SOUTHERN RURAL SOCIOLOGY, 21(2), 2006, pp. 65-88.

THE EFFECTS OF RACE, PLACE, CLASS, AND GENDER ON INSTRUCTIONAL STRATEGIES IN KENTUCKY'S SEVENTH GRADE SCIENCE CLASSES: INDIVIDUAL AND SCHOOL LEVEL ANALYSES

STEPHEN K. MILLER
UNIVERSITY OF LOUISVILLE

D. CLAYTON SMITH
WESTERN KENTUCKY UNIVERSITY

LARRY S. ENNIS
LINDSEY WILSON COLLEGE

ABSTRACT

This study explored the relationship of student demographics to teaching method in Kentucky's seventh grade science classrooms for 1997-98, based on performance assessment data (student level $N = 21{,}499$; school level $N = 264$). Students' perceptions of seven instructional strategies from the KIRIS student questionnaires were placed into three groups: traditional, inquiry-based, and computer. At the student level, these strategies were regressed on race, gender, free/reduced lunch, urbanity of the district, Appalachian status, and Educational Service Region. At the school level, the three approaches were regressed on aggregate school data for these same variables.

Findings indicated that demographic factors do affect teachers' instructional strategies. Student-level results demonstrated numerous small but statistically significant influences on all three instructional approaches. Nearly all demographic effects disappeared when examined at the school level. The strongest finding was that schools with higher percentages of free/reduced lunch students reported more computer usage. Less computer use was reported for schools with more female students. Findings are discussed in light of science instruction, computers, and technological development for the rural south.

Demography and Schooling

The Coleman Report (Coleman et al. 1966), a massive and influential study of inequality in American schools, crystallized in the public realm what educators had always known: schools, as currently constituted, are unable to overcome the effects of family background. Language patterns, cognitive style, school readiness skills, cultural values, and social class-related attitudes that children bring to the school clearly affect educational outcomes (Rothstein 2004). Nevertheless this does not mean that schools do not affect children's success. The school effectiveness (Levine and Lezotte 1990) and teacher effects (Berliner 1983; Wayne and Youngs 2003) fields can both be viewed as reactions against the "schools do not make a difference" conclusion from Coleman's work, confirming what good teachers have also always known: instruction matters. Two seemingly contradictory positions are raised here:

(a) that sociodemographic factors have an almost unshakeable influence on student outcomes, and (b) what schools and teachers do makes a difference for students. Too often these findings are viewed as simplistic all-or-nothing claims. That the differences among children are too great to be eliminated by schools, at least given current resources, does not mean that the quality of education cannot help ameliorate some of these differences.

A long history of empirical evidence supports the proposition that curriculum and instruction are determined in large part by the type of students in a school. Critical theorists (Anyon 1981; Apple and Weis 1986; McNeil 1988) have documented that curriculum is stratified by type of school: rote, lower level cognitive work with emphasis on control and complaisance for working/lower class schools; more demanding, "high status" disciplinary-based college prep for middle class schools; independent, leadership-oriented, problem-solving classical liberal arts for affluent and upper class schools.

Similarly the type of students in a school influences instruction. One of the strongest conclusions in all educational research is that teacher expectations affect student achievement (the self-fulfilling prophecy). Teachers have lower expectations for lower status pupils with respect to content covered, level of creative demands, assessments of students' abilities, instructional skills used, and quality of curricular knowledge, with concomitantly lower student outcomes (Brophe 1983; Good 1987; Rosenthal 1987, 1997). Teacher beliefs and practices vary across communities differing in economic level (Solomon, Battistich, and Hom 1996). More broadly, schooling in America reflects the stratification of the larger society (Brookover and Erickson 1975; Persell 1977; Rothstein 2004).

Purpose

The relationships among demographic factors, instructional practice, and student outcomes have been extensively studied. Non-alterable contextual variables (Bloom 1980) affect student achievement, much stronger at the school level than the individual level (Coleman et al. 1966; White 1982). Despite years of efforts, America has not negated differences between advantaged and disadvantaged students, although at-risk students fare better with good teachers in effective schools.

However, several issues are still pertinent. Larger studies of demographic factors typically investigate student outcomes directly rather than as mediated by instructional practice. Investigations that have examined how these family background variables affect instruction (e.g., critical theory, process-product, or self-fulfilling genres) have typically been qualitative in nature or based on small samples of a single or few classrooms. Large scale comparative data on the effect of sociodemographic factors on instructional practice, especially comparing results at the level of the individual versus the school, are rare.

In addition curriculum-based questions remain. Mathematics and language arts or reading have been extensively studied but other disciplines have received far less attention. Science in particular is problematic because it generally lags behind progress in other content areas (O'Sullivan, Reese, and Mazzeo 1997), a finding particularly true in Kentucky (Petrosko 2000). Likewise, the age of students is an issue, with middle school achievement not keeping pace with elementary or even with high schools (Kentucky Department of Education 2000; Southern Regional Education Board 1999). Finally, little evidence on any of the above issues exists within the context of high stakes accountability (Linn, Baker, and Betebenner 2002; Wise and Leibbrand 2001).

The following research question addresses several of these concerns directly. For Kentucky seventh grade science accountability data for the 1998 KIRIS assessment, what is the effect of sociodemographic factors

1. Measured at the level of individual students
2. Aggregated to the composite school level

on teachers' instructional strategies in science

1. As perceived at the level of the student?
2. As aggregated to a school-level composite?

The Kentucky Context

In Kentucky where overall achievement has progressed from the bottom five among the 50 states to near the middle on a variety of assessment measures, the Kentucky Education Reform Act (KERA) implemented in 1990 has produced significant statewide improvements through systemic restructuring (National Assessment of Educational Progress 2003; Pankratz and Petrosko 2000; Poggio 2000; Prichard Committee on Academic Excellence 1999). Central to the KERA reforms was the stated belief that all children can achieve at a high level and the adoption of a value-added model (Hornbeck 1990) of high-stakes accountability for schools (Petrosko 2000). This progress, however, masks several ongoing demographic challenges for Kentucky. Continued improvement in school outcomes will require better understanding of the relationship between the characteristics of place (Bushnell 1999) and their concomitant effects on instruction.

