

Methods, History, Selected Findings, and Recommendations from the Louisiana School Effectiveness Study, 1980-85*

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ABSTRACT

An overview of the first five years of the Louisiana School Effectiveness Study (LSES) is described. The longitudinal nature of the study has allowed the research team to develop an evolving methodology, one benefiting from prior external studies as well as prior phases of LSES. Practical implications and recommendations for future research are presented.

INTRODUCTION

When the Louisiana School Effectiveness Study (LSES) began in 1980, school effectiveness research had reached a watershed. Since the publication of the Coleman, et al. (1966) report, educational researchers have been attempting to demonstrate that schooling or school climate had an effect on student achievement. The publication of the Brookover, et al. (1979) study of Michigan elementary schools and of the Rutter, et al. (1979) secondary school study in London provided evidence that school process has an important effect on student outcomes, regardless of the effects of student socioeconomic characteristics (SES).

Good and Brophy (1986) referred to the Brookover and Rutter studies as being "two of the most rigorous and salient process-product studies of school effectiveness." These studies have also been among the most influential in determining the direction that school effectiveness research has taken since

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1980. As D'Amico (1982) noted, the Brookover and Rutter studies plus the Phi Delta Kappa study (Duckett, et al. 1980) and the work of Ron Edmonds (Edmonds, 1979) are the underpinnings for much of the school improvement projects begun since 1980.

With the publication of these major studies, a shift occurred in the focus of much school effectiveness research. Several prominent researchers developed school improvement models and programs, while journal articles in the area tended to focus on reviews of school effectiveness research. Few new, large scale process-product studies of school effectiveness have emerged since the publication of the Brookover and Rutter studies.

The LSES is such a study, one that has the advantage of occurring after criticisms of the 1970's studies had been published. The design of the LSES benefitted from these criticisms. Specifically, the LSES developed improved methodology in four areas:

(1) The LSES is an ongoing longitudinal study progressing from a pilot study, to a macro-level (large-scale process-product) study, to a micro-level phase (in-depth case studies), to a school improvement phase, to a model development phase. Several writers (e.g. Purkey and Smith, 1983) have criticized the school effectiveness research area for the one-shot nature of many of its studies. The LSES is an attempt to integrate a variety of different methodological approaches into one study utilizing the same population of schools, with somewhat differing samples depending on the phase of the study. The five phases of the LSES are presented in Figure 1.

Figure 1. Five Phases of the Louisiana School Effectiveness Study*

Phase	Brief Description	Period
<i>Phase One</i> PILOT STUDY	Conceptualization of project Overall data Initiation of project Pilot Study Field tested instruments <i>Phase One Report</i> completed	1980-82
<i>Phase Two</i> MACRO LEVEL STUDY (PROCESS-PRODUCT STUDY)	Selected sample of 76 schools Administered school climate questionnaire and other instruments to 74 principals, 250 teachers, 5,400 students Analyzed data <i>Phase Two Report</i> completed	1982-84
<i>Phase Three</i> MICRO LEVEL STUDY (CASE STUDIES)	Selected and compared nine matched pairs of schools ----- Derive policy implications for what makes an effective school in these pairs of matched schools <i>Complete Phase Three Report</i> by 1986	1984-86
<i>Phase Four</i> SCHOOL IMPROVEMENT STUDY	Change 3 or 4 ineffective schools, focusing on information gained from Phase Three	1986-87
<i>Phase Five</i> MODEL BUILDING PHASE	Utilize data gathered from Phases One to Four to develop comprehensive models of school effectiveness and improvement	1987 --

*The dotted line in Phase Three indicates progress of project as of the summer of 1985.

(2) In determining the school samples for the macro and micro-level phases, we used representative sampling techniques. Prior school effectiveness studies have been criticized for oversampling poor, urban schools. In both our sample of 76 schools for Phase Two (LSES-II) and 18 schools for Phase Three (LSES-III), we included lower and middle-class, rural, suburban and urban schools. Recent studies in California (Hallinger and Murphy, 1985) and Kentucky (Miller, 1985) are similarly involving diverse school populations.

