THE SEARCH FOR CONSEQUENCES: ASSESSING THE IMPACT OF DISTRICT INSTRUCTIONAL INFORMATION SYSTEMS

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Background

Before we came along, Lenny, the Research Director in North District, and Don, the Testing and Special Education Director in South District, didn't know that their respective districts had given birth to instructional information systems. Each knew only that his district had spent considerable time and attention on methods for combining student achievement test scores with other district data so as to produce information useful for instructional planning and management. Each knew that, for the past five or six years, he had worked with other key central office staff to provide information, training, and support to school-site groups and individuals.

For our part, we at UCLA's Center for the Study of Evaluation had, for several years, investigated what school district research and evaluation offices did (Lyon et al., 1978). We had discovered that most R&D personnel spent much of their time administering district-wide testing programs and conducting mandated state or federal evaluations. We found that policy making, administrative decision making, and classroom operations were rarely affected by the work done by the R&D unit. In re-analyzing our questionnaire data, doing further interviews, and reviewing the literature on school districts as organizations, we discovered a number of reasons for this phenomenon (Bank & Williams, 1981a). Many school districts exist in a socially turbulent environment where critical factors such as annual budget levels, numbers of students, placement of students in schools, and personnel matters relating to principals and teachers are not exclusively in district hands. Outside

forces are often overwhelming. Furthermore, the internal controls that central office staff exert over school principals and classroom teachers are "loosely coupled" (Weick, 1976). That is, teachers are quite autonomous "behind their classroom doors" (Lortie, 1975). Each school has its own community and culture; although districts differ, most have no strong guidelines as regards teaching methods, although most do have general guidelines for curriculum. Given these features, it is unusual for school districts to plan and carry out systematic and centrally-directed activities relating to instruction. Because there is an absence of such centrally-coordinated instructional decision making, it is not surprising that centrally collected testing and evaluation data are regarded primarily as useful signals to funding agencies that the school district is complying with program evaluation requirements (Zucker, 1981).

Nonetheless, there are exceptions; there are districts where district-directed testing and evaluation activities are linked with instruction. Lenny's district and Don's district are two of the eight "heroic" districts that we studied over the course of several years. In these districts, particular factors in the external and the internal circumstances of the districts -- including strong leadership, a critical mass of supporters, a benign environmental setting -- facilitated the central offices' assuming a role in the improvement of instruction (Bank & Williams, 1981b, 1982). In Lenny's and Don's districts, the district central office provided relevant, timely, and easily understood data to key decision makers (e.g., district administrators, principals, and teachers).

While we were conducting our case studies in Lenny's and Don's districts, it occurred to us that there was a relationship between the information systems they were developing and the management information systems discussed in the business community. Our investigation into the management information research literature revealed that there were indeed parallels. In our view, the parallels overshadowed the differences. And so we coined the construct "instructional information systems" (IIS) (Bank & Williams, 1983). Instructional information systems (IIS) may not be pictured on an organization chart, but they can be described in terms of an observable set of components: specified users, specified uses, specified data inputs and outputs, a delivery system with particular format and timelines, and a monitoring and feedback mechanism.

Once having concluded that such systems in either complete or incomplete form do exist in districts, we set out to examine certain features of those systems. We used Lenny's and Don's districts as field sites. In another article (Catterall, 1983) we looked at the costs associated with Lenny's and Don's systems. In this paper, we will be specifically concerned with the impact district instructional information systems have on the individuals they are intended to serve.

Questions of Interest in Assessing Impact

Our interest in studying the impact of a district-operated IIS on system users is a natural one. Given the commonplace in the educational administration literature that, in loosely coupled settings, policies man-

dated from the top are considerably altered as they filter down to those expected to implement them, we were curious as to what might be the impact of Lenny's and Don's systems on teachers, principals, and parents.

Our major question, therefore, was "What is the impact of the instructional information systems in these two districts?"

Before thinking about what procedures we could use to answer this question, we had to answer several prior questions for ourselves.

Question #1. How should the impact of an IIS be defined?

Considerations: The ultimate expectation in both districts is that the instructional information system could increase student learning as measured by total, subgroup, or individual changes on achievement test scores. However, the causal linkage between information provided to adults, who then make well-informed decisions which lead to improved classroom practices which, in turn, lead to increased student learning showing up as higher test scores was very weak. We decided that we could not identify the impact of an information system simply by tracking student test scores over time.

Conclusions: Instead, we focused only on the intended users of the instructional information system -- those adults to whom the district supplied information. We defined impact as composed of the attitudes of individuals and groups towards the information, and their behaviors in relation to the information, e.g., how they felt about it and what they did with it.

Question #2. How should impact of particular kinds of information supplied by the district be distinguished from other information used by individuals to make instructionally-related decisions?

Considerations: It has been pointed out that the single decision maker making a particular decision at a given point in time using a limited set of data is an unrealistic view of how people in organizations operate (Alkin, et al., 1979; Cronbach, et al., 1980). How then could we separate out the influence of the district aggregated and distributed information from the "working knowledge" (Kennedy, 1982) that such people already possess?

Conclusion: We decided that our respondents themselves would be the best judges as to what influenced their thinking. We would ask them to discuss a decision that they had made using district-supplied information and estimate the importance of that information in their own decision-making. We would also ask them about the particular contribution of each aspect of the IIS.

Question #3. How should "ripple effects," often termed unanticipated, unintended, or secondary impacts, of the instructional information system be identified and described?

Considerations: These impacts, we believed, would not be part of the "official" story that people told spontaneously. These effects would have to be inferred, carefully, by researchers using interview data cross-checked with observations. However, we wanted to capture the ripple effects because they would shed light on the informal, daily life consequences of instructional information systems.