Kentucky is a southern state with a rural tradition. Differences in economic development parallel structural cleavages in manufacturing, agriculture, and extractive industries (Blumer 1964; Harris 1979; Levy 1966). The schism between traditional and modern value systems is associated with structural change along these factors (Allen and Dillman 1994; Eisenstadt 1973; Inkeles and Smith 1974) and the forces of urbanism (Critchfield 1994). Yet over the last several decades, the South has been changing toward an industrial base more rapidly than other regions, a pace that inevitably exacerbates cultural backlash (Grasmick 1973; Hofstadter 1963). Thus ironically, at the very time that greater intellectual capital is needed to support the emerging industrial/post-industrial economy, many traditional values so inimical to higher education generally and science in particular seem highly resistant to change (Ford 1978; Reed 1972). These same processes can be seen throughout the Appalachian region where the influence of mining typically reinforces the traditional rural mindset (Caudill 1963).

Schooling in Kentucky reflects this rural tradition. Kentucky's county districts are predominantly composed of rural, small town populations. Some counties have both a primarily rural county school district and a separate independent district for the urban center. These independent districts typically have better resources and higher socioeconomic status (SES), particularly in Appalachia (DeYoung 1983). Close to a third of Kentucky's students are in counties defined as Appalachian (Smith 2004), and slightly more than half receive free/reduced lunch (Reeves 2003). Given the consistent research on the deleterious effects of these factors on achievement—e.g., Miller (1995) on SES and poverty; Smith (2005, in press) on Appalachian status; Borland and Howsen (1999) and Kannapel and DeYoung (1999) on rurality—it is not surprising that Kentucky has a long history of educational underachievement (Berman 1978), especially since these factors often overlap (Khattri, Riley, and Kane 1997). Moreover, given the difficulty that many rural districts have in attracting and retaining highly qualified teachers (Holloway 2002; United States Department of Education 1994), the link between these demographic factors and instructional quality is obvious.

Student Versus School Composition Effects

It has long been recognized that the effects of family background on achievement are far less pervasive at the level of the individual as compared with the level of the school. The Coleman Report (1966) demonstrated that the strongest school-level influence on achievement was the composition of the student body in terms of race and class. A major review by White (1982) found family background correlations with student achievement in the .2-.3 range while those same factors aggregated to the school were in the .55-.75 range.

Recent research in the era of accountability is even more striking on the potency of sociodemographic characteristics on achievement at the composite school level. A major study of the entire student population of a large urban district in Kentucky (Moore 2003) examined reading and mathematics achievement data for the year 2002. Based on Commonwealth Accountability Assessment System (CATS) data that included both norm-referenced (CTBS) and criterion-referenced (Kentucky Core Content Tests) assessments, Moore found that seven sociodemographic variables explained from 19-36% of the variance in achievement across all different tests for all grades at the student level. In contrast, these same seven factors accounted for 56-91% of the variance when aggregated to the school level.

Although actual effect sizes vary from study to study, the distinction between individual and school level analyses can be confounded. There are several different ways to conceptualize student and school effects. Fundamental is the notion of total variance, i.e., the range of achievement from the highest to the lowest achieving student among all schools in a population or sample. This is typically divided into two portions—within school variance, the range among students within each school; and between schools, the range across mean school scores. Widely utilized in the literature, most of the total variance occurs within schools, e.g., from 65-85% in the Coleman Report (1966).

Some studies take another approach. Moore (2003) compared total student variance (for all students, apart from their school) to the variance between schools. Performance assessment, however, often focuses on gain scores, typically examined at the composite level since the school is the organizational unit where improvement is targeted and accountability occurs. Thus some studies have compared the school-level scores (between school variance) to school-level change scores (between school variance but for percent improvement). Reeves (2003) is a recent example of this, but his analysis did not examine individual student variance, either total or within school.

Thus while the literature typically confirms the larger effect of demographic factors at the composite school level, there is often inconsistency about what constructs are being compared. With the coming of accountability, the situation is more complex as the school-level effects examined are likely to be change scores. What this implies for any analysis is careful consideration of which constructs are being investigated and the nature of any contrasts performed.

Concentration Effects

The finding that the school-level impact of demographic factors is stronger than individual effects is consistent with theory. Wilson's (1987) work on concentration effects is perhaps the most salient explanation. Very simply, demographic factors are not equally dispersed (Friedman and Lichter 1998; Kozol 1991; Wilson 1987). In a large district with average 35% free/reduced lunch eligibility, schools may range from less than 5% eligible to nearly 100%. Similar concentrations occur with other demographic factors such as race, student mobility, or family structure (Beck and Shoffstall 2005). The differential concentration, however, is only part of the explanation. Social capital (Coleman 1988) intertwines among families, communities, and schools. Who one plays, works, and interacts with has a powerful influence on mores, career aspirations, and attitudes toward schooling, immediate as well as future college attendance (Eckert 1989; Horvat, Weininger, and Lareau 2003; Israel, Beaulieu, and Hartless 2001). Because there are consistent differences across these factors by social class (Miller 1995; Persell 1977), students in different schools are exposed to significantly different educational milieus. These peer effects are especially potent at middle and high school as compared with elementary school (Corsaro and Eder 1990; Ogbu 2003) when peer group becomes more important as students begin to recognize class differences, develop personal agency, and assert their independence from the home.

Methods

The data for this study were collected and analyzed at the school level ($N = 333$ Kentucky public schools housing seventh grade during the 1994-98 accountability cycle) and student level ($N = 49267$ seventh grade students for 1997-1998). This secondary file includes approximately 99.5% of the student population (Kentucky Department of Education 1998a, 1998b).

Dependent Variables

Teacher instructional strategies (IS) are the target variables in this research. However, direct measures of teacher behavior are not available. Instead, students' perceptions of their teacher's science instructional practices are the actual dependent measures, based on seven supplemental questions that are part of a student survey taken during accountability assessment. The questions are listed below:

IS1. In your science class, how often do you read from textbooks or work on worksheets?

IS2. In your science class, how often do you work together in pairs or small groups?

IS3. In your science class, how often do you use a computer?

IS4. In your science class, how often do you study science, using ordinary objects from everyday life?

IS5. In your science class, how often do you watch the teacher give a science demonstration?

IS6. In your science class, how often do you have a hands-on activity to help learn science?

IS7. In your science class, how often do you do a science experiment in class?

The students have four response choices: (a) never; (b) about once a month; (c) about once a week; and (d) almost every day. These questions, while focusing on student behaviors, clearly indicate the frequency of classroom instructional strategies being implemented by the teacher. Student responses were translated into an interval 4-point scale (4 high). At the student level, the student's response to these questions is matched to his/her demographic background. At the school level, instructional strategies are aggregated to the 7th grade.

Based on exploratory factor analysis and coefficient alpha, the internal structure of the seven alterable instructional strategies was examined. Three instructional approaches were found. ACTION, representing inquiry-based, active student participation, consists of five practices: IS2; IS4; IS5; IS6; and IS7. This set had an acceptable coefficient alpha for both student (.69) and school level (.90). IS1 (TEXTBOOK) and IS3 (COMPUTER) are included as single-item variables.

Student Level Independent Variables

At the student level, the following demographic variables are included.

Free/Reduced Lunch (FRERED). Coded receiving assistance = 1; not receiving = 0. At the student level, comparing these self-reports with school reported Title I and poverty level data indicated students at some schools drastically under-reported their Title I status. Based on the official school figure, Smith, Neff, and Nemes (1999) included students from a school if these two percentages were within 5%. Following that procedure limits the population to 47.8% of all seventh-graders, dropping the population for this study from 49267 to 22508. These restricted numbers are used when reporting student-level statistics for both the population parameters and the regression analysis. This could be problematic. Tabachnick and Fidell (2000) note that loss of data from a population beyond 5% may be suspect.

Gender (GENDER). Coded as female = 1; male = 0, based on KIRIS assessment self report.

Race/Ethnicity (RACE). Coded white = 1; nonwhite = 0. Other categories are collapsed as nonwhite based on KIRIS self report.

Appalachian Status (APPAL). Coded Appalachian = 1; non-Appalachian = 0. Counties are defined by the Appalachian Regional Commission.

District Percentage Urban (PCTURB). Coded as a continuous variable from 0, totally rural, to 100, totally urban, taken from the 1990 School District Data Book.

Region (REGION). Dummy coded by region of residence (1-8), based on the instructional support regions established by KERA in 1990.

School Level Independent Variables

These same variables are aggregated to the school (seventh grade) level. The larger study for these data (Ennis 2002) examined school-level change scores for science for the four-year Accountability Cycle 2. This report examines only the relationship between demographic factors and teachers' instructional strategies. To the extent possible the demographic data represent an average across the improvement cycle, 1995-1998. Unless otherwise noted, the source is the same as the parallel variable at student level.

Free/Reduced Lunch (SCHLUN). Determined by adding the percent of free and reduced lunch students at the school level as obtained from KDE for both 1997 and 1998.

Gender (SCHGEN). Percentage of female students, taken from Kentucky Performance Reports (KPR) for years of study.

Race/ethnicity (SCHRACE). Percentage of white students, taken from KPR for years of study.

Appalachian Status (SCHAPP). Coded as schools in Appalachian counties = 1; other schools = 0.

School Percentage Urban (SCH%URB). Schools coded according to the percentage urban from 0, totally rural, to 100, totally urban, for the district in which they are located.

Region (SCHREG). Students dummy coded by regional residence (1-8), then aggregated at the school level within each region.

Analysis Plan

In this research, simultaneous multiple regressions were used to assess the influence of the demographic variables on the instructional strategies. Region 8

(Southeast Kentucky counties) is the comparison category for the dummy coded regions. Because there are two levels of dependent variables, separate multiple regression analyses are conducted for student and school levels. With respect to the specific variance explained, this work is consistent with Moore (2003); student-level analyses represent total variance while the composite school-level data constitute between school variance.

The dependent variables comprise three distinct types of instructional strategies—ACTION, TEXTBOOK, and COMPUTER. Had these approaches been more similar, multivariate analysis would interpret the three interrelated outcomes. In reality, ACTION and TEXTBOOK are often seen as antithetical and computers have too often become an end in themselves. Accordingly, separate regressions were performed for each dependent variable. Finally, although multiple regression is an inferential procedure, the Kentucky Department of Education (KDE) routinely uses multiple regression for statewide population data. That approach was followed here.

Results

Population parameters for dependent and independent variables are presented first, followed by the multiple regressions.

TABLE 1. POPULATION PARAMETERS FOR STUDENT AND SCHOOL LEVEL INSTRUCTIONAL STRATEGIES (IS)

VARIABLE	N	μ	σ	MINIMUM	MAXIMUM
		STUDENT LEVEL			
ACTION...........	21670	2.571	0.16	1.000	4.000
TEXTBOOK. ...	21499	3.492	0.78	1.000	4.000
COMPUTER....	21990	2.027	1.09	1.000	4.000
		SCHOOL LEVEL			
ACTION...........	264	2.610	0.17	1.901	3.582
TEXTBOOK. ...	264	3.506	0.17	2.923	3.903
COMPUTER....	264	2.244	0.34	1.514	3.427

The dependent variables are the seven instructional strategies, more precisely, students' perceptions of how frequently teachers used these practices on a 4-point scale. Factor analysis and coefficient alpha confirmed three distinct factors: TEXTBOOK, ACTION, and COMPUTER. Table 1 presents population parameters for the three factors for student and school level, respectively. Of note is the relatively low usage for COMPUTER (means near 2, about once a month) and the near saturation for TEXTBOOK (means approximately 3.5, between once a week and almost every day). Apart from the reduced standard deviation for school-level TEXTBOOK and COMPUTER, the values are similar for student and school level.

TABLE 2. POPULATION PARAMETERS FOR STUDENT LEVEL DEMOGRAPHIC VARIABLES ($N = 21{,}670$)

VARIABLE	μ	σ	MINIMUM	MAXIMUM
FRERED...........	0.162	0.368	0.000	1.000
GENDER (F)....	0.488	0.500	0.000	1.000
RACE (W)..........	0.897	0.304	0.000	1.000
APPAL...............	0.243	0.429	0.000	1.000
PCTURB[a]..........	45.3	40.1	0.000	100.0
REGION 1[b]........	0.100	0.298	0.000	1.000
REGION 2.........	0.139	0.346	0.000	1.000
REGION 3.........	0.167	0.167	0.000	1.000
REGION 4.........	0.161	0.368	0.000	1.000
REGION 5.........	0.196	0.397	0.000	1.000
REGION 6.........	0.130	0.337	0.000	1.000
REGION 7.........	0.031	0.174	0.000	1.000
REGION 8.........	0.076	0.266	0.000	1.000

[a]Coded as a percentage. All other variables are computed as decimal fractions.
[b]Regions are dummy coded.

The demographic factors are the independent variables. At the individual level (Table 2), the values are consistent with known distributions of these variables in Kentucky except for two factors. Only 16% receive free/reduced lunch; this seems low given the mean of 52% at the school level (see Table 3). At the individual level, these data are self-reported and likely reflect the stigma associated with this poverty indicator. The corrective procedures described above (Smith et al. 1999) would affect disproportionately schools with higher percentages of free/reduced lunch status. The mean District Percentage Urban is 45%, a high figure given the rural/small town population in Kentucky, apparently due to the relatively liberal definition of urban in the School District Data Book.

Free and reduced lunch eligibility at the school level (Table 3) is more consistent with known Kentucky demographics. Other discrepancies between the values for Table 2 and these school-level figures are related to the size of schools that students attend. For example in Table 3, the mean for School Percentage Urban is lower (only 31% compared to 45% for student level), indicating that students in more urban areas are concentrated into fewer schools per district. This interpretation is consistent with both the political boundaries for independent districts (typically a single school in the city/urban center of rural counties) and larger schools in the urban counties of Jefferson (Louisville) and Fayette (Lexington).

TABLE 3. POPULATION PARAMETERS FOR SCHOOL LEVEL DEMOGRAPHIC VARIABLES ($N = 264$)

VARIABLE	μ	σ	MINIMUM	MAXIMUM
SCHLUN[a]...........	51.690	23.241	0.00	96.39
SCHGEN (F)[a]....	48.413	5.285	25.79	69.44
SCHRACE (W)[a].	92.353	13.000	48.50	100.00
SCHAPP............	.500	.501	0.00	1.00
SCH%URB[a]........	30.978	37.396	0.00	100.00
SCHREG 1[b].	0.125	0.331	0.00	1.00
SCHREG 2.........	0.117	0.332	0.00	1.00
SCHREG 3.........	0.057	0.232	0.00	1.00
SCHREG 4.........	0.080	0.271	0.00	1.00
SCHREG 5.........	0.121	0.327	0.00	1.00
SCHREG 6.........	0.186	0.390	0.00	1.00
SCHREG 7.........	0.095	0.293	0.00	1.00
SCHREG 8.........	0.220	0.415	0.00	1.00

[a]Coded as a percentage. All other variables are computed as decimal fractions.
[b]Regions are dummy coded.

Student Level Regressions

Table 4 reports the standardized beta coefficients for the three separate student-level multiple regressions for ACTION, TEXTBOOK, and COMPUTER. (Region 8, Southeast Kentucky counties, is the comparison category.) For the first column (ACTION) the overall regression is significant, $F(12, 21657) = 37.77$, $p < 0.001$, although the R^2 of 0.02 is an exceedingly small effect size. With the large N, all independent variables but Region 5 are significant. Except for Region 1 ($\beta = -.128$), demographic factors have slight influence. Students on free/reduced lunch, females, nonwhites, and those in non-Appalachian and more rural districts perceive that ACTION strategies are used more frequently. All students except in Region 5 perceive less inquiry-based instruction compared with those in Region 8, Southeast Kentucky counties.

TABLE 4. BETA COEFFICIENTS FOR THE REGRESSION OF INSTRUCTIONAL STRATEGIES ON THE DEMOGRAPHIC VARIABLES AT THE STUDENT LEVEL ($N = 21,670$)

VARIABLE	ACTION	TEXTBOOK	COMPUTER
FRERED.	0.022**	-0.001	0.111***
GENDER (F).	0.037***	0.064***	-0.083***
RACE (W).	-0.053***	0.001	-0.080***
APPAL.	-0.036*	-0.011	0.071***
PCTURB.	-0.044***	0.043***	-0.051***
REGION 1.	-0.128***	0.029	0.057***
REGION 2.	-0.049**	-0.010	0.061
REGION 3.	-0.074***	-0.018	-0.019
REGION 4.	-0.037*	-0.046**	0.056
REGION 5.	0.020	-0.034	0.056**
REGION 6.	-0.030**	-0.016	-0.060***
REGION 7.	-0.025**	0.019*	0.002
F.	37.77***	15.84***	64.98***
R^2.	0.02	0.01	0.03

*$p < .05$; **$p < .01$; ***$p < .001$.

Columns 2 and 3 of Table 4 (TEXTBOOK and COMPUTER) are interpreted similarly. The overall regressions are significant—$F(12, 21657) = 15.84$, $p < 0.001$ for TEXTBOOK; $F(12, 21657) = 64.98$, $p < .001$ for COMPUTER. Again effect sizes are minimal, 1% and 3%, respectively. The strongest influence for these two regressions was Free/Reduced Lunch for COMPUTER ($\beta = .111$). Of interest is the profile of students who perceive greater use of computers as an instructional strategy: lower income, male, nonwhite, Appalachian, and rural, all generally at-risk categories with respect to achievement. The betas for Regions represent no specific pattern across TEXTBOOK and COMPUTER.

School Level Regressions

Table 5 summarizes the school-level regressions. With smaller *N*, the *F* ratios are considerably smaller, with ACTION nonsignificant. Both TEXTBOOK, $F(12, 251) = 2.69$, $p < .01$, and COMPUTER, $F(12, 251) = 4.58$, $p < .001$, are significant. These school-level effect sizes are stronger, explaining 11% and 18% of the variation, respectively. The only significant betas for TEXTBOOK are Regions 5 and 6, indicating less traditional instruction compared with Region 8 (Southeast

Kentucky). The highest beta in the study is Free/Reduced Lunch for COMPUTER, almost two-fifths of a standard deviation. Schools with more free and reduced lunch students and more males report greater use of the computer for classroom instruction; schools in Regions 3 and 6 perceive less use.

TABLE 5. BETA COEFFICIENTS FOR THE REGRESSION OF THE INSTRUCTIONAL STRATEGIES ON THE DEMOGRAPHIC VARIABLES AT THE SCHOOL LEVEL ($N = 264$)

Variable	ACTION	TEXTBOOK	COMPUTER
SCHLUN.	0.022	0.029	0.394***
SCHGEN (F).	0.033	-0.001	-0.148**
SCHRACE (W). ..	-0.105	0.098	0.152
SCHAPP.	0.079	0.004	-0.089
SCH%URB.	-0.026	0.098	0.106
SCHREG 1..........	-0.051	0.090	-0.019
SCHREG 2..........	-0.031	-0.038	0.028
SCHREG 3..........	-0.100	-0.178	-0.211*
SCHREG 4..........	0.055	-0.181	-0.095
SCHREG 5..........	0.026	-0.225*	-0.029
SCHREG 6..........	-0.063	-0.181*	-0.231***
SCHREG 7..........	-0.125	-0.037	-0.097
F.	0.70	2.69**	4.58***
R^2.	0.03	0.11	0.18

*$p < .05$; **$p < .01$; ***$p < .001$.

Discussion

This study investigated relationships between demographic factors (gender, race, SES, and various measures of place) and instructional practices. The secondary data base from KDE was organized at both student and school level. Primary to this study are student responses from the KIRIS accountability assessment regarding their perceptions of the instructional strategies used by their teachers in seventh grade science classrooms. The seven teacher practices were combined into three factors: ACTION (IS2—work together in pairs or small groups; IS4—work with ordinary objects from everyday life; IS5—watch the teacher give a science demonstration; IS6—do hands-on activities; and IS7—do experiment), TEXTBOOK (IS1—read from texts or do worksheets), and COMPUTER (IS3—use a computer).

At the student level, several demographic variables influence seventh grade teacher instructional behaviors: (a) the larger the number of Free/Reduced students, the more ACTION strategies and computers are used; (b) the larger percentage white, the less teachers use ACTION strategies and computers; (c) the more females, the more frequent use of ACTION and traditional strategies but less frequent use of computers; (d) for students in Appalachian districts, ACTION strategies are used less but COMPUTER is used more; (e) the larger percentage urban in a district, the less teachers use ACTION and COMPUTER but the more traditional textbooks are used; and (f) students in Regions 1-7 experience a mixed set of results compared with Region 8 (Southeast Kentucky) for all three instructional approaches. However, these tendencies are slight.

At the school level the demographic factors do not affect the use of the inquiry-based strategies (ACTION). There are a couple of significant regional contrasts for both TEXTBOOK and COMPUTER. Interestingly, Region 3 (Jefferson County Public Schools—the state's largest urban area, Louisville) uses computers less than students from Region 8 schools. By far the strongest finding in the study is that those schools with more Free/Reduced students report higher use of the computer ($\beta = .394$). In contrast, schools with greater percentage females report decreased use of computers.

The contrasting results just summarized highlight the purpose of the study: exploring differences in student versus school-level effects of demographic factors on teachers' instructional strategies in seventh grade science. Based on students' perceptions of teacher behaviors, the seven strategies were grouped into three approaches.

Inquiry-based Instruction

At first glance, it appears that there are considerable differences between the student and school-level results for the ACTION strategies. At the individual level, all of the demographic factors and all but one regional contrast are significant. For the school level, there are no significant factors. Yet statistical significance examined without attention to effect sizes can be misleading. The R^2 variance explained is very low for both levels and is actually higher at the school level (.03 compared with .02). Further the betas for the respective independent variables are comparable. The size of the population produces the difference in significance ($N =$ 21,670 vs. $N = 264$). These results suggest that student level demographic factors, with low-level influence across the state, are evenly dispersed, yielding no evidence of concentration effects from one school to the next (Wilson 1987).

These findings seem positive, i.e., demographic factors have essentially no impact on teachers' use of inquiry-based, active instructional practices in Kentucky's seventh grade science classrooms, and the slight effects are dispersed evenly across schools. Teachers not being influenced by class, race, etc., is a good thing. Yet the focus on regression effects masks a more fundamental problem. Kentucky teachers are not using these ACTION strategies as much as science curriculum specialists recommend (National Research Council 1996; Zemelman, Daniels, and Hyde 1998). The mean scores for perceived frequency are about 2.5, between about once a month and once a week. In the larger study, Ennis (2002) found that the inquiry approach was positively related to science outcomes, confirming for Kentucky middle schools the wisdom of best practice recommendations. Yet the reality is that these strategies are simply not seen that often.

Textbooks/Worksheets

In contrast to the ACTION strategies, the student-level traditional approach to teaching science yielded only two significant demographic factors, plus two regional contrasts. Female students perceive greater use of TEXTBOOK by their teachers, as do students in more urban districts. At the school level, no demographic factors and only two Service Regions (5 and 6) are significant. For this traditional approach, the effect size at the student level is very small ($R^2 = .01$). The school level explained variance is higher (11%) but the significant betas are limited to regional contrasts.

Reflection on the population parameters for traditional instruction helps explain this picture. At both the student ($\mu = 3.49$) and school ($\mu = 3.51$) levels, the reported values for frequency approach once daily, suggesting a possible ceiling effect with this practice so saturated across the state that little variation occurs. This raises the question whether girls are assigned traditional tasks more often, or do they simply report this because they are more likely to stay on task than boys (this being a quiet, inactive assignment). This suggests the possibility that gender differences may be what students *do* as opposed to what they are *supposed* to do.

A similar argument could be made based on students' *liking* of traditional text usage, since reading is fundamental to this approach. Girls consistently like to read more than boys and there could be a halo effect on students' liking of this approach. It should be noted that these possibilities are speculative. The current study does not provide any direct evidence on instructional strategies nor on affective considerations related thereto. Studies examining congruency between observed instruction and student perceptions have, however, confirmed the accuracy of student perceptions vis-à-vis what teachers do in their classrooms (Evans-Andris 2000; Perreault and Isaacson 1995).

Again note that the virtual absence of significant regression results and very low effect sizes for traditional instruction seem positive, i.e., teachers' instructional strategies are essentially free of "taint" by the demographic characteristics of their students. The absence of concentration effects (Wilson 1987) except for two regional contrasts is also positive. Yet again, this apparent good news masks the stronger reality in Kentucky classrooms. Most science instruction is accomplished through traditional text/worksheet assignments, not the more progressive inquiry-based approach. This has mixed effects in terms of achievement. The larger study for these data (Ennis 2002) demonstrates that traditional strategies have a slight positive effect at the student level (apparently a content-covered consequence—more instruction, more knowledge). However, this achievement effect washes out when aggregated to the school level. Simultaneously, the saturation for TEXTBOOK leaves little time for the more progressive and more efficacious inquiry strategy, which produces a stronger effect on science outcomes when actually used.

Computer Usage

Finally, there are demographic influences on teachers' computer usage at both the student and school level. Class, race, and gender and three of the regional contrasts are significant at the individual level; the effect size is still weak ($R^2 = .03$) but is the strongest of the three instructional approaches. Unlike the other two approaches, there is a substantial difference between the student and school-level analyses. By far the strongest influence of any variable in the study occurs for school-level COMPUTER (Free/Reduced Lunch $\beta = .394$), almost two-fifths of a standard deviation. The strongest overall effect size ($R^2 = .18$) also occurs for school-level COMPUTER, although the variance explained is still modest. Clearly there are concentration effects for both class and gender for computer usage.

Much has been written on the digital divide, that the poor and minorities, and females to a lesser extent, have lower levels of access to computers. There is evidence that this holds true both at home and school, although recent work suggests both *access* and *how* computers are used are problematic (Ching, Basham, and Jang 2005; Warschauer, Knobel, and Stone 2004). The current study provides no evidence on computers at home, but school access appears to be mostly positive. At the student level, students who are poor, minority, male, rural, and reside in Appalachia perceive greater computer usage, albeit with slight effect size. At the school level, schools with higher percentage free/reduced lunch and males report more computer instruction in science. Thus with the exception of females, those groups typically on the bottom of the digital divide apparently are experiencing greater access. The data do not indicate whether this is an intentional effort to compensate historically underserved populations or another circumstance.

Again, however, first impressions can be deceiving. The "good news" above is predicated upon the *presumption that computers equal good.* Yet if ever there were a "logic of confidence" (Meyer and Rowan 1978) that something is beneficial without confirmatory evaluative data, it is the presence of computers in schools. In fact, the evidence is accumulating that the *contrary is true.* In the larger study for these data (Ennis 2002), computer usage is negatively associated with science achievement for both student and school level analyses. That finding has been confirmed by several recent studies. For example, see Cuban's (2001) work in Silicon Valley and an analysis of 100,000 students in 31 countries from the Programme for International Student Assessment (PISA) (Fuchs and Woessmann 2005) and other literature cited in these sources. Thus what seems a positive effect of compensating underserved populations with greater school access to computers has the ironic twist of being more of a bad thing for those who have the greatest need. As Warschauer et al. (2004) note, *how* computers are used is clearly important.

A further caution is warranted. The procedures used to eliminate suspect self-report data on free/reduced lunch at the student level (Smith et al. 1999) resulted in the loss of more than half the population. Since presumably these students were disproportionately from schools with higher percentages of lunch program eligibility, it is likely that the remaining population was biased in the direction of proportionately fewer at-risk students. That leaves the real possibility that the beta for free/reduced lunch at the student level may be higher than the analyses from this study indicate. Significantly, the free/reduced lunch variable already demonstrates the strongest effect on perceived computer usage ($\beta = .111$), even with the reduced population.

Conclusions

This study examines middle school science instruction eight years into the KERA reforms, for both student and school levels. It provides new knowledge on the effect of demographics on instructional strategies in high-stakes value-added statewide accountability. For the three groupings of instructional approaches, the findings can be summarized as follows. For the inquiry-based ACTION strategies, the demographic factors were significant at the student level but with very small effect. The school level produced no aggregate effects. For the traditional TEXTBOOK approach, only a couple of demographic factors were significant with essentially no effect and again no aggregate effect was found apart from a couple of regional contrasts.

The most important findings were for COMPUTER. All the demographic variables were significant at the student level but again with very low effect size. By far the strongest finding in the study was that, at the school level, the larger the percentage poor students, the more the computer is used. There was also a gender effect, advantage males. For all three instructional approaches, significant regional comparisons did not form any particular pattern.

Several reasons could be advanced for this increased use of the computer by lower SES students: (a) remediation; (b) no computer at home and extra opportunity is provided at school; (c) aggressiveness by these students; (d) lack of monitoring; (e) use as a tool for classroom management. Obviously the current study provides no direct evidence about why these or other possibilities may occur.

The results indicate that the composition of a class or school does affect instructional strategies that teachers use in the classroom. The summary profile of the relationships between demographic factors and teachers' instructional strategies (based on student perceptions) indicates some differences between student and school-level analyses, particularly for computers.

Why these differences exist is not currently known. Although effect sizes are not large, the consistency of findings raises concern. Studies are needed to determine why and how these demographic factors affect teachers' instructional strategies. It should be noted that this study provides no evidence on the *quality* of teachers' instructional practices; these student perceptions measure only the frequency with which their teachers use these approaches. However, research on teacher effects and the self-fulfilling prophecy suggests that a general stigma associated with at-risk or have-not students leads to lesser quality of instruction (Berliner 1983; Good 1987; Rosenthal 1987, 1997; Soloman et al. 1996), perhaps because of assumptions that many of these students have lower cognitive capacity and cannot understand more sophisticated instruction (Brookover and Erickson 1975).

Yet the pattern of results reported suggests this explanation is too simplistic. The ACTION strategies are consistent with recommendations for best practice by various science associations (National Research Council 1996; Zemelman et al. 1998). Here these positive strategies are more likely to occur for traditionally underserved groups. Likewise for computers, underserved groups report more usage. While the larger study from which this report is taken indicates that more computer use produces *lower* achievement (Ennis 2002), a finding supplemented by

Cuban (2001) and Fuchs and Woessman (2005), most educators would assume that greater computer use is a good thing.

Thus it would be difficult to impute any negative intent associated with at risk-students as the genesis of the results uncovered here. Qualitative studies to investigate teacher behaviors, attitudes, and intentions vis-à-vis both the quality and quantity of their instructional strategies are clearly warranted. This is particularly true because science achievement typically lags behind other content areas in Kentucky and elsewhere. Under KERA, middle school science is the particular subject and grade level that has been most impervious to change.

These answers are important. Instructional quality is crucial to school improvement. Science is crucial to developing the intellectual and technological capital that communities need to prosper in the post-industrial economy of the 21st century. This is particularly true throughout the rural south where intellectual and technological development have lagged behind the rest of the country, both traditionally and still today. If demographic factors, either intentionally or at a taken-for-granted level of unawareness, are influencing teacher instructional behaviors in Kentucky's middle school science classrooms, policy makers and educators need to know both how and why.

References

Allen, J.C. and D.A. Dillman. 1994. *Against All Odds: Rural Community in the Information Age*. Boulder, CO: Westview Press.

Anyon, J. 1981. "Social Class and School Knowledge." *Curriculum Inquiry* 11:3-42.

Apple, M.W. and L. Weis. 1986. "Seeing Education Relationally: The Stratification of Culture and People in the Sociology of School Knowledge." *Journal of Education* 168:7-34.

Beck, F.D. and G.W. Shoffstall. 2005. "How Do Rural Schools Fare Under a High Stakes Testing Regime?" *Journal of Research in Rural Education* 20(14). Retrieved November 16, 2006 (http://www.umaine.edu/jrre/20-14.pdf).

Berliner, D.C. Editor. 1983. "Research on Teaching." Special Issue. *Educational Psychologist* 18(3).

Berman, E.H. 1978. "The Politics of Literacy and Educational Underdevelopment in Kentucky." *Comparative Education Review* 22:115-33.

Bloom, B.S. 1980. "The New Direction in Educational Research: Alterable Variables." *Phi Delta Kappan* 61:382-5.

Blumer, H. 1964. "Industrialization and the Traditional Order." *Sociology and Social Research* 48:129-38.

Borland, M.V. and R.M. Howsen. 1999. "A Note on Student Academic Performance in Rural Versus Urban Areas." *American Journal of Economics and Sociology* 58:537-76.

Brookover, W.B. and E.L. Erickson. 1975. *Sociology of Education.* Homewood, IL: Dorsey Press.

Brophy, J. 1983. "Research on the Self-Fulfilling Prophecy and Teacher Expectations." *Journal of Educational Psychology* 25:631-61.

Bushnell, M. 1999. "Imagining Rural Life: Schooling as a Sense of Place." *Journal of Research in Rural Education* 15:80-9.

Caudill, H.M. 1963. *Night Comes to the Cumberlands, A Biography of a Depressed Area.* Boston: Little, Brown.

Ching, C.C., J.D. Basham, and E. Jang. 2005. "The Legacy of the Digital Divide: Gender, Socioeconomic Status, and Early Exposure as Predictors of Full-Spectrum Technology Use among Young Adults." *Urban Education* 40:394-411.

Coleman, J.S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94(Supplement): S95-S120.

Coleman, J., E. Campbell, C. Hobson, J. McPartland, A. Mood, F. Weinfeld, and R. York. 1966. *Equality of Educational Opportunity.* Washington, DC: U.S. Government Printing Office.

Corsaro, W.A. and D. Eder. 1990. "Children's Peer Cultures." *Annual Review of Sociology* 16:197-220.

Critchfield, R. 1994. *The Villagers: Changed Values, Altered Lives, the Closing of the Urban-Rural Gap.* New York: Doubleday.

Cuban, L. 2001. *Oversold and Underused: Computers in the Classroom.* Cambridge, MA: Harvard University Press.

DeYoung, A. 1983. "The Status of Formal Education in Central Appalachia." *Appalachian Journal* 10:321-33.

Eckert, P. 1989. *Jocks and Burnouts: Social Categories and Identity in High School.* New York: Teachers College Press.

Eisenstadt, S.N. 1973. *Tradition, Change, and Modernity.* New York: John Wiley.

Ennis, L.S. 2002. "Effects of Instructional Strategies on Seventh Grade Science Achievement as Perceived by Kentucky Students." PhD dissertation, Department of Leadership, Foundations and Human Resource Education, University of Louisville.

Evans-Andris, M. 2000. *Instructional Time in 15 Kentucky Middle Schools: Executive Summary*. Frankfort: Kentucky Department of Education, Office of the Commissioner. Retrieved April 5, 2001 (http://www.kde.state.ky.us/oapd/MiddleSchool/instructional_time_in_15_kentuck.asp).

Ford, T.R. Editor. 1978. *Rural U.S.A.: Persistence and Change*. Ames: Iowa State University Press.

Friedman, S. and D.T. Lichter. 1998. "Spatial Inequality and Poverty among American Children." *Population Research and Policy Review* 17:91-109.

Fuchs, T. and L. Woessmann. 2005. "Computers and Student Learning." Presented at the Royal Economic Society's Annual Conference, March, Nottingham, England. Retrieved October 24, 2005 (http://www.cesifo.de/~DocCIDL/1321.pdf).

Good, T.L. 1987. "Two Decades of Research on Teacher Expectations: Findings and Future Directions." *Journal of Teacher Education* 38:32-47.

Grasmick, H.G. 1973. "Social Change and Modernism in the American South." *American Behavioral Scientist* 16:137-57.

Harris, M. 1979. *Cultural Materialism: The Struggle for a Science of Culture*. New York: Random House.

Hofstadter, R. 1963. *Anti-Intellectualism in American Life*. New York: Alfred A. Knopf.

Holloway, D.L. 2002. "Using Research to Ensure Quality Teaching in Rural Schools." *Journal of Research in Rural Education* 17:138-53.

Hornbeck, D.W. 1990. *Recommendations Related to Curriculum*. Frankfort, KY: Legislative Research Commission.

Horvat, E.M., E.B. Weininger, and A. Lareau. 2003. "From Social Ties to Social Capital: Class Differences in the Relations Between Schools and Parent Networks." *American Educational Research Journal* 40:319-51.

Inkeles, A. and D.H. Smith. 1974. *Becoming Modern: Individual Change in Six Developing Countries*. Cambridge, MA: Harvard University Press.

Israel, G.D., L.J. Beaulieu, and G. Hartless. 2001. "The Influence of Family and Community Social Capital on Educational Achievement." *Rural Sociology* 66:43-68.

Kannapel, P.J. and A.J. DeYoung. 1999. "The Rural School Problem in 1999: A Review and Critique of the Literature." *Journal of Research in Rural Education* 15:67-79.

Kentucky Department of Education. 1998a. *Briefing Packet: Kentucky School and District Accountability Cycle 3 (1994-95 to 1997-98).* Frankfort: Division of Assessment, Department of Education.

_______. 1998b. *1997-98 KIRIS Performance Report: Summary Data and Descriptive Statistics.* Frankfort: Division of Assessment, Department of Education.

_______. 2000. *Middle Level Initiative.* Frankfort: Division of Curriculum and Development, Department of Education.

Khattri, N., K.W. Riley, and M.B. Kane. 1997. "Students at Risk in Poor, Rural Areas: A Review and Critique of the Research." *Journal of Research in Rural Education* 13:79-100.

Kozol, J. 1991. *Savage Inequalities: Children in America's Schools.* New York: HarperCollins.

Levine, D.U. and L.W. Lezotte. 1990. *Unusually Effective Schools: A Review and Analysis of Research and Practice.* Madison: National Center for Effective Schools Research and Development, University of Wisconsin.

Levy, M.J., Jr. 1966. *Modernization and the Structure of Societies.* Princeton, NJ: Princeton University Press.

Linn, R.L., E.L. Baker, and D.W. Betebenner. 2002. "Accountability Systems: Implications of Requirements of the No Child Left Behind Act of 2001." *Educational Researcher* 31(6):3-16.

McNeil, L.M. 1988. *Contradictions of Control: School Structure and School Knowledge.* New York: Routledge.

Meyer, J.W. and B. Rowan. 1978. "The Structure of Educational Organizations." Pp. 98-107 in *Environments and Organizations*, edited by M.W. Meyer and Associates. San Francisco: Jossey-Bass.

Miller, L.S. 1995. *An American Imperative: Accelerating Minority Educational Advancement.* New Haven, CT: Yale University Press.

Moore, B.L.D. 2003. "An Exploration of the Influence of Demographic Factors on Individual and Aggregate Student Achievement Measurements in the Kentucky Accountability System." PhD dissertation, Department of Teaching and Learning, University of Louisville.

National Assessment of Educational Progress. 2003. *The Nation's Report Card, NAEP Data.* Retrieved March 4, 2003 (http://nces.ed.gov/nationsreportcard/naepdata/).

National Research Council. 1996. *The National Science Education Standards.* Washington, DC: National Academy Press.

Ogbu, J.U. 2003. *Black American Students in an Affluent Suburb: A Study of Academic Disengagement*. Mahwah, NJ: Lawrence Erlbaum.

O'Sullivan, C., C. Reese, and J. Mazzeo. 1997. *NAEP: 1996 Science Report Card for the Nation and the States. The Nation's Report Card*. National Center for Educational Statistics. Retrieved June 10, 2000 (http://nces.ed.gov/nationsreportcard).

Pankratz, R.S. and J.M. Petrosko. Editors. 2000. *All children Can Learn: Lessons from the Kentucky Reform Experience*. San Francisco: Jossey-Bass.

Perreault, G. and N. Isaacson. 1995. "Searching for Second Wave Pedagogy: Student Perceptions of Classroom Practices." *Education* 115:623-7.

Persell, C.H. 1977. *Education and Inequality: The Roots and Results of Stratification in America's Schools*. New York: The Free Press.

Petrosko, J.M. 2000. "Assessment and accountability." Pp. 3-81 in *2000 Review of Research on the Kentucky Education Reform Act*, edited by J.M. Petrosko and J.C. Lindle. Lexington: University of Kentucky/University of Louisville Joint Center for the Study of Educational Policy and Kentucky Institute for Education Research.

Poggio, J.P. 2000. "Statewide Performance Assessment and School Accountability." Pp. 75-97 in *All Children can Learn: Lessons from the Kentucky Experience*, edited by R.S. Pankratz and J.M. Petrosko. San Francisco: Jossey-Bass.

Prichard Committee for Academic Exellence. 1999. *Gaining Ground: Hard Work and High Expectations for Kentucky Schools*. Lexington, KY: Prichard Committee for Academic Excellence.

Reed, J.S. 1972. *The Enduring South: Subcultural Persistence in Mass Society*. Lexington, MA: D.C. Heath.

Reeves, E.B. 2003. "Disentangling the Effects of Nonmetro Location and Student Poverty on School Performance/Improvement: Implications for Equitable Excellence in Kentucky Public Schools." *Journal of Research in Rural Education* 18:17-30.

Rosenthal, R. 1987. "'Pygmalion' Effects: Existence, Magnitude, and Social Importance." *Educational Researcher* 16(9):37-41.

_______. 1997. "Interpersonal Expectancy Effects: A Forty Year Perspective." Invited address at the annual meeting of the American Psychological Association Convention, August, Chicago. (ERIC Document Reproduction Service No. ED 415 460).

Rothstein, R. 2004. *Class and Schools: Using Social, Economic, and Educational Reform to Close the Black-White Achievement Gap.* New York: Teachers College, Columbia University and Economic Policy Institute.

Smith, D.C. 2005. "Appalachian and Rural Student Performance Differences on Kentucky's Educational Assessment: 4th Grade Results." *Research in the Schools* 12(1), 63-73.

_______. 2006. "Appalachian and Rural Student Performance Differences on Kentucky's Educational Assessment: 8th Grade Results." *Southern Rural Sociology* 21(2):47-64.

Smith, D.C., D.O. Neff, and J. Nemes. 1999. *Assessing Race and Gender Performance Differences in KIRIS Accountability Cycle 2 Results.* Kentucky Department of Education Paper Series. Frankfort: Kentucky Department of Education.

Solomon, D., V. Battistich, and A. Hom. 1996. "Teacher Beliefs and Practices in Schools Serving Communities that Differ in Socioeconomic Level." *The Journal of Experimental Education* 64: 27-47.

Southern Regional Education Board. 1999. *Leading the Way: State Actions to Improve Student Achievement in the Middle Grades.* Retrieved February 4, 2001 (http://www.sreb.org/programs/MiddleGrades/publications/reports/midgradeedinitiative.asp).

Tabachnick, B.G. and L.S. Fidell. 2000. *Using Multivariate Statistics.* 4th ed. Boston: Allyn and Bacon.

United States Department of Education. 1994. *The Condition of Education in Rural America.* Programs for the Improvement of Practice No. 99-1106. Washington, DC: U.S. Government Printing Office.

Warschauer, M., M. Knobel, and L. Stone. 2004. "Technology and Equity in Schooling: Deconstructing the Digital Divide." *Educational Policy* 18:562-88.

Wayne, A.J. and P. Youngs. 2003. "Teacher Characteristics and Student Achievement Gains: A Review." *Review of Educational Research* 73:89-122.

White, K.R. 1982. "The Relation Between Socioeconomic Status and Academic Achievement." *Psychological Bulletin* 91:461-81.

Wilson, W.J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy.* Chicago: University of Chicago Press.

Wise, A.E. and J.A. Leibbrand. 2001. "Standards in the New Millennium: Where We Are, Where We're Headed." *Journal of Teacher Education* 52:244-55.

Zemelman, S., H. Daniels, and A. Hyde. 1998. *Best Practice: New Standards for Teaching and Learning in America's Schools.* 2nd ed. Portsmouth, NH: Heinemann.