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ABSTRACT

Research relevant to instructional improvement has usually been conducted from one of three perspectives: the adoption of improvements in the classroom, the dissemination of information about improvements to practitioners, or the relationship between adoption of improvements and the administrative organization of the adopting agency. This paper synthesizes the research done from all three perspectives at the classroom, school, local district, and state education agency levels to give an overview of the entire field as an aid to planning and implementing instructional improvement efforts. The chapter on classroom improvements discusses curriculum alignment, attention to student characteristics, use of instructional time, success rate, and quality of instruction. The school-level improvement chapter concentrates on the role of the principal, the learning environment, organization for effective instruction, and curriculum alignment. Data-based decision-making, support for instructional improvement, planning, and interagency coordination are topics related to the local education agency and are covered in the next chapter. The chapter dedicated to state-level efforts deals with state dissemination programs, databases for decision-making, local responses to state and federal initiatives, supporting local implementation, and leadership and coordination. A set of propositions on which to base planning rounds out the document. (Author/PGD)

INSTRUCTIONAL IMPROVEMENT: A SYSTEM-WIDE APPROACH

by

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PREFACE

This paper was developed for the Maryland State Department of Education (Office of Project Basic) by Research for Better Schools (Regional Exchange). It explores research relevant to the substance of instructional improvement and the processes of planning and managing such activity within a complex system (made up of classrooms, schools, LEAs, and the SEA).

Project Basic, initiated in 1977, is a statewide competency-based education program with student objectives in basic skills (reading, writing, and mathematics), life skills (citizenship, survival, and the world of work) and the arts and physical education. Although Project Basic includes testing, it emphasizes instruction and to that end initiated curriculum alignment activities which were carried out by all LEAs. Implementation is facilitated by on-site SEA-supported staff who provide technical assistance. Another form of assistance was made available in 1981 when LEAs were encouraged to apply for grants to implement one or more instructional processes (mastery learning, active teaching, student team learning, and teaching variables). Each of these initiatives was informed by research, and state studies indicated a high degree of success in terms of local involvement and positive impact on classroom activities.

Continuing the disposition to explore relevant research, the Office of Project Basic supported the development of this paper. It is intended to stimulate discussion, to serve as a knowledge base against which educators may review their own assumptions and activities, and to suggest ideas useful in planning and decision-making.

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I. INTRODUCTION

The purpose of this paper is to present a synthesis of research relevant to instructional improvement, not only from a classroom perspective but also from the perspectives of schools, local education agencies (LEAs) and state education agencies (SEAs). In recent years evidence has been building on "what works" in the teaching/learning process and on how those inside and outside schools can work together to improve student achievement. However, the research crosses three areas of study--instruction or classroom management, dissemination or knowledge utilization, and educational administration or organization. Most researchers in a given field do not cross into the other areas (Erickson, 1979). This paper makes that attempt. It is intended as a working paper for educators, a "target to shoot at" in planning and implementing instructional improvement efforts. The primary audience is SEA staff, but the paper begins with the classroom, then considers the school and district, before discussing issues directly affecting the SEA as an organization.

The paper suggests some courses of action and identifies issues for decision-makers. The greatest issue--identified only after all the chapters were brought together--is the conflict between the elements of effective instruction and the dimensions of educational organizations: The former has clear implications for action which may only be possible if changes are made to the latter.

II. CLASSROOM IMPROVEMENT

This chapter focuses on variables that have been found to impact upon student achievement that can be controlled in the classroom. Included are: an overview of relevant research; discussions of curriculum alignment, attention to student characteristics, use of instructional time, success rate, quality of instruction; and implications for action.

An Overview of Relevant Research

In 1966 the Office of Education published Equality of Educational Opportunity (Coleman et al., 1966), a report originally commissioned to assess the equality of educational opportunity for minority groups within the United States. The results of this report, however, rocked the educational establishment. For Coleman, after examining data on 645,000 students from 4,000 schools, their teachers, principals, and superintendents, reported that "only a small part of variation in achievement is due to school factors. More variation is associated with the individual's background than with any other measure" (p. 7). Squires, et al., list three possible interpretations of Coleman's findings:

> Despite all the resources put into schools, they are not able to affect student achievement. Therefore schools should receive fewer resources.
>
> If SES is what makes a difference, then the rich get richer, the poor, poorer, and the schools perpetuate and reinforce the American class system.
>
> What was studied did not appear to make much difference, with the exception of SES. Therefore, other aspects of schools should be examined.
>
> (Squires, Huitt, & Segars, 1981, p.4)

Fortunately, researchers chose the only positive course of action, looking for other factors, turning away from the kind of static input measures used by Coleman, (such as teachers' educational background), turning instead toward process-product research, that is, looking at in-school processes (teacher and student behaviors) in relation to student outcomes (academic achievement and attitudes). Furthermore, researchers sought especially to find those factors which are not only correlated with effective outcomes, but those which can be shown to cause these outcomes and are alterable. The following statement by Hunter (1979) is typical of the new stance of looking at alterable process factors rather than static input:

> ...studies are showing that it is not what a teacher is, or how a teacher feels, but what a teacher <u>does</u> that has the potential for affecting students' achievement.
>
> (Hunter, 1979, p. 62)

Bloom (1980) notes the following examples of this shift to examination of alterable variables: the new focus on time on task (how much available time is actually spent on an instructional task) instead of just looking at total available time (how much time has been allocated for that instructional task); consideration of a student's cognitive entry (how much the student knows before instruction) rather than rating intelligence (a factor which may or not be fixed but in either case one we certainly don't yet know how to change); and increased attention to formative testing (finding out how a student's learning is progressing at frequental intervals for diagnostic purposes) in comparison to summative testing (to get a measure of final achievement).

Focusing on this process-product relationship, a number of large-scale longitudinal studies have been conducted which show that schooling does make a difference, for example, the Follow Through Evaluation Study (see Stallings and Kaskowitz, 1974), the Beginning Teacher Evaluation Study (see McDonald & Elias, 1976, and Fisher et al., 1978), the Instructional Dimensions Study (see Brady et al., 1977), and the British report on secondary school effectiveness prepared by Rutter and others, 1979. These and many other studies have identified characteristics of schools and classrooms which correlate with student achievement.

Although most of these studies report correlations, rather than causal relationships, current research indicates that many of the most crucial factors are indeed causal and alterable. (This is being demonstrated in studies in which specific factors previously identified in correlational research are experimentally altered to compare effectiveness outcomes with and without treatment.)

Those factors found to correlate most strongly with effective outcomes, as measured primarily by student achievement but also by student attitudes, fall into the following major categories: curriculum alignment, attention to student characteristics, use of instructional time, student success rate, and quality of instruction.

Each of these categories of factors will be discussed briefly below. A representative sampling of correlational research findings on effectiveness is included, as are the results of a few studies in which those behaviors and conditions which have been identified

as accompanying effective outcomes have been altered in an attempt to document causal relations. In addition, brief discussions of three models for effective learning are also included along with some indication of recent research on their utility for specific classroom improvement efforts: the mastery learning model (discussed below under Prior Learning), the diagnostic-prescriptive model (see Teacher Role) and the direct instructional model (see Teacher Management). Each of these models is useful as a demonstration of an overall instructional strategy based on application of recent research findings.

For a fuller treatment of topics discussed in this paper, the reader is encouraged to consult the research reports cited.

Curriculum Alignment

The term "curriculum alignment" refers to the alignment of the three basic elements of the curriculum: objectives (what should be taught), instruction (what is actually taught), and assessment (what is tested).

Curriculum alignment will be discussed more fully in the next chapter (School Improvement) since selection of instructional objectives, instructional materials, and assessment instruments and procedures usually takes place at the school, district, or state level. However, in recognition of the fact that what actually goes on in the classroom on a day-to-day, minute-by-minute basis is in the hands of the classroom teacher, the concept is mentioned at this point.

In general, classroom effectiveness appears to be related to instructional processes in which specific objectives, incorporating sequenced skills, are clearly defined; instructional events are determined by those objectives; and subsequent assessment is based on content covered during that instruction. For example, research by Brady and others, (1977) found that the closer the match between the content covered and the assessment instruments, the higher the achievement shown. The extent of actual mismatch found during the Instructional Dimensions Study of 100 first-grade and 100 third-grade teachers varied greatly, thus creating a vast range of instructional opportunity for children in one class or another. (They found that the overlap between content taught and content tested ranged all the way from as little as 4 percent to as much as 95 percent.)

Attention to Student Characteristics

Attention to student characteristics has also been shown to be related to positive outcomes (both achievement and attitudes). Those student characteristics found to be most pertinent to the learning process are prior learning, learning style, and learning behaviors. Prior learning and learning style are discussed below. Student learning behavior is discussed later.

Prior Learning

Prior learning is defined as including knowledge of both content and concepts related to the instructional task and skills required to engage in that task. It has been found to be a good determiner of learning task achievement. Moreover, if prior learning is found to be

inadequate for a given instructional task, achievement can be improved if corrective procedures are followed prior to instruction.

In 1976 Bloom examined prior learning in relation to variation in pre and posttest scores and reported that 60-80% of variance in achievement is due to prior learning. Bloom's findings have been supported by others, including Brady and others (1977), Brookover and others (1979), Cooley and Leinhardt (1980), and Leinhardt (1978). For instance, Leinhardt, using data from the Instructional Dimensions Study, found that prior learning accounts for 49% of reading achievement and 43% of achievement in mathematics. Therefore, it stands to reason that more effective teaching will occur if teachers are aware of student's relevant prior knowledge. If there are any necessary learning prerequisities to the learning task, these must be taught before instruction is begun. Conversely, if a student already has mastered the learning task, time should not be taken to "reteach" mastered material.

Evidence from studies conducted by a number of Bloom's students indicate that achievement patterns can be altered if students are taught prerequisite prior learning before going on with instruction. Furthermore, Bloom states that a number of bonuses will accrue from attending to the prior learning. Most of the students will have the cognitive requisities for the instructional task, students will have more interest and confidence in their work (see below, success rate), and there will be more active learners in the classroom (see below, engagement rate).

As a result of these reports, considerable attention has been focused on the need to attend to prior learning, that is, applying corrective procedures so that a student will have the requisite prior knowledge and skills needed to successfully complete a given instructional task.

A direct application of Bloom's theories on the importance of prior learning can be seen in the mastery learning model. The essential characteristics of this model are described in Bloom (1976) and Block and Burns (1976). They are:

-systematic instruction
-small units of learning
-clear mastery criteria
-frequent feedback on mastery
-corrective procedures to remediate prior learning deficits and to facilitate mastery

This model has become the subject of much research and discussion (see for example Vol. 37, No. 2 of Educational Leadership), and it has been used extensively in two large metropolitan areas, Chicago and Denver. (See Katims, 1979, for a description of results in Chicago, and Barber, 1979, for information on its use in Denver). In general, research has shown that mastery learning is more effective than non-mastery learning. In an attempt to find out just how much better it was, Burns (1979) applied meta-analysis techniques to research data from studies comparing mastery and non-mastery techniques. He found the average effective size for mastery learning to be .83 for cognitive and .67 for achievement. However, he found little data on effect of types of learning and types of students. Thus mastery

learning seems to be effective for learning certain types of material in certain settings. Research is continuing in this area to determine specifically who benefits most from this type of instruction and what types of learning are best facilitated by this method.

Learning Styles

The term "learning style" is used to refer to how an individual goes about learning. Research on learning style has focused on both sensory modalities and cognitive processes.

Dunn and Dunn (1979) conceive of learning style as composed of four aspects: environmental (reaction to sound, light, temperature, design); emotional (motivation, persistence, responsibility, need for structure); social (preference for working alone, with peers, with adult); and physical (perceptual strengths, reactions to time of day, need for mobility). Using these constructs, they report data which show that "when taught through methods that complemented their learning characteristics, students at all levels became increasingly motivated and achieved better academically" (p. 238). Noting that 20 to 30 percent of school age children learn best through auditory channels, 40 percent are visually oriented, and 30 to 40 percent learn best through tactual/kinesthetic or some other combination of sensory inputs, they question the practice of conducting 90 percent of instruction through lecture or lecture/demonstration, as it is generally done.

Letteri (1980), on the other hand, focused on cognitive processes as an aspective of learning style. He cites evidence which indicates

that individuals do have distinct cognitive profiles, that there is a causal link between these profiles and achievement, and that these profiles can be altered.

Letteri constructed a model of cognitive profiles across seven cognitive dimensions (for example, is the learner reflective or impulsive, does the learner have a broad or narrow breadth of categorization, is the learner tolerant or intolerant of incongruous or unrealistic experiences). He identified three cognitive types based on configurations of the seven bipolar dimensions. Type 1 is analytical, a focuser, narrow, complex, reflective, a sharpener, tolerant; Type 3 displays the opposite traits on this spectrum; and Type 2 displays neither extreme or is a mixture of Types 1 and 3. Letteri then applied this model to 7th and 8th grade students of high, medium, and low achievement. He found that Type 1 was 0.5 or more grade levels above grade placement; Type 2 was on grade level; and Type 3 was 0.5 or more grade levels below grade placement. Furthermore, he found that type identification predicts achievement scores at .05 or better and that cognitive profiles account for 87% of variance in achievement scores.

Letteri's on-going research at the Center for Cognitive Studies indicates that cognitive training can change individual students from Type 3 to Type 1, with accompanying achievement results.

Use of Instructional Time

A number of recent studies have examined correlations between achievement and factors related to time. Studies have focused primarily on allocated time (the amount of time set aside for instruction on a specific topic), engagement rates (the percentage of allocated time which is actually focused on the instructional activity), and engaged time (the amount of time during which a student is actively engaged in a specific learning activity).

Allocated Time

Huitt and Segars (1980), comparing data from four separate research stueies (Mann, 1928; McDonald & Elias, 1976; Brady et al., 1977; and Weiss, 1977), found that:

> ...in general elementary teachers allocate between 55 minutes to 106 minutes each day for reading and between 52 minutes and 37 minutes for math.
>
> (Huitt & Segars, 1980, p.9)

Although correlations have been found between the amount of time set aside to learn a particular skill and achievement of mastery of that skill, attention to allocated time alone can be misleading, for study of engagement rates shows that students are usually actively engaged in a given activity during only about 60-70% of the time allocated for its study (Brady, et al., 1977; Fisher, et al., 1978).

There appears to be considerable variation in the amount of time allocated to the areas of instruction. The Beginning Teacher Evaluation Study (BTES) found that second grade teachers allocated from 25 to 60 minutes per day to mathematics. Allocated time for reading in fifth grade varied from

60 to 140 minutes per day. In general, it was observed that "teachers who allocated more time to a particular area or topic had students who achieved at higher levels than teachers who allocated less time to that content area of topic" (Dishaw, 1977, p.53).

From examination of this data Huitt and Segars (1980) conclude that "differences in allocated time suggest that some students may have more than two or three times the opportunity to learn specific academic content than do other students" (p. 9). However, although it might be assumed that the more instruction, the more learning, reanalysis of these materials revealed that there appears to be an optimum amount of time for the study of a particular subject matter and that devoting more than this optimum amount of time leads to diminished achievement (Squires et al., 1981).

Student Engaged Time

Student engaged time refers to the amount of time the student is actively engaged in the learning task. This measurement has been found to correlate much more closely to achievement than allocated time. In fact, Stallings and Kaskowitz (1974) in their nationwide study of Follow Through Programs found that, in their analysis of over 60 factors in relation to student achievement, engaged time was the single strongest correlation to student achievement gains.

Similarly, Fisher, in analysis of the Beginning Teacher Evaluation Study, found that student engaged time varied from 30-90% but was positively related to achievement.

Success Rate

Success rate refers to the percentage of correct responses a student gives. In general, a high success rate correlates with academic achievement.

In other words, if you give students work on which they can produce a lot of correct responses, they will end up knowing more than if you give them a lot of work on which they have difficulty.

Writing in 1968, Skinner accused teachers of asking questions they knew would be hard for students in order to keep up the students' anxiety levels, the assumption being that "students do not pay attention unless they are worried about the consequences of their work" (p. 51). Skinner believed this to be not only reprehensible but theoretically unsound. Skinner instead advocated presentation of instructional material in such a way that the learner will be likely to respond correctly, stating that, "There is no evidence that what is easily learned is more readily forgotten."

Although Skinner's statements were largely a matter of his own beliefs, recent research indicated that students do, in fact, learn better if their success rates are high. For example, Fisher and others (1978) found that student learning improved with emphasis on allocated time, engaged time, and student success rate. In fact, after analysis of the Beginning Teacher Evaluation Study data, Fisher and his associates attach such importance to the success rate factor that they define Academic Learning Time as "the amount of time a

student spends engaged in an academic task that he/she performs with high success" (p. 52). (High-success here means only careless errors or at least 90% correct responses on written work.) They go on to state, "If the task is so difficult that the student produces few correct responses, then not much learning will result. On the other hand, if the student produces many correct responses, he/she is more likely to be learning." Specifically, they found that students who spent more than 50% on high-success activities generally have better than expected scores on reading and math.

However, a note of caution in interpretation of these results is sounded by Huitt and Segars (1980) who suggest that the optimal success rate may depend on mode of instruction. They cite the finding of Crawford and others (1975) who found the optimal success level for oral questioning to be 75%. Crawford (1978) also suggests that variations in optimal success rate may be due to student characteristics.

Quality of Instruction

Quality of instruction is discussed here in terms of the teacher's role, the teacher's management style, and the use of direct instruction.

Teacher Role

The teacher's role in the classroom is related to student achievements and attitudes in a number of ways. Two types of teacher efforts are noted below, those which relate to the teacher's role as decision-maker and those which are the results of teacher attitudes and expectations.

Hunter (1980) focuses on the teacher as decision-maker, noting that the teacher makes and implements decisions before, during and after instruction.

Teachers make decisions in regard to content (whether it will be presented sequentially or non-sequentially, and how it will be broken down into simple from complex units); they diagnose levels of previous learning; and they analyze the style of the learner. In view of research correlations between prior learning, learning style, use of instructional time, and success rate, teacher decisions relative to these factors inevitably have an effect on learning outcomes. Factors related to management decisions and creation of the learning environment are mentioned below.

In terms of teacher attitude and expectations, Rutter and others (1979), in their three-year study of 12 secondary schools in a large urban area (London), found only three academic factors that correlated with positive student achievement that are controlled within the classroom: whole class instruction; assigning of homework; and display of student's work.

Teacher Management Style/Learning Environment

What does an effective teacher do that is different from the behavior of a non-effective teacher? This question, which is central to teacher training and to teachers' day-to-day classroom management, has received a great deal of attention in the past ten years and, of the numerous profiles of the effective teacher that are emerging, there

seems to be a great deal of overlap. A few elements of these profiles are presented below.*

Rutter and others (1979) found that the behavior of students was better in classes where teachers spent more time on instructional topics. Student behavior, attendance, and achievement were all better when teachers interacted with the class as a whole rather than with individual students. They also found that student attendance was greater in classes where teachers devoted more time to academic topics, as opposed to extracurricular activities, such as school assemblies.

Emmer and others (1980), in a study of third-grade teachers, found that the more effective managers spent the first weeks of school teaching procedures, for example, how to get assistance, how to contact the teacher, how to line up, turn in work, and how to behave during seatwork and group and whole-class activities. These "teachers established their credibility early and they were predictable." Therefore, they surmised, it is necessary to establish "an efficient system for organizing procedures, rules, and initial activities, and for treating the communication of this system to the pupils as a major teaching task at the beginning of the year" (p. 230).

Evertson and others (1980), in a study of 68 English and math teachers in 9 junior highs in one urban district (using direct observation and outcomes measurements, that is, achievement and student

*Excellent reviews of this research are provided by Brophy (1979) and Jones (1982).

attitudes toward teachers), found that the more effective teachers were "more task oriented, affectionate, enthusiastic, oriented to students' personal needs, competent, confident, and academically effective" and had "better organized classrooms and fewer behavior problems" (p. 46). They also noted that "successful teachers of lower ability classes reacted to students' misbehaviors severely if necessary, rather than simply 'letting things slide'" (p. 54). In math classes greater achievement and positive attitudes were associated with more lecture-demonstration than seatwork, more public questioning (response opportunity) and more contacts, both private and public.