Conclusion: We decided to include in our interview a list of possible "ripple effects" and ask respondents to react with any examples that occurred to them. We also asked them to imagine what they and others would do if the district-supported IIS was disbanded, either partially or completely.

Methodology for the Study

Issues. A number of factors influenced the way in which we approached the study of impact in the North District and the South District.

First, we wanted to establish collaborative relationships with both Lenny and Don, with whom we had previously worked, in order to make the study of use to them as well as to ourselves. Since the IIS had been in place in each district for a number of years and since it appeared to be operating smoothly and without major problems, neither Lenny nor Don was motivated to assess impact without our outside impetus. Each had his own concerns that the study might needlessly raise teacher doubts or anxieties about the system; or perhaps surface expectations for additions or changes that they would not be able to act upon because of other district priorities. Together with Lenny and Don, we discussed how to "position" the study in the eyes of the respondents so as to minimize the potential risks that Lenny and Don saw, and how to frame the interview questions so that Don and Lenny too might derive useful information from our data.

Second, we wanted to design a simple procedure that would be appropriate for use by other districts who desired to do their own impact studies.

The methodology therefore needed to be inexpensive, short-term, and acceptable to participants.

Sample. In each district we selected sample schools where implementation was assured -- that is, where "everyone knew" that individuals and groups were aware of and were using district-supplied information for decision making. In Lenny's large district, we selected five elementary schools of varying sizes, and one high school. In Don's smaller district, we interviewed in all seven elementary schools.

At each site, 8-10 individual teacher and parent respondents were selected by the principal of the school in accordance with our request for a variety of perspectives, experience, and attitudes towards the IIS.

Instruments. We considered and rejected questionnaires as impractical because of the difficulties of getting a high rate of return and because they would be more high-profile than both districts wished. Interview schedules with the same format were developed but they were individualized for each school. Respondents were asked about their own background; then they were asked to reconstruct a decision or a process which involved them with the district's IIS; they were asked to identify the importance of each system element in that process; finally, they were asked to react to a number of possible "ripples." We then asked how they and their group would react if the district discontinued the IIS; and finally, we asked them to add anything else they thought would be of interest to us.

Analysis and Implications. Interview notes from each district were transcribed and analyzed, site by site, to determine school variations. Within-district themes across schools were also identified. However,

comparisons of the districts with one another were not appropriate as the two instructional information systems differ from one another in terms of intended purposes and operations.

North District: Assessing the Impact of the District's Instructional Information System

PURPOSE OF THE SYSTEM

It should be noted at the outset that while the North District's IIS was originally generated at the school district level and currently remains a central administrative responsibility, the purpose of the system is to provide planning-relevant data and a planning and decision-making procedure for local school site councils. The decision-making responsibility resides at the local level -- the district merely facilitates the local decision-making and planning process. It follows that questions about the impact of the district's instructional information system should focus upon whether or not this system does indeed influence local school site councils in the way it was designed to do.

The central office collects pupil achievement data and needs assessment data, processes those data, and fashions them into sets of easy-to-read tables with accompanying narratives. These easily allow school site councils to determine trends and identify strengths and weaknesses in the school's program. The district has adopted an implicit, linear decision-making model that has several discrete stages. Data from the district system can presumably have some influence at each stage of the decision-

making or planning process. The decision-making stages and the role of data can be briefly described as follows.

1. Problem identification and clarification means determining if there are shortcomings or problems at the school and, once having identified such problems, initiating programs or activities that would be expected to solve or reduce them.

Of course, many people involved in a school can perceive that there are problems in their school. Often such perceptions are based on a single experience or hearsay. And often, based on such ill-informed perceptions, schools launch reforms or changes. The goal of North District's instructional information system is to make data-based decision making more systematic, comprehensive, and objective.

- Needs assessment survey data, collected from large numbers of parents, educators, and students, can identify whether there are commonly perceived problems, the strengths of those perceptions, and the degree to which they are commonly held among the various constitutent groups. Such data reduce the likelihood that one influential individual or group of individuals can overwhelm others with its version of what the problems are.

- Similarly, norm-referenced test data can be used to identify possible weaknesses in the instructional program. If 3rd grade students' spelling scores, for example, are below a desired level, the reasons for this might be explored. They could range from a spelling text-test mismatch, to lack of pupil instruction, to inadequate amounts of instructional time.

- Of even greater potential decision-making and planning use is the interrelationship between the needs assessment data and the test score data. That is, one could see if there were parallels between commonly held perceptions of the program and the test data.

2. Solution generating and solution selection. Once a school site problem has been identified or clarified, one might next move to generalizing solutions and then making selections among the generated options.

The data described above, particularly the needs assessment survey data, can be especially useful in this regard. School site council members, empowered to develop solutions, can represent parent as well as teacher (and, in some cases, student) thinking. Informed voting should result in the selection of a useful solution.

3. Program/activity evaluation and monitoring. Once a decision has been made and a program or activity has been implemented, test data and opinion questionnaires can be very useful in determining whether or not the intended outcomes were realized. For example, picking up on the earlier instance of low test scores in spelling, suppose one of the school site councils in North District had decided to provide a creative training program for teachers on how to effectively teach spelling. The Council might reasonably expect that such training would ultimately result in better pupil achievement, which would be reflected in the students' achievement on a standardized test. By observing the test scores for subsequent years, the school site council might have an information base to supplement teacher judgments and student homework to ascertain the effects of its policy. Similarly, differences in the annual needs assessment regarding the respondents' perceptions about some previously identified problem could provide another information base.

In summary, the district should expect the impact of its instructional information system to be felt at three levels: problem identification and classification; solution generation and selection; and program/activity evaluation and monitoring.

