced modernizing influences.

Because of time constraints, I generally explain what elements I want students to listen for in a given piece and then play an excerpt that illustrates the point I am trying to make. I often fade the music down to talk over it, then fade it back up to let the music reinforce what I've just said. The DJ in me would, of course, prefer to play each track in its entirety—and sometimes students will implore me to let the music play—but excerpts are usually better suited to 50-minute periods and short adolescent attention spans. (See www.rethinkingschools.org for a listing of albums and individual tracks used in this lesson.)

I begin in South America with an example of Inca music from Peru, pointing out the distinctive handmade instrumentation and piping melodies. I next play some West and Central African drumming, focusing on the complex polyrhythms not commonly found in European or Native American music. This is followed by examples of Spanish and Portuguese guitar music, during which I refer to the earlier North African influence on Spanish flamenco. I then show how these distinct elements were fused to create Afro-Cuban salsa, Colombian cumbia, and Brazilian samba.

For example, the music of Toto la Momposina, a wonderfully folkloric female singer from Colombia, consciously combines Native American flutes with Afro-Latin percussion and Spanish guitar. When her full band brings in the horns, it becomes a contemporary cumbia orchestra. As I point out to students, this sort of pervasive intercultural exchange characterizes not only the music of the Americas but virtually all aspects of our culture—our food, language, religion, and social customs. It is, effectively, what defines us as Americans.

I launch the North American segment of the lesson by explaining some of the ways in which the practices of British slave owners in North America differed from the Spanish, French, and Portuguese in Latin America and the Caribbean. Most notably, the British banned hand drums and other African instruments, so that slaves were forced to invent their own instruments or adapt those of the Europeans to their purposes. The polyrhythmic hand clapping in Black churches and the bottleneck slide guitar favored by Delta blues singers are examples of such improvised African retentions. (The exception to this was New Orleans, essentially a Caribbean city until the early 1800s, which is why New Orleans plays such an important role in the birth of blues and jazz.)

I first play recordings of West African griot music, in which singer-songwriter historians travel from village to village, singing praises to the various clans. I then play examples of traditional Celtic music from Ireland and Scotland, noting the similarities between West African griots and Celtic bards. Both functioned as oral historians as well as musicians, and both made their livings by bestowing praise upon wealthy clan chieftains. (Rappers who give "shout outs" to fellow rappers and their record label execs are thus perpetuating an old African tradition.) Next, I show how the West African griot tradition survived in North America in the archetype of the itinerant Delta bluesman, and how Irish and Scottish music mated with African American blues in the backhills of the Appalachians to produce country and bluegrass music. Then I briefly fast-forward to the mating of "Black" blues, gospel, and R&B with "White" country and bluegrass that gave birth to rock 'n' roll. The first rockers, I tell my students, were the slave musicians who took the master's instruments back to the slave quarters and put them to their own purposes, whether praising the Lord or getting the party started. Elvis Presley's first record featured a bluegrass cover on one side and a blues tune on the other. Both sides came out sounding like what we now call rockabilly.

Students are invited to ponder the ironic contradiction. Because of slavery, African and European musical concepts met and made love on unfamiliar ground. The heritage spawned by this act of cultural miscegenation is contemporary American music, in all of its artistic glory and commercial crassness.

It has conquered the world in a way that U.S. military and political might never will. That such a terrible and dehumanizing institution as slavery could create the conditions that allowed the brilliance and beauty of great Black artists such as Louis Armstrong, Duke Ellington, Otis Redding, and Aretha Franklin to flourish is one of the tragic ironies of modern Western civilization. U.S. history is full of such contradictions. As historians, and as citizens in a nominally democratic society, we must study these contradictions so that we will not be fooled by those who would insist that Americans have always been the good guys. Or, for that matter, the bad guys.

There are, of course, no recordings to document how American music evolved from the 17th century through the 19th century. But from the invention of the phonograph in the early 20th century, popular musical recordings have charted what average Americans were thinking and feeling, how they talked, how they sang, and how they danced. For history teachers not to take advantage of these historical artifacts, especially in light of the technological advancements that have vastly improved the sound quality of old recordings, is comparable to leaving the photographs out of a textbook.

FROM HARLEM RENAISSANCE TO "HIPPIE DAY"

I come back to music throughout our study of 20th-century America. When we read about the Harlem Renaissance in the 1920s, I play classic recordings by blues and jazz greats such as Bessie Smith, Fletcher Henderson, Armstrong, and Ellington to demonstrate the cultural sensibility that produced the poetry of Langston Hughes and Zora Neale Hurston. In 2000, Rhino Records released an excellent four-disc set called *Rhapsodies in Black: Music and Words From the Harlem Renaissance,* featuring poetry readings by well-known African American actors, musicians, and celebrities spliced with original recordings from the era by the artists mentioned

above and many others. For students to hear rappers such as Ice T and Chuck D, and actors such as Debbie Allen and the late Gregory Hines, reading African American poetry helps to make the connection between the historical context and their own lives. It also helps make the music—which was, of course, the funkiest party music of its time—come more fully alive.

When we discuss the Great Depression and the New Deal, the class watches the movie *The Grapes of Wrath* (one of the few films I show in its entirety) over two and a half class periods. This is followed by a half-period lesson on the tradition of White, working-class protest music, from Woody Guthrie's Dustbowl Ballads through Bob Dylan's early political-protest songs, Bruce Springsteen's *The Ghost of Tom Joad* and Rage Against the Machine's rock/rap cover of Springsteen's title track, which echoes Tom Joad's last lines from the movie: "Wherever there's somebody fighting for a place to stand/Or a decent job or a helpin' hand/Wherever somebody's struggling to be free/Look in their eyes, Ma, you'll see me."

