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This collection of four symposium papers explores research and data problems in big-city schools. The papers are "Data Accessibility: Policies and Organizational Strictures in Big-City Schools" by W.G. Monahan (ED 019 749), "Some Data Problems in Systems Research" by M.C. Alkin and W.L. Duff, Jr. (ED 021 324), "Towards Adequate Educational and Socio-Cultural Data for Continuous Educational Planning in Large School Districts" by D.J. Leu, and "Impact of Research Findings and Recommendations in Urban School Districts: A Case Analysis" by C.R. Steinhoff and R.G. Owens. Monahan describes difficulties occurring when researchers with their own goals intervene in a system which has defensive as well as information acquisition goals, and provides a theoretical framework for solving such problems. Alkin and Duff discuss problems they have encountered in systems research such as specifying output measures, data incompatibility, and missing data. Leu places the data problem in the context of planning and asserts that we do not prepare administrators for this key activity. Even when data become available, using them for planning remains central. Steinhoff and Owens provide a case study of a cooperative university and school system effort at data collection and utilization, identifying problems and proposing duties for the participants. (TT)

RESEARCH AND DATA PROBLEMS IN BIG-CITY SCHOOLS

A Symposium

Edited by
WILLIAM G. MONAHAN

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INTRODUCTION

Robert E. Ohm
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The issue to which the symposium addressed itself is both current and continuing. Data accessibility is essential to not only the schools for both short- and long-range planning but to researchers who would help the schools in their difficult task.

The papers presented cover a continuum of problems in data accessibility and document well the fact that it is as much an internal problem for the schools as it is an outsider's problem for researchers. Monahan begins with a description of common difficulties and typical mis-communications occurring when researchers with their own goals intervene in a system which has defensive as well as information-acquisition goals. He then provides a theoretical analysis which reduces the seemingly large variety of problems to several logical categories derived from bureaucratic theory and susceptible to rational solution.

Steinhoff and Owens in turn provide a case study of a cooperative effort involving university personnel and staff members of a school system. Problems of cooperative effort were identified and duties proposed. As in Monahan's analysis, the information acquisition and use problem was considered central to effective cooperative effort.

Leu's paper confronted the information problem from the perspective of a consultant team working within and for the system. The necessity of using multiple sources of data including a commercial demographic data organization is worth noting as an indication of the difficulties of getting information in appropriate quality and quantity. Leu places the problem in the context of planning and asserts that we do not prepare administrators for this key activity. Even when data become available, either through research or through normal acquisition processes, the problem of plugging data into planning remains central.

In summary, this set of papers has opened up a territory generally ignored by the data producers as well as data users. As in all social systems, the information subsystem and its operation is a central problem. This symposium penetrated several key structures and strictures of the information subsystem of big-city schools. It has made a contribution to the growing literature on the problems of information generation and its use in schools.

DATA ACCESSIBILITY: POLICIES AND ORGANIZATIONAL STRICTURES IN BIG-CITY SCHOOLS

William G. Monahan
The University of Iowa

Access to data in large school districts for research purposes is a rather complex problem. Researchers interested in large-city school matters are frequently heard grumbling about red tape, delays, lost instruments, and refusals of permission to search records or draw samples.

On the other hand, school personnel point out that researchers are either ignorant or uncaring about the impositions they place upon the district; there is little return to the district from most of the research; and as a Buffalo, New York, administrator reported, "We are in danger of being inundated by the flood of requests."

This brief paper has a two-fold purpose: first, a summary analysis of educational policy regarding research requests in fifteen big-city schools together with some commentary regarding the processing of such requests; secondly, some theoretical speculations regarding certain organizational factors in large school systems which operate as research restraints.

Educational Policy

The official policies regarding requests for data (or for permission to conduct research) by outside agencies or individual researchers do not vary a great deal in large-city school systems. Among fifteen large systems that I surveyed, the policy statements with reference to such requests differed mainly in detail rather than purpose. In other words, some policies were broadly conceived while others provided comparatively detailed procedures. The districts surveyed ranged in size from 63,300 pupils to 294,200 pupils (see appendix A).

Among these fifteen school districts, eleven indicated a formal established written policy and provided copies of these to me; two districts indicated their policy regarding research requests was not written; and two other districts indicated they had no policy regarding research requests. In the latter case, however, these districts nevertheless spelled out definite procedures through which requests must pass, and in all districts it is apparent that a proposed research project or request for data is subject to critical assessment by someone in the school system. Usually this is a deputy superintendent or a director of research. In one case, a school principal had such authority but this was the only system among those surveyed in which such requests were not mandatorily channeled through central administrative offices.

The procedure for handling research or data requests is generally similar for these systems: the researcher submits his idea, preferably in the form of a meaningful proposal, together with any instruments he plans to use. This is evaluated in terms of (a) its value to the school system, (b) the nature of its design (and therefore the extent that it may disrupt the normal work of the school), (c) approval of the unit or school to be concerned, and (d) the purposes and reputation of the researcher.. This process may delay a legitimate piece of research a few days or a few weeks. Respondents generally agreed that proposals for research receive relatively prompt processing.

Some systems of the size I surveyed do receive a great many inquiries from researchers and indicate a willingness to respond to such requests accommodatingly, but it is not surprising that administrators who are involved are somewhat cynical. Respondents in my sample indicated that too many of the proposals they are asked to approve are ill conceived and poorly designed. Another frequent complaint was that there was too little benefit accruing to the schools - - most of it accruing to the researcher. In districts easily accessible to colleges and universities, some long-standing norms have developed which constitute a *special* kind of policy. A respondent in one such city said:

> We have a very good working relationship with the university, who is our greatest source of outside research requests. The people there understand our procedures, and are happy to comply with it. Once in a while a new professor must learn the ropes the hard way, but all in all we are pleased with our association with the university.

The districts also complained that there was too much duplication; many requests reflect total ignorance of data problems in cities; some requests are foolish; requests frequently assume an obligation on the part of the school system when there is none; researchers are overbearing with teachers; and districts seldom receive any followup even when policy stipulates it.

In summary at this point, the scope of a district's policy ranged from very general statements like: "Research studies to be conducted in this district shall be authorized by the superintendent or his delegated representative. Each project shall be evaluated in terms of its feasibility, value to the professional development of staff, and contribution to the welfare of students."

At the other extreme, a policy frequently specified the following:

1. Voluntary participation by staff.
2. Person or agency to receive and review proposals.
3. Limitations of responsibility of the district.
4. Notices of approval and routing thereof.
5. Coordination by the research division.
6. Reports of findings to the system and the attendance unit (if involved).
7. No group of children to be involved in more than one project per year.

Research and Data Collection - A Distinction

Clearly there are conflicts between people in the school and people who want to use the school for research purposes. But there is an interesting difference in the nature of the school district personnel's reaction to proposals for conducting research on the one hand and to requests for data or to search records to gather data, on the other hand. There is a real distinction between these two types of research conditions. A district apparently feels more comfortable when a researcher presents a complete statement of what he proposes to do. This allows district personnel to respond to the proposal as a package. There are two important advantages of this procedure for the school district; first of all, district personnel are able to immediately assess the total feasibility of the project in terms of implications for the school district (personnel to be involved, time, inconvenience, etc). Secondly, and perhaps more important for big-city school districts today, the complete statement in the form of a research proposal provides school district personnel a better basis upon which to evaluate the motives of the researcher. Certainly this does not insure that the purposes specified by the researcher are indeed those which he intends to pursue, but even that may be apparent in terms of the way the statement "hangs together."

Requests for access to data or permission to search records, on the other hand, are quite different. Large-city districts seem to be much more sensitive about requests for data when they are not clearly aware of the way the data shall be used or the purposes for which the data are requested. By virtue of the fact that the big-city district finds itself the focal point in a sometimes violent, frequently nonrational, and increasingly complex socio-urban structure, this sensitivity is understandable. Add to that the tremendous size and the bureaucratic rigidity of the public schools in large cities at a time when they are asked to do almost everything differently and better in the face of a stabilized and sometimes decreasing economic base, and you have the parameters within which sensitivity develops. The response of such districts to almost any kind of request for information or data by researchers outside of the organization is likely to be somewhat defensive. Where district personnel are not in a position to know the purposes a researcher has for requesting certain data, there is likely to be an assumption that in some way or another the data will be used against the district; i.e., to make the district look bad. There is ample precedent for this point of view according to personnel in large districts. Newspapers have been reported as rearranging data in order to place a negative emphasis on a conclusion rather than a positive one. For example, a school district rather proudly may put out that 40 per cent of its students scored two standard deviations above the mean on a particular standardized test; the newspaper then prints the story to the effect that 60 per cent of the students scored below two standard deviations above the mean. The distinction between a newspaper reporter and a reliable researcher is not necessarily made on the basis of a rational survey of the situation. When a request for data is presented to a school district without additional information upon which the district can evaluate the purposes for the request and the nature of the way the data shall appear, there is appar-

ently a good chance that the request will be thwarted. One major city had great dificulty with a civil rights research team who studied achievement records of youngsters in a number of schools, and concluded on the basis of what was reported to be a rigorous analysis of the data in kindergarten through the fifth grade, that the longer a youngster stayed in a particular school, the less he achieved from year to year. Personnel in the school district pointed out that the data for each grade were based on different children; in other words, due to mobility patterns, the children on whom achievement data were gathered in the second grade were not the same children on whom achievement data were gathered in the third grade. District personnel asserted that they had limited success in correcting the misleading conclusion.

It is reasonable to assume that large school districts are apparently sensitive to isolated requests for data as well when personnel within the school district are expected or asked to perform tasks associated with the supplying of it. In the normal day-to-day activities of many people in the school districts throughout the country, compliance with provisions of federal funding agreements necessitates a considerable amount of this kind of activity as a regular part of the job; certain staff people consider this to be official and proper and feel that additional unofficial requests from researchers is a careless imposition. This condition is applicable to all districts - - not just large city districts; however, the great size of large-city districts suggests the scope of this reporting activity. Staff personnel in school districts who are primarily responsible for research activities point out that with increasing utilization of information processing equipment, the extent to which such districts can respond to specific requests for data will be substantially improved. They also point out that extensive debugging of the information systems at the present time is contributing to some of the difficulties apparent in accessibility to data, not only by outside researchers but for purposes of internal information needs as well.

Organizational Strictures as Research Restraints

As students of bureaucracy are clearly aware, Max Weber treated contradictory assumptions in organizations only incidentally; he was interested in the characteristics of pure organizations. Weber intentionally ignored the informal organization because it was compatible with his purpose to do so, but in more recent times we have come to recognize that the informal organization is perhaps as important as the formal. Of this, Peter Blau states:

> Informal relations and unofficial practices develop among the members of bureaucracies and assume an organized form without being officially sanctioned.

Blau also privides a clue to one of the most significant kinds of research restraints when in his discussion of the role of expertise and specialization as a factor in the technical effeciency of bureaucratic structures, he suggests that,

"Even experts, however, may be prevented by personal bias from making rational decisions." In this paper, this type of condition is refered to as an *organizational stricture.* The term is borrowed from physiology and as used here refers to a narrowing of the "passage way" through which something must pass; in this case, the something is a research proposal or a request to gather data. Theoretically, it is postulated that the establishment of a special branch or division or bureau within a large school district for the singular purpose of managing and monitoring the research and related activities of the school district will have as one of its major consequences the delimiting of access by outside researchers or research agencies. There are two explanatory derivations of this limiting process:

Derivation A: Research proposals or request for data will be delimited due to the establishment of more stringent criteria.

Derivation B: Research proposals and requests for data will be delimited through the personal bias of research evaluators who consider their own expertise as adequate justification.

The consequences of the establishment of a special research branch can be equally applicable to districts of varying size. Indeed, what is called into question here is the interpretation concerned with how large is large. Yet, there seems to be some empirical basis for distinguishing the very large school district. First of all, size contributes to an understanding of the motives for the establishment of such a division. The very large district has as much to gain *defensively* from the establishment of such an agency whereas a smaller school district, though it might still be large enough to support such a unit, would be more likely to emphasize the role of the research division perhaps as a change agent. Performing "gate-keeper" functions can be expected as part of the responsibility of a research division in either type of district; however, the differential emphasis placed on this function by big-city school districts compared to smaller districts should be obvious. It becomes one more element in what one might characterize in the big-city public school system as the "firefighting syndrome."

Another empirical basis for assuming the delimiting aspects of a research branch with reference to personal bias has to do with the large organization's dependency upon impersonal rules, greater concern by personnel with the internal distribution of rewards, and greater competition for professional visibility.

Other Types of Organizational Strictures. - - Other types of organizational strictures which make accessibility to data within the large city school system difficult and which are generally well known to researchers are:

Transmission Strictures. - - Transmission strictures are more familiar to researchers; when instruments or proposals or documents are lost, or delayed, it is usually the result of a transmission stricture. Transmission strictures are manifested either as noninformational in which the document or instrument or proposal arrives at some staff member's desk without any instructions attached. Consequently

it receives no action, or as requiring consensus validation and is therefore placed in a file for some upcoming agenda. Transmission strictures do not usually result in more than delays but then, of course, documents are occasionally lost just in the process of moving through the organization. When requests for data rather than research proposals are involved in transmission strictures, the data which the researcher ultimately gets back are almost always dysfunctional for his purposes; this requres that the data then be retransmitted; the implications of that process are notorious.

Disapproval Strictures. - - Any proposal or request for data that requires voluntary participation by some subject or the approval of some unit director such as a school principal is always subject to disapproval. In such cases the researcher then must exercise, if it is available to him, some form of subtle pressure to influence the approval of the unit he wants. This results in delay, and in some cases, in the necessity to redesign.

The Authority Stricture. - - The authority stricture may assume any one of several forms. The most obvious is when two divisions collect similar data and there is disagreement between individuals with equal status as to which division should supply the information. Another form of the authority stricture occurs when a proposal which has been routinely approved by someone comes to the attention of someone who has more authority, and he in turn raises questions about its appropriateness. The authority stricture is also likely to create problems of data accessibility for persons within the organization, or for persons specifically employed by the district to gather certain kinds of data and to pursue certain types of inquiry. This is closely related to those problems of status and prestige which were mentioned in this paper with reference to the delimiting role of the newly established research bureau. However, the nature of explicitly stated rules or informal norms governing the conduct of research by personnel within the organization is not within the scope of this paper.

Summary

Among fifteen large-city school districts, the established policies regarding the conduct of research or the collection of data by persons or agencies outside the school district are generally concerned with assessment of value and purpose; the nature and adequacy of design; approval, or voluntary participation by subjects; and the purposes and reputation of the researcher. In effect, policies ranged from relatively concise statements to more complex listings of specific procedures. The nature of educational policy regarding research, however, suggests that difficulties researchers confront are not a consequence of inability to conform with established policy. Therefore, difficulties must be attributable to certain factors within the organization itself. In this paper these factors have been designated with the term "organizational strictures," and certain postulations regarding the type and nature of the strictures were presented.

APPENDIX A

School Systems and enrollments in fifteen units surveyed. Enrollment data are based on: Educational Directory, Public School Systems, 1964-65. U.S. Office of Education, Department of Health, Education and Welfare, Washington, D.C., 1965.

District	*Enrollment*
Detroit, Michigan	294,200
Houston, Texas	199,800
Cleveland, Ohio	148,800
Milwaukee, Wisconsin	115,900
St. Louis (City), Missouri	112,400
Atlanta, Georgia (City)	108,500
Indianapolis, Indiana	105,600
Boston, Massachusetts	98,600
Denver, Colorado	98,300
Seattle, Washington	95,500
Cincinnati, Ohio	84,100
Pittsburgh, Pennsylvania	75,600
Minneapolis, Minnesota	73,500
Buffalo, New York	73,200
Jefferson County, Kentucky	63,300

SOME DATA PROBLEMS IN SYSTEMS RESEARCH

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"When I use a word," Humpty Dumpty said in a rather scornful tone, "it means just what I choose it to mean -- neither more nor less."

"The question is," said Alice, "whether you can make words mean different things."

"The question is," said Humpty Dumpty, "which is to be the master -- that's all."

Through the Looking Glass
Lewis Carroll

It would certainly be convenient if the researcher could transform the meaning of data with the impunity Humpty Dumpty enjoys in transforming words. If this were permitted, some of his more troublesome problems would mercifully vanish through Alice's looking glass. But, alas, the researcher is disciplined by the requirements of his trade. He is expected to reserve certain words for certain uses, and when he uses a word to describe or identify different concepts or things, he is obligated to explain and justify his actions.

"Systems" is a Humpty Dumpty type word; its meaning depends a great deal upon who uses it. Some speak of philosophical systems while others are concerned with control systems, and still others with political systems or weapons systems. Some use systems to identify a physical construct while others use it to describe a conceptual approach. Many use the term to indicate their concern for complicated organizations made up of many interrelated parts. Each has equal claim to the word. The writers, however, define a system in rather simple terms: A system is an entity that has at least one input and at least one output associated with it; it may or may not be complicated. Furthermore, we restrict our interest to only those systems that are controllable by man. In the remainder of this paper the use of the term "system" will be consistent with this definition.

The systems analyst is usually concerned with building a model of a "real world" system. A model is an abstraction from, and a simplification of, reality. which hopefully captures the crucial relationships in the real world. Systems are often enveloped by larger systems. For example, a classroom, a school, a district, a state's or nation's educational facilities can be legitimately defined as systems. The delineation of a specific system depends upon the decisions one wishes to make and the related questions the analyst wishes to answer. The generic question the systems analyst attempts to answer is, how can we maximize the systems output utilizing available resources. To this end he must evaluate the resource cost and the corresponding outputs associated with various combinations of inputs.

During the past years we have attempted to apply systems research to educational problems. Basically, our concerns have been with the decision options of administrators. Thus, a question of concern is, how can school principals and superintendents modify the manner in which they use resources within their institutions in order to maximize educational outputs. To accomplish these purposes, we have initiated a number of systems studies, one of which involves high schools in California.

We developed a mathematical model simulating a high school in terms of a description of its inputs (student and school), selected outcomes, and various organizational characteristics believed to mediate in the achievement of the outcomes. As a first step, multiple regression techniques were used to identify the relationships between the inputs and outputs. The inputs were divided into two categories -- those which are controllable by school administrators and those which are not. While "uncontrollable" inputs are important in that they interact with and thereby affect any decisions relating to the "controllable" inputs, our main interest is in the examination of the administratively controllable variables.

Included among the "uncontrollable" inputs were a variety of data items descriptive of the socioeconomic and student characteristics of the school environment. "Controllable" inputs included items descriptive of teacher characteristics, school programs, and organizational characteristics of both the school and the district.

Specification of Output Measures

In this paper, we propose to discuss four types of data problems we have encountered in doing systems research. The first of these is related to the difficulties of specifying outputs. The specification of the output measures is perhaps the most difficult problem in systems studies. It is obvious that there is nothing approaching a consensus in defining the specific objectives of educational systems. They certainly are not given in a usable way by a national, regional, or even local or district authority. In addition, after reviewing the rather nebulous statements of objectives that did exist, it became apparent that they were often multiple and conflicting. Under these conditions it was obvious that alternative means (inputs) used to reach any one end

(output) of the system would cause "spillover" effects—both negative and positive—on other ends of the system. It should be mentioned that this is not necessarily a criticism of school administrators, district boards, or others. Indeed, it is an almost unavoidable concomitant in studies of complicated systems, such as public education.

It is impossible to define meaningful objectives for systems studies without knowing something about the feasibility and cost of reaching them. We consider, therefore, that the formulation of and learning about objectives is a prime purpose of systems studies. For all of these reasons, systems studies are an iterative process; assumptions necessary to specify the model as well as the criterion measures must be derived from, and played back against, the analysis. This is best illustrated by relating a story told by Charles Hitch in one of his early papers on systems analysis:

> A friend of mine who is a sophisticated systems analyst once tried to solve a personal problem by a rigorous maximization of an objectives function supplied by his doctor. He needed to lose weight, so he determined by consulting the experts his minimum requirements for proteins, carbohydrates, fats, vitamins, minerals, etc. He also obtained the quantities of each of these food elements in the 500 or 600 foods on the BLS list. Then, on the plausible theory that mass is filling and that most dieting attempts fail because the subject feels hungry, he maximized, subject to various constraints, the weight (not counting water content) of the diet that would give him his minimum caloric requirements. The answer, ignoring minor quantities of various foods, was that he should drink 80 gallons of vinegar per day (vinegar is a weak acid, and its weight per calorie is remarkably high). Since his own tastebuds and digestive tract were to be the victims of this experiment, he knew intuitively that the answer was crazy and informed his machine that it should recalculate, ignoring vinegar. The second answer, incidentally proved to be as unacceptable as the first, so he introduced still other conditions.(2)

Now, Hitch's colleague was proceeding very sensibly with his problem, and properly using the tools of the systems analyst. But a part of the process was being able to recognize what is a reasonable solution, and having the ability to introduce complications and constraints as their necessity became apparent. Hitch underscores this observation later in the same paper.

> . . . it is slightly worrisome that the method used is very similar to the one so many of us use to take some plausible objective as given, and calculate like mad to maximize it. But we are using it in areas where out intuition doesn't reach very powerfully, and it therefore isn't so easy to recognize vinegary answers for what they are. That doesn't keep them from being just that.(3)

It is obvious, from Hitch's story, that *learning about* outputs is one of the chief outputs of systems studies. We are reminded to look at our outputs as carefully as we look at our model and its inputs. If we begin with tentative objectives, such as we did in our high school study, we should expect to replace or modify them as we move along. It is unlikely that we will be able to define satisfactory objectives at the beginning of a study.

The purposes of a system study, therefore, are twofold: a) to provide information for rational administrative decision-making in order to improve the real world system, and b) to continually re-examine and modify the arguments of the model in order to improve the model and the analysis.

Data Incompatibility

Another problem in systems research that we have faced in our study is that of data incompatibility. Unlike the researcher in the laboratory, the systems analyst must often use data collected by other people for other than its original purposes. Frequently, these data are not wholly suited to his ends. He is nevertheless often forced to use it due to the expense involved in gathering the large quantity of information usually needed in systems studies. In specifying our high school model, for example, we included over 200 variables from each of 180 high schools. Thus, the study, had it been based on data collected especially for this purpose, and had it included responses from each of the students involved, would have required in the neighborhood of 80 million individual observations. In addition to the direct cost of collecting the data, we must add the indirect costs that we might, under other circumstances, shift to the school and its students. The loss of student and faculty time is no less a cost in data gathering than is the cost of printing the testing instruments. Faced with the total costs of recollecting compatible data, we searched for reasonable alternatives.

Conceptually, we identified two major categories of data incompatibility. We may think of these as the second and third problems to be discussed in this paper. The first occurs when different instruments are used to measure the same concept. The second occurs when the concept we wish to measure is not precisely captured by existing data categories. In our study we have used or considered several different methods of coping with these problems.

The problem in the first type of data incompatibility is to find an equation that accurately transforms one information piece to another. For example, if we found that some schools recorded the body weights of students in grams and others recorded them in ounces, we could simply multiply the gram weight by 28.35. By doing so, all the data are transformed to ounces and are compatible. Thus, if we found that some of our subject population had taken different mathematics achievement tests, we might (after taking a deep breath and crossing our fingers) be willing to postulate a relationship between the recorded scores of the two groups. A second alternative is to simply throw away the suspect data. In our study, we often chose this latter alternative. (As a matter of fact, we discarded over 33 per cent of the sample for this or related reasons.)

In cases where we felt relatively sure of the conversion formula, we attempted the transformation. For example, in our study we found that each high school listed the scores of entering students (8th grade) for the areas of reading and arithmetic and also 11th grade scores for the same areas. Three of the summary scores reported were:

median score, score at the 1st quartile, and score at the 3rd quartile. For comparison purposes, scores on different tests had to be converted to one comparable form. Before we could proceed with our study, the above three summary scores were converted to percentile scores on national norms for each of the tests. Thus we, in effect, had produced three new data items which were the national percentile scores for the student at the median, first, and third quartiles at each school.

The identification of the second type of data incompatibility is a rather subjective exercise. A great deal of what we call real data is in fact a proxy for some abstract concept. Consider, for example, the problem we faced in measuring one of our criterion concepts. We wished to identify the effects that the inputs have on college attendance and performance. The input data, however, was on students still in high school and it was impossible to get output measures on these same students without waiting several years. Our solution was to use as an output measure the attendance and performance of preceding graduating classes from each school, the assumptions being that: a) the nature of the community and, consequently, the student input to the system (i.e., the uncontrollable variables) have remained relatively constant, and b) the educational program (i.e., the controllable variables to which the graduates were subjected) are substantially the same as that which presently exist. These two assumptions seem reasonable in view of the fact that schools and communities generally are slow to change.

In addition, we also found that some already available data would be of more use if it were combined or changed in certain ways. We felt that an examination of students attending college and their success is more properly expressed as a function of academically able students in the school population. For example, by taking the ratio of bright students (those with an IQ of 115 or above) to those attending college, we obtained a more suitable criterion measure.

Missing Data

Up to this point we have discussed rather briefly the criterion problem and the two types of data compatibility problems. We shall now turn to a fourth problem area - - missing data. We recognized that schools varied in the consistency with which they record information. The schools simply did not record all scores on all students. This was really no surprise, but it nevertheless presented us with some messy problems. As we have noted, in cases where the data were missing from an output measure, we decided to discard that case from the analysis. With regard to input categories, on the other hand, we attempted to stastistically recapture the missing information.

The procedure we used was really quite simple. In statistical terms, we were faced with the situation of having a different number of observations represented in specific zero-order correlations between predictors and criterion variables. The problem was solved, in effect, by uniting two existing computer programs available

at the Health Sciences Computing Facility at UCLA. The two programs are: a) the BMDO3D program which produces an intercorrelation matrix with missing data (i.e., individual zero-order correlations are based only on those observations for which data is present); and b) the BMDO2R program which is a stepwise linear multiple regression equation. Thus, we developed a program which uses the intercorrelation matrix produced by BMDO3D as the input for a stepwise regression equation. We consider this technique more appropriate for our purposes than the traditional practice of filling missing data items on individual observations with the mean of that item—a procedure which tends to reduce the variance on the item.

In addition, we are presently engaged in examining the possibility of developing prediction models for each of the independent variables in terms of the other predictors, and using resultant equations to generate estimates of missing data on an individual case basis.

We have mentioned but four of the many problems facing the systems researcher. This was partly because these are, in our judgement, some of the more interesting and pervasive problems that we have encountered. It should be remembered, however, that we are in the first stages of our study and, therefore, suspect the existence of many problems that we haven't as yet identified, much less solved.

We are proceeding with the abandon of one who has a problem to solve but knows he may never have all the information necessary to find a definitive solution. We lament the necessity of subjecting our data to what some might call "Humpty Dumpty transformations," but we harbor no delusions of impunity. The process of dealing with real world problems oftentimes requires solutions that would not be totally acceptable in the world of "pure" scientific research. A systems analytic viewpoint demands that we do what is possible to define the constraints of the system and that we specify the procedures we have used to enable ourselves to construct a model out of imperfect data. We have defined four kinds of problems: (1) specification of output measures, (2) data incompatibility where different instruments are used, (3) data incompatibility where the concept is not precisely captured by existing data, and (4) missing data. For each of the problem areas we have indicated the procedures we used to solve the problem. We recognize the imperfections in the proposed problem solutions but hope to resolve some of these difficulties by "testing for vinegar" at each stage of the analysis.

FOOTNOTES

1. The research and development reported herein was performed pursuant to a contract with the United States Department of Health, Education, and Welfare, Office of Education, under the provisions of the Cooperative Research Program at UCLA Center for the Study of Evaluation of Instructional Programs.

2. Charles J. Hitch, *On the Choice of Objectives in Systems Studies,* The RAND Corporation, Economics Division, March 30, 1960, p.9.

3. Ibid., p. 10.

TOWARDS ADEQUATE EDUCATIONAL AND SOCIO–CULTURAL DATA FOR CONTINUOUS EDUCATIONAL PLANNING IN LARGE SCHOOL DISTRICTS

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Historically, educational planning has been largely restricted to the use and analysis of "internal" data. The school curriculum, school personnel, students, school finance, and school buildings have provided the raw data for research, planning, and decision making. In recent years the "ball game" has drastically changed. Educational planners are discovering that many of the more significant factors or variables impacting education may be classified as "external" data located outside of the formal educational system.

For example, three recent educational planning projects were initially identified as problems of school buildings, cross busing, and educational budget. "Internal" data were carefully gathered and analyzed. In fact, all three problems required extensive demographic data, legal predictions, economic analysis, and close planning linkage with a complex metropolitan political intra-structure.

Figure 1 illustrates one model which I find helpful in causing educational planners to externally conceptualize new planning problems.

V = Values
G = Goals
O = Organization
E.S. = Educational System