Emmer and Evertson (1981), analyzing data from the Beginning Teacher Evaluation Study (which examined second and fifth-grade classes to identify teaching behaviors that promote student learning) found that classrooms of teachers who were good managers displayed higher levels of student engagement, low levels of distractive student behavior, and efficient use of instructional time. They also found that "higher amounts of teacher academic feedback and more substantive academic interaction" (p. 343) produced higher engagement rates. Conversely, discipline-related feedback was negatively related to engagement. In math, greater teacher structure correlated with higher engagement rates. Greater stimulus control occurred with more on-task behavior. Structuring of transitions between activities seemed to lead to less off-task activity. Off-task behavior seemed

to increase during teacher inattention, for example when the teacher spent a long period of time with one student. More teacher questioning and signaling occurred with higher on-task behavior. On-task behavior was greater during teacher-led activities, that is, when the teacher maintained the pacing. In student-led activities, on-task behavior improved if the activity was tightly programmed.

Good and Grouws (1979) conducted a study which sought specifically to identify the characteristics of effective teachers. They studied 100 4th grade teachers in middle-class urban school districts. All the teachers used the same texts. Their effectiveness was judged on pre and post student achievement scores on standardized tests. Those teachers who produced stable student achievement rates over three consecutive years were studied to determine their characteristics. Those teachers who were most effective displayed the following characteristics:

> (1) taught the class basically as a whole (a few students might be assigned individual work, but essentially the teacher had one instructional group); (2) presented information more actively and clearly; (3) were task-focused (most of the period was spent on mathematics, not socialization...); (4) were basically nonevaluative and created a relatively relaxed learning environment (comparatively little/underlined praise or criticism); (5) expressed higher achievement expectations (more homework, faster pace, more alert environment); and (6) had fewer behavioral problems.
>
> (Good & Grouws, 1979, p. 60)

Other researchers found that the most effective management produces group cohesiveness, productive group norms, positive student-teacher and student-student relationships (Duckett et al., 1980;

Goldstein & Weber, 1981). By contrast, an authoritarian posture, in which the teacher takes full responsibility for student behavior (especially through pressure and force) is significantly less effective.

Brophy and Evertson (1976) also report a number of teacher characteristics not related to student gains: teacher affection or enthusiasm, student attentiveness, indirect teaching, teacher questioning at varying cognitive levels, democratic leadership, teacher confidence, politeness, and random questioning.

Direct Instruction

Rosenshine reviewed research literature on classroom instruction and other factors related to effective teaching. He found that current research on classroom instruction indicates that an approach which he labels "direct instruction" should be most effective. He developed this model through correlation of evidence from previous studies. By direct instruction he means:

-academic focus
-teacher-centered focus
-little student choice of activity
-large group instruction
-factual questions and controlled practice

In addition, direct instruction classrooms use sequential and structured materials, and instructional goals are clear to students.

As described by Good (1979), direct instruction is characterized by active teaching and is strongly associated with increased learning gain. In addition, in direct instruction, "teacher sets and articulates

the learning goals, actively assesses student progress, and frequently makes class presentations illustrating how to do assigned work."

However, Good suggests that selection of this model should be based on the type of learning outcomes desired and the learning characteristics of the students to be taught. After analyzing studies comparing achievement in standard and open classrooms, he found that standard (direct instructional) methods were better in terms of achievement results whereas an open classroom tended to promote creativity, problem solving, a more positive attitude toward school and the teacher, independence, and curiosity. These findings are supported by Peterson (1979).

Furthermore, Good (1979) cites a variety of studies which indicate that choice of instructional method depends on the type of student involved. Direct instruction appears to be inappropriate for students with strong inner control, high achievers, who are task oriented. Conversely, students with low pretest scores and those who were anxious or dependent did better with direct instruction. Another implication is that direct instruction is better for basic skills and less effective for inquiry skills.

Review

Research related to quality of instruction is difficult to synthesize since studies focus on various student populations and the findings collectively look like laundry lists. However, some attempt is made here.

Beginning the school year by spending time teaching rules and procedures, setting norms, and establishing clear standards for student

behavior is worthwhile. During this time effective teachers also clarify their understanding of students' abilities and interests and let the students know that the primary goal is academic, and that there are high expectations for achievement. Also, effective teachers set expectations for student accountability--taking responsibility for getting their work done well and on time. While these "getting organized" activities have been found useful in elementary and middle school classes, more time and effort is needed for younger children.

For academic subjects, and especially for low achieving students, effective teachers plan and manage instruction in a fairly structured manner, both in unit planning (e. g., using mastery learning for units of three to nine weeks), and in each lesson (e. g., using direct instruction or a model such as active teaching*). Use of a pattern of instruction, practice, and feedback facilitates diagnostic-prescriptive teaching. With low achieving students effective teachers repeat the pattern several times during a lesson, introducing content in "bite-sized" pieces and ensuring reasonable success on one piece before moving to the next. Homework is assigned for individual practice after students have demonstrated a reasonable success rate in class.

Effective teachers are well-organized, spending little time on transitions, having a system of letting students who finish tasks early know

*Active teaching lesson structure: review work to date including checking homework; present lesson objective; provide whole class instruction, guided practice, feedback, practice, feedback, independent practice (homework).

what to do, providing whole class instruction or maintaining visual monitoring of the total class when students do group work, staying on-task, and being consistent in their own behavior. Regular procedures are used for lesson planning and record-keeping.

Teacher-student interactions are mostly task-related. Praise and criticism are controlled, consistent, specific, basically non-evaluative (e. g., "that's right" rather than "that's good"), and used in moderation. Individual misconduct is dealt with in such a way that other students are not distracted.

Implications for Action

There is very strong consensus of research on the key variables related to instruction that influence student achievement...time on task, curriculum alignment, attention to student characteristics (especially prior learning), success rate, and quality of instruction. Appropriate activity in these areas is necessary for improved achievement: "enrichment" activity can be added to the essentials later. (See Table 1 for recommendations.)

None of the instructional models described above is mutually exclusive. The classroom processes model is a way of looking at what goes on in the classroom. The diagnostic-prescriptive model is compatible with the assessment of prior learning, which is integral to the mastery learning approach. And finally, the direct instruction model provides a classroom procedural framework into which a mastery learning program can be placed. Any one of the models or specific techniques can be applied by

any teacher: there is no absolute need for the school to be involved (with the exception of curriculum alignment). However, it has been found that principal support and peer interaction are highly influential in sustaining improvements. The following chapter discusses factors controlled by the school that affect student achievement, and ways in which the school can support classroom improvement.

Table 1

Recommendations to Individual Teachers:
Instructional Improvement

Variables	Actions
Time-on-Task	- Allocate sufficient time to cover content. - Ensure that all students are actively engaged in learning at least 75% of the time.
Curriculum Alignment	- "Map" your instruction against given objectives (and test items if possible). - Analyze student achievement scores (on class, district, or state tests) in terms of objectives and instruction provided. Identify needed adjustments.
Student Characteristics	- Find out what your students know before beginning a new course of instruction. (Talk to other teachers, pretest students, analyze test results, look at school or district scope and sequence or curriculum alignment charts.) - Recognize and allow for different learning styles, and vary instructional methods and assignments.
Success Rate	- Ensure that all students score 90% or better on at least half their assignments.
Quality of Instruction	- Get the school year off to a good start by establishing a workable set of rules, procedures, and expectations. - Structure academic lessons so that instruction, practice, and feedback facilitates diagnostic-prescriptive teaching. - Assign homework (after reasonable success rate). - Organize to keep track of students, time, and activity consistently, with attention to curriculum alignment, prior learning, and reasonable success rates. - Use praise and criticism in moderation -- as controlled feedback. - Be fair, consistent, severe when necessary in dealing with disruptive behavior.

III. SCHOOL IMPROVEMENT

Although a great deal of research during the past ten years has sought to identify classroom factors which affect student outcomes, little research has been done of the effects of whole-school factors. Despite the limited number of studies involved, existing data clearly indicate that the processes, norms, and values within a school do make a significant difference in the academic achievement of its students. This chapter is a discussion of those findings, and includes the following sections: relevant research, role of the principal, learning environment, organization for effective instruction, curriculum alignment, and implications.

Relevant Research

Much of the information in this chapter is based on a three-year study of 12 secondary schools in a large urban area (London). This study, conducted by Rutter, et al. (1979), sought to identify clear differences between schools that promote success and those that promote failure. The four outcomes that they examined were academic achievement, attendance, behavior, and delinquency. Those outcomes which relate to academic achievement are of primary concern to this paper.*

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*Although correlations with academic achievement, not attendance and/or behavior outcomes, are the primary focus of this paper, the Rutter findings in relation to both attendance and student behavior are cited ocassionally in this paper. There are two reasons for this. First, in as much as attendance affects opportunity to learn and opportunity to learn is related to academic achievement (see Chapter 2, Use of Instructional Time) practices which have been correlated with attendance may have bearing on achievement. Similarly, because student behavior problems detract from instruction, primarily by diverting teacher instruction time from academic tasks, a few correlations between school practices and behavior outcomes are also mentioned.

In addition to the work by Rutter and associates, other major studies of the correlations between school effectiveness and academic success are reported by Brookover and associates (1979), a study of elementary schools in Michigan, and in the Phi Delta Kappa report (1980), a collection of papers on studies of school effectiveness. Useful research summaries have been provided by Brookover (1982) and Squires (1980).

Several limitations to conclusions based on existing data should be mentioned. First, and most obvious, is the fact that very little data do exist. Second, some of the most often quoted data come from a study which was not conducted in the United States (Rutter, et al., 1979) and may, therefore, be biased by conditions which do not exist in this country. And third, identification of specific factors related to achievement may be masked by factor inter-relation. Brookover, addressing this point, warns that effects may be cumulative or

> may interact in such a way that one suppresses the effect of others...furthermore any appraisal of the effectiveness of the schools...must recognize the possiblity that the school learning environment that maximizes the desired outcomes for some students may minimize the outcomes for others
>
> (Brookover, 1982, p.13)

For example, citing data which show parent involvement to be negatively correlated with basic skills achievement in white, middle class schools, but positively correlated in Black schools, Brookover warns that some positive academic outcomes may be positively correlated with a specific factor in one school setting, but negatively correlated with the same factor in another setting.

Given all these provisos, existing data on correlations between specific factors and school achievement are given below.

Role of the Principal

It is generally believed that the principal plays a key role in determining the effectiveness of his or her own school, a view supported by the Phi Delta Kappa report (1980). The precise way in which the principal functions in terms of student achievement, however, is not known..

Squires, reviewing reports of journalists sent out to visit schools in which students attained higher than expected test scores (Ford Fellow in Educational Research Report) describes these articles as follows:

> Throughout the articles, the principal emerged as the one who sets focus, tone, philosophy, and direction in a school. "Good principals tend to rock the boat. They forsake the desire to be loved for the hard task of monitoring students' progress. They set achievement goals for their students, and they judge their teachers and themselves by them" (Benjamin, 1979, p.102). Furthermore, they tended to observe classes frequently, to have at least a partial say in hiring teachers, to actively structure curriculum and instruction development, to obtain commitment of the staff to a school-wide program, and to elicit respect from students as a "straight shooter." The articles described both elementary and secondary principals with varying leadership styles. One of the headlines from the articles sums it up, "Principals demand -- and get -- results, but allow flexibility in achieving them."
>
> (Squires, 1981, p.24)

Two main roles of the principal are described below: the principal's role as academic leader and the principal's role in relation to discipline.

Academic Role

Citing the results of a small study of declining and improving schools (Brookover & Lezotte, 1977), Brookover states that:

> The declining schools' principals were well thought of by the staff, had good relationships with them, and were generally more public relations oriented. In improving schools, the principals could be more accurately characterized as directors of instruction.
>
> (Brookover, 1982, p.20)

However, Brookover goes on to qualify these findings:

> The Phi Delta Kappa (1980) studies support the general conclusion that the principal is a major factor in effective urban schools. The particular type of principal behavior, however, is somewhat varied. Our hypothesis would be that the principal's role should be defined as a director of instruction and an evaluator of the school's effectiveness.
>
> (Brookover, 1982, p.20)

Unfortunately, from the limited data available, it is not possible to construct a list of principal's behaviors related to student academic achievement similar to those provided for teacher behaviors in the last chapter. One small piece of evidence exists, however, which might provide the beginning of such a list. Rutter and associates (1979) found that academic achievement is higher in those schools in which teachers feel that their views are seriously considered by decision-makers, and that teachers perceive that they are checked on whether or not they assign homework. (A small point, but a start nonetheless.)

Disciplinary Role

It is generally agreed that the principal has the responsibility of building and sharing expectations and coordinating school rules. Since systematic school discipline is positively correlated with lower levels of school property loss and low levels of student violence (U.S. HEW, 1978), one would be led to suspect higher academic achievement would be associated with good school-wide discipline (Rutter, et al., 1979).

Learning Environment

A number of studies indicate that the total school environment has a strong relationship with academic achievement (McDill, et al., 1967; Brookover, et al., 1979; Rutter, et al., 1979). Several aspects of this environment are discussed below. They are discipline policies; attitudes and expectations; communication of norms, and models; academic emphasis; student responsibility and participation; and reward structures.

Discipline Policies

Correlational data are presented below in relation to two aspects of disciplinary policies: the existence of school-wide policies and corporal punishment.

School-wide disciplinary policies. Rutter and associates (1979) found that academic achievement is higher in those schools in which teachers report that there are general standards of classroom discipline established throughout the school, rather than these standards being left to individual teachers. The U.S. Department of Health, Education, and Welfare study on school violence (1978) found higher rates of violence where students complain of unfair discipline and greater property loss where teachers express authoritarian and punitive attitudes (p. 134). Squires notes that these conditions "tend to exist in schools that have a weak or lax disciplinary policy" (Squires, 1980, p. 8).

Corporal punishment. Rutter and associates (1979) found that the level of corporal punishment within a school was not significantly related

to academic achievement (although high levels of corporal punishment were present in those schools in which there was the most negative behavior).

Attitudes and Expectations

The role of attitudes and expectations in relation to academic outcomes is discussed below in terms of four dimensions: teachers' expectations in regard to student academic outcomes, students' concepts of their own abilities, students' concepts of their power to affect their own academic achievement, and teachers' concepts of their abilities to teach their students.

Teachers' expectations in regard to student academic outcomes. Rutter found that schools in which teachers expect that pupils will pass exams have higher academic achievement and student attendance rates. (However, teachers' expectations are not necessarily related to student abilities, as evidenced by Rutcer's finding that teachers in two schools which ranked in the bottom third in terms of expectations actually were teaching students who ranked in the top third in terms of their intake abilities.) Several other reports collaborate Rutter's findings on the importance of teacher expectations of student achievement (e.g., Brookover, et al., 1979; and Phi Delta Kappa, 1980).

Conversely, Brookover (1980) suggests that correlation between low teacher expectations and low student achievement may occur because teachers are less likely to devote much time and energy to their students if they have negative expectations for them.

Students' concepts of their own abilities. In 1979, Brookover and associates found a high-mean self-concept of academic ability among Black students which did not correlate with their actual achievement. The students also had high feelings of futility, relating to sense or locus of control. "This suggests that it is necessary for students to believe that they can learn and also to believe that it is possible for them to succeed" (Brookover, 1982).

Coleman, et al., in their large-scale study of educational opportunity, found that a student's sense of control over his or her environment had the strongest correlation with academic success than any factor other than socio-economic status (Coleman, et al., 1966). Coleman's findings are substantiated by Brookover and others:

> Our data indicate that high achieving schools are most likely to be characterized by the students' feeling that they have control, or mastery of their academic work and the school system is not stacked against them. This is expressed in their feelings that what they do may make a difference in their success and that teachers care about their academic performance.
>
> (Brookover, et al., 1979, p. 143)

Teachers' concepts of their ability to teach their students. The importance of teacher confidence in their own abilities to teach students and their commitment to do so are clearly indicated by the research of Brookover and associates (1979) and by the Phi Delta Kappa study of school effectiveness (1980). Brookover, however, (1982) states that there is some evidence that many teachers think they cannot teach certain students. This feeling may be bolstered, according to Brookover, by the proliferation of special teachers and special programs (such as those funded by Title I)

in which students are removed from instruction by their teachers. If such a feeling exists, it may indeed be a self-fulfilling prophecy.

Communication of Norms, Values, and Models

The role of communication of norms, values, and models in the improvement of academic performance within schools has not been explored to any great extent, however, Brookover states that:

> Although there is limited evidence, general norms of high achievement and orderly behavior are very likely a necessary condition for effective schools. The Phi Delta Kappa case studies of elementary schools and review of literature (1980) suggested this is a characteristic of effective urban schools, although not specifically stated in these terms.
> (Brookover, 1982)

One study, McDill and associates (1967), found that academic emulation was indeed a primary factor in math achievement.

Rutter and associates (1979) explored this issue by focusing on personal contact between teachers and students, a situation in which one might assume there would be transference of norms. Rutter found that academic achievement was higher in those schools where students report that they would approach school staff to discuss a serious personal problem. (Positive behavior but not academic achievement seems to be correlated with teachers having more contacts with students outside of class and being willing to meet with students anytime, rather than only by appointment.)

Academic Emphasis

Data on the effect of academic emphasis come primarily from Rutter and associates, who found positive correlations on four measures.

- Assignment of homework.

- Display of student academic work. Academic achievement was higher in those schools in which students' work is displayed on walls, i.e., those schools in which 3/4 of available classroom wallspace was devoted to student work.

- Use of the library. Library use (students reporting that they had used the school library at least once during the previous week) was positively related to academic achievement.

- Maximal use of available time for instruction. Because of the strong correlations between Academic Learning Time and student achievement (see Chapter 2, Use of Instructional Time), it is interesting to note that student attendance in the Rutter study was negatively correlated with teachers' finishing lessons before the class time was up and that, conversely, attendance was up in those schools in which a higher proportion of the school week was devoted to teaching. These findings may well relate to others which indicate that students perceive the seriousness with which teachers and administrators regard the instructional tasks and tend to take schooling less seriously in schools where staff appear to take it less seriously, for example, by not making maximal use of available time.

Reward Structure

Rutter and associates explored reward structures of several kinds. Correlational data on three measures are presented below.

- Good physical settings for students. Better pupil conditions (e.g., access to telephones, clean and well-kept bathrooms, availability of hot drinks and good meals) correlated positively with academic achievement.

- Public commendation of students. Public praise of student work does not seem to be correlated with academic success, but public commendation at assemblies, was positively correlated with behavior. Also, having various avenues for students to succeed was related to achievement.

- Extracurricular activities. The Rutter study found no correlation between the extent of extracurricular activities and academic achievement.

Student Responsibility and Participation

In general, student responsiblity and participation in school activi-

ties seem to be positively related to academic outcomes. Again, data come from the Rutter study.

- Responsibility for academic tasks. Student preparation for class, as measured by students' bringing required materials to class (such as books, folders, and pencils), was positively correlated with attendance. However, Rutter does not report any correlations between academic achievement and student completion of homework.
- Holding positions of responsibility within the school. When a high proportion of students (40 to 50 percent of the student body) held positions of responsibility with the school, academic achievement was high. Academic achievement was also correlated with student participation in assemblies or class meetings.
- Other. Academic achievement was higher in those schools in which students contributed to some kind of charity organized by the school (possibly indicative of evidence of "school spirit").

Organization for Effective Instruction

Two aspects of school organization in relation to school effectiveness are discussed in this section: physical considerations and decision-making procedures.

Physical Considerations

Size and composition of the school, and teachers' working conditions make up the physical conditions discussed here.

Unit size. The Department of Health, Education and Welfare report on school crime (Violent Schools -- Safe Schools, 1978) indicates that size and level of impersonality of a school are related to school crime:

> - Large schools have greater property loss through burglary, theft, and vandalism; they also have slightly more violence.
> - The more students each teacher teachers, the greater the amount of school violence.
> - The less students value teachers' opinions of them, the greater the property loss.
>
> (U.S. DHEW, 1978, p.132)

Although these data have not been analyzed in terms of their correlation with academic outcomes, it is likely that a high incidence of school crime is not compatiable with a positive learning environment.

School composition. Brookover, in discussion the grouping and regrouping of administrative units into compositions which include, or exclude, middle schools, three or four-year high schools, etc., and the strong arguments which are advanced on one side or another, states that "we know of no systematic study that demonstrates that different organizations of these sorts are more or less effectice in producing student outcomes" (Brookover, 1982, p.19).

Similarly, according to Brookover, no studies or data have linked school size to academic achievement. His own attempt to derive this data from a random sample of Michigan schools suggested that "size is negatively associated with mean student achievement" (Brookover, 1982, p.19); however, when the factors of student body socio-economic and racial composition were constant, no effect was seen.

Teacher work conditions. Rutter found no correlation between academic achievement and teacher work conditions (such as space for grading students' work, adequate equipment, clerical and/or technical help, and free periods). However, when teachers are involved in adopting or developing a new program, access to materials and adequate planning time are important (Louis, et al., 1981).

Decision-Making Procedures

Two types of decision-making procedures relate to student outcomes: general decision-making and course planning.

General decision-making. Rutter reported positive academic outcomes in schools in which decisions are made by a group of senior teachers and the principal. Other studies (e.g., Firestone, 1977) have also found that shared decision-making is crucial to the success of a new program.

Course planning. Course planning by a group of teachers monitored by their department head did not seem to affect academic achievement, although it was positively correlated with higher levels of attendance and positive behavior (Rutter, et al., 1979).

Curriculum Alignment

Curriculum alignment is the matching of the three elements of the curriculum: objectives, instruction, and testing. Specifically, these three elements can be thought of as follows:

- Objectives (expected outcomes) are a listing of useful skills, attitudes to be acquired.
- Instruction is composed of directly outcome-referenced materials, procedures, and activities.
- Assessment is carried on through regular and reliable assessment of rates and levels of learning.

(Niedermeyer, 1979)

Since implementation actually occurs at the classroom level, it is part of the function of the school administration to oversee teachers' activities and coordinate work with the district plans. For this reason, one procedure which can be used by principals in obtaining data on actual curriculum implementation (what really does go on in the classroom) is described below.

To find out what actually is happening in classrooms, English (1979) proposes that teachers be asked to construct a "curriculum map" to describe

the instructional activities which go on in their classrooms. A curriculum map specifies what is taught and how much time is devoted to each instructional unit. This map has the advantage of describing what actually does go on in contrast to a traditional curriculum guide which tells what should be taught (and which is usually kept at the bottom of some desk drawer). The maps prepared by all teachers, can be used to inform decisions about content, time, and sequence, and a match with evaluation instruments can subsequently be determined. While responsibility for the initial development of curriculum alignment rests with the LEA, responsibility for maintenance of alignment rests with the school. Teachers can work in grade level clusters to examine student achievement test data and explore relationships between low scores and the curriculum objectives and instruction provided.

Implications

Principals and other school administrators are under great pressure to develop "effective schools" as measured by student academic achievement. Based on the research presented in Chapters 2 and 3, it is possible to alter classroom and school processes to obtain better student outcomes. However, the decisions involved in the process of school improvement must be data-based. Principals should be guided by local data on student learning as assessed by tests which reflect both the instructional objectives of course/school/district and the instructional content of the courses provided; by local program results; and by national research findings. One starting point in action planning is consideration of the

use of non-teaching time. For instance, inservice days might be used by a school faculty to explore research-based recommendations for instructional improvement, and subsequently to select and implement appropriate activities.

Table 2

Recommendations for School Faculty:
Instructional Improvement

Variables	Actions
Principal's Role	- Direct instruction: set instructional achievement standards and judge teachers and self by those standards. - Obtain faculty commitment to a school-wide program, philosophy, or priority (e.g., instructional emphasis) - Take teacher's ideas into consideration in decision-making - Observe/supervise teachers, including checking on such activities as assignment of homework
Classroom Improvement	- Work together to support individual teacher activities relating to time-on-task, curriculum alignment, attending to student characteristics, success rate, and quality of instruction. - Expect students to come to class prepared (pencils etc.) - Assign homework - Display students' work - Encourage use of the library
Decision-Making	- Participate in decision-making for instructional improvement - Allocate more time and effort to instructional tasks than to extracurricular activities (class and inservice time)
Expectations of Students	- Hold high expectations (supporting principal's standards) for student achievement - Encourage students' belief in their own control of their actions, and show that teachers care about the students' performance
Student Participation & Responsibility	- Have a high proportion of students in positions of responsibility - Encourage student participation in class and school assemblies - Encourage student contribution to a school-organized fund-raising activity
Discipline	- Work together to establish and carry out a general standard of discipline (which is not overly authoritarian)
Physical Setting	- Maintain good physical settings for students

IV. LOCAL EDUCATION AGENCY EFFORTS*

Local Education Agencies (LEAs) are in the business of assuring interest groups that mandates and recommendations are implemented, and also monitoring or supporting school staff as they implement their programs. LEAs are organizations within their own right, with their own internal technology, culture, and politics; they also function as bridges or buffers between schools and the multiple external organizations attempting to influence activities and procedures in the schools.

This chapter does not attempt to discuss the range of issues and activities dealt with by LEAs, but focuses on those most relevant to develop and maintain an effective K-12 instructional program. The following areas are discussed:

- Data-based decision-making
- Supporting instructional improvement
- Planning
- Interagency coordination

Data-Based Decision-Making

This section of this chapter addresses the following questions:

- Why should LEAs engage in data-based decision making?
- What can be learned from research and models of planned change?
- How can research be accessed and used?
- How can student achievement data be used for instruction improvement?

*Note that much of the information in this chapter and the next may be relevant to both state and local agencies.

Why Data-Based Decision-Making?

In recent years, a great deal of research has been conducted and reported that has clear implications for the improvement of instruction. With such a knowledge base available, educational leaders can no longer afford to "best guess," but should consider how they can access and use appropriate information in order to make data-based decisions.

The bottom line for educators is the extent to which an instructional program accomplishes the intended outcomes. While out-of-school factors such as socio-economic status and/or racial composition of the student body influence outcomes, factors that can be controlled by schools and districts are just as influential (Coleman, et al., 1966; Brookover, et al., 1979). Since there is no simple cause-and-effect relationship between a single factor and a desirable outcome, and yet there is mounting evidence identifying critical influential factors, LEAs should develop and maintain a system to monitor their own instructional programs and also, results of major research studies. If designed to focus on specific local priorities (relating to outcomes of instruction), such a system could tap data bases, screening and selecting only relevant information which in turn could be used for decision-making.

Such activity, resulting in identification of strengths and weaknesses of local programs and in the identification of relevant research or research-based models, suggests change. While all LEAs function in a rapidly changing environment and all central offices introduce innovations, some plan and mangage educational change, and others do not. There is extensive research on the management of planned change which is relevant

not only to staff involved in the implementation of an innovation such as systematic data-based decision making, or the adoption of a new validated reading program, but also to LEAs managing instructional improvement.

Models of Planned Change

The following discussion lists models of planned change and summarizes some key findings of studies of application of some of those models.

The literature on educational change and school improvement identifies six major models of change (Roberts, 1978),* each "rooted in a particular image of the practitioner" (Sieber, 1972), and all including provision of technical assistance and use of R&D (research and development) resources and/or knowledge. Three of those models (Social Interaction, Problem Solving, and Linkage) have been applied (or are still being applied) in major federally funded efforts. Each of these programs, and others like them, relates to "dissemination" -- purposeful efforts to put research into practice, bring about knowledge utilization, and encourage data-based decision-making.**

Assumptions driving dissemination efforts are: 1) practitioners should have access to relevant and reliable information in usable forms, 2) practitioners should be encouraged to tap information resources and use research-based knowledge in day-to-day activities, and 3) technical

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*Table 3 -- Stages in Six Models of Educational Change -- summarizes the models.

**See Table 9 for a summary of studies of some of these efforts.

Table 3

Stages in Six Models of Educational Change

Model	RDDA	Social Interaction	Problem Solving	Linkage	OD	Local process of change
Developers and/or proponents	Brickell, 1961; Clark & Guba, 1967	Rogers, 1962; Rogers & Shoemaker, 1971	Lewin & NTL, 1947; Lippit, Watson, & Westley, 1958	Bhola, 1965; Havelock, 1969	Lewin & NTL, 1947; McGregor, 1961; Lippit, Watson, & Westley, 1958	Berman, et al., 1975, 1977
Stages	1. Research	1. Awareness	1. Translation: need→problem	1. Identification (of need)	1. Entry & Contract Setting	1. Mobilization a. Problem definition b. Solution seeking c. Solution selection d. Generation of support e. Decision-making (re: strategies)
	2. Development a. Invention b. Design	2. Interest	2. Diagnosis (of problem)	2. Diagnosis (of problem)	2. Data collection	2. Implementation: Mutual adaptation of project and organization
	3. Diffusion a. Dissemination b. Demonstration	3. Evaluation	3. Search & Retrieval	3. Problem Statement	3. Diagnosis (of organization)	3. Institutionalization: Assimilation by teachers and Incorporation by school system
	4. Adoption a. Trial b. Installation c. Institutionalization	4. Trial	4. Adaptation (of innovation)	4. Search & Retrieval	4. Action interventions	
		5. Adoption	5. Trial	5. Selection (of Innovation)		
			6. Evaluation	5. Implementation		

assistance should be available to help practitioners put research into practice.

In a synthesis of studies of educational change (Emrick & Peterson, 1978) and two more recent studies (Louis, et al., 1981; Royster et al., 1981) certain factors are acknowledged as influential: availability, accessibility, and form of the information; technology, culture and politics of the user. Educational change is defined as "the implementation of practices or procedures in response to the dissemination of new knowledge" (Emrick & Peterson, 1978a, p.3). Conclusions from those studies relevant to an LEA are summarized here:*

- Information alone is not enough; personal intervention is necessary to initiate and sustain use.
- Quality of materials (or programs) is critical -- in terms of relevance to the school's perceived need and the adequacy of guidance for implementation/use.
- Assistance of facilitators (external field agents) has a powerful positive influence on outcomes of knowledge use.
- Local problem-solving activities should involve cross-level teams, build consensus, attend to planning for implementation, make use of the external agent's expertise, and develop capability and commitment to systematic program improvement.

There is compelling evidence demonstrating that when a school or district addresses a perceived need by drawing upon research-based information (programs, products, or processes), employs appropriate problem-solving activities, and is assisted by a competent external change agent, program improvement occurs. Successful planned change, e.g., systematic

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*A more extensive review of the literature identifies some specific roles and responsibilities for local systems (Roberts, 1979, pp. 92-100) which are summarized in Table 4. The table also summarizes tasks relating to access and use of information.

Table 4

Data-Based Decision-Making for Instructional Improvement

Access and Use	General LEA Responsibilities
• Technology: Develop the means to collect and analyze local data, to access ERIC, NDN, Research and Development agencies, libraries, know the strengths of each, maintain communication to facilitate use. Do not adopt or impose "standard packages." Do use quality materials. • Culture: Understand real local needs, develop commitment to instructional improvement, establish norms acknowledging the merit of data-based decision-making, recognize and accept assistance available from outsiders. • Politics: Understand constraints of the organizational structure, recognize power bases and internal and external pressures, apply appropriate strategies (e.g., use of feedback rather than one-way specification of rules).	• Accept leadership role. • Recognize the power of administrative influence. • Build coalitions to promote steady progress. • Hold cross-level meetings. • Arrange for linkage with external resources. • Use capabilities for leadership, planning, and conflict resolution. • Attack barriers of: - goal ambiguity - conflicting interests - early/threatening evaluation. • Attempt to overcome barriers of: - routininzation - resource rationing - uncertainty - problem definition/solution. • Recognize barriers of: - stability/status quo - vulnerability.

instructional improvement, is more likely when a model such as the local process of change or linkage is used rather than the RDDA model -- assuming that appropriate strategies are employed and relevant knowledge is use.

Accessing and Using Research Study Results

Factors influencing knowledge utilization include: availability, accessibility and form of the information, and the technology, culture, and politics of the user environment. Each is discussed below.

Information is available to all schools and school districts through ERIC, other federally funded programs such as those mentioned earlier, state and local libraries, professional organizations, and other similar systems. Traditionally, information systems were passive, with staff acting as one-way communicators* with responsibility to search, select, and retrieve the knowledge needed. Recently, information systems have become more proactive, often including outreach programs and an individual (resource linker*) who "helps clients find and make the best use of resources inside and outside the system" (Havelock, 1973, p.9) In very sophisticated information systems, availability and accessibility are considered insufficient for knowledge use: the form -- quality, quantity, format, and language -- must also be controlled. Staff function as facilitators*, interacting with clients in order to screen out

*These three roles are described in Table 5 -- Linker Roles and Responsibilities -- derived from the results of a study conducted by Madey, (1979).

Table 5

Linker Roles and Responsibilities

Roles	Modes	Activities	Skills	Outcomes
Communicator	One way: Spread of information	Tell client groups about potentially useful resources, programs, information. (Sometimes assist clients in getting the kinks out of a new program.)	Know data bases and client groups. Communication. Marketing. (Sometimes program implementation)	Client systems adopt new programs and/or use information provided.
Resource linker	Two way: Exchange of information	Provide client with valid information relevant to specific need.	Know data bases and how to access them. Problem definition. Search negotiation and retrieval.	Increased client access to valid and relevant information.
Facilitator	Two way: Collaborative improvement activity	Assist client in resolving problems or completing tasks by providing valid and relevant information and technical assistance.	Know data bases and how to access them. Planning. Problem solving. Implementation. Communication. Evaluation. Simulation etc.	Increased client use of valid and relevant information. Increased client capability in all aspects of knowledge-based decision making and problem solving.

unwanted information, synthesize data, or influence researchers to write user-oriented reports. Such facilitators may be external or internal to the local system, but are usually perceived as external to the school.

Even when information is available, accessible, and in a usable form, it may not be used if the technology, culture, and/or politics of the school system work against it (McKibben, et al., 1981).

For instance, every LEA needs the technology (expertise, processes, forms, system of communication) to access ERIC. This does not mean that the LEA has to own an entire microfiche collection, a thesaurus of descriptors, cumulative index, or computer terminal. It simply means that a person (e.g., librarian) understands the system and how to access it. LEAs also need the technology to access other resources such as the National Diffusion Network, the Regional Exchange for the state, and state and local agencies providing resources for particular kinds of activities. When this responsibility is assumed by a resource linker (single individual within the LEA such as a library/media specialist), that person must also maintain a system of effective communication to facilitate use. Although LEAs access research-based information, these efforts are not systematic and LEAs rarely communicate to schools that such information is available.

In addition to technology for accessing "outside" information, an LEA needs to be able to process "inside" information such as test data and records of instruction provided on specified objectives. This technology may include human expertise and purposeful use of micro-computers.

In some cases, the culture of an LEA works against knowledge utilization. The knowledge, skills, and attitudes of individuals which contribute to the norms of the system may create a culture which does not reward, or perhaps does not even consider using results of national, state or local research efforts. Several major studies (e.g., Berman, et al., 1978; Louis, et al., 1981) found that the strongest factors influencing educational change were local commitment and locally perceived need. For effective knowledge use, the LEA must understand its own need, develop commitment to improvement, and recognize that there is information available that is directly relevant to the task at hand. A culture relying on internal resources may "reinvent the wheel" or maintain an undesirable status quo. A culture acknowledging the potential merit of research-based information is more likely to be cost-effective in program development and implementation.

Both the culture and technology of an organizational system are related to the politics -- power bases and structure, processes used in planning and decision-making, and the allocation of resources to support programs and transfer organizational learnings.

An LEA may be perceived as a bureaucratic organization rationally managing and controlling

> to structure and to modify learning opportunities...which teachers to hire, which courses to teach, which books and equipment to purchase, how long students will study each subject, which grades to house in which buildings, which extra-curricular activities to provide, which students to assign to which teachers, how much to spend per pupil, and so on.
>
> (Brickell, 1980, p.9)

Such a system, controlled by rules and procedures, coordinated by a few senior managers, is organized by areas of specialization each with its own set of tasks and responsibilities. Communication is vertical within each specialized subsystem, with interactive decision-making occurring only at the top, among the senior managers. Use of information from one subsystem to another and from outside the total system is rare, and is usually controlled by top management.

> The...organization will succeed as long as it can operate in a stable environment. When next year is like this year, so that this year's tested rules will work next year, then the outcome will be good...But Greek temples are insecure when the ground shakes...are slow to perceive the need for change...If the needs change (they)... continue to forge straight ahead confident in (their) ability to shape the future in (their) own image. Then collapse, or replacement ...is usually necessary.
>
> (Handy, 1978, p.180)

At the other extreme, an LEA may be perceived as an open system, influenced by schools, parents, community, state and federal recommendations, and its own priorities. Within the LEA loosely-coupled subsystems, functioning almost independently or in a matrix structure, conduct a variety of tasks, many of which require energy to deal with the influencing forces at the system boundaries. Here, power is spread out, with each subsystem having high autonomy (once it has acquired resources needed to survive). A great deal of information enters an extremely open-system LEA through many different entry points, but there is rarely a systematic way to organize and use that information.

Each type of organization has its own power structure and political norms influencing how planning, organizational learning, and decision making takes place. If data-based decision-making for planned

instructional improvement is to be carried out, systematic effort is needed to control influential factors such as availability and accessibility of relevant information and the technology, culture, and politics of the system.

Using Student Achievement Data

Findings of national and state studies, accessed and used systematically, can provide a general knowledge base of effective models or techniques for instructional improvement. Results of local program evaluations, particularly student achievement data, can identify specific needs. Data-based decision-making activities can then be driven by local needs, with appropriate solutions drawn from the broader knowledge base.

Tests selected by SEAs and LEAs are most often standardized (norm-referenced) tests. They identify differences in achievement among individual students but are not designed to measure the effectiveness of a particular program.

> The Instructional Dimensions Study, for example, indicates generally that more than 60 percent of the content on norm-referenced achievement tests needs to be covered for students to improve their percentile ranks (Cooley & Leinhardt, 1980). However, this same study shows that the amount of overlap between content taught and content tested ranges from a low of 4 percent for some students to a high of 95 percent for others.
>
> (Squires, et al., 1981, p.175)

Results of standardized tests may be used to compare student achievement in one school, LEA, or state with others, but data are relevant only to the extent that students have received instruction related to the objectives tested.

Recently, influenced by competency-based education programs, more SEAs and LEAs are developing criterion-referenced tests. Here, it is assumed that there is a three way match between objectives, instruction, and test items. In at least one state (Maryland) systematic procedures have been used to ensure such a match.

> ...an uplifting experience in that it provided an opportunity for a K-12 interdisciplinary, and multi-role involvement and fostered a level of curriculum and instructional discourse which had not previously occurred...It certainly resulted in an opening of communications across discipline and departmental lines which holds great promise for instructional improvement.
>
> (Dudley, 1980, pp. vii-viii)

If such a match (or curriculum overlap) occurs, test results may be analyzed to determine program effectiveness on a general level, and also to identify strengths and weaknesses of instruction for a particular course or class, and of individual student achievement for particular objectives. Records may also be maintained of students' "opportunity to learn."

Data in a computer or on a researcher's desk are relatively worthless. LEAs should determine the questions that can be answered from available student achievement data, prioritize those questions in terms of usefulness for program improvement, and analyze and report results accordingly. For instance, if data are analyzed by class by objective and reported back to teachers, teachers can identify those objectives needing instructional reinforcement.

Two systematic programs use student achievement data in this way. In Delaware, the SEA provided technical assistance to LEAs by providing by class/by objective printouts of test results of basic skills. Teams of

teachers analyzed the results, identified low scoring objectives and used a key to identify materials or text chapters addressing those objectives. Teachers needing additional materials borrowed objective referenced instructional packages from the SEA. A second example is the Proficiency Verification System (PVS), developed by Southwest Regional Laboratory (SWRL), is used in Los Angeles and many other LEAs, and reinforced by a teacher-controlled recording system based on the Mastery Learning concepts (Block & Burns, 1976). The difference between the two systems is that in the former a state criterion-referenced test was used, and teachers and LEA staff worked with SEA staff on improvements in the middle of the school year (using October test data); in PVS, SWRL develops criterion-referenced tests relating to LEA curricula and objectives, and provides printouts analyzing results which local systems subsequently use for determining their own improvements.

In both cases, the following factors are found important to bring about program improvement: objectives to be taught must be clearly understood; instructional materials (e.g., commercial texts) used in the school system must be analyzed and keyed to objectives tested, or objective-referenced instructional lesson guides or packages must be available; LEAs must demonstrate commitment and support by arranging for teacher release time, providing appropriate test analyses and other materials, and providing training and on-going assistance to teachers; teacher teams should be made up by subject area and subgrouped by grade cluster (e.g., K-3, 4-6) to facilitate cross-grade communication.

Effecting a match between objectives, instruction, and tests will bring about significant improvement. However, it may not be enough: LEAs may also need to collect and analyze data on the other key variables found to impact student achievement (see the previous two chapters of this paper). Also, they may need to test assumptions and local realities relating to curriculum and instruction.

Supporting Instructional Improvement

This section discusses ways in which LEAs may support instructional improvement in terms of curriculum and instruction. As Zaharis and Barnard (1981) point out, curriculum and instruction are separate but related areas. Curriculum is the substance -- the "what" -- that is taught; instruction is the process -- the "how" -- of teaching/learning engaged in by the teacher and students. Curriculum can exist without instruction, but instruction cannot take place without curriculum.

Curriculum

Traditionally, curriculum is determined or strongly influenced by those outside the classroom -- department heads, central office or SEA staff, textbook publishers, etc., while teachers maintain the greatest degree of control over instruction. The underlying assumption here has been that the teachers would use the curriculum they were given, apply expertise gained through preservice training, experience, and peer support, and bring about appropriate learning outcomes. Such an assumption is invalid, partly because not all curricula can meet learning outcome claims, partly because teachers are selective in what they choose to

teach, and partly because instructional expertise varies considerably from teacher to teacher.

Recent research and practice in many parts of the country and in many subject areas provides an extensive knowledge base in "what works" in curricular and instructional improvement. LEAs should apply that knowledge base in providing support for instructional improvement.

Four kinds, or levels, of curriculum are described by Glatthorn:

> ...mastery curriculum...is both basic and structured, requires careful planning and articulation. Sequence is important; objectives and textbooks are useful; testing is essential.
> ...organic curriculum...is just as essential, but does not require careful structuring...The affective outcomes of the curriculum are organic...nurtured at every opportunity.
> ...team-planned curriculum is not essential -- it is enrichment and it also requires careful structuring.
> ...student-determined curriculum is neither basic nor structured; its enrichment aspects can be developed solely out of the interests of able students.
>
> (Glatthorn, 1981, p.111)

This conceptual framework may be expanded to include corrective curriculum as well as the enrichment referred to in the last two levels. The framework suggests degrees of control. For instance, a mastery or "core" curriculum crosses all grade levels, and a set of mastery curricula cover all main subject areas. Therefore, it should be designed by representatives of all interest groups. An organic curriculum suggests the need for a shared philosophy among those involved in a given subject area, and also -- possibly -- faculty of a given school. The team-planned curriculum could be designed in a given school, and individual teachers may control the student-determined curriculum. In all cases those involved can

benefit from the expertise of peers and specialists and from a sound up-to-date knowledge base.

Products. Formats of curriculum guides are changing. Today, for a given subject area, a guide may consist of a "package" of materials: a scope and sequence chart of goals and objectives for the mastery curriculum, organized by grade level or by grade level cluster (e.g., K-3, 4-6, etc.); a summary of major research findings, a philosophy statement, or set of assumptions representing state-of-the-art knowledge of the subject; instructional activity plans relating to the objectives and including suggestions for classroom evaluation; and a list of resource materials (Glatthorn, 1981; Holdzkom, et al., 1981; MarDel, 1982). The package expands and evolves over time to include criterion referenced tests and program evaluation measures, new and relevant research and resource references, examples of team-planned and student-determined lesson plans and student assignments; and special inserts indicating graduation or grade promotion requirements or minimum competencies tested by the SEA.

Process. Tradition suggests:

> ...we would assemble a...curriculum committee, pay them to work together over the summer to produce a...curriculum guide, hand it to the teachers, and then conduct some inservice sessions to tell the teachers how to use it. But that process doesn't always work even in tightly coupled systems.
>
> (Glatthorn, 1981, p.110)

The alternative does not put staff development at the end, but at the beginning or as an on-going process throughout the curriculum development activity. A planning team, of four to six people, led by a subject area specialist, drafts a general plan and builds a knowledge base of relevant

research. In the subsequent steps, planning team members rotate or share leadership, working with school faculty and following the first six steps of the open systems planning process outlined in the planning section of this paper.* The final step is the actual development and pilot testing of curriculum and instruction. Subsequently, the planning team makes data-based revisions before initiating a second planning cycle for districtwide implementation. If the planning team is well-prepared, step one of the process (involving school faculty and relevant others) defines the realistic ideal in terms of a draft K-12 scope and sequence of objectives and the operating assumptions (knowledge base) for the curricula in the course of a two to three day workshop (Roberts, 1981).

Instruction

The above approach to curriculum improvement includes attention to instruction. However, it should be recognized that many instructional models or activities are generic, crossing subject areas, and worthy of attention in their own right. In many cases such models or activities are referred to under the general heading of "classroom management," and several are described in Chapter 2 of this paper.

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* A rephrasing of those steps is: 1) Define the realistic ideal by determining accepted philosophy from relevant research through staff development activities; 2) Define the present system by "mapping" existing curriculum resources, and instructional processes; 3) Map the environment by identifying supporters and saboteurs; 4) Detail task responsibilities for teachers, administrators, LEA staff, evaluators, federal program staff, etc.: 5) Analyze perspectives -- :turf" threats, expertise fears; 6) Strategize -- commit energy for negotiation, resource allocation, staff development, extended membership in the project etc.; 7) Finalize action plan and develop materials.

Since there is such strong research consensus on the key instructional variables that influence student achievement it is the responsibility of educational leaders to understand the knowledge base and its implications and then to plan for implementation appropriate to the needs of the district or school. Unfortunately there is a "tendency to neglect the careful tracing of connections between organizational variables and student outcomes" (Erickson, 1979).

> ...administrators are in a position to direct, or at least influence, what instructional systems are in use in schools. Thus, through advocacy of promising systems such as mastery learning, administrators may be able to make an important difference (on student learning).
>
> (Boyd & Crowson, 1981, p.358)

It is interesting to note the use of "advocacy" and "influence" rather than "mandate" or "dictate" -- recognizing the realities of classroom and school autonomy. However, it should be understood that central office staff have considerable means at hand to influence and advocate: the power sources of expertise, position/authority, resources (and sometimes personal charisma), and the influence methods of rules and procedures, exchange/negotiation, persuasion, and organizational ecology (Handy, 1978, p.142). Thus, with the use of appropriate strategies LEAs can ensure adoption of improved instructional approaches.

Mechanisms used by LEAs include task forces and committees, assignment of "coordinators," and encouragement of pilot implementation efforts in "lighthouse" schools. Any one can work as easily as another.

Facilitators of success include: 1) user need focus (Berman, et al., 1977; Louis & Rosenblum, 1981); 2) mobilization of support in terms of generating enthusiasm and commitment to improvement (Charters & Jones,

1975; Kirst, 1977; Kritek, 1976); 3) effective leadership by the superintendent and staff in planning and conflict resolution (Brickell, 1964, p.503; Hall & Alford, 1976, p.47); 4) involvement of an individual from an external agency to provide the knowledge base and assist in planning/implementation (Crandall, 1977; Louis & Rosenblum, 1981; Mann, et al., 1981); 5) careful allocation of resources, especially time and staff energy (Berman, et al., 1977); 6) an on-going planning/implementation process involving all levels of educators (Firestone, 1977; Moore, et al., 1977); 7) provision for training and follow-up assistance with mutually agreed upon feedback and accountability systems (Berman, et al., 1977; Kirst, 1977; Kritek, 1977). These facilitators are interactive and each alone is unlikely to produce significant effects.

The most common concept of LEA support to school faculty is inservice. In terms of systematic instructional improvement, inservice may be considered one of several techniques to disseminate information. Alternatively, LEA staff may set aside the idea that inservice consists of a presenter lecturing or running a workshop for participants. Instead, individual learning may be directly linked to organizational goals, requiring a leadership style and knowledge building and training activities that fall on a continuum from a lecture (creating awareness), through guided practice (building skills), to on-site coaching (facilitating application). Traditional inservice is insufficient. Distribution of standard packages such as curriculum guides is inadequate and unproductive. Allocation of funds without user recognition of a problem to be solved is wasteful. Top-down directives result in lip-service compliance

without improvement. It is also possible (although no data are available as empirical evidence) that individual activities by subject area specialists (curriculum development, workshops, newsletters etc.) do not reflect LEA priorities or philosophy, are not research-based, are each isolated activities, and are not cost-effective in terms of student outcomes.

> This mess...is a system of problems. This means that the problems interact. Therefore, if we do the usual thing and break up a mess into its component problems and try to solve each one separately, we will not solve the mess. (Ackoff, 1977).

Research in educational administration indicates that much time and effort is spent on organizational maintenance and system integration -- trying to bring resources together and improve communication in order to reduce redundancy and isolation. However, "system integration really exists only tenuously" (Boyd & Crowson, 1981, p.341). In light of reduced resources and multiple pressures for improvement of student achievement, and in light of the fact the relevant knowledge exists for the "what" and the "how" of such improvement, educational organizations need to refine and increase their efforts at integration/coordination. One approach may be to use Block Grants as an opportunity rather than a constraint, and initiate coordinated planning related to a major local priority.

Planning

If instructional improvement is to occur systematically and if it is one of the top priorities of local systems, attention needs to be given to planning. This section of this chapter discusses generalizations, perspectives, and realities of planning, and some models and techniques used by local systems.

Generalizations

Procedures and techniques for planning that are most commonly advocated are goal-based and rational. In many cases, traditional planning activities are conducted by senior management without communication to or from those who implement the plan. The value of traditional planning concepts, methodology, and operations have recently been challenged in light of realities of rapidity of change and of application of open-systems theory. In order to clarify the perspective of this paper, a set of generalizations are offered (see Table 6). They function as operating assumptions in the subsequent discussion.

Perspectives and Realities

The issue of how school systems actually behave organizationally, how they perceive themselves as organizations, and how they are perceived by influential others is extremely important in considering planning for instructional improvement.

In the preceding discussion of data-based decision-making, reference is made to the LEA as a system, and two models, or images, are mentioned -- a loosely-coupled open system, and a bureaucracy. As Erikson (1978) points out, much research is being conducted on determinants of organizational modes, and yet "many despair of finding a single theory or model that can account adequately for rational and non-rational aspects of behavior" (Boyd & Crowson, 1981, p.320).

Those who focus on the rational aspects see a bureaucracy and advocate rules and procedures for uniform use of traditional planning

Table 6

Generalizations About Planning

1. Planning is the activity initiated formally by an organization and informally by organizational participants as a means to:
   - sense the future
   - understand the present
   - rationalize the past
2. Planning is undertaken to achieve symbolic, advertisable, rationalistic, political, procedural, decisional, and futuristic ends.
3. Planning is a device that can affirm (or undermine) the bond between the individual and the organization.
4. Planning is a diverse process that occurs throughout an organization all the time; it can be usefully imagined as comprehensive, encapsulated, contained, spontaneous, continuous, and loosely coupled.
5. Planning is "of the organization," as well as "by the organization." It is a naturalistic process through which organizational participants help to create and maintain their organizational environments.
6. Planning is context-bound and situationally oriented. It is affected by:
   - the degree of coupledness of the organization
   - the stability, sufficiency, flexibility, and reliability of the organization's resource base
   - the level of institutionalization of the organization's activities and audiences (sustaining, emerging, or projected).
7. Planning is a process with multiple products, e.g., mission statements, memoranda of understanding, position papers, proposals, planning reports, a better or worse sense of institutional identity, procedural improvements or decrements, higher or lower consensus about the organization.
8. Planning yields multiple organizational impacts of varying levels of predictability and control.

(Lotto, et al., 1980)

technology. Those who perceive non-rational activity argue that the varied loosely-coupled systems may engage in planning for purposes other than the production of a goal-based plan as a guide to future action. In both cases there appears to be a concern about the lack of "good planning," or at least the failure of goal-based rational planning systems, which Clark (1980, p.5) argues is not grounded in technical details but in the "discrepancy between the assumptions underlying rational planning systems and the reality of what actually occurs in educational organizations."

Rational Bureaucracies. One underlying assumption is that activities can and should be programmed, scheduled and evaluated in planning cycles. A related assumption is that the practitioner is perceived by external influencers as relatively powerless and very rational. Sieber (1972) argues that such a person has clear-cut objectives, bases decisions on the best available information that promises to increase efficiency by predicting outcomes of alternative courses of action, and is invulnerable to opinions of associates since values are developed through antecedent statuses, ideologies, or environmental constraints. Authority is recognized: regulations flow down and compliance evidence flows upward. Such an individual belongs in a bureaucracy where "goals are unambiguous, stable, and agreed upon...and...the means by which the goals may be achieved are understood and specifiable" (Hannaway & Sproull, 1979). The means depend upon the degree of standardization of the situation.

> In situations that are highly predictable and routinized, an organization relies on formalized means, e.g., standardization and written rules and regulations. In situations that are dynamic and less predictable, it relies on less

formalized, often oral means, e.g., feedback and negotiation.
(Hannaway & Sproull, 1979)

Since school change is dynamic, and strategies and schedules of implementation of instructional improvement processes such as mastery learning or curriculum alighment are not absolutely prescribed and predictable, rational practitioners in bureaucratic organizations should build feedback and negotiation into plans in these areas.

Loosely-Coupled Systems. In contrast to the bureacratic model is the loosely-coupled system first described by Weick (1976).

> The loosely-coupled model suggests that...its subsystems are loosely articulated...The connector elements are not observable control behaviors such as inspection or negotiation, but are, instead, low level procedures and beliefs about the organization of schooling. This latter kind of connector has been called a "logic of confidence."
> (Hannaway & Sproull, 1979)

This perspective suggests plans based on a common cross-hierarchical philosophy and trust, which permit flexibility in implementation.

It is obvious that the two models are different. It is suggested that most people perceive LEAs as bureaucracies or as part of a single statewide bureaucracy, but among researchers there is increasing recognition that school systems are loose coupled. Yet

> ...we find that developments in school governance have created a press toward...a "hyper-rationalization" of bureaucratic control. Although policies are increasingly centrally determined and more highly specified, the implementation of policy at the site level remains a task that, ideally, calls for adaptability and situational sensitivity.
> (Boyd & Crowson, 1981, p.344)

The press toward "Hyper-rationalism" comes from outside the system "...by judicial decisions, increased state and federal program regulations and reporting requirements, and the growth and impact of collective

bargaining" (Boyd & Crowson, 1981, p.342). One way of dealing with such pressures is to take stock of existing behaviors, explore alternatives, and -- working on a top local priority relating to instructional improvement -- thoughtfully employ data-based decision-making to improve planning processes.

Models and Techniques

This part of the paper reviews some planning models; discusses local planning in response to external stimulus, and levels of sophistication; and outlines the differences between plans and planning.

There are thousands of publications presenting models and techniques of planning or used in planning efforts. Clark, referring to a 1979 monograph by Anthony Gambino on state level planning, lists

> ...five planning technologies applicable to educational institutions: 1) Management Information Systems (MIS), 2) Simulation Models, 3) Planning, Programming Budget System (PPBS), 4) Zero-Based Budgeting (ZBB), 5) Management by Objectives (MBO).
>
> (Clark, 1980, p.1)

The six models of educational change (Table 3) outline stages described in plans for program improvement. Miles (1976) examines six models of planning drawn from the literature and finds advantages and disadvantages for each (see Table 7). In order to make sense of the array of models and techniques, Kirn (1976) suggests situation analysis, in which the planner identifies the primary demands of the task/situation and subsequently selects a technique or process tool (see Figure 1).

The point is that each technique or model is useful for a specific purpose but should not be considered a uniform prescription. Planners, or technical assistors helping LEAs to plan, should develop expertise in

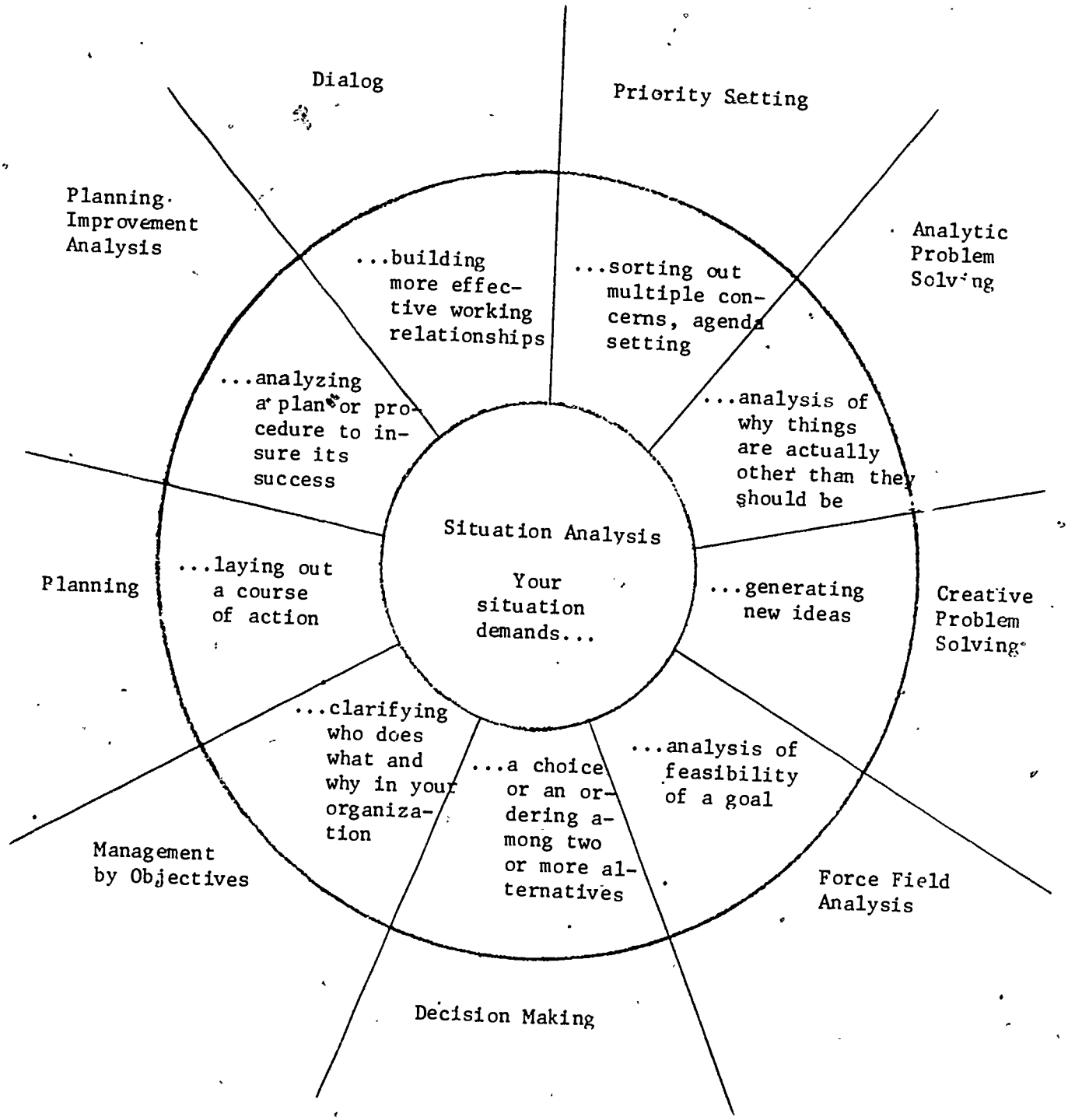
Table 7
Models of Planning
(Miles, 1976)

Model	Character	Members	Future Orientation	Design	Adaptiveness	Linkage: Planning/Implementation	Advantages	Disadvantages
Muddling Through	improvisation expediency	low expertise	indirect	vague	high	pragmatic	recognizes irrationality, that unanticipated outcomes are 100% likely, and that means cannot be tightly connected to goals	can regress into "unplanning" with lost goals, unimaginativeness, little difference from status quo
Natural Development	emergence from day-to-day activities of inhabitants	key operational staff	work into it, short time frame	specific at implementation	high	one and the same	user need orientation taps energies, provides individual successes	can lead to opportunism, focuses inward to the detriment of strategic planning related to external resources
Engineering	ingenious problem-solving using known technology to fit/overcome operating constraints	external expert plus clients	direct imaging	specific problem/solution	high	incidental	clear, simple, appealing	can resist feedback and redefinition of problem, assumes that all parameters are known, separates expert planners from implementers
Rational Planning	chronological tasks related to specified goal, systematic resource allocation, decision-making	experts plus operators	direct, supported by "tools"	very high (process)	varies	varies	rational, straightforward, deals with time as scarce but managable commodity, can manage complexity, economy of energy	treats goals & means as not mutually influencing, unintended outcomes of decisions always occur, focuses inward, does not help implementers with political realities of environment
Simulation	creation of imaged system, careful study of its properties	operators (plus experts)	direct	fairly high	fairly high	direct	pre-assesses consequences, deals with complexity, identifies core problems and relationships, uses human intelligence in best way	need to avoid "garbage in: garbage out" syndrome, simulation can become so "real" that reality is ignored
Adaptive Planning	spiral--recognition of need, action, fact-finding, redesign, gives priority to feedback from actions	operators, clients, gatekeepers	only as it becomes present	low	reflexive	vigorous	well-suited for survival	can slip to expedience or natural development model

Figure 1

Types of Situations and Corresponding Rational Process Tools

(Kirn, 1976)



using the various techniques in order to select appropriate alternatives for a given purpose.

Planning is an on-going process and does not stop once a paper product called a plan has been submitted to a supervisor or external funding agency. The actual decisions and actions of planning/implementation relating to instructional improvement in the local system should be closely related to those described in the written plan. It should be clearly understood by all concerned that the longer the timeframe of the plan the more likely it will be that activities will evolve, unintended outcomes will occur, and contingency planning will be needed.

If the assumptions in the above paragraph are not accepted, there will be dissonance in the system, friction between the LEA and the external agency, and -- possibly -- little evidence of instructional improvement. If they are accepted, the issue at hand focuses on the components, facilitators, and barriers of "good" planning.

Local Planning in Response to External Stimulus. For the purposes of this paper the type of planning under discussion is that performed by an LEA in response to an external stimulus -- an incentive such as funds through Block Grants or state school improvment projects, or a mandate such as the New Jersey "Thorough and Efficient" law which requires action plans to correct "deficiencies." Such planning requires the LEA to submit a written plan to the SEA. Usually the plan describes goals, objectives, activities, and performance standards or evaluation methods and criteria. A plan may also include a rationale or needs assessment. Statements of

allocation of resources -- external funding and inkind contributions -- are made, and general timelines are given.

Quality planning leading to effective implementation is continuous or cyclical so that modifications can be made as needed. There is good use of time and other resources. Tasks reflect a consumer-centered approach to a real local need, and decisions and actions are shared across organizational levels. There is collaboration between the local system and an external technical assistor with access to a sound (R&D) knowledge base. Barriers to successful planning include: lack of understanding by the external agency of internal circumstances, conflict of interest, poor internal/external communication, poor timing, organizational weakness or lack of expertise, and a short-term perspective. (Roberts, 1978, referring to several major studies of planned change.)

In a comparative study between successful and unsuccessful districts, Kiser (1978) found that successful comprehensive planning was characterized by: active participation by teachers, administrators, and superintendent; direction of the planning/implementation by a task force representing all three subsystems; coordination by the assistant superintendent; use of a work plan and schedule; functioning of external consultant as advisor (not director); flow of task directives from task force to subsystem members; goal congruence of all three subsystems; productivity as illustrated by staff training, documentation, systems analysis of problematic areas; teachers' positive perceptions of performances of superintendent and assistant superintendent -- their commitment,

expertise, use of open-system processes to generate a positive climate, ability to resolve conflict and serve as resource persons.

One point to be emphasized is the involvement of implementors in the actual planning process. "Group decisions which have been arrived at interactively elicit more solid support and issue into action more frequently than do those which are handed down authoritatively" (Lindzey & Aronson, 1969, p.261). Administrators must be sincere in seeking teachers' input; if teachers find that their suggestions are ignored they may sabotage the project (Firestone, 1977). The key is relevance. Everyone does not have to be involved in reaching consensus on every decision, but all must have a shared image of the total plan and each must have the opportunity to influence decisions relating to actions that person or group will have to carry out.

A second important point relates to goals or needs. A real local need should be addressed, with goals congruent between SEA and LEA and subsystems within the LEA. If there is incongruence, task avoidance and non-implementation will occur. For instance, the SEA may advocate that Block Grants be used to supplement a generic instructional improvement effort while interest groups within the LEA may each advocate specific content areas. Or, the SEA may offer funding for a specific purpose (state priority), and the district office may accept the funds thinking to use them for another purpose (local activity). Given this level of conflict, it is apparent that planners must be skilled in problem definition and consensus-building. (In one of the RDU projects -- Pennsylvania -- it was found that this area of activity took two-thirds of the

available planning time. The remaining third was then used in analyzing, selecting, and organizing alternatives for action -- problem solution.)

The third point for consideration relates to expertise. If, as in Kiser's study, LEA administrators have the necessary expertise (knowledge and skill in planning techniques etc.) there is no difficulty. If such expertise is lacking, or cannot be applied at the time, the LEA should seek help from an external agency (e.g., the SEA, a regional service agency or R&D labortory, university, NDN state facilitator, or private company -- if funds permit).

The last key point relates to internal/external interaction. Effective communication and shared understanding is essential. Negotiation is preferable to compliance. The SEA should be prepared to provide technical assistance to planners -- not simply relating to fiscal allocations but to all aspects of the planning process. The LEA should ensure that the SEA understands local realities. Ideally, an on-going relationship should be established between state and local liaisons functioning as communication channels and facilitating delivery of appropriate, timely technical assistance.

Levels of Sophistication. Outsiders looking in can recognize the varying degrees of sophistication among local systems. However, members of an organization may not judge themselves well. (In Kiser's study (1978) there was little difference between self-assessment ratings given by members of successful and unsuccessful districts in comprehensive planning efforts.) Ackoff (1977) argues that organizations progress through three levels of planning capability. The first is reactive.

> This type of planning tries to get rid of deficiencies in an organization one by one...concentrates on selecting "top priority" projects and allocating most resources to them. The reactive planner walks into the future facing the past...the principal tactic for removing a deficiency is to try to identify a simple cause and suppress or repress it...Reactive planners try to treat symptoms where they occur, mistaking symptoms for causes...principal tools are judgment, intuition and experience.
>
> (Ackoff, 1977).

This is like the Kepner-Tregoe or zero defects models listed by McPherson (1967). Educational research indicates that there is no single cause for high student achievment, yet even today some schools and districts try to treat single symptoms (e.g., poor self-esteem, use of non-standard English) hoping to effect complex change (e.g., reading ability).

> The second type of planning (most prevalent among professional planners) can be called preactive or prospective planning. It consists of "predicting and preparing"...Forecasting plays a fundamental role...tries to predict accurately both the problems and opportunities that the future will bring, so that it can minimize the one and maximize the other...focuses on programs -- sets of interconnected projects directed at producing a desired future state...But the external environment in which an organization operates is beyond the planner's boundaries...principal tools are science, technology, and experimentation...Preactive planners look at the whole system and interpret a difficulty as a symptom of a systematic deficiency, not of an isolated part.
>
> (Ackoff, 1977)

This is like a mix of rational planning, simulation, and some creative problem-solving models. It probably characterizes most LEAs, although within this planning type there are several sublevels of sophistication. The third -- highest level -- of planning is interactive, in which the planner's approach is to "make it happen."

> ...conceives of planning as the design of a desirable future and the invention of ways to bring it about...tries to idealize, that is, do better in the future than the best that is conceived now...emphasizes organizational design and management...focuses

> on all three aspects of an organization -- the parts (but not separately), the whole, and the environment. Interactive planners focus on the interaction of the system and its environment. (Ackoff, 1977)

This is the type of planning reflected in open-systems theory. It is not common in educational organizations and yet is probably very appropriate given the extent to which those organizations are influenced by the environment.

Plans vs. Planning. It is useful to recognize the difference between the process of planning and the written product. Much of the foregoing discussion relates to the process. However, LEAs respond to SEA planning requirements by producing a written plan, which is often designed (sometimes in detail) by the SEA. That written outline is an operating reality but should not necessarily dictate the process followed. In other words, it is not useful for an LEA planner to begin planning by starting on page one of the SEA plan and systematically filling in the blanks. The purpose of the paper product is to inform the SEA of local intentions relating to the use of external resources, and/or the "when and what" of actions relating to external mandates. The purpose of the planning process is to create a shared image for action acceptable across LEA divisions and hierarchies. A single individual can inform the SEA, taking a few hours to fill out the forms. A task force with subgroups must work much longer and employ many techniques to create the image for action which will be summarized on the SEA forms.

Assuming that the LEA is prepared to engage in such a process of planning, it is useful to review an example. For an extremely comprehensive set of process guidelines reflecting Ackoff's second level, the

reader is referred to Cummings and Cook (1973). The one offered here is based on the open systems approach, reflects Ackoff's third level, and is used widely in industry.

1. Define the "realistic ideal" -- get a consensus image of what the successful project looks like at a given point in time (6 months, a year, 3 years in the future).
   - Involve competent people who will be responsible for carrying out the change.
   - Encourage holistic thinking, avoiding implementation details and concerns, with everyone working at the same level of detail.
   - Aim for an 80% level of accuracy.
   - Expect to spent 50-60% of available planning time on this step.

2. Define the present system -- share understandings of existing realities (technology, culture, politics).
   - Involve experienced people from different levels and departments (nobody understands the whole system, but each understands his/her own part).
   - Recognize that the present system is your competition: the planned change must be better in order to survive.
   - Don't underestimate the power of the present system, no matter how failure-prone it appears to be.

3. Map the environment -- answer: Whose support is needed to bring about the realistic ideal? Who can sabotage the project's implementation?
   - List domains (e.g., SEA, parents/community, teachers, special ed.).
   - Prioritize in terms of power to influence your project.
   - Select the top 20% of the domains for step 4.

4. Detail task responsibilities -- for each interest group or individual, imagine you are saying "We want you to continue doing a good job on your regular activities, but for this effort, we'd like you to ..."
   - Work through each domain, identifying specific responsibilities for all levels within a domain.
   - State what you need, not how it should be done.
   - Display all task lists. Identify and resolve overlapping responsibilities and inconsistencies.

5. Analyze domain perspectives -- for each domain, identify costs and benefits related to the project.
   - Rate awareness of the project for each domain on a 1 to 10 scale (1 = knows nothing, 10 = knows as much as we do).

- For each domain, assuming they rated high, estimate reactions: hate it = few benefits, high costs; neutral = minimal benefits and costs; conflict = high benefits, high costs; love it = few costs, high benefits.
- identify specific costs and benefits from the domains' perspectives in order to identify the "problem domains" -- those who will benefit least and therefore feel most threatened by the planned change.

6. Consider strategies for problem domains -- decide how to deal with problem domains by answering:
   - Can we afford to ignore them? What are the consequences?
   - Neutral is enough: can we move them to that level?
   - Can we buffer them from the project? How?
   - The basic choice is always between changing the project to accommodate the organization, or changing the organization to accommodate the project with the latter taking more energy. Which do we do?

7. Conduct action planning -- produce a comprehensive written plan with all or appropriate parts available to all affected by the project. (Since the action plan includes not only project tasks but also strategies -- possibly political -- some parts may not necessarily be useful to everyone.)
   - Apply your favorite techniques/formats, e.g.,
     a. Brainstorm major action steps
     b. Ask individuals to sequence the steps into phases
     c. Agree on a common time line and/or strategy
     d. Detail each action step/task
     e. List group and/or individual responsibilities for each action step or task, indicating timelines
     f. Set a starting data, and begin.

(based on English, 1981)

It should be noted that the approach outlined above cannot be used effectively by a team of senior managers working alone, but requires involvement of the people who will carry out the planned change. It should also be noted that equal (or more) attention is paid to the system -- its culture and politics -- as to the task technology of the planned change. This is a deliberate acknowledgement of the fact that organizations are socio-technical systems with the greater control held by the "socio-" part -- the people, individually and in groups who can make or

break a plan, during its design or its implementation. Barriers, facilitators, and steps relating to the open systms approach are summarized in Table 8.

Educators act on a continuum from quick individual decisions, through crisis management by committee, to comprehensive participatory planning and implementation. For systematic instructional improvement, the latter is probably essential if only because complex change requires sophisticated coordination processes.

Inter-Agency Coordination

In the foregoing discussion, references are made to interactions among schools, LEAs, the SEA, and federal agencies. Mention is made of mandated and funding allocations. Involvement of external facilitators or liaisons is advocated. All relate to the statements at the beginning of this chapter which put LEAs in the middle of several organizations or systems. Whether they like it or not LEAs must interact with those other organizations -- using energy either to maintain their own territory or to coordinate efforts. Traditionally they have been perceived at a hierarchical level between schools and SEAs (and/or intermediate units in some states). They have supposedly cooperated or complied with SEA recommendations and in turn expected cooperation and compliance from schools.

This perspective loses credibility in light of research on planned change which clearly indicates that each "level" is an organization in its own right with a high degree of autonomy. Also, the perspective is not desirable if resources (funds, person time and energy) are spent in

Table 8

Planning:
Barriers, Facilitators, and Steps of the Open Systems Approach

Barriers	Facilitators	Open Systems Approach
• lack of understanding by the external agency of local circumstances • conflict of interest • poor internal/external communication • poor timing • organizational weakness or lack of expertise • short-term perspective	• active participation by teachers, school and LEA admininstrators • direction of tasks by a cross-level team • coordination by the assistant superintendent • use of a work plan and schedule • good use of time and other resources • functioning of external consultant as advisor (not director) • goal congruence reflecting real local need • communication across levels • productivity: staff training, documentation, systems analysis of problems, teachers's respect for administrators' expertise, commitment, ability to resolve conflicts	• define the realistic ideal involving cross-level team and drawing on relevant research • define the present system by mapping existing curriculum, resources, and instructional processes • map the environment; identify supporters and saboteurs • detail task responsibilities for all staff levels • analyze perspectives, e.g., "turf" threats • strategize re negotiation, resource allocation, staff development, etc. • finalize action plan and develop written product

"spinning wheels" -- a frustrating exercise with no forward movement that increases the interorganizational friction and the risks inherent in competition for a non-existent reward.

> The alternative is coordination which...is founded on willingness to align one's own purposes with those of diverse others and to negotiate mutually acceptable compromises rather than always trying to coerce and dominate to get one's own way...requires a conceptual strategy for problem-solving.
>
> (Trist, 1978, p.331)

For the purpose of instructional improvement, coordination could mean mutual commitment to a selected few priorities, with the SEA identifying (and offering resources for implementation) various products, programs, or processes to attack those priorities; the LEA working with schools to identify related needs; and then the schools, LEA, and SEA negotiating who does what to bring about improvement. An example of this process is Maryland's School Improvement Through Instructional Process (SITIP) project. The state conducted four orientation conferences on: Mastery Learning, Active Teaching, Teaching Variables, and Student Team Learning, with presentations made by the developer/researcher of each process. LEAs selected one or more the processes to meet a local need, and made commitment for two years of implementation supported by grants, training and technical assistance provided by the SEA. Of the 24 LEAs, 19 submitted plans and in most cases, predictive data indicated that implementation was likely to be successful (Buttram, et al., 1981). As implementation progressed, interorganizational groups formed, worked together on specific tasks or problems, then returned to their own sites. These work groups

are referred to in organizational literature as action sets. They do not simply coordinate their activities, but actually work together in collaboration.

A synthesis of the literature on collaboration results in a set of propositions which may serve as a basis for discussion to determine the "ground rules" of coordination.

- Tasks: collaboration is unlikely when a trainer/trainee relationship is established or when action set members work separately to develop components of a set of materials. (The former is an example of cooperation and the latter of task coordination.) Tasks requiring use of complimentary skills, a problem-solving orientation, and clearly defined desired outcomes provide good opportunities for collaboration.

- Resources: staff time is the most crucial resource, followed closely by a need for expertise in working productively with other people.

- Goals: participants need to share a common generalizable goal (e.g., school improvement, cost-effective production) and each organization needs its own goal that is directly related to the collaborative effort (e.g., membership in a consortium, an expanded program).

- Motivation/commitment: effective strategies to build commitment include: 1) balancing the tensions of survival and growth; 2) establishing early successes and publicizing them; 3) involving staff of all levels meaningfully; and 4) identifying and tapping specific motivators.

- Communication: lateral and hierarchical patterns, formal and informal methods, and written and oral forms of communication must all exist. Mutual problem-solving rather than accountability helps to encourage timely information-sharing.

- Interdependence: within action sets members must demonstrate mutual respect, recognizing that each alone could not accomplish the task as well as the set working together.

- Interagency intelligence: each organization and action set must learn about the interests, capabilities, and operating constraints of others involved, and either work within those bounds or find cost-effective ways to resolve perceived problems in order to accomplish the specified task.

- Internal coordination: if interorganization collaboration is to occur, intraorganization coordination is crucial.

- Equity of rewards: each organization or action set member must believe that rewards received are worth the effort expanded.

- Double wins: if an activity or product serves several purposes its value increases and individuals, persuaded that collaboration is advantageous, demonstrate a greater professionalism.

- Leadership: each organization designates a coodinator, who, like a minister without portfolio, is responsibile for coordination but does not have the traditional authority to command participation, and therefore needs to be able to tap individual motivation, maneuver within the system, and deal with political pressures.

- Individual incentives: when participation cannot be commanded nor purchased, the greatest force for success is individual motivation.

- Collaboration: the uniqueness of collaboration (and some forms of coordination) rests on the following: interdependence, multidirectional communication, and leadership that does not rely on resource or position power but on the ability to balance tensions between innovation and the status quo.

LEAs engaged in systematic instructional improvement in coordination with the needs and recommendations of other organizations and interest groups may consider the following: all educational "levels" have the same overall goal -- to improve student achievement; schools are closest to the technical delivery to attain that goal; LEAs are in the best position to mangage integration -- motivate and coordinate; SEAs have in institutional responsibility to promote consensus on values that legitimate efforts to attain the goal; all three "levels" are involved in adaptation -- balancing organizational and environmental pressures; current environmental pressures include reduction of funding allocations which could lead to careful data-based decision-making, planning, and coordination for instructional improvement.

V. STATE EDUCATION AGENCY EFFORTS

State Education Agencies (SEAs) have the overall responsibility for education within the state. Headed by a Chief State School Officer (CSSO), who may be elected or appointed, they are organizations in their own right -- with their own technology, culture, politics and structure -- and they are also part of the state-wide educational system, influenced by other parts of that system, by the general public, and by the federal government. The one area of responsibility relevant to this chapter is instructional improvement, and more particularly the use of a sound knowledge base in improving and maintaining an effective instructional program. The topics addressed are:

- State dissemination programs
- Data bases for decision-making
- Local responses to state and federal initiatives
- Supporting local implementation
- Leadership and coordination

State Dissemination Programs

SEAs proposing to design or support instructional improvement systems can learn from the experience of state dissemination programs. This section describes such programs and their information, linkage and management efforts.

Three activities, referred to as information resources, linkage and management, were identified by the National Institute of Education (NIE) and formed the basis of the State Dissemination Grants Programs initiated

in 1975.* This program awards State Capacity Building Project (SCBP) grants averaging $100,000 a year for up to four years per state, and special purpose grants of $25,000 to $37,000 for single year training, planning, or specific development efforts. SCBP grants were awarded in "waves" to cohorts of states, with 10 funded in Cohort I, 14 in Cohort II, six in Cohort III, and four in Cohort IV (1978). Since then a fifth cohort has been funded. Comprehensive data are available on the first three cohorts, and some on Cohort IV (which included Pennsylvania and Maryland). These data were collected and reported by NTS, in a series of publications (e.g., Madey, 1979; Royster & Madey, 1980). Highlights from those studies are presented here.

NIE required each SCBP to build information resources, "a full range of resources including data, documents, products, and technical expertise;" to provide a "means of linking the client group to the resource base;" and to provide "leadership and arrangements which facilitate provision of services on any problem to all members of the client group." Projects were allowed to begin with a specific clientele (e.g., LEA superintendents), a specific topic (e.g., pre-packaged information on basic skills), or an information focus (i.e., little attention to technical assistance), but over the period of the grant they were supposed to achieve a "generalized dissemination capacity which promotes equality of educational opportunity" -- everything for everybody. Recognizing the differences between states, NIE allowed a certain amount of flexibility in how the goals were achieved.

*In Maryland, the SCBP program is Project LIFE (Library Information Functional Exchange) funded in 1978, and administered by the library/media services division of MSDE.

Information Resources

In most cases the information resources included access to ERIC and similar computerized data bases, to fugitive documents such as research papers, pre-packaged information (often developed by SEA staff), other research information files, promising educational programs (usually through the State Facilitator of the National Diffusion Network, and the IVc program), and curriculum materials (including audio-visuals). In some cases SCBPs also provided information on legislation, managed a "talent bank" (human resource file), and -- within the SEA--established a management information system related to their information resources and the management needs of SEA divisions (e.g., computerized cross-referenced files of LEA state or federally funded programs described on a set of common dimensions).

Information resource bases were located in the SEA in all 29 states studied. In addition, 12 states housed some resources in intermediate service or other agencies. In 16 states no fee was charged for services, four states provided services on a subscription basis, and the rest charged for some services or to some clients.

Linkage

Methods of delivery were to some extent determined by the size and organizational structure of each state. In large states (e.g., Alaska), highly populated states (e.g., New York), and in states with established regional units (e.g., Illinois) field agents--linkers--negotiated client needs and channelled information to and from the SCBP resource base. In small states (e.g., Delaware), and diverse others (e.g., Arizona,

Kentucky), clients accessed information by contacting the SEA resource base directly. Linkers and staff at the resource base applied information science search and retrieval strategies to identify, screen (and sometimes synthesize) materials to respond to client needs. They also distributed packages on "hot topics" relating to state priorities. Linkage systems were supposed to be based on NIE's four-level definition of dissemination:

- spread: the one-way communication of knowledge in a variety of forms, e.g., materials, ideas
- exchange: the two-way flow of information relating to needs, problems, and potential solutions
- choice: the rational consideration of products and processes based on R&D outcomes, and selection of viable alternatives to improve education
- implementation: the facilitation of adoption.

Information linkage related to spread and exchange, sometimes encouraged choice, and reflected a traditional approach to dissemination -- that of distribution or marketing. In order for the implementation level to be addressed, technical assistance linkage was necessary. All but five of the 29 states studied claim that implementation was addressed, often by LEA or SEA instruction division staff on an "as needed" basis. In all projects except one, some form of linker training was provided. In addition to personal contacts, SCBPs communicated through: 1) targeted mechanisms such as newsletters or "hot topic" packages (25 states); 2) mass media advertising of services (17 states); and 3) computer-based systems in which clients accessed the resource base by using a computer terminal or other form of telecommunication (five states, with Alaska and Minnesota probably the most sophisticated).

Leadership

NIE encouraged placement of SCBPs so that the project director would be in "an advantageous position to arrange, coordinate, and facilitate cooperation across the divisional lines within the agency." Five projects had directors at the second tier of the SFA hierarchy, reporting directly to the CSSO; most (14) were located at the third level; seven were at level four, and two at level five. In three states project directors were assisted by part or full-time co-directors; ten states had full time managers; one had a part time manager; in the remaining fifteen states the directors also managed the project. Size of project (professional and support) ranged from a high of 20 (South Carolina) to a low of 1.75 (Utah). The most frequent size was 3.5 staff. (In all cases staff involved with project activities as part of their existing responsibilities are not considered project staff.) Projects were placed in administration (10), service (12), or research/planning/evaluation (7) divisions (at the time of data collection). In some cases projects began in research/planning divisions then moved to service divisions. A majority (22) of projects had advisory groups. All projects use some form of needs sensing to guide planning and decision-making. All but one state conducted on-going evaluation efforts, using SEA evaluation staff, project staff, or external contractors.

Findings

The NTS study findings are summarized by Royster and Madey (1981): 1) information resources in SEAs have been expanded "primarily in the areas of promising practices and other state and local information files"; 2) "states

have modified existing arrangements to develop the capacity for the delivery of information to clients through "linkers" who function as information brokers"; 3) coordination for dissemination in SEAs has improved between programs such as NDN and Title IV, but not between the SCBPs and content-specific programs such as special education or basic skills; 4) much depends on the energy and ability of the project director; 5) placement in administration facilitated coordination; placement in a service unit facilitated service delivery to clients and project institutionalization; 6) there were no significant relationships between SCBPs and statewide school improvement efforts, possibly because program objectives did not specify such linkage.

The foregoing discussion is written in the past tense, not because NIE's program has ended but because funding has ended for states in Cohorts I and II and is reduced for the remainder, and in many cases projects have ended or evolved so that they are no longer as they were when described in the 1979 and 1980 reports (see McLaughlin, 1981). Perhaps providing "everything to everybody," following the federal emphasis on equity was too ambitious. Perhaps the concept of dissemination was --for practitioners --a passive combined image of a library and a distribution center, when NIE had hoped to put research into practice at all levels of the educational system through an active network of in-person linkers. Perhaps the cultural and political norms forced projects to change, allowing information linkage but discouraging or diffusing technical assistance. Perhaps the lack of relationship to major state priorities made it difficult for projects to prove their value. It is interesting to note that states

funded more recently have learned from others' experience and been less ambitions within NIE's guidelines.

Data-Bases for Decision-Making

Chapters Two and Three of this paper summarize current relevant research--some of the knowledge bases for instructional improvement. Chapter Four discusses sources and factors influencing knowledge use. Here, factors directly relevant to SEAs are added to those discussions.

Sources of Information

If the purpose of SEA activities is instructional improvement, data-bases accessed by SCBPs are the obvious first source of information. Computerized systems include access to: ERIC, dissertation and journal abstracts, the national promising practices file maintained by Bibliographic Retrieval Services (BRS), the inter-state network (Spin-spif) also maintained by BRS, the national talent bank of individuals and agencies maintained by the Resource Referral Service of the R&D Exchange, and various in-state files. Manual systems and human networks expand access to virtually unlimited information. The search, retrieval, and screening capabilities of information science staff are fairly sophisticated, with most able to provide an annotated bibliography or literature review of 10 to 20 selected references in a 5 to 10 day turnaround time (Roberts, 1979). If the SCBP maintains a talent bank, SEA staff can also identify individuals and agencies with particular expertise to assist in problem solving. Also, it is the responsibility of the SCBP to keep informed about all major dissemination activities within a state (e.g., the National Diffusion Network, Title IV), and to maintain communication with

the Regional Exchange* in order to keep abreast of regional and national developments in relevant research and school improvement.

Accessing Information

To a certain extent a SCBP can be proactive, inviting SEA staff to use its services, offering to provide materials in support of conferences or workshops, initiating a tailored monitoring or journal highlights system or managing information resource files. However, much of the time SCBP staff are reactive: they respond to requests from LEA and SEA staff who may or may not know what they need. During negotiation SCBP staff may suggest that certain limits be put on an information search task. They may also ask a series of questions designed to help clarify what is needed. SEA staff provide the answers, which are often fuzzy or unrealistic, resulting in an over-whelming amount of information with marginal usefulness.

If SEA staff are to use research-based information to guide major instructional improvement efforts they need to understand what is available, how it can be accessed, and how it can be selected so that the quantity is manageable and the quality relevant. They also need to know that the organization expects them to draw on sound knowledge bases and that "good ideas" and "personal experience" are not sufficient--if indeed the SEA advocates such behavior. The alternative--if it is not feasible to require all staff to access and use research-based information--is for the SEA to provide knowledge syntheses on priority topics once or twice a year

*All states are served by a Regional Exchange, funded by NIE to support statewide school improvement and dissemination efforts by providing R&D-based information, training, and technical assistance.

and use them not just for "required reading" but for work in progress and professional development.

Collecting Data from Local Systems

In addition to the data-bases accessed by the SCBPs, SEAs should also use test results and program evaluation data supplied by LEAs or generated in state data gathering activities. Bearing in mind that the purpose is instructional improvement, and recognizing that information submitted to the SEA is almost always in response to questions or requirements designed by the SEA, the task is to determine the most relevant areas and begin data collection there.

To begin with, there are two key questions: 1) what are students achieving? and 2) what curricula and instruction are provided? If there is curriculum alignment (a match between objectives, instruction, and test items) and student achievement scores are low, data should then be collected on the other variables found to have the highest impact on achievement (e.g., in the classroom -- time-on-task, prior learning, and success rate; from a school perspective -- teacher/principal decision-making, school focus on academic achievement, common high expectations on achievement and behavior, common discipline code, high proportion of students holding positions of responsibility etc.). Whether data are collected formally or informally, SEA staff should understand and act upon the results. It is not desirable for SEA staff to "best guess" cause-and-effect relationships or recommend a "neat idea" for improvement. The strength of the evidence on the impact of the key classroom variables is such that only after they have been dealt with appropriately is it worth attending to less strong

factors such as questioning techniques or enrichment activities like field trips.

Previous chapters of this paper address other issues related to data-based decisions, many of which are relevant to SEAs. In particular, the discussion of organizational culture, technology, and politics in Chapter Four is highly relevant to SEA activity. For if instructional improvement efforts are to be cohesive and systematic, the culture and politics of the SEA must be supportive of a highly coordinated system to ensure a standard quality of decision-making.

Local Responses to State and Federal Initiatives

If systematic instructional improvement is the goal, planning must take into account the perspectives of each part of the system. It cannot be assumed that federal mandates will be interpreted and carried out the same way by all states and districts: neither will all districts perceive state guidelines as favorable. The discussion below reviews some of the research on local responses to external programs and identifies some implications for SEA efforts.

In a study of school and district interaction, most of the information required by the district was related to state and federal programs and "nowhere did we find any evidence that these data were used to inform or improve the production process" (Hannaway & Sproull, 1979). (The production process is defined as student learning.) On average, principals spent 21% of their time on district-related tasks, and 90% of that time was not related to instructional program issues. Central office staff spent less

than 10% of their time on tasks initiated by school staff, of which 3% related to curriculum.

In a study of the work of district superintendents, paperwork was identified as most disliked, "often seen as unnecessary busy work carried out to conform to rules or regulations" (Willower & Fraser, 1980). In the same study the area most perceived as beyond the control of the superintendents was state and federal mandates.

In a federal experimental schools project (Kirst, 1977) and a study of participatory planning (Firestone, 1977), it was found that barriers to successful implementation occur when the interests of the local system conflict with those of the external group (state or federal) and when communication and understanding between the groups are inadequate.

Findings such as these illustrate that: 1) LEAs are indeed open systems strongly influenced by state and federal pressures; 2) local superintendents perceive such influence as beyond their control; 3) district staff in turn influence school staff by requiring them to provide information on state and federal program activities; 4) conflict of interest and poor communication are not uncommon; 5) local educators dislike the related paperwork; and 6) data generated or provided for compliance or accountability are not used to influence program improvement. It is highly probable that where these findings occur the external agency has perceived the local system as relatively powerless and rational, and has established rules and procedures for planning and implementation which might be appropriate for a bureaucracy in a stable environment, but may well be inappropriate for a loose-coupled system in a changing environment.

Reactions of LEAs fall into two categories -- opportunistic and problem-solving (Emrick & Peterson, 1978, p.14). The former collect the federal funds, giving lip-service to the regulations, but making no real improvements to their programs. The latter identify a real local task or need and attack it using federal funds. In both cases the external rules (e.g., planning requirements) are followed, but it is the internal system that determines the real activity and impact of resources.

The two patterns of reaction are found in such programs as Right to Read, Vocational Education 1968 Amendments Part D, ESEA Title III and VII (Berman, et al., 1974-1977) and in Special Education (Weatherly & Lipsky, 1977). However, not all federally initiated programs are the same.

> The major federal approach used to support school improvement has been a combination of direct fiscal support through formula fundings of various types combined with legislation and regulations that require many, if not most, districts to make changes in their curriculum, staffing, use of time, facilities, and othe areas of school functioning, if they are to receive federal funds. The RDU strategy (Research and Development Utilization)...looked quite different from this: it emphasized voluntary involvement, offered small amounts of seed money funding, and put a mojor emphasis on providing both technological and process/human support that would be responsive to locally defined needs.
> (Louis & Rosenblum, 1981, p.1-2)

In all cases, LEAs spend time and effort on planning, documentation, and implementation of some kind, but cost-effectiveness varies. Also, when the external plan demands staff time already allocated to a different local plan, coping behaviors become apparnt and impact of both or either plan is low (Weatherly & Lipsky, 1977).

The question of the relative contributions or influence of local and external systems on a program improvement effort is addressed in the study

of the Research and Development Utilization (RDU) Program (Chabotar, Louis, & Sjogren, 1981). It was found that inkind contributions asveraged 80% of total costs -- cash value of staff time spent without compensation in problem-solving meetings, workshops, and materials development sessions. The federal contribution ranged between $1,000 and $8,000 per school for 300 schools across the country. Externally imposed requirements included: application of a rational approach to problem-solving, focus on a locally identified need, consideration of products and processes with a research and development (R&D) basis, and involvement of an external "linker" (person providing technical assistance). Schools and districts were not required to submit or develop compliance plans. Overall, results were very positive, e.g., 68% teachers reported curriculum improvement; 46% reported improved classroom management practices; most principals reported that changes were formally incorporated into the instructional program, and R&D resources would continue to be considered in solving local problems. (Louis & Rosenblum, 1981).

Several features of the federl RDU program are incorporated in a state program -- Maryland's Project Basic. Both rely heavily on in-person assistance to local sites by linkers/facilitators; both advocate local capacity building and use of a sound (R&D) knowledge base; both expect local educators to apply problem-solving behaviors for instructional improvement; both present frameworks but not prescriptions for action. Maryland LEAs were required to submit plans, following a framework developed by a task force of state and local representatives. The one absolute requirement from the state education agency (SEA) to LEAs in the first year of implementation

was a curriculum/competency match (K-12 analysis to determine where state-mandated competencies are taught in local curricula), to be followed by verification of instruction, with program development if necessary. In the curricula/competency match task and in the general involement in this competency-based education program, LEAs had no choice as to whether they would comply, but only in how they would meet the requirements. The in-person on-site assistance provided by the SEA was found to be crucial for local implementation (and not simply lip-service) to occur.

> ...the facilitator role had developed a local orientation, with task variations occurring to meet the differing needs of the districts. A high degree of trust had been developed between facilitators and their LEAs; their reliability was appreciated and their responsiveness to local needs was acknowledged.
>
> (Mann, et al., 1981, p.32)

Differences between acceptable/successful and unpopular/unsuccessful externally initiated efforts appear to relate not to the extent of external influence but to the nature of that influence as perceived by the local systems. The following appear to be favorable: allowance for variation among LEAs, local need orientation, coordination of resources and support (by the SEA), in-person assistance, and clearly understood purpose and framework for action (Louis & Rosenblum, 1981; Mann, et al., 1981; Weatherly & Lipski, 1977).

There is strong evidence indicating that the major influence on success of a planned change is the extent of local commitment, which is most likely to be apparent when external influences are perceived to match local priorities. Since this is true it must be recognized that external groups such as state and federal agencies can influence but cannot control

local education agencies. Thus, an imag of LEAs as part of a single state bureaucracy is a mirage.

An SEA may analyze the LEAs in that state to determine whether organizational behavior is bureaucratic or loosely coupled or a mix of both modes within single local systems or across the state. There are implications for action in any case, particularly in light of federal deregulation and general reductions in funding currently being experienced in education.

Planning for Blotk Grants, the new Chapters I and II of federal educational funding, can create opportunities or burdens. Title I will probably stimulate territorial planning, but Chapter II could become a mechanism for coordination and a local problem-solving orientation to instructional improvement. The control is local: LEAs are evaluated against their own criteria according to their own plans. However, the federal influence is set in the guidelines, and state influence will be apparent in the interpretation of those guidelines. It would seem that states perceiving local practitioners as rational and relatively powerless operating by rules and procedures, are likely to perpetrate the status quo. States perceiving rational and autonomous practitioners, using negotiation and feedback within a flexible framework are likely to see more improvement but considerable variation between LEAs. States perceiving local autonomy, using negotation within a flexible framework and providing quality inperson on-site assistance, may encourage rational planning leading to more consistent program improvement.

Current trends clearly indicate reduced federal influence on local systems. SEAs must now determine their legal and fiscal responsibility for

federal and state recommendations. They must also determine desirable and feasible mechanisms and behaviors not simply to maintain the educational system but to support instructional improvement -- preferably involving LEAs in decision-making. In turn, LEAs accessing state and federal funds have to accwept the given guidelines which call for a systematic approach to planning and implementation.

Supporting Local Implementation*

There is a great deal of evidence to indicate that federal or state efforts to support school improvement require in-person assistance to local sites. This section of this chapter discusses technical assistance and relevant research; outlines the roles and characteristics and activities of people providing technical assistance, and discusses the organization and maintenance of an assistance system.

Technical Assistance

Technical assistance in educational settings, most generally defined, is a process of providing the best available information, guidance and help, in an appropriate time and manner, in order to increase the effectiveness of local educational practice. It involves an in-person relationship between a helper, and a help-needing system or individual. The helper, usually external to the local system, provides assistance to the client in addressing some current needs or priorities.

*This section of this chapter is adapted from Rosenblum (1982).

Recognition of the importance of technical assistance can be traced to the growing knowledge base on how -- and why -- implementation of new programs and educational change do or do not occur. This knowledge base has evolved from studies of a variety of efforts to promote educational improvement, each of which was based on a particular perspective or model of change (see Table 3).

Each of these perspectives of change has some underlying validity. Mandates and regulations are often necessary to promote change; new technology, innovations and information can be usefully transferred to other settings; contextual conditions can be barriers or determinants of local change. How can these various perspectives be integrated? An approach to change that has attempted to meld and build on the other perspectives has been referred to as the linkage model. One feature of the linkage model is that it involves local educators in defining the need or problem that requires information or assistance. Another main feature is the involvement of an individual, usually from outside the local school system, (frequently called a field agent, linking agent, or facilitator) who can assist in the local school improvement process by assessing and understanding the local internal processes and conditions that characterize the system, helping foster conditions amenable to change (and the program mandate, if there is one), and linking the local staff to appropriate resources and information from outside the system that can solve local needs. Thus, the development of the linkage model can be seen as the precursor of technical assistance, as described in this paper.

Relevant Research

Recent research on dissemination and educational change programs, representing various perspectives on how to promote change, underscore the important contributions that external assistors can make. Some of the important studies are the following.

- Federal Programs Supporting Change (often referred to as the Rand Change Agent Study); (Berman, et al., 1978)
- The Title I Demonstration Study (Vanceko and Ames, 1980)
- Evaluation of Project Information Packages (Stearns and Norwood, 1977)
- Evaluation of The Pilot State Demonstration Project (Sieber, et al.,1972)
- Evaluation of the National Diffusion Network (NDN) (Emrick, et al.,1977)
- Study of the State Capacity Building Program (Madey and Royster, 1981)
- A Study of Technical Assistance Groups (TAG); (Moore, et al., 1977)
- A Study of Rural Experimental Schools Programs (Rosenblum and Louis, 1981)
- A Study of the R&D Utilization Program (RDU) (Louis, et al., 1981).

Table 9 presents a summary chart of the studies, perspectives, prominance of technical assistance roles, and relevant study findings.

What has been learned from these and other studies about the importance of technical assistance for each perspective of change? First of all, the regulatory approach, as frequently implemented, has been found to fall short of achieving desired program impacts. Monitoring of federal and state programs has tended to concentrate on whether funds have been used properly, and not whether they have been used effectively. Reseachers have

Table 9

A Summary of Major Studies on Educational Change and Dissemination: The Importance of Assistance Roles

Study	Perspective of Change	Focus of Program	External Assistance Role/ Intensity of Involvement	Relevant Findings
Federal Programs Supporting Change (Berman & McLaughlin, 1978)	Somewhat Regulatory/ Technological	Study of effectiveness of several Federal programs	Ad-hoc consulting/low	Institutional setting dominates change process; systematic external assistance may be needed; recommends increased SEA role
Study of Title I Demonstration (Vanecko & Ames, 1980)	Regulatory	Provides funds and regulations for compensatory education	Ad-hoc consulting and compliance monitoring/ low	Compliance not necessarily associated with effectiveness; technical assistance needed
Evaluation of Project Information Packages (Stearns & Norwood, 1977)	Technological	Dissemination of packaged exemplary programs	none or little	Adoption/implementation rare without in-person assistance
Study of Pilot State Dissemination Program (Sieber, et al., 1972)	Technological and Linkage	Develop information bases, disseminate and promote use	Major role for educational field agents/moderate, high	Continuous involvement of generalist linker strongly associated with information use
Evaluation of National Diffusion Network (NDN) (Emrick, et al., 1977; Crandall, et al., 1981)	Technological and Linkage	Dissemination of exemplary programs	Assistance roles: facilitator and developer demonstrator/ moderate, low	External agent involvement associated with use and perceived benefits
Assistance Strategies of Six Groups that Facilitate Educational Change (Moore, et al., 1977)	Problem-Solving/ Context	Technical assistance groups for change at school/community level	Technical assistance teams/ moderate, high	Need for system mapping, client responsiveness, long-term involvement
Study of Rural Experimental Schools Program (Rosenblum & Louis, 1981)	Problem-Solving/ Context	5 years to plan and implement comprehensive change	Ad-hoc consulting/federal monitoring and assistance/ low	Change is manageable process, but local conditions dominate, locals don't necessarily have capacity to acquire needed technical assistance
Study of State Capacity Building Program (Royster & Nadey, 1981)	Technological/ Linkage	Build dissemination capacity, create state resource bases	Assistance roles varies by state; some major agent involvement/moderate, low	Some indications that use is enhanced with agent involvement
Study of the R&D Utilization Program (Louis, et al., 1981)	Technological/ Linking/Problem-Solving	Link research to practice, emphasis on external assistance and internal problem-solving process	Major role for field agents; high/moderate	Combination of products, assistance and internal process, strongly association with school change; intervention was more powerful than local conditions

noted that excessive attention to compliance does not insure success, and often overlooks the important question -- is the program actually working, or how can the program be made more effective (Elmore, 1980; Hill, 1978; Vanecko & Ames, 1980)? The desire to achieve programmatic results has often resulted in tougher regulations and more surveillance, with compliance becoming an end in itself, rather than a means to improve program performance.

On the other hand, local personnel have often demonstrated: resistance to change, limited capacity to detect their own program weaknesses (as in Title I), difficulties in implementing rigidly prescribed management practices (as in Right to Read), and limited capacity to seek appropriate outside expertise. Researchers have found that federal regulations matter less than local factors in producing change, and that local commitment to change, rather than needs for compliance, are what motivate school improvement (Berman, et. al., 1978, Vol. 8).

Since compliance monitoring may have little payoff in program performance, a strict focus on compliance with regulations and reporting requirements is increasingly becoming viewed as secondary to improving and supporting local capacity. Thus, providing support to local school staff, helping them clarify what they are trying to do, and connecting them with others who have expertise for providing specialized information and resources have come to be viewed as important state level responsibilities.

Research has also shown that close adherence to a straightforward technological approach, that is, simply making information available about

new products and practices is not likely to affect wide-spread adoption, implementation and "change-oriented" use. Program designers have tended to overestimate the willingness of local school districts to innovate, their awareness of the availability of information and resources, or their capacity to acquire and use the information or materials. Some form of personal intervention is necessary to generate interest among school personnel and to initiate and sustain change (Emrick & Peterson, 1978).

This is not to discount the importance of high qualilty information, products and materials. In fact, studies of school improvement programs, which promoted both the adoption and implementation of new practices and also provided in-person assistance in the school improvement effort (as for example, the R&D Utilization (RDU) Program, the Pilot State Dissemination Program, and the National Diffusion Network) found that the quality and availability of materials also play a central role in supporting and maintaining change.

It is useful to note that the Rand Change Agent Study concluded that externally developed innovations are rarely successfully implemented in local schools without local adaptation or locally-developed materials. However, in contrast, the Study of the R&D Utilization Program found that exemplary programs can be successfully adopted and implemented, and can produce desired impacts. This difference in outcome, however, was due to the technical assistance that the RDU program provided local schools to appropriately match new programs to their identified needs and local conditions. One can conclude from both studies that it is not just the

presence of in-person assistance that is important, but it is the type of assistance that is provided that may be critical.

From the perspective that change is largely influenced by contextual factors -- whether they be political, structural, or cultural -- there is also evidence that technical assistance can reduce barriers to change and promote an environment conducive to school improvement. The Study of the Rural Experimental Schools Program, The Rand Change Agent Study, and others, clearly demonstrated that there are many forces that promote status quo in schools and districts, even when extensive planned change efforts are underway. However, when such efforts have been accompanied by technical assistance (as in the Pilot State Dissemination Program, RDU, NDN, and those described in the TAG studies), school staff have responded to incentives created by social interaction with external agents. In all of these studies, local commitment to change and perceived local needs were found to be the most powerful predictors of change. Skilled providers of technical assistance can assess the local political and cultural conditions, develop strategies that are responsive to these local conditions, and help foster local involvement and commitment and capacity for change.

These major studies also concluded that educational performance could be improved if more attention were paid to all stages of the local change progress -- validating the importance of a problem-solving orientation. The studies emphasized, however, that both time and resources are needed to effect change, including fairly continuous involvement with external providers of assistance and training.

In sum, there is substantial research evidence that in-person technical assistance can greatly facilitate school improvement. An SEA planning to implement a system of technical assistance needs to determine the roles, characteristics, and activities of the individuals assigned, and to design effective management structures and behaviors for organization and maintenance of the system.

Roles, Characteristics and Activities

There are several forms which technical assistance can take described in the cumulative literature on educational field agents. These forms correspond somewhat to the different perspectives of changes and include the following:

- conducting activities associated with helping the change process, including assisting in planning and implementing new programs within the specific context, influencing broad participation in decision-making, analyzing problems and managing conflict (facilitator or process helper). This form reflects an adherence to the contextual perspective of change, and the importance of the problem-solving approach

- conducting activities associated with finding resources for clients, including collecting and organizing information, analyzing information, monitoring ideas (resource linker). This form provides process assistance for the technological perspective. More directive assistance for the technological perspective consists of activities associated with actually giving solutions (solution giver)

- conducting activities which may overlap with those described above, and which are more general, including acting as a catalyst of change, coordinator of activities, providing a communication link within the system, and between the local system and other levels in the educational hierarchy, and brokering resources (generalist coordinator).

There are many discussions as to the knowledge, skills, and attitudes that technical assistors should possess (e.g., Crandall, 1977; Mann, et al., 1981). An underlying assumption of these discussions is that in

order for technical assistance to be effective, the provider must be viewed as having relevant expertise; must have the necessary administrative and management skills, and must be able to convince local officials that the advice and assistance will be useful (Corwin, 1978). The provider must establish credibility and "entitlement" in the technical assistance role (Butler & Paisley, 1978). Thus, whether technical assistors are generalist coordinators, process helpers, or resource linkers, their activities must be grounded in knowledge and skills.

Technical assistors should possess knowledge in at least the following areas (Mann, et al., 1981; Moore, et al., 1977):

- knowledge about educational systems and how they operate, so that they can carefully assess the local context, its social, political and cultural conditions, and determine the most appropriate strategies for intervention
- knowledge about the program context (if applicable), so that the program parameters and guidelines can be adhered to, while at the same time, not be viewed as obstacles to the primary goal of program impact and school improvement
- knowledge about information sources and resource bases, so that the best available technology can be applied in the local setting.

Leadership and process skills have also been found to be particularly important for technical assistance providers, including (Mann, et al., 1981; Louis, Kell & Young, 1981):

- communication skills (clarifying issues, being assertive)
- problem-solving skills based on knowledge of the steps in the problem-solving process (helping to identify problems, suggesting alternatives, initiating appropriate action, evaluating adjustments to unpredictable changes.
- interpersonal relations skills (gaining entry and building trust, understanding the internal system and working within the power structure)

- leadership/management skills (supporting cooperation and collaboration, coordination, exercising adaptability and flexibility, facilitating sharing)
- perception skills (interpreting interpersonal dynamics, timing, perceiving need for clarification, intervening where appropriate).

There may be times in a local school improvement effort when content expertise is needed. A content expert is an individual with specialized skills in a particular curricular area, such as reading, science, or vocational education, or in relation to a specific innovation. Technical assistors cannot be expected to possess skills in all content areas. They should, however, have access to content expertise, in order to broker more specialized content-related technical assistance when needed. Multiple sources of assistance can be extremely important. The recently completed RDU study concluded that multiple sources of assistance, including specialized assistance for implementation by a content specialist, was strongly associated with program success (Louis, Rosenblum, & Molitar, 1981).

Individuals who provide technical assistance may have different attitudes and beliefs about how to make change happen. They may emphasize individual incentives, the need to consider the social structure of the school and how it might be altered through the introduction of innovations, or the need to understand and manipulate the power structure of the school. Most likely, effective assistors will at different time shift emphases, applying the one that is most appropriate in the local setting. However, research has shown that certain attitudes are associated with effective technical assistance. These include a willingness to be a "behind the

scenes" person so that local commitment and ownership can be fostered, and an attitude that technical assistance will work best if it is responsive to local needs and does not contradict the basic values of the local system (Louis, Kell, & Young, 1981; Madey, 1978).

Providing technical assistance for program development and school improvement requires an ongoing process and several steps may be involved. Not every provider/client relationship is exactly the same. In each situation, some steps may be more important than others, and some may not be necessary at all. While there is no "one best way", the following provides some guidelines for the steps that could be taken in providing technical assistance (based on Emrick & Peterson, 1978; Patrick, et al., 1981).

1. Establish relationship with client: Gaining entry
   Sometimes a client will ask for help, but often the external agent must be the initiator. The ways in which the assistor presents him/herself is an important step in building the trust that will be necessary to having a successful relationship. Sometimes this will involve describing one's own experience and interest, or displaying one's own skill and knowledge. But it is also important to listen, and to get a better sense of what the client's needs, interests and concerns are.

2. Learn about the context
   Schools are complex, and the formal and informal structures and sources of influence vary. Information should be gathered from multiple sources in order to really understand the system and its needs. Speaking to people at different levels in the system may also be important to building local ownership that is necessary for the success of any change effort.

3. Diagnose
   If there is a problem to be diagnosed, or a need to explore, it is important to include those who are the intended targets of the change. If the change is to involve teachers, then teachers should be included in problem identification and in looking forward to how their needs can be best addressed. If there is a committee or team within the district or school that is working on

the issue, the external person can help them clarify what they are about and foster collaboration. In some cased, this "process assistance" may be the major form of the technical assistance that is offered.

4. Assess resources
Sometimes the major step will be determining the additional information or assistance that the client needs, and to make known the sources and availability of such resources and assistance. The assistor may have to engage in a search for resources, or may be able to provide the solutions directly. Resources and assistance will, of course, vary depending on the stage in the process. It may entail a search for exemplary programs, a search for a content expert to provide training, or a specialist in evaluation.

5. Encourage necessary steps in program development or change
Schools sometimes overlook some of the most important steps in school improvement. For example, if a new curriculum or management system is planned, or if new materials are acquired, schools sometimes underestimate the importance of planning for implementation or pre-implementation training. Sometimes implementation is seen as the final step, which is also short-sighted. Evaluation, adaptation, supplementary training, etc. are often crucial to foster local ownership and for real impact to occur. Assistance with these steps can include encouragement, provision of information, linking clients with specialists, and so forth. Sometimes the technical assistor may become the trainer, per se at some of these steps, depending, of course, on expertise.

6. Be wary of over-involvement
A technical assistor can provide valuable information and services and these may be crucial to the success of a school improvement effort. But it is also necessary to be wary of over-involvement and too much dependency. This is so for several reasons. While outside assistance is important, local ownership and commitment are critical, and the external person must continually foster that guard against self-ownership of the effort. Furthermore, building local capacity may be the most valuable impact of a school improvement effort, something which may be handicapped by excessive dependency on external assistance. The process of change is slow and requires rather continuous attention and support, particularly at the early stages. But as local staff gain experience with new procedures, external support can be gradually withdrawn.

In sum, effective technical assistance for program development and school improvement includes the following basic characteristics:

- face-to-face interaction
- two-way communication
- client responsiveness
- assistance tailored to local needs
- strong process skills and existing knowledge of effective processes and information
- using existing capacity and skills within the client system and further developing capacity
- extended over a period of time
- rooted in the establishment of trust and credibility.

Organizing and Maintaining a Technical Assistance System*

There are a number of issues which need to be addressed in organizing and maintaining a technical assistance system within an SEA. These include role design, organizational design and logistics, and ongoing management issues. Some are dilemmas which SEA administrators continue to face since there are no clear-cut answers from research to resolve all the issues. Further, it is important to point out that each issue cannot be dealt with in isolation. Building and maintaining a technical assistance system is an interactive process. How one issue is resolved will influence decisions regarding the others. Some important issues that need to be considered are listed below, then each is discussed in turn.

- Structuring the role in terms of intensity and scope; i.e., Should a technical assistance provider serve few or many schools or districts? Can technical assistance be combined with other roles and functions?

*This discussion is based largely on: Clifford & Trohanis, 1980; Louis & Rosenblum, 1981; Mann, et al., 1981.

- Defining the role: What type of assistance should be provided?
- Defining the role: How formalized should the role definition be?
- What kinds of people should be selected for the role?
- In what types of organizations should agents be located?
- How should the system be managed? How much control or autonomy is appropriate?
- What are the appropriate communication structures for a technical assistance system?
- What about training or support systems for technical assistance providers?

Intensity. Research has shown that in order to be effective, field agents must establish trust and credibility, and must spend a lot of time on site. This may be difficult if potential clients are numerous and spread over a large geographic area. An important question therefore is, how many schools or district sites should be assigned to an agent providing technical assistance? Often, such decisions are based solely on numbers (cost and efficiency), with little consideration of the kind or amount of assistance needed locally. This narrowness is unfortunate, because the need to work with a large number of sites can reduce an external agent's effectiveness in situations where high involvement in particular stages of the change process is important. An increase in scope will compel the agent to decrease the time spent in follow-up activities that are critical to successful implementation. As a result, an agent's ability to provide effective technical assistance during implementation is greatly reduced if many clients must be served.

Scope. A related issue is whether individuals should be full-time field agents (that is, their entire job is to provide assistance to a number of assigned sites) or whether they should be assigned a few sites in addition to their other administrative or program responsibilities in the state agency. The RDU study concluded that the most effective agents were those who spent a major portion of their time in field agent roles.

Type of role. Defining the role in terms of the type of assistance that should be provided is likely to be heavily influenced by the kind of outcome the program is trying to achieve, and the prevailing views of change described earlier. Thus, for example, if one views the technological approach as important, the predominant form of technical assistance may be as resource linker or solution giver. If one holds strong views about the importance of the cultural or political context, then an emphasis on process helping might seem most crucial. These considerations need to be traded off, however, with cost and efficiency factors. Defining the role may be even more complicated if a strong regulatory view is held, and if the role is structured to combine both assistance and monitoring responsibilities. The authority of a program monitor is inherent in his/her formal position and the sanctions that may be applied. But for technical assistance to be accepted, local officials must be convinced that the provider has competence and expertise in the assistance role. Further, it is unclear whether a program monitor can establish the trust and credibility and provide the "help without threat" that is necessary for effective technical assistance. Field agents may also come to experience conflicting loyalties. As a successful technical assistor becomes involved with a

client system, he/she may adopt a more cultural perspective and realize that the real needs of the site may differ from the requirements of a program mandate and the agency's expectations.

Thus, while a variety of activities may be appropriate for technical assistors in different times and in different settings, an important policy question is -- can one person combine monitoring and assistance tasks? Research results suggest that if monitoring is required, the two roles should be separated, or the technical assistance is not likely to be very effective (e.g., Corwin, 1977; Firestone & Wilson, 1981).

Role definition. The technical assistance role has often been poorly explicated. On the one hand, this may have the advantage of allowing flexibility for role occupants, enabling them to structure their role according to their own views of change and the local needs of the client schools. On the other hand, defining the role very clearly may have the consequence of increasing the role conflict often experienced by field agents, since there may be conflicting expectations of what they should be doing in their host agencies and in the client sites. One possibility in resolving this issue of how far the agency should go in clearly defining the technical assistance role, is that it be a negotiated process, in which potential or actual role incumbents are involved in role definition and clarification. Such a job description should be sufficiently clear and detailed to provide guidelines to the agent, and sufficiently flexible to allow adaptability, when needed.

Selection. Current data do not support a "science of selection" for technical assistance roles. Many different kinds of individuals, having

different personalities or perspectives of change, have successfully carried out technical assistance activities. In the RDU study, the only personal characteristic that emerged as significant were agent experience and an ability to play a "behind the scenes" role. Such individuals must, however, have a high tolerance for ambiguity and uncertainty, and a level of independence. Individuals who need constant supervision may not be suitable for technical assistance roles.

Location. Some of the problems mentioned above, such as geographic dispersion of sites and the need for accessibility may be alleviated by locating or placing field agents in intermediate service agencies, local educational agencies or other organizations more proximate to client schools. Research has shown that often the most effective technical assistance can be delivered from such smaller, less complex, and easily accessible organizations. This raises the problem, however, of coordinating or managing the activities of field agents, especially if they are operating under the aegis of a state-mandated program. It also increases the complexity of the split loyalty problem, for the agent may then have allegiances and expectations of three organizations, the state, the intermediate agency and or district, the client schools.

Management. An important issue is how much control over technical assistance activities should be exerted by the state agency coordinator, and how much autonomy should be allowed for individuals delivering the service. This issue is of course influenced by the decision of where the field agents are located. (If agents are located in Intermediate Service Agencies or LEAs, the physical distance may militate against too much

control.) But the issue needs to be resolved on its own merits.

On the one hand, the field agent must be given sufficient autonomy to be client responsive and adapt the service to the local needs of the site. On the other hand, there may need to be assurances that the local activities are meeting the demands of the program mandate or of the technical assistance role as it has been defined. Furthermore, some field agents, especially inexperienced ones, may need more frequent supervision, or they may flounder in their role, increasing their sense of stress and marginality. Thus, the SEA coordinator must strike a delicate balance between control and autonomy in managing the technical assistance system, and

> take the initiative to ensure that members are brought together, that collegial relationships are formed, that information is exchanged, and so forth...The strong leader in this instance will behave as an idea broker and consultant rather than a source of firm and final decision.
> (Louis & Sieber, 1979, p.95)

Communication. Closely related to the issues of location and management is the issue of communication -- the structures that influence the flow of information, the mechanisms used, and the kind of messages transmitted and received. If the field agents are locally-based, the situation is more complex, and the needs are intensified.

> The dispersed client-centered organization appears to require an organizational structure that maximizes the flow of information between the various members rather than relying on rules and standard procedures.
> (Louis & Sieber, 1979, p.189)

This suggests a matrix management or network structure, encouraging information sharing rather than direction giving, and designed to meet the needs of individual members and management. For instance, field agents suffering role confusion or feelings of inadequacy may find the support and

influence of peers of greater importance than communication with a supervisor (Louis & Sieber, 1979, p.108). At the same time, the system coordinator needs up-to-date information and should not always wait for formal monthly reports. Therefore, both formal and informal mechanisms should be used, and opportunities provided for both vertical and lateral communication. Encouragement of laterial communication will reduce the burden on supervisors and expand the problem-solving capability of the system (Louis & Sieber, 1979; Pasmore, et al., 1978). Supervisors need to give immediate feedback so that field agents learn to be appropriately selective about information offered. There has to be mutual respect between the coordinator and field agents and recognition of the value of interactive communication about SEA priorities and relevant R&D knowledge base (often identified by the coordinator) and the priorities and operating realities of local systems (usually identified by the field agents).

Training. There is no clear evidence that the skills that are important for providers of technical assistance can be acquired completely through training. Successful assistors and facilitators of change learn much of their role while "doing," and through interacting with peers. This is especially so since the technical assistance role is often poorly defined. Furthermore, the ways in which an individual assistor carries out the role is influenced by background, experience, personality, and personal perspectives of change. However, some skills training is needed, as well as training which focuses on the organizational change process and on role

clarification. The latter can open up a variety of options for roles that agents can play on site. In general, training has been found to be most effective if it involves agents in designing the training.

Support. Some argue that support systems for field agents are even more important than formal training. Effective support systems include opportunities for sharing ideas and experiences with peers as well as supervisors (not only for information but for shared problem solving). It also includes having a general sense that the activities engaged in are considered important and valuable, both in their own agencies and by the staff of LEAs with which they work. In addition, there are more concrete support structures that are necessary for a technical assistance system. They include managerial support that is necessary to handle a wide range of activities or events, such as travel and purchasing. They also include content support, or access to materials, products, and recognized content expertise in areas in which the agent, or agency, is providing technical assistance.

Leadership and Coordination

It is assumed that the reader of this section has reviewed previous chapters and sections of this paper. In many instances discussions of organizational concepts are generalizable for schools, districts and SEAs. Also, the knowledge base of variables influencing instruction that can be controlled by individual teachers and school faculty is the substance for planned change coordinated or supported by LEAs and SEAs. This section does not repeat what has already been discussed, but examines the implications for SEA leadership.

A Process Model

The model presented as Figure 2 illustrates the dimensions of an effective organization.* When all dimensions are attended to a comprehensive plan may be developed or program implemented. Also, each circle represents a dimension in time, with a short timeframe being close to the center and longer time and greater impact being on the outer rim. For example, when an SEA makes decisions and acts by distributing knowledge and providing funding support, very little SEA time may be used and there may be little impact on LEAs receiving the information and funds (center circle). On the other hand, when there is coordinated planning with interactive communication to build shared perceptions among individuals to be involved in implementation, more time is taken, but there is greater impact (outer circle).

The remainder of this section uses the framework of the process model to explore alternatives for organizations developing and maintaining an instructional support system.

Politics: Linking Processes

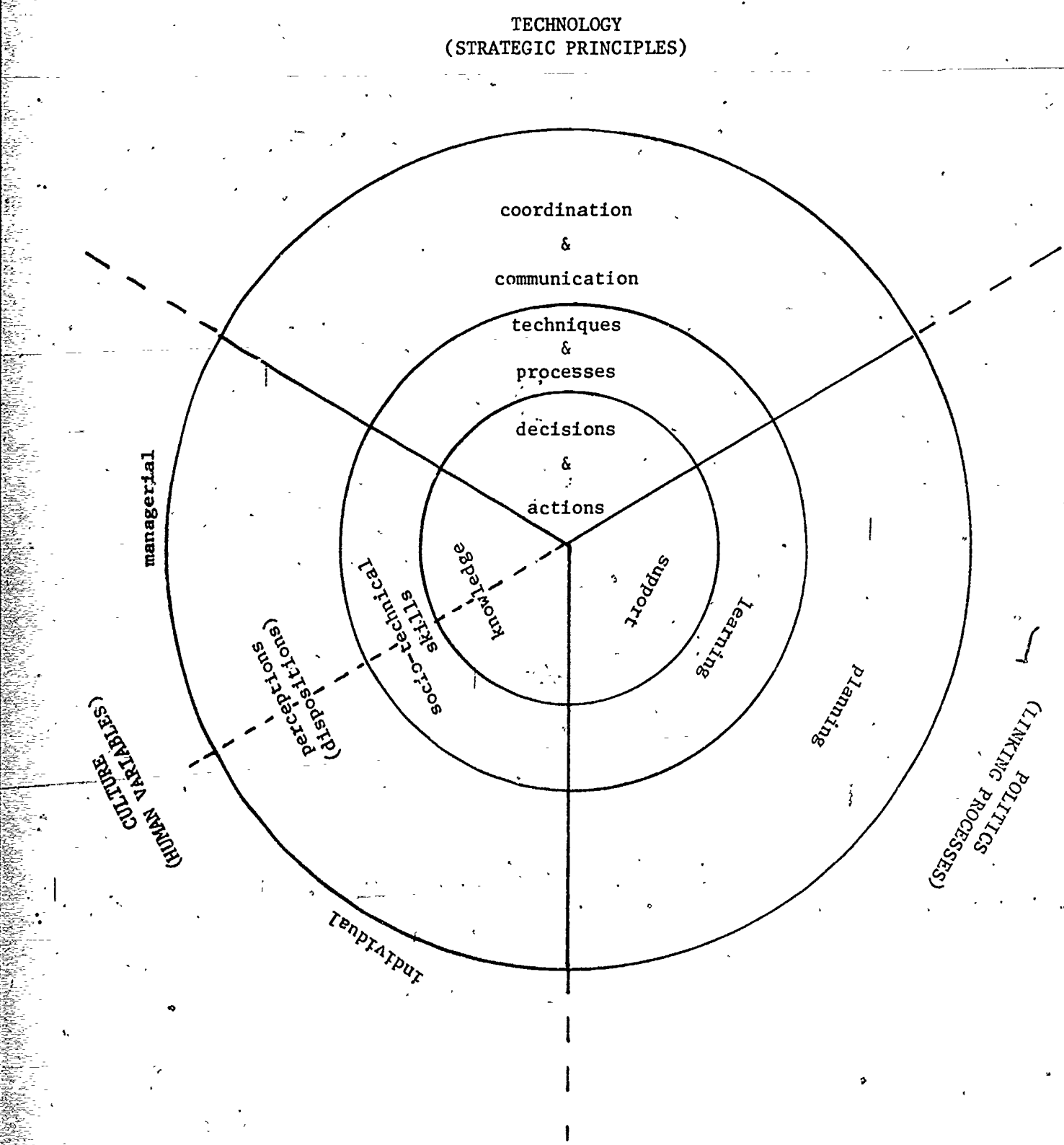
This area includes support -- financial and affective -- learning, and planning. It includes both the formal and informal systems but focuses more on the organization than the individual members.

Support. The chief executive of the organization (principal, local or state superintendent) must publicly support any major improvement effort,

*The model synthesizes ideas from organizational development (e.g., Smith, 1980), and research in educational change (e.g., McKibben et al., 1981).

Figure 2

A Model of Organizational Change And Analysis



and actively be involved in key decisions, planning sessions, or resource allocations (including personnel reassignments). Sufficient resources -- time, staff, and funds -- should be allocated: staff time is particularly crucial in any effort requiring coordination or in-person delivery of technical assistance. Initiators of the improvement effort should identify organizational power bases (divisions, program areas), determine their potential for support or sabotage, and develop appropriate strategies for their involvement or exclusion. For instance, programs such as Special Education, Vocational Education, and Title I are relevant power bases; the latter would be included and the former two might be excluded if the primary focus of the program was the mastery curriculum. But all three would be included if the focus was overall staff development. Strategies for encouraging commitment include: 1) establishing an initial success, 2) giving voice to influential advocates, 3) working at achieving a positive image, and 4) providing rewards for involvement e.g., public or financial recognition for accomplishment, promotion, opportunity for professional growth.

Learning. This refers to the corporate history or past experience of the organization, and how the various divisions learn (or don't learn) from their own and each other's actions. For instance, there may be two or three SEA-initiated experiences in curriculum development -- social studies, competencies in various areas, oral and written communication skills -- each conducted in a different way, with different levels of resource support, and different impacts and quality. What learnings can be derived from those experiences? One may be that the SEA should involve a

state-wide task force in developing goals and objectives organized into a scope and sequence by grade cluster, but that all subsequent activities should be managed by LEAs with SEA assistance. Or, a learning may be that some methods are more cost-effective than others. Or, a learning may be that a curriculum (or part of a curriculum) developed in one organizational unit without reference to similar others causes internal conflict and local confusion. Learning is painful but should be considered in a major improvement effort.

Planning. Open-systems theory planning is relevant here. In addition, three techniques are worth considering to reduce the impact of political conflict: a modified Delphi, the nominal group technique, or a survey feedback approach conducted by a neutral outsider. In statewide improvement efforts, there are two levels of planning -- for the SEA and for the local systems -- with the latter driving the former. For instance, from initiation to a reasonable level of implementation, most improvement programs take at least three years (e.g., Project Basic SEA level 1976-1979, local implementation planning in 1978-1979 school year, implementation 1979-1982; RDU programs had three years; SCBPs had four years of federal support, with the last at a reduced level). A local cycle might be three years with every fourth year used to revise plans and design or select programs or processes appropriate to needs identified in the first three year cycle, or to expand the populations affected by the activities of that first year (a 3+1 cycle).

Given reduction of resources for education and increasing state responsibility, cost-effective mechanisms are extremely important.

Planning methods or formats advocated by the SEA for local use should therefore be concise, reasonably comprehensive, and consistent. The last factor is especially important for block grant planning. It is highly frustrating for LEAs to have to meet varying standards and use varying formats for plans submitted to different SEA divisions and units. Also, if one format is used, the SEA could more easily build a management information system cross-referencing local activities, resource allocations, and results, reducing record-keeping burdens and facilitating comparative analysis of assessment data. At the local level, the same issues need to be addressed. Also, each organization needs to determine the cost of crisis management and the returns on systematic planning, hopefully leading to use of the latter.

Culture: Human Variables

This area reflects the organizational culture from the perspectives of management and of individuals. It includes knowledge, skills, and attitudes (perspectives) and how development in each is rewarded (or punished).

Knowledge. Traditionally, most educational organizations have relied heavily on individual expertise (content specialists) to provide the knowledge base for instructional improvement. More recently two trends have become apparent: 1) input from research sought deliberately, sometimes encouraged by state or federal programs, sometimes demanded by local systems impatient with out-of-date ineffective ideas; and 2) legislative influence changing positions from in-house content experts to field-oriented generalists. Staff involved in instructional improvement programs need up-to-date knowledge of specific content areas, of the process-product

research, and of the data-bases and processes to access and use relevant information.

Skills. Knowledge must be applied to be useful, which requires staff skilled in technical assistance strategies. If the focus of instructional improvement is a mastery curriculum requiring state-wide testing, skill must be developed in evaluation, test development and analysis to facilitate curriculum alignment and appropriate sequencing of objectives, and in designing feedback systems for LEAs and schools so that assessment data can be used in planning and implementing improvement. (Although such feedback should occur annually, in a 3+1 cycle, special attention should be given by the SEA at the beginning of the "plus one" year to help LEAs in their revisions.) Since staff skills are found in several divisions or units, the most important management skills relate to coordination. At other levels, skills relate to direct application of knowledge, e.g., implications of process-product research relating to the needs of a specific student population.

Attitudes/Perceptions. From an organizational perspective, increased intensification of needs for greater resources makes coordination increasingly attractive, but everyone wants to lose as little power and autonomy as possible (Aiken & Hage, 1968). The key question is "what's in it for me?" The idealistic response is "increased student achievement which is what your job is all about." However, this may not be sufficient in some cases, which means strategies to increase support must be employed, or individuals or units reassigned or ignored.

In many educational organizations reductions in force have meant reassessment of staff knowledge, skills, and attitudes, resulting in termination of employment for unproductive staff and reassignment of others to facilitate organizational redesign. To remaining staff the "punishments" are clear. While such action may seem drastic, it may be necessary if the organization's needs are not being met by existing staff. However, in planning and implementing an improvement effort, it is important to deal with rewards if attitudes are to be changed. External incentives may be offered and internal/individual motivation should be tapped.

Technology: Strategic Principles

The controlled purpose of the organization is reflected in its technology -- the decisions and actions, techniques and processes, coordination and communication mechanisms -- employed in a given area of activity.

Decisions and actions. Many SEAs and LEAs are bureaucracies managed by a small group of division directors who share organizational decisions but act fairly autonomously in their own domains. Instructional improvement in its most general sense is the business of the whole system, but could be perceived as the business only of the division of instruction or curriculum. In light of current research, instructional improvement cannot realistically be perceived as the responsibility of a single organizational division or unit. Therefore, all senior managers should be involved in decision-making. Also, since it is recognized that the SEA cannot control what happens in local systems, representatives from those systems (including teachers) should have the opportunity to influence decisions and actions related to the design of an instructional improvement system.

The actual nature of decisions and actions are determined during planning but should relate to intensity, scope and content, and processes of the system.

Techniques and processes. Other publications discuss techniques and processes relevant to instructional improvement -- the types of curriculum guides and instructional processes and variables controlled in classrooms and schools that make a difference to student achievement. How such information is accessed and the factors influencing knowledge use are also discussed. Together, that information provides the basis for the techniques and processes selected by the SEA and LEAs in designing an instructional improvement system.

Coordination and communication. Both of these areas are discussed in other publications. If instructional improvement is to occur, coordination and communication are crucial. However, in many organizations autonomy and ineffective communication are common, and difficult to change. It takes less energy to change a project than to change an organization. Assuming that the organization structure does not change, or changes very little, there are three alternatives to ensure effective communication and coordination: 1) reinforced traditional management, 2) matrix, and 3) network.

In the first, all division and unit managers impacted by the project form a cabinet. Staff remain in their current positions, but have modified assignments to allow their participation in improvement efforts. As tasks are attacked, staff (from several units or divisions) work together as action sets, returning to their original assignments on task completion. Most information flows through the cabinet whose members know all aspects

of the project. An individual -- usually in a high administrative position -- coordinates activities, chairs the cabinet, and channels communication to and from local systems and federal agencies. Tasks are mostly short-term or periodic, e.g., -- for an SEA -- review of local plans; organization and follow-up of statewide conferences; design, development, or dissemination of new products or processes. The main advantages are: high overall management control, little threat to "turf." The main disadvantages are: low sense of ownership (and commitment) from staff who may see system tasks as "add ons" to their "real work;" heavy workload for system coordinator; probable "rules and procedures" dominance leading to non-implementation.

In a matrix system, all division and unit managers are classified as "content" or "process," with the two groups forming the two dimensions of the matrix. For instance, "content" might include basic skills, Title I, and social studies, and "process" might include inservice, evaluation, and Title IV. The process group designs and operates a field delivery system (the technical assistance arm) brokering in content expertise as needed. The content group carries out development activities (often crossing hierarchical boundaries), brokering in process experts as needed. The technical assistance arm is managed by a coordinator who regularly consults with other process managers. The main advantages are: reduced redundancy of effort, little change/disruption in staff assignments. The main disadvantages are: staff organized by function may increase contacts/demands on LEAs or schools and serve administration purposes rather than the instructional needs of local educators.

A network may be an informal system whose members are operational level staff in several units, loosely coupled by a shared philosophy and some formal accountabilities related to instructional improvement. Alternatively, there can be a network of field staff and a network of in-house staff, both connected by a coordinator who cooperates with a matrix management team. All SEA/LEA/school communication related to instructional improvement flows through the on-site field staff (for information and/or involvement). The main advantages are: highly coordinated school/local/ state communication, low number of SEA demands but high intensity of effort on common goals, potential for high internal coordination. The main disadvantages are: decentralized control of field staff, potential resistance from in-house staff resenting field staff communication channels.

Which ever structure is used and regardless of politics, a system for instructional improvement must take into account specific needs of classes and schools, objectives and concerns of LEAs, and state goals and priorities. This suggests the need for two coordinating mechanisms, one to tie together the substance and the other the educational levels. The first may occur in the "plus one" year and be a comprehensive review of student achievement data, progress on priority programs (state and local), and relevant national research. Results of the analysis should identify areas of overlap to be addressed in the next planning cycle. The second mechanism is partly determined by the assistance structure designed by the SEA. Traditionally, boundary spanners are CSSOs, LEA superintendents, and principals. Also, there are content-area professional associations which

cross hierarchical levels. These and similar networks should be used for information sharing. At the same time, so that messages do not "slip between the cracks" it is useful to identify instructional improvement liaisons within each organization who serve as key contacts for communication and coordination of activities. At the local level, liaisons could be assistant superintendents for instruction. Schools may assign an assistant principal or energetic influential teacher.

Summary

Although examples in the above discussion relate to systemwide instructional improvement, this process model may be used to analyze or design any project for change or improvement. The more complex the project and the greater the intended impact, the more important it is that all elements are considered. Thus the elements may be used as a checklist in planning. Once a project is underway, the model may be used to analyze implementation, identifying and suggesting areas in need of improvement.

VI. CONCLUSION

The four preceding chapters of this paper have reviewed the current knowledge base of substantive and organizational processes relevant to instructional improvement. An attempt was made to explore relevant research and ways in which it might be used in a systematic statewide instructional improvement system. There is no single set of "right" answers since situational needs vary from state to state and school to school. However, it is sometimes useful for policy makers to begin planning by having a "target to shoot at" rather than a "black hole in space." Therefore, realities, and implications are brought together in a set of statements that may be considered as propositions. Planners may review these propositions, ask to what extent they believe in them as operating assumptions, and consider their implications if used as the basis of an instructional improvement system.

- Instruction is controlled by teachers, influenced by other educators.
- Curriculum is influenced by many educational levels, sometimes controlled by LEAs or SEAs.
- How teaching and learning occur is as important as what is taught.
- Most instructional processes having high impact on student achievement are generic--crossing curricular and grade levels.
- The process variables having the highest influence on student achievement are: time-on-task, curriculum alignment, attendance to student characteristics (prior learning and cognitive style), success rate, and quality of instruction.
- Only when key process variables have been attended to successfully is it worthwhile to introduce other "enriching" ideas for instructional improvements.

- Since the business of education is bringing about student learning, all levels of the educational hierarchy should support instructional improvement.

- Focus for activity in a given school should be based on the assessed needs of the school (with student achievement data highly influential), employing research-based strategies identified by the LEA and SEA.

- Focus for activity in a given LEA should be based on assessed instructional needs of schools in the system, employing research-based strategies with SEA support.

- LEAs should consider the value of using federal block grant funds for systematic instructional improvement rather than for separate program activities.

- Systematic instructional improvement does not occur quickly or easily, but is likely to follow three year (or more) cycles of focused activity (with variation in strategy from site to site).

- The structures, technology, culture, and politics of schools, LEAs, and SEAs do not facilitate rational planning. Therefore careful attention must be paid to techniques and strategies which encourage data-based decision-making and goal-based rather than role-based action.

- LEAs must be encouraged to apply quality planning processes. If paper plans are of value only to the SEA, perhaps SEA staff should themselves "fill in the forms," obtaining the necessary information through participation in local planning activities.

- The SEA should support LEAs who should support schools. In-school efforts among teachers should relate to instructional improvement advocated by the LEA and the SEA.

- SEAs should support local instructional improvement efforts by providing research-based information, and on-site technical assistance to LEA staff.

- SEA/LEA interactions for instructional improvement should be streamlined by a network of instructional support liaisons, each SEA liaison providing on-site assistance for an LEA, and each LEA liaison providing assistance for target schools.

- Organizational units with process functions, e.g., inservice,

evaluation, should be part of the instructional improvement system (LEA and SEA), or at least closely coordinated with it.

- Sufficient research-based information exists on what needs to be done in classrooms and how improvements can be supported by LEAs and SEAs, that educators can apply that information with fair confidence of success to bring about instructional improvement.

- Different ways of viewing the change process underscore its complexity. Educators need to understand the innovations themselves, as well as the context and the perspectives of those who will ultimately use the new ideas.

- Innovations are introduced into schools where the system is already vulnerable to many social pressures. Problems of coordination are difficult because of the loose connections between classrooms and schools.

- With no clear answers, educators must understand and act upon the tension between change and stability. Sensitivity to the school's various constituencies, the changes, and the particular social system is essential. But each course of action will be different because situational factors vary.

- People may engage in innovative activity for many reasons. Such activities are both rewarding and costly. Because of the dynamics of the change process, these rewards and costs vary over time. What is rewarding at one time becomes costly at another.

- Many innovations are modified as teachers adapt new technologies to their classroom realities. This is so because innovations are often underdeveloped and are subject to different interpretations and because new ideas are mediated by different teacher styles.

- Ideas and people from outside the school system can be powerful initiators of school improvement, provided that they identify with the realities of schools and are willing to adapt to local conditions.

- Information that relates to teachers' real classroom situations and their support for innovation is a necessary prerequisite for instruction-focused school improvement.

It is apparent that systemwide instructional improvement requires complex and coordinated activities. To reduce management concerns, implementation may be incremental (e.g., using Maryland's SITIP model). Alternatively, it may be perceived as a common goal worth the effort to bring about instructional excellence.

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