IMPACT OF THE SYSTEM

We now turn to our findings with regard to primary and secondary impacts of the district's system; and we report the ripple and unexpected impacts of the system.

The reader should note that we are looking at the impact this IIS has on the decision-making and program implementation activities of the school site council. We are not looking at the ultimate consequences of the decisions that were made. To illustrate: we are looking to see if a school site council's decision to spend money on inservice training for teachers in, say, spelling instruction was influenced by data provided by the district's IIS. We are not looking to determine if the inservice training of teachers ultimately has its desired effect, namely improving the pupils' spelling ability. This latter -- ultimately the most interesting and important question -- is beyond the scope of this study.

1. Problem identification and clarification. If the district's IIS were fully working as designed and intended, one would expect that the needs assessment survey of staff, parents, and pupils and the annual test results would be used to identify those weaker programs and activities in need of school site council attention and funding.

In each of the six schools we visited, we asked the respondents to recall a major decision that their school site made during the 1981-82 academic year and to reflect on how members had come to identify that area or concern. The impression that emerges from the six schools is that the test data played only a minor role as a means by which the schools

identified the needed improvements. The survey data also played a minor role, being used to bolster an argument or proposal that had been advanced by a faculty member or group. One school site council, for example, decided to invest in a science program. This decision was made due to the argument of one teacher who had a strong interest in enhancing the science program. Three schools' site councils had decided to purchase computers for their schools. In all three instances they had been influenced by a faculty member or administrator who convinced the council that purchasing computers would be a wise use of funds. In another school the school site council decided on a multi-cultural mathematics instructional program. This program had been tried in other district schools with some success and teachers pushed hard, and successfully, to have the program funded in their own school.

Thus, from the sample six schools we saw little evidence that either the test data or the needs survey data played a decisive role in the school site council's decision-making processes as regards the major items we discussed with them.

While the respondents did not identify the information supplied by the district as having a decisive role, they did identify several instances where the surveys and the test data alerted them to special needs that required additional funding. The following are some examples: One elementary school changed their math books on the basis of test scores which indicated lower pupil performance than expected. Another school uses a participative, non-hierarchical decision-making procedure and administrative structure, where teachers and parents are regularly involved in the

school's instructional decision-making. Here, the district's information system has been thoroughly integrated into the school's decision-making style. Everyone is so used to this model that it is difficult for them to see where their own system ends and their needs for district-supplied data begin. They cannot conceive of operating their school without either system.

We do not know of all the instances where the district-supplied data may have been used in identifying needs. It was clear that in five of the six schools, school site committees were following the recommended district decision-making model and were looking at the survey and test data. Although the impact of these data was not as clearcut as we had expected, it was obvious that people were familiar with them and consulted them when making plans and decisions.

One explanation for this somewhat less-than-consensual use of the system is that this procedure is carried out annually and has now become an established way of identifying problems over several consecutive years. Because the data from year to year do not change very much -- that is, test scores do not fluctuate very much and parent and staff opinion probably remains quite stable -- the school site councils continue to fund programs they identified in previous years. And thus, when we asked about one year and about one decision, we did not surface dramatic uses of the data for problem identification purposes. However, it is likely that data-based decision making has had a cumulative effect on the participants in the school site councils. They might be very concerned about making major decisions without a quick check of the data to see if they contained any strong contra-indications or problems demanding more immediate attention.

2. Solution generating and solution selection. If the district's instructional information system were working as designed, one would expect that the school site council, or more often, the component committees of the school site council, would comb the surveys and norm-referenced test data for their implications as to solutions to the problems identified in the first part of this decision model.

This did not turn out to be the case. With regard to the major decisions that we explored with our respondents from the six schools: their decisions were not based on needs spotlighted by the data nor were the solutions necessarily implied by these data. For example, the decision to start a Math-Physical Education flip-flop schedule was based on teachers' awareness that this program had been used successfully in other schools in the district. The teachers were experiencing a problem in teaching math. They thought class sizes were too large. They knew that other schools had resolved this problem with the "flip-flop" and they persuaded the council to spend its money to implement such a program.

In the schools that decided on purchasing computers, there appeared to be little searching for other options. In one school, the council wanted to "have the most computers of any school in the district." In part this desire was an answer to their perceived need to compete successfully with a nearby private school. But data about parent preferences or student performance had little influence on this decision. In another computer-purchasing school the decision was motivated by the fact that a group of rapid-learning students were coming in to the school with their own classroom computers. Largely in response to this, the school site council decided to invest in computers for the remaining students.

It is important to note, however, that this school site council felt the need for data to help with a related decision. There was a split in the council as to whether the school should invest in computers or air conditioners. This dilemma was resolved when the school site council devised its own parent questionnaire on this specific question. The final decision choice was based on the results of that survey. Thus, while the results of the district's survey were not used, the district's survey method was indeed used in resolving this dilemma. Thus, in a very real sense, it can be said that the district's surveys affected the search for that solution.

The decision to invest money in more teacher aides in another school was not influenced by data; indeed, the needs survey data did not contain anything which would bear on that decision. The council went along with staff ideas about what was important to help the teachers in their work.

With regard to the smaller decisions that are made by the school site councils' component committees, one senses that data are sometimes used to identify problem areas but that the selection of the solution does not arise from exploring the implications of the data. Instead the component committees select solutions based on common sense or on what other schools are doing.

It appears in some schools that decisions of where to allocate funds are based in part on making sure that the various curricular components of the school site council have their "fair" share of the money. Once an equitable division is decided upon, the component committees determine how

to spend the money. The small amount of allocated funds does, of course, limit the range of solutions they can consider.

Our research methods may well have limited our perceptions of the effect the district's management information system has had on the school site council's decision-making processes. It may well be that what we perceived as a very limited search for alternative solutions may indeed be the residual from very extensive alternative-solution searches that were conducted in years past. And likely the limited amounts of funds now available to each component reduce the tendency for heroic, wide-ranging flights into generating unconventional alternative solutions.

3. Program/activity evaluation and monitoring. If the district's instructional information system is working as designed and intended, one would expect that the data from both norm-referenced tests and the surveys would be used by the school site councils to assess whether previous activities and programs had achieved their desired effect. For example, if a component committee had funded the teacher in-service training program in spelling to improve the quality of the teaching of spelling, one might expect that the students would perform better on subsequent spelling tests or that the parents' or teachers' attitudes toward the need for improvements in spelling would change. Such information probably should influence council decisions regarding the future continuation of the program.

With regard to the major decisions we saw little evidence of the data being used that way. The respondents had some firm ideas about whether or not their council's programs had been implemented and about their relative success -- but the district-generated data didn't play much of a role in determining those opinions.

For example, one school had implemented staff development programs. At the time we visited the school, our respondents reported that the in-service program had indeed been implemented but was not having its intended impact; there was considerable disappointment with the results. The respondents seemed to base their opinion on their own experience in the program and on conversations with colleagues who had also participated, rather than on parent survey responses.

In a school that had earlier adopted a Math-Physical Education and Multicultural "flip-flop" they decided to drop the program even though many people felt it had been successful. The basis for the decision was that the teacher who was responsible for the program became "burned out" and no longer could continue in that position.

In some activities and programs, e.g., the computer purchase, there appears to be no felt need to have exhaustive data. For example, once the computers are purchased it is unlikely that that decision will be reversed in the forseeable future. Nor is it likely that the computers will have any measureable impact on test scores or parent and staff attitudes for several years, if then. Again, the survey may eventually pick up future changes in knowledge and/or attitudes but the decision to actually buy a computer or additional computers will probably not be affected by such data. The survey may affect the priorities for use and types of computer programs employed, but it is too early to detect any trends along that line.

With regard to the "smaller" decisions made by the school component committees it is likely that the test and scoring data are used to

monitor programs' success more in some components than in others. Some respondents talked about how they would "set a target figure for an increase in satisfaction level" but no mention was made about whether or not much attention was given to whether or not the target was hit -- and the subsequent consequences of this relative accuracy. In that same school, a respondent stated, "We compare this year's figures to last year's figures. If we stayed the same because our scores were high we don't need to change anything. But if there was a drop in scores, we set a percentage goal, and we ask what it is that we have to do to get better scores, is what we are doing worthwhile?"

Because of the large number of component committees in the several schools we visited, it is very difficult to give anything more than general impressions about the extent to which the data were being used to monitor the effects of decisions previously made. Clearly, these data were being used in this way in some schools and in some component committees. Many respondents simply did not comment on this function and it is difficult to attach meaning to this. One reason for this might be, indeed, that the data simply are not used for this purpose but are used more in originally deciding to spend money on a particular activity. It is likely that some decisions, such as hiring teacher aides, do not result in measureable differences and, thus, these data are not very valuable in assessing impact. In other instances, it may be difficult to extract the use of such data from the regular flow of decision-monitoring-revising-decisions that characterizes the functioning of some school site component committees.

In summary, this monitoring question appears to be a regular part of the decision process in some schools and component committees. However it did not surface in revising and monitoring the large decisions such as computers, Math-PE-Multicultural "flip-flop" and the science curriculum program.

OTHER IMPACTS

In the preceding section we discussed how the district's instructional information system, i.e., providing school site councils with the test and survey data, has impacted on the decision-making process in the councils. Here, we turn to impacts that may not be directly related to a data-based decision-making process. The impacts we noted from the open-ended responses can be categorized into communication, parent participation, and school culture and climate.

1. Communication. Common sense would lead us to believe that an information system has high potential for improving or enhancing the level of communication in the school both within and among the various constituent groups (parents, teachers, administrators, pupils). There are several ways it might have a practical effect.

A. It provides a common language or common data base that can be tapped into by the various groups. A common complaint about educators is that they have their own professional language and culture and this makes it difficult for those who are not a part of that culture or who do not fully understand the professional language to communicate very effectively, (e.g., parents, pupils). The district's management information system has a powerful potential for

bridging this communications gap in that all the participants have the same data -- and those data are arranged in such a way that they are quite clearly understandable to the various constituent groups.

B. A second, related effect is that it reduces the potential control of those who have sole access to initial information. Thus, as is often the case with school site councils, the principal's or staff's potential ability to manipulate events is minimized because critical information is also available to other decision-making or planning participants.

C. It essentially forces various constituent groups to come together, to access a common data set, and to reach consensus. In this process, perceptions are shared, ideas are explored, and decisions are reached. This results in bringing together people who might not otherwise work together in such an intense way towards common goals. The effect is that erroneous perceptions each constituent group might have for the others are reduced or corrected somewhat.

D. Finally, it results in a communications network in that each member of the school site council and its various component committees has his or her own groups of friends and acquaintances with whom to share information about the school's activities and their perceptions of people and events in and around the school. This network can help to break down communication barriers and enhance the level of school-community relations.

In visiting the schools, we saw evidence of these activities in most; the level of influence the instructional information system had on each school varied depending on circumstances and motivations.

In the high school it had considerable effect, particularly in bringing people together -- people who typically do not meet to discuss school plans and activities. Parents' interest in participating in school planning typically falls off at the secondary level. But the school site council provided an avenue and means for including some parents wishing to be involved in decision making. Similarly, the high school's typical division into subject matter specialists and departments tends to reduce inter-faculty involvement in school-wide activities. The school site council tended to encourage such cross-departmental communications.

In one relatively non-graded elementary school the district's instructional information system served to enhance and support an ongoing, high level of faculty communication. The school's design and operations already encouraged considerable internal faculty communications -- this district program empowered the already extant system to be even more effective by providing vast amounts of useful data.

In other elementary schools it brought together parents and teachers into problem-solving groups that used the data to identify and attack problems and to enrich the school-community relationship.

But the existence of this system did not guarantee that this happened. In one school the main purpose seemed to be a means whereby the faculty could purchase additional items and people to enhance their teaching. This, of course, is not an undesirable effect, but the program as

practiced in this school virtually ignored the parents and minimized the teacher cooperative decision making. Instead, the faculty divided up the allocated money and bought what was viewed by each individual teacher as best for him or her.

In summary, we saw the instructional information system having varying effects in the schools depending on circumstances. Overall, it seemed to have a strong impact on communications but that impact was not guaranteed -- individuals in the school had to value the data and believe in the system's decision-making and planning model.

2. Parent participation. As has been noted in the previous section on communications, the district's instructional information system brings various constituent groups together (teachers, administrators, parents, pupils). Thus, parents are included as a part of the school's decision-making body -- at least as concerns the expenditure of SIP or Chapter 1 funds.

The school site council membership is mandated by law and is quite similar from district to district. But, as has been previously pointed out, being on a school site council should not be equated with participation; that is, often such councils are dominated by the professional staff. What is unique here is that the parents, through the systematic provision of data in a concise and understandable form, enhance the likelihood that they can actually participate in the school site council's planning and decision-making process.

The varying level of parent participation has been noted previously. Perhaps it is sufficient to say that these data, presented as they are

along with a decision-making model, seem to have had the desired effect on increasing parent participation in those schools where the staff has an inclination to include parents. In our sample of six schools, we would conclude that parent participation was adequate in five of the schools. One note of interest: all the schools reported difficulties in maintaining the appropriate level of parent participants largely because women, who are the main participants, are increasingly working during the day and unavailable to participate.

3. School culture/climate. The district's instructional information system might reasonably be expected to impact on the decision-making processes and it is not surprising that it influenced the communications pattern and interactions and affected parent involvement. Here we discuss something that we really hadn't anticipated, namely the culture of the school.

Typically, school teachers, administrators, and parents are not known for utilizing data to identify problems, determine solutions, and implement plans or decisions. Indeed, the more common portrait of teachers is that of working alone behind their closed classroom doors. Principals are often portrayed as being more preoccupied with administrative matters than with instruction and programs. Staff meetings more often deal with management and budgetary matters than with instruction or program items. Those program, curricular, and instructional changes or developments that are made are seldom influenced by test data or any comprehensive set of survey data. Teachers spend their time alone in the classroom; principals busy themselves with administrative and management concerns. Programmatic-

planning is minimal and generally uninformed by data collection. Parent involvement is often limited to fund raising, and sponsoring and running various school activities through the PTA or at the classroom level through "class mothers." Clearly, the district instructional information system has changed this standard culture in the schools we visited. Some of these changes have been noted, e.g., communications patterns, parent involvement, decision making. But another important change or impact was also observed, one that is not quite included in these activities. For lack of a better term, we will call it a spirit of inquiry -- orientation toward problem solving -- a bias towards data.

We saw this impact time and again as we observed school site councils at work and as we gathered the perceptions of those who participated in these activities. The component committees seemed to constantly refer to data when reaching decisions. This is not to say that the data provided by the instructional information system was always critical to the decision. To be sure, other factors such as personal opinions, professional judgments, and strong advocates often prevailed. Sometimes, the data merely corroborated what the group wanted to do anyway. But collecting and analyzing data had clearly become something the participants valued and indeed were comfortable with.

Perhaps this approach can best be illustrated by the events in two schools. In the sample high school, staff were wondering about whether or not to support a staff development program in the school. Faced with uncertainty over whether there was support for such a program, the staff devised its own survey questionnaire which was distributed to all faculty

members. (The district questionnaires did not adequately cover this topic.) The resulting data were analyzed and the program decision was made on the basis of those data.

In one of the elementary schools, the school site council was faced with a choice between buying air conditioners (for year-round classrooms) or purchasing a school computer. The results of the district questionnaires did not give insights into such a specific question. The school site council devised its own questionnaire and, on the basis of the results from staff and parents, decided to purchase the computer. Other examples abound. One elementary school has devised its own student survey which is distributed regularly and the results are considered when making funding decisions. Another school has used the data when writing proposals for funding from private sources and state agencies.

Not all of the data are used equally, however. We found very few respondents who referred to the norm-referenced test scores when making decisions. There may be several reasons for this: the district's test scores tend to be uniformly quite high and, thus, the scores do not attract the attention they would if they revealed glaring deficiencies. Also, the pattern of test scores probably does not shift dramatically from year to year. Given the eveneness, one would expect that there would be little likelihood that the scores would point up major deficiencies. Finally, the test scores fit into a pattern -- a stream of data, if you will -- and probably the test scores figured more prominently in decisions when the program was begun in each school. Because we didn't see them used now, it does not follow that they were not used at an earlier point in the

program's history. The survey data were used far more extensively, but even here some data received more attention than others. The parent survey data received the most attention largely, we suspect, because it frequently was the only systematically collected, comprehensive data set of parent opinions regarding the school. There is no other way available to collect such data. These data appeared to be examined quite carefully by the school site council. But the data were not without shortcomings. For example, the percentage of sample returns was sometimes quite low -- below 50 percent. Also, some teachers felt there were validity problems and that sometimes the parents were responding about things of which they had little knowledge. For example, in one school the parents said that the home economics program needed improvement. Subsequently, the home economics program was completely dropped from the school. In the next parent survey, the parents noted that the home economics program had improved! Even though the data are not infallible, they do represent an important data source and they receive a good deal of attention.

The teacher survey data do not seem to receive as much attention. The main reason appears to be that the teachers have many opportunities to talk and discuss matters and to influence each other. Thus, for the staff, the teacher surveys do not provide many insights or surprises. Probably, the teacher responses may provide some insights to the parent members of the school site councils and component committees but parents do not play as critical a role in the deliberations as do the professional staff.

In summary, we were impressed that these schools had a proclivity towards data and that they valued a decision-making procedure that was

really quite atypical of what would be found in most schools. The principals and staff were not able to (nor were they inclined to) dominate discussions and decisions. Parents and, where appropriate, students, had a real sense of efficacy and participation. The wall that sometimes separates the public from its schools had been broken down and a bridge of communication and mutual trust had been constructed in its place.

South District: Assessing the Impact of the District's Instructional Information System

This study is of a small district which has, over the past eight years, created a workable system by which teachers continually tailor their instructional practices to the learning outcomes of their students. The district has created a centrally-mandated, school-managed, classroom-operated set of procedures that ensure a quality education for children.

What is unique about South's system is not the idea itself. After all, personnel in most districts would say that quality teaching and learning is the primary business of the public schools. Also not unique are the individual components of the system. Testing, standard setting, text selection, staff development, district-wide curricula, school resource rooms, are common elements in most district settings. And the system's uniqueness is not that there are many hard-working teachers, satisfied parents, high achieving students. These, too, can be found in many school districts.

The uniqueness of the system of instruction is that it is coordinated, pervasive, and self-renewing. A common orientation towards teaching and learning has become the customary way of life for students, teachers, principals, central office personnel, board members, parents, and others in the community.

It was not always this way. In the late 60's, the school reform spirit in the country prompted South's central office to action. The years of trial and error in developing a testing system, the early contentiousness of school teachers and administrators about the curriculum, the initial expenditures of non-productive dollars have now become part of the district's folklore. Stories of these early days and of the personal toll they exacted form a background against which to understand present-day proud comments from teachers such as, "We're all overachievers." "I want my own children to go here." "We can catch incoming children up to grade level within two years." "The quality of our schools would go down without the district system. We are consistent from school to school."

The following account looks at the impact of South's instructional information system after a brief description.

DESCRIPTION OF SYSTEM

1. The criterion-referenced testing (CRT) system. These tests, initially developed and continually revised by teams of teachers, are the major devices regulating instruction. The CRTs, each taking no more than half an hour to administer, are given in each classroom three times a year, or more often at the individual teacher's discretion. Normally, teachers teach a unit of material in math, reading, or language arts, then wait two

weeks and give the test to their students. Test booklets may be scored by the teachers or may be machine-scored. In either case, the testing coordinator returns to the teachers' computer printouts with their students' scores organized by objectives and printed out by learning group. Printouts are also available by child, by class, and by school.

2. The district continuum. All CRTs are referenced to milestone objectives on a kindergarten-through-eighth grade instructional continuum for reading, language arts, and math. The tests provide a gross diagnosis of student progress through each subject sequence. After teachers review the test results, they decide whether to move their instruction back or forward along the continuum. Each teacher uses the tests for a rough assessment of individual performance; that is, for projecting and measuring student growth on the continuum over the course of a school year. All teachers as a group work with the school principal to identify grade level instructional priorities according to student performance on the tests, since the results allow teachers and administrators to determine the percentage of students performing below, at, and above grade level in a given subject area.

The district scope and sequence for reading, language arts, and math is a graded set of objectives accompanied by suggested teaching methods. The continua contain more objectives than there are CRTs. They are sequenced and constitute a minimum set of expectancies for children by grade level. The continua are filed in looseleaf books, well-thumbed and referred to continuously by all teachers.

3. The Professional Development Program. The Professional Development Program (PDP) provides teachers with the skills necessary to act upon the results of the CRTs. The PDP is coordinated by a full-time specialist who either teaches all the courses or hires consultants to do so. In addition, some PDP courses are taught by district teachers. The program has evolved over time.

The PDP, as well as teaching particular instructional techniques to all teachers, has developed for teachers and principals a common vocabulary in which to discuss children's learning. Clinical supervision of teachers by principals is made easier by a common frame of reference and a common understanding about desirable teaching strategies. Teachers and learning specialists, both of whom have gone through the same PDP, have a set of methods for acting upon the results of the CRTs.

4. Learning specialist. The learning specialist might in other school districts be called the vice principal. In South the learning specialist does not have either the administrative or the disciplinary functions generally associated with the vice principal role. The learning specialist is a master teacher who functions as a resource to teachers and makes it possible for teachers to act upon the diagnoses implied by their children's responses on CRTs. The learning specialist brainstorms with the teacher about instructional alternatives. More important, he or she provides extra instructional time, on a pull-out basis, for children who need it.

The learning specialist coordinates and facilitates the criterion-referenced testing, making sure that the tests are given, that the results

come back on time, and that teachers review and act upon them. Additionally, the learning specialist provides, for new teachers and for new policies, in-service sessions about the functioning of the CRT system.

5. School principal. Principals are expected by the district to spend a good deal of time in the classroom. Principals regularly walk around the halls and drop into classes in addition to doing their formal classroom observations. The formal observation may either be invited, if the teacher is perhaps nervous or new and requests it, or uninvited if the principal feels comfortable about doing it. The principal visits have an evaluative function: "I am the clout that backs up the learning specialist" says one principal. "I evaluate; the learning specialist helps."

Additionally, the principal, during the end-of-year planning days, meets with the teachers and discusses the expected progress of groups of students for the year. During the course of the school year, principals receive student scores and look them over for progress and "surprises." Teachers are held accountable for student performance -- not for having all children achieve all of the preset goals -- but for explaining deviations from teachers' earlier expectations.

Principals in South are themselves evaluated both informally and formally in conjunction with the amount of time they spend on teacher supervision and checking on students' progress.

Principals meet regularly with the superintendent. Discussion of student progress is a regular, periodic part of their agenda.

PURPOSE OF THE SYSTEM

All districts, when asked to describe the important features of their instructional programs, will likely mention the goal of improving pupil achievement and they will insist that a major district practice is to individualize instruction to the needs of students who have differing skills and capacities. Most often, however, the attainment of this individualized instruction goal is left to the devices of individual teachers who work with minimal supervision behind their closed classroom doors. Some teachers are quite skilled at individualizing instruction; some are not. While school districts might offer some supervision and occasional in-service training in how best to individualize instruction, the degree to which such individualization occurs is largely incidental to any school district effort or intervention.

Not so in South District. While South might resemble many other districts in regard to the expressed goal of improving pupil achievement through individualized instruction, it differs considerably in the extent to which the district actively involves itself in assuring that this goal is realized throughout the district. Teachers in each South District classroom are expected to individualize instruction as a result of a comprehensive instructional program that is directed by the district central administration, but that reflects the teachers' concerns and intents.

If asked to select one word to define the essence of this program, we would choose integration. The entire system is designed to integrate the elements listed earlier, i.e., criterion-referenced testing system,

district continuum, professional development program, learning specialists, and principals, into a tightly-coupled system that assures that teachers are skilled at individualizing instruction and are aware of the progress their pupils are making towards mastering the components of the school district's instructional continuum.

The school district, in integrating these five elements into a common program, provides the teachers with tools and concepts they can use in their classrooms. For example, they have a series of teacher-developed, district criterion-referenced tests the teachers can use to diagnose pupil achievement and, when appropriate, to prescribe remediation or change the instructional pace or method. The teachers are also given intensive inservice training to provide them with the skills to meet individual pupils' varying instructional needs. Further, the teachers and principals, and indeed the parents, are provided with a set of terms and methods that translate into a common language about the instructional program and the pupils' progress through the program. This reduces considerably the miscommunication and misunderstandings that are often found in many school districts.

Keeping the above in mind, the impact of this system should be measured by the extent to which classroom teachers consider that the system is useful to them in meeting the overall goal of enhancing pupil achievement through individualizing instruction.

IMPACT OF THE SYSTEM

When we began our impact inquiries in South District, we entered a system that had been developing and in operation for many years. From

previous visits we knew that the reading and mathematics parts of the program had been operating for many years. While we could ask "impact questions" about these two instructional fields we were unsure if our teacher respondents would be able to differentiate between the district instructional information system's impact and the extent to which current practices contained some unknown carryover from practices that predated the district's instructional information system.

In an effort to get as clear a picture as possible of how the instructional information system worked and its impact, we decided to select a recent addition to the system and measure its impact. We chose the district's new writing instruction program as the focus of our inquiry.

In a nutshell, the district had become aware that some parents and teachers, were concerned that the schools were not adequately teaching the students to write creatively, clearly, or accurately. After collecting criterion-referenced test data and visiting other districts and writing projects (one principal visited some British schools), the district decided to launch a comprehensive program to improve student writing throughout all grades. This decision was reached after considerable discussion and analysis which included principals, teachers, and parents.

All of the system components were brought to bear on this project. Teachers helped develop a special criterion-referenced testing series; teachers also helped develop a district continuum of K-8 writing skills, which was built upon the Bay Area Writing Project; almost all the teachers have attended a voluntary inservice program that instructed them in the fundamentals of teaching writing, of diagnosing and treating student

writing problems, and motivating students to want to write creatively and well. Learning specialists helped teachers with diagnostic problems and worked with small groups of students with common problems; principals visited classes often to assess the teachers' progress and to make programmatic adjustments where warranted.

One of the first questions we explored was the extent to which this program had been implemented. In a typical loosely-coupled school district it is not uncommon for the central administration or board to mandate a particular program and find, after some period of time, that the program had not been implemented as designed, or that it had been differentially implemented, that is, implemented in some schools or classrooms and not in others.

So, a first question we explored before trying to measure impact was the universality of implementation. After completing our field work, we were convinced that the district's writing program had been implemented in every elementary school in the district and in almost all the classrooms. There were some few teachers who did not participate in the program but their number was small. One can say with considerable confidence that the program has been implemented; parents can be quite sure that their children enrolled in the South School District will experience a comprehensive and sequenced instructional program in writing.

The teachers and administrators with whom we talked identified a large number of impacts. For the purpose of brevity we have reduced their comments into three categories: academic learning time, school climate and culture, and communications.

Academic learning time. Derived from the Beginning Teacher Evaluation Studies, this term means that pupils spend an adequate time on an instructional task at a level that allows the student to achieve mastery and to be challenged to move, when appropiate, to higher levels of achievement. Once we sorted through all the teacher's comments, this theme emerged clearly. It was manifested in several ways, such as:

- The start-up time at the beginning of the year is greatly reduced because the teacher has criterion-referenced test results on each of the new pupils on each of the district continuum elements. After a brief check to see if the test results are accurate the teacher can immediately begin to work with students, at each student's appropriate level.

- The criterion-referenced tests, which can be administered and corrected in a short period of time, provide teachers with what they generally view as a valid measure of pupil progress. They can quickly see where the gaps are in pupil learning, and they can place students into temporary instructional groups with peers who have similar instructional needs.

- The teachers can be quite specific when talking to parents about the students' instructional needs and the kinds of home activities that will help students achieve mastery of the subject matter.

- The negative effect of having substitute teachers is diminished in this program. Substitute teachers can be provided with a rather specific individualized plan to follow with classes.

School climate and culture. Typically in elementary schools teachers work quite independently behind their classroom doors. To be sure they follow a general district pattern of studies, that is, a third grade teacher attempts to cover "3rd grade material." But the teachers are loosely supervised by the principal; the principal generally does not interfere with a teacher's activities unless it is plainly clear that the teacher is quite incompetent. It is difficult for the principal or other teachers to determine the extent to which individual teachers are meeting

the instructional needs of individual pupils. One could, thus, characterize the culture of most schools as minimizing organizational cooperation. There is little sense of teamwork; the school does not work as an integrated whole.

In South District schools, one senses a much different culture and climate. With regard to the teaching of writing, the climate can be best described as teamwork -- as a group of teachers and a principal and learning specialist working toward a common goal in a common way. All the teachers teach writing in the same way and a teacher at one grade, say 4th grade, can be sure that the students have had a similar writing experience with their 3rd grade teacher. What is more, the fourth grade teacher can use CRTs in identifying specific knowledge or skills that each student may not have mastered in the previous year.

The relationship between the principal and teachers is also quite different. Principals visit classrooms regularly and have a common understanding with the teachers about what should be occurring in the classrooms. But the atmosphere or mood during these visits is not one of supervisor "checking up" on subordinates, but is instead one of a colleague who is interested in another's work. Principals do not report being concerned about teacher competency; the teachers have been carefully selected and trained by the school system, and they receive continuous feedback on their effectiveness.

What is more, the teachers have been, and continue to be involved in developing and refining the system in use. Thus, there is none of the kind of "sabotaging" that sometimes occurs when new instructional materials are implemented from the top without teachers' involvement.

Communications. Finally, an important impact of this system is the degree to which it eases communication among the various groups that make up a school, e.g., teachers, students, principals, supervisors, and parents. As has been previously noted, this system provides a common set of expectations, methods, and outcome measure. It also provides a common vocabulary. The effect of this on communications among teachers, principals, and learning specialists is obvious: they can quickly understand each other and problems are easily placed in a familiar context.

One of the greatest impacts this common set of expectations and vocabulary has seems to be on the communications between teachers and parents. Instead of the more common teacher-parent conference where the parent is informed about the pupil's progress in terms of how he or she compares with other students or the level of effort the student is putting forth, South District teacher-parent conferences can focus on those skills and knowledges from the district continuum that the pupil has mastered or not mastered. At the beginning of each school year, the teacher and parent review the child's CRT results and a specific teaching and study strategy is mapped out for the coming year. The roles of the teacher, parent, and student in achieving the desired goals are agreed upon and clearly understood. At subsequent conferences during the year the student's progress is noted and adjustments are made, if needed.

OTHER IMPACTS

Because this is a carefully designed, comprehensive system that has been fully implemented, there were few unexpected impacts. Those that were

initially encountered, such as teacher resistance, have been ameliorated. The only impacts that appeared to be of any consequence were: time commitments, computer and measurement errors, and an inordinate number of intra-district transfers into South District.

Time commitments. Numerous teachers commented on the amount of time the CRT program took in their classes. However, they also noted that the district no longer gave norm-referenced tests and thus the total time devoted to testing was perhaps not significantly greater than that which is spent on testing in other districts. The teachers who commented on the time commitment, however, also felt that the time was well spent because it resulted in data that helped them to check pupil progress and individualize instruction.

Computer and measurement errors. Many teachers observed that they must read the computer data very carefully because occasionally the computer results are erroneous. Also, the CRTs are not infallible. Students occasionally score considerably above or below their real level of competency. Usually, when this occurs, the teachers catch the error and either retest or use their own judgment in planning the student's instructional program. In short, this system, with all its sophistications, cannot totally replace teacher judgment in making instructional decisions.

Intra-district transfers. The state in which South District is located allows parents from one district to apply to have their children transferred into another district. Because of South District's reputation and its instructional program, the district believes that it has had an inordinate number of parents from surrounding districts who wish to have

their children transferred into South District. This does not represent a problem -- it is merely an unexpected impact.

Summary

Having reviewed the impact of these two quite different instructional information systems, we will conclude with some final observations about the similarities and differences between the two and what this tells us about measuring impact.

Differences. Clearly, these two systems are aimed at serving quite different audiences. North seeks to inform school site councils; South, the classroom teacher. North's system is far more indirect in its immediate impact on the classroom. Indeed, much of the impact may not have any direct measurable effect on individual classrooms and teachers. The two systems, quite expectedly, differ in the level and consistency of implementation. North District portrays considerable variation in the way and degree to which its system has been implemented. South District, on the other hand, is quite uniform and comprehensive in implementation from school to school. Finally, the two districts face different problems as regards the further implementation and development of their programs. North must address reasons for the differential implementation from school to school and seek to understand the reasons for this variation and, if necessary, consider strategies for overcoming undesirable variations in program implementation.

South, on the other hand, must assure that their program does not become a victim of its own success. That is, success sometimes breeds complacency which then results in the organization losing its drive and capacity to approach new problems with a fresh perspective.

Clearly, if a district is going to try to measure the impact of its instructional information system, it must make sure that it has a clear understanding of what the system is intended to accomplish, the degree to which the system components have been developed, and the conditions that allow the district to make reasonable progress.

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