(3) Recent critics (Good and Brophy (1986); Rutter (1983) have postulated that the effect of school variables on student learning may be underestimated, due to lack of variability in predictor variables or in measures of student achievement. To predict the amount of true between school variance, researchers should use norm-referenced rather than criterion-referenced (often "minimum competency") tests. The LSES-II used results from both types of tests, but most analyses focused on norm-referenced test data.

Similarly, previous studies overutilized a narrow range of predictor variables that apparently had little influence on student achievement, such as financial or physical plant resources. We utilized modified versions of the Brookover team's student, teacher, and principal questionnaires in LSES-I, II, and III. These indices of school climate or culture had demonstrated reliability and validity based on Brookover's work, and they proved to be excellent instruments for assessing school climate. We added measures of student, teacher and principal self-concept and locus of control to these instruments.

(4) A major focus of LSES-III is the gathering of specific qualitative and quantitative classroom observational data on teachers in matched pairs of effective and ineffective schools. In reviewing studies published prior to the LSES-III, Good and Brophy (1986) note that: "not a single naturalistic study of effective schools provides basic data ... to demonstrate that the behavior of individual teachers in one school differs from the behavior of teachers in other schools." A first bridge between the more developed teacher effectiveness literature and school effectiveness studies is being provided in LSES-III. Using a modified version of the classroom snapshot from the Stallings Observation System (SOS) (Stallings, 1980), we have gathered an average of 48 hours of classroom observational data (2 observers x 4 hours of observation per day x 6 observation days) in eight pairs of effective and ineffective schools. Some preliminary findings from LSES-III are presented in Stringfield, Teddle and Suarez (1985) elsewhere in this issue.

In the following section, notes on these methodological aspects of the LSES will be integrated with a brief history of the project to date.

HISTORY OF THE LOUISIANA SCHOOL EFFECTIVENESS STUDY

The LSES was a response to a legislative mandate associated with Louisiana's first educational accountability legislation in 1977. The Louisiana Department of Education was required to conduct educational studies to assess the effect of educational variables on student learning (Desselle and Teddle, 1985).

We were able to develop the study in a methodical, unrushed manner. As Figure 1 illustrates, two years were devoted to conceptualizing and pilot testing the study.

LSES-I

The pilot study (LSES-I) was conducted during school year 1981-82 (Teddle, Falkowski, and Falk, 1982). Two separate activities were accomplished during

LSES-I: (1) the school climate questionnaires were field tested in one school district and modified based on the information gained there; and (2) the entire methodology for LSES-II was pilot tested in a number of schools in a second district.

In the field test of the student school climate questionnaires, we first tested third grade students in regular classroom settings. We then interviewed small groups of students to determine if they understood the questions and to gather information on how the instrument might be improved.

After this pretesting of the student school climate questionnaire, we gathered secondary data on third, seventh, and tenth grade schools in the second district. Profiles were generated describing how well individual schools *actually performed* compared to district average test results on the state assessment tests. Schools were grouped into three areas: "above," "below," or "equal to" the parish's average test score. Next, profiles were generated using a mathematical model developed by the researchers, describing how well individual schools performed relative to their *expected performance* (based on SES) on the tests. These profiles grouped schools into those performing "above," "equal to," or "below" expected performance.

When the comparisons by actual performance were examined, a clear pattern emerged. Schools in which the students scored above the district mean had higher parental SES, and schools in which students scored below average had much lower parental SES. Schools in which students scored approximately at the district average lay somewhere in between on almost all the characteristics.

When we looked at profiles of schools scoring "above," "equal to," or "below" prediction, however, the picture was quite different. Instead of finding a clear distinction among the groups of schools, the researchers found that there were no SES differences between these effective, typical and ineffective schools. The researchers concluded that given similar SES inputs, schools can yield radically different outcomes. Despite the gloomy pronouncements of early school input-output research, schools appeared to make a difference in the academic performance of their students independent of SES.

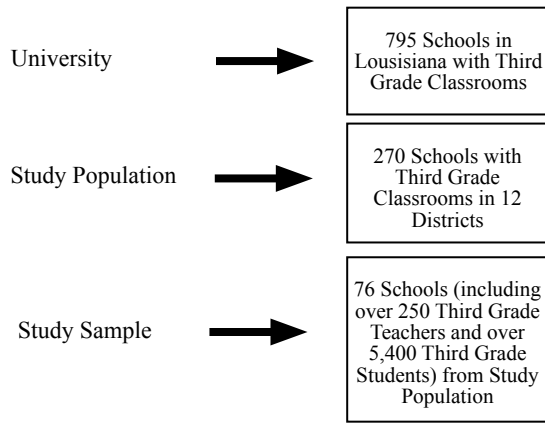
Further analyses of this secondary data determined the amount of variation in student achievement which could be explained by SES and school variables, compared their relative strengths, and determined which variables were most significant. Results of the pilot study were detailed in Teddlie, Falkowski and Falk (1982).

In another part of the pilot test, the scores of third grade students on the state assessment tests from each school were compared with the scores predicted from parents' SES. Ten schools out of a possible 29 which scored significantly above or below prediction were selected for further study. School climate questionnaires were administered to principals, teachers, and 565 third grade students in these schools. Analyses of this questionnaire data yielded different characteristics for the schools scoring above and below prediction. The most significant differences involved students' and teachers' expectations of educational attainment and perceptions of school climate. The results from LSES-I set the stage for the second, greatly expanded phase of the study.

LSES-II

A major difference between the LSES-II and the Brookover et al. (1979) process-product study concerned different measures for assessing student achievement. Brookover and his colleagues employed the Michigan State Assessment reports, specifically using the mean percentage of all reading

Figure 2. Sampling Frame for the LSES Phase Two



and mathematics objectives mastered. These tests were administered by the local districts in their usual fashions. We administered and analyzed mean scores on the Educational Developmental Series, Level 5, which is a nationally standardized norm-referenced achievement test.

Thus, our technique for assessing student learning differed from those employed by Brookover and his colleagues in two important ways: (1) our data were normreferenced rather than criterion-referenced; and (2)

we administered the test ourselves, while his tests were administered as part of an overall statewide testing program. We believe that these methodological differences partially determined the fact that we were able to explain more variance in student achievement using school climate variables in the LSES-II than did Brookover et al. (1979).

Data for LSES-II were collected during the 1982-83 school year. Data analyses were divided into two distinct efforts parallel to those from LSES-I. In the first analyses, factor and regression analyses were used to determine the amount of variance in student achievement that could be explained using student SES, school structural variables, and indices of school educational climate.

Twelve school districts participated in LSES-II. These districts were chosen from various parts of the state based upon criteria related to availability of personnel data and the willingness of the central office and the particular schools involved to participate. The 12 districts included urban, suburban and rural areas.

The sampling frame for LSES-II is presented in Figure 2 (above). As Table 1 (next page) indicates, the effort to make the study sample representative of the statewide population was successful.

Additional multivariate analyses of variance (MANOVAs) were used to compare schools in the following six groups:

Socioeconomic Characteristics of Students' Parents

		Middle SES	Low SES
School's Performance Relative to Expectation	Effective		
	Typical		
	Ineffective		

This second set of analyses enabled us to look at' the following comparisons: (1) differences among effective, typical, and ineffective schools; (2) differences between middle and low SES schools; and (3) differences among the six groups of schools.

Table 1

*Selected Characteristics of Statewide Population, Study Population, and Study Sample: LSES Phase Two Study**

Selected Characteristics	Statewide Population	Study Population	Randomly Selected Sample of Schools	
Number of Schools with Third Grade	795	270	76 Unweighted	Weighted
Average Number of Third Graders per School	66.3	68.3	76.3	
Average Educational Level of Mother	3.7	3.9	3.9	3.9
Average Language Arts Score on Louisiana Basic Skills Test	93.10	93.69	93.41	93.15

*For mother's educational level: 3 = attended high school; 4 = graduated from high school. Data are from the 1981-82 school year. Weighted and unweighted refers to whether or not the overall mean was influenced by the number of students in the schools.

Data collection for LSES-III was completed in May 1985. Currently, we are constructing datasets from the sixteen site study and are beginning data analyses. Although a wide range of both quantitative and qualitative data have been gathered, these analyses will necessarily be more qualitative in nature than those from LSES-II. School selection and observation procedures are summarized elsewhere (Suarez, 1985), while preliminary data analyses may be found in Stringfield, Teddlie and Suarez (1984).

FUTURE WORK

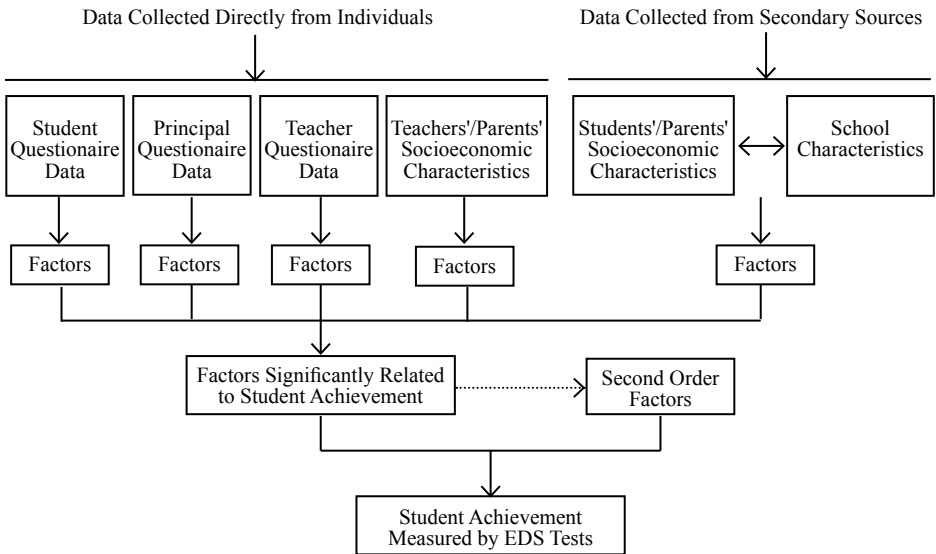
We plan to conduct the school improvement phase of the study in school year 1986-87. The current plan is to revisit a subset of the sixteen schools from LSES-III in school year 1985-86 to determine which schools to involve. Further information for this decision will come from in depth interviews conducted in the spring of 1985 with all principals involved in LSES-II and III.

LSES-II results are summarized in detail in Teddlie et al. (1984). The remainder of this section will present a brief summary of the factor and regression analyses. Teddlie and Stringfield (1985) found elsewhere in this issue, describe the results of the MANOVAs.

Given that data were gathered on over 300 variables, it was necessary to use factor analysis to produce a manageable number of interpretable dimensions. Figure 3 indicates the flow of factor and regression analyses used to produce the process-product model for LSES-II.

Five separate models for predicting student achievement were developed and analyzed. The model presented here appears to us to possess the best balance between parsimony and substantive interest. More detail on this model may be found in Stringfield and Teddlie (1985), while information on previous models may be found in Teddlie et al. (1984).

The first step in the analyses used to derive the current model involved a principal component factor analysis of each non-achievement dataset. In each case the oblique factors were promax rotated. Factors were chosen for analysis if they met three criteria: (1) they possessed eigenvalues greater than 1.00, (2) they passed a scree test, and (3) they appeared interpretable and substantively interesting.

Figure 3. Datasets Used in Factor and Regression Analysis

Resulting factors from each dataset were then separately correlated with student achievement as measured by the Educational Development Series, Level 5, (EDS). A single prediction equation was then calculated by performing a stepwise regression of all 17 significant factors against student achievement. This model produced an adjusted r^2 of .704, or 70% of the variance in student achievement.

Being interested in a more parsimonious model, we then entered all of the student, teacher, principal, and SES factors which significantly correlated with school mean achievement score on the EDS into a second order factor analysis. In the second order analysis, orthogonal factors were varimax rotated. Five second order factors emerged. The five resultant factors were then regressed against achievement and the results compared with regression results from the larger number of first order factors.

The five second order factors produced by this analysis are: (1) *student SES* and school personnel expectation for student achievement; (2) *student and teacher race*, with principal intervention behavior; (3) *positive academic climate*; (4) *family commitment to education*; and (5) *generally negative school climate*. The third, fourth, and fifth factors are school climate factors, while factor one is primarily a SES variable. Factor two is a combination SES/school climate variable.

Although a full discussion of the two levels of the factor analytic procedure is beyond the scope of the present article (see Stringfield and Teddlie, 1985), we will briefly note several aspects of these results.

First, previous school effectiveness studies had not differentiated types of expectations for student achievement. In our analyses students, teachers, and principals all produced separate factors for current versus future academic expectations. Second, the teachers' and principals' academic expectations, and particularly future expectations, were frequently linked to student SES. The teachers' first order factors of "College Expectation" and "Student Academic

Ability" and the principals' factor "Student Academic Expectations" all loaded above .70 on the second order factor which included student SES. In fact, no teacher factor which was significantly related to student achievement loaded on any second order factor other than SES.

Third, regressed on achievement, the five second order factors produced an adjusted r^2 of .690 ($p < .0001$), and each factor added at least 5% to the total variance accounted for (r^2).

Fourth, factors from the student questionnaire proved to be the richest contributors to second order factor number three (S.O.F.3) "Positive Academic Climate." This is important, because S.O.F.3 proved to be the best single predictor of school level achievement.

Fifth, and perhaps most importantly, the three second order factors which are clearly alterable variables, positive academic climate, family commitment to education, and generally negative school climate, run in a single regression accounted for an adjusted r^2 of .394. Taken together with a study in progress at U.C.L.A. (Solorzano, 1985), this data indicate that schools not only make a difference beyond SES, but that alterable, school level variables, properly measured, may well account for substantially more variance than SES.

RECOMMENDATIONS FROM LSES-II

As Murphy and Hallinger (1984) recently noted, policy analysis at the school district and school level is becoming increasingly important. The use of research findings about effective schools is an area of often intense interest to local districts and schools. The LSES-II provided policy recommendations and research that may be of value to schools and school districts.

We believe that, taken as a group, the recommendations based on the LSES-II results can provide a framework for improvement in many schools. The value to a particular school of any one recommendation will obviously vary depending on the current performance level of the students and staff pertaining to suggested activities. The research team visited some schools that impressed us as being extremely well administered and highly effective. Yet invariably, the principal expressed the belief that his/her school could improve in some area. Perhaps this research can serve as a catalyst for change in schools in which change is desired.

Recommendations based on the data from LSES-II are presented on three levels: the school, the local system, and the state.

SCHOOL LEVEL RECOMMENDATIONS

Recommendation 1: *Principals and teachers should convey a clear academic mission to students and parents.* Schools that obtained the lowest student achievement provided a mixed message on goals (e.g., "Achievement is most important ... and so is student self-concept and social development and ...") Everything can't be most important. Taxpayer polls consistently indicate that parents want schools to teach academics.

In LSES-II, schools in which students thought teachers cared a lot about grades achieved more than those who did not, regardless of SES.

Recommendation 2: *Principals and teachers should actively elicit parental support and involvement.* In this study, regardless of parents' SES, schools that elicited more active parental support and involvement achieved more. Many schools need to substantially broaden their relationships with their community.

Perhaps specialists in this field should be employed by some school systems to ensure better community/school relations.

Recommendation 3: Principals and teachers should hold high, but realistic expectations for students' achievement. In LSES-11, particularly in less affluent schools, students of teachers who held high, specific, and reasonable expectations (e.g., "You can learn the material in our third grade tests") achieved higher than was predicted.

Recommendation 4: Principals and teachers should allot and use substantial blocks of uninterrupted time for the teaching of reading and math. In this and many other studies, uninterrupted time spent by teachers in interactive teaching of reading and math predicted student achievement. Teachers in the low SES, effective schools reported spending more class time on reading and mathematics than either of the other two low SES groups.

Recommendation 5: Middle and low SES schools need to use somewhat differing strategies to increase student achievement. One of the major findings of the study was that effective schools whose students were from relatively underprivileged backgrounds were substantially different from effective schools in middle class contexts.

Effective, low SES schools had: (1) young and relatively inexperienced teachers; (2) a large percentage of teacher's aides in the classrooms; (3) principals who had a large voice in the hiring of their teachers; (4) principals who were frequently in the classroom; (5) teachers who held firm academic expectations for their students while at their schools; and (6) teachers who spent much time on reading and math and assigned a great deal of homework.

On the other hand, effective, high SES schools had principals, faculty, students, and parents who expected and experienced excellence in academics. The teachers in these schools had frequent contact with parents and accepted much responsibility for their student's outcomes. Principals were less likely to make visits to classrooms than those principals in the effective, low SES schools. Striving for excellence was apparently fostered at home and reinforced at school for the students in this group (see Teddlie and Stringfield, 1984).

Recommendation 6: Teachers and principals need to be made aware of the variables they can control in their schools to affect student achievement. Teachers' and, to a lesser extent, principals' perceptions of the successfulness of their school were more strongly tied to the socioeconomic status of students' parents than to their own actions. Yet we found many nonaffluent schools whose students were achieving more than many of their more affluent peers. Economic background of students matters, but in this study it proved to be a less powerful predictor of student achievement than a schools' climate of caring about academics and success.

It is simply incorrect to believe that SES by itself produces achievement. School climate is as important a predictor of achievement, and it is something the faculty creates and can alter. Further education of teachers must occur on this point, or mediocrity and failure in school will continue for many less affluent children. This further education could occur through a well-orchestrated series of workshops, college courses, and other learning experiences aimed at changing teachers' attitudes and perceptions.

LOCAL SYSTEM LEVEL RECOMMENDATIONS

Recommendation 7: Principals should have substantial voice in the hiring of teachers in their schools. Principals in schools achieving more than predicted

tended to have greater voice in the hiring of teachers. In fact, 23% of the principals in the effective, low SES schools make their own hiring decisions. Local school systems should give their principals a vote in the selection of teachers. Principals should receive training in recruitment and other management tasks.

Recommendation 8: *Local school systems should develop modern Management Information Systems (MIS)*. If local administrators are to make decisions that are at least partially data-based, they must have ready access to multifaceted, integrated data bases. School systems were generous in their provisions of data to the LSES researchers, but often local employees had a great deal of difficulty providing rudimentary data to the team within a reasonable time frame. Our experience indicates that this is a national problem. With a fully integrated MIS, an administration could provide its board, its local government, its State Department of Education, and its own staff, accurate, specific data on one day's notice. Superintendents are under ever-increasing demands for information. Computerized, integrated MISs can help them meet the demands of their difficult jobs. There is no doubt that an efficient MIS helps many businesses run more effectively; it is time that our local school systems provide this same capability for our schools.

Recommendation 9: *Local systems should continue their progress toward total racial integration of faculties and student bodies*. Louisiana and the United States generally have come far in the last two decades in integrating their faculties and student bodies, and should continue their efforts in this direction. Nationwide, school segregation has fallen markedly since 1968, but 33% of black students still attended virtually all-black schools in 1980. Our data indicate that only 23 percent of the total population of black students in Louisiana still attend virtually all-black schools. These virtually all-black schools constitute only 11 percent of the total number of schools in Louisiana. We believe that the melting pot philosophy that has characterized American education, and indeed American democracy, will produce more effective schools.

STATE LEVEL RECOMMENDATIONS

Recommendation 10: *Many voices in the education community are speaking on alternative methods for spending education dollars*. School effectiveness research, such as the LSES, can provide evidence for more appropriate ways of spending these state level funds. Schools should be rewarded for the following: (a) increases in Average Daily Attendance, (b) student achievement beyond expectation based on student SES, and (c) increases in parental/ community involvement.

The LSES data indicated that Average Daily Attendance (ADA) predicted achievement independent of SES. Children who aren't in school cannot be expected to learn. Therefore, some system for rewarding schools in which ADA increases should be instituted. Documented achievement above expectation should be rewarded. Brookover (1984) has stated that rewarding schools for excellence is as important as rewarding teachers for excellence. One of the basic premises of school effectiveness research is that each school has a particular educational climate that fosters or does not foster learning. The LSES-II data confirms this premise. The effective schools should be rewarded.

The rationale for rewarding schools with increases in parental/community involvement can be found in Recommendation 2 above.

Recommendation 11: *More teacher's aides should be employed, especially at the early elementary levels and in schools in which the students come from low SES backgrounds.* The effective, low SES schools had more teacher's aides than any of the other groups of schools. Having teacher's aides in the early grades in low SES schools appears to make these schools more effective in educating their students.

Recommendation 12: *Local school systems, schools, principals, and faculties should be provided information on student achievement at the school level, accompanied by a range of predicted scores for the school based on student SES. This will enable the systems, schools, and faculties to know if they have an effective school on this criterion.* In the LSES, teachers and principals in effective, low SES schools did not report an understanding of how well they were doing. In fact, many seemed discouraged.

The ranges of predicted scores accompanied by actual scores would provide documentation of these faculty members' success.

Recommendation 13: *Teachers should be encouraged to participate in workshops and in-service training concerning effective school climate.* One of the strongest findings of the LSES is that school climate has a great effect on student achievement that is independent of the students' socioeconomic background. Important aspects of this school climate include the expectations that teachers hold for their students, and the amount of emphasis placed on academics in the school. Teachers should have the opportunity to explore these and learn ways to apply the ideas in their classrooms.

SUMMARY

We believe that a new era of school effectiveness studies has now begun. The Brookover and Rutter studies of the 1970's dispelled the perception that SES produces achievement in and of itself. The LSES and other studies of the 1980's should more completely explore the relative contributions of school climate and SES to student achievement, plus provide more sophisticated analyses of what is actually producing effective and ineffective schools.

We see the following needs in school effectiveness research for the years ahead:

(1) While full-scale process-product studies (such as those of Brookover and LSES-II) may be difficult to perform and costly, they should be undertaken. School effectiveness researchers now have improved methodologies, instrumentation, and statistical techniques available. Better studies are now possible, and large gaps remain in our understanding of what produces student achievement at the school level.

(2) Future school effectiveness studies should be longitudinal in nature and should be methodologically tighter. There are now examples for doing such studies. For instance, it should be incumbent on researchers to use instruments, such as the Brookover team's school climate questionnaires, which have been shown to be reliable and valid.

(3) More sophisticated causal models should be developed. Critics [e.g. Rowan, Bossert and Dwyer (1983)] have persuasively argued that the school effectiveness research area has not employed adequate causal modeling. In our research, we are currently developing different causal models for predicting

student as opposed to teacher expectations for student achievement (see Teddlie, et al., 1984, for preliminary analyses).

(4) More representative sampling strategies will greatly aid our understanding of what produces good schools, regardless of neighborhood.

(5) We see an evolving interface of the school effectiveness literature and the teacher effectiveness literature. We encourage our colleagues to begin investigating in depth what teachers in effective as opposed to teachers in ineffective schools do. While the variance from classroom to classroom may often be greater than that from school to school, it is important that we study both levels simultaneously to determine why faculties in one school are better able to produce achievement than those in others. ■

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