In this case, I don't announce what I am about to play before I play it. I'd rather have students make the connection on their own.

When we come to the 1950s I devote two class periods to retracing the musical and cultural conditions that gave rise to rock 'n' roll. In the first, I cover the parallel development of Black music (gospel, blues, swing, rhythm and blues) and White hillbilly music (country, western-swing, bluegrass) from the 1920s through the 1940s. I then show how these styles were crossbred in the early 1950s by Black artists such as Fats Domino and Chuck Berry and White artists such as Bill Haley. For example, Chuck Berry's "Mabellene," an early rock classic, has the same beat as Bob Wills and the Texas Playboys' "Ida Red," a traditional western-swing tune from two decades earlier. Yes, Chuck Berry, like many Black artists of his generation, was influenced by country music as well as blues. On the other hand, Bill Haley's "Rock Around the Clock," one of the first rock 'n' roll records by a White artist, takes its musical cues from Joe

Turner's "Shake, Rattle and Roll," a jump-blues tune sung by a much-older Black artist with roots in the swing era.

Rock 'n' roll existed in form before Elvis Presley, but the moment of pop-culture conception arrived with Presley's first single for Sun Records in Memphis, which, as I alluded to earlier, covered Bill Monroe's "Blue Moon of Kentucky," a bluegrass tune, on one side and Arthur "Big Boy" Crudup's "That's Alright, Mama," a blues tune, on the other. It's no coincidence that Presley's next single was a cover of Roy Brown's "Good Rockin' Tonight," one of the first R&B hits to use the term *rock* (a frequent euphemism for sex) in the title.

In the next day's lesson, we examine the relationship between rock 'n' roll and the postwar emergence of a popular mass culture focused on youth. We watch excerpts from Presley's movies—the big dance number from *Jailhouse Rock* is always a winner—and listen to his huge hits from the late 1950s, as well as those of other teen idols from the period including Jerry Lee Lewis, Little Richard, Buddy Holly, and Frankie Lyman. We also listen to Otis Blackwell, an obscure Black musician whose original recordings of "Don't Be Cruel" and "All Shook Up" were "borrowed" by Presley, almost note for note. (Hear for yourself on Blackwell's only CD release, *All Shook Up,* reissued on the Shanachie label in 1995.)

The music lesson should naturally lead to a discussion of the impact popular youth culture has had on American life in the past 50 years, and how musical integration opened the door to legal integration. Once large numbers of average White kids started listening to popular Black music and attending concerts featuring White and Black acts sharing the same stage, it became increasingly difficult for local authorities to keep audiences racially separated.

Rock 'n' roll promoters such as Cleveland disc jockey Alan Freed began to insist that their concerts be integrated. It is widely assumed by rock historians that Freed's conviction in the payola scandal of the late 1950s was due, at least in part, to his courageous stand against segregation.

Undoubtedly, the most anticipated music lesson I give all year is Hippie Day, which has become a spring tradition at my school. On the day after the big essay exam that covers the civil rights movement and Vietnam, the principal gives the entire freshman class permission to come to school dressed in 1960s fashions instead of the usual uniforms. At lunch, we hold a "sit-in" on the quad, featuring performances by student and faculty musicians.

During my history class periods, I play classic rock and R&B records while explaining the evolution of 1960s protest music from the folk-music revival through folk-rock and into acid-rock, and from civil rights–era soul to Black Power funk.

Explaining the drug references in some songs is always a bit dicey, since I do not want to be accused of promoting drug use, and that's exactly what these songs do. But my students seem to be sophisticated enough to appreciate that while much of the music was great, and much of the politics admirable, the 1960s counterculture bequeathed a mixed legacy to subsequent generations.

It's too simple to blame today's crack babies on the Beatles' use of LSD and to blame the AIDS epidemic on "free love." But it's also too simple to say there is no connection at all. It's another of those contradictions that serve to make the United States the complex society that it is, and another reason why we should be suspicious of those who try to make complex issues seem simpler than they really are, like those who thought drugs would be a shortcut to nirvana and those who now brandish the slogan "zero tolerance" as a weapon of righteousness.

Cultural History Is Real History

For culture-war conservatives, I suppose my music lessons could be considered at best fluff, at worst a subversive challenge to the notion of a classical eurocentric education. I would agree that they might very well be subversive, but they are not fluff. They are instead the stuff of real history.

Too often, history is taught as a timeline of wars and famous leaders, in which average people are little more than pawns and cannon fodder. Just as thousands of anonymous soldiers died when Napoleon met his Waterloo, from which he emerged unscathed, so too will the war in Iraq be remembered as Bush's war, though he is likely to survive no matter how many historically nameless Iraqis and Americans do not.

While major military and political events serve as natural landmarks in any history syllabus, the true and often untold history of our world consists of what societies were doing both during and between these cataclysmic chapters. Musical recordings offer vivid evidence of what was taking place in previous decades and centuries and can bring history alive in ways that books, photos, and even films cannot. Of course, it is important to examine how culture reflects and influences political events. But cultural history should not be considered merely a sidebar to military and political history. It is important in its own right, perhaps more important than memorizing the names of past presidents and generals.

In "School Day," his ebullient mid-1950s ode to the newborn child called rock 'n' roll, schoolboy Chuck Berry can't wait for the bell to ring so he can head down to the corner juke joint and rock out. Why wait for the bell, Chuck, when we can learn so much about who we are as a society from listening to your records? Hail, hail rock 'n' roll!

Discussion Questions

How open are you to using "nontraditional" approaches to teaching your curriculum?

How might you deal with individuals who might not understand nontraditional approaches to curriculum mastery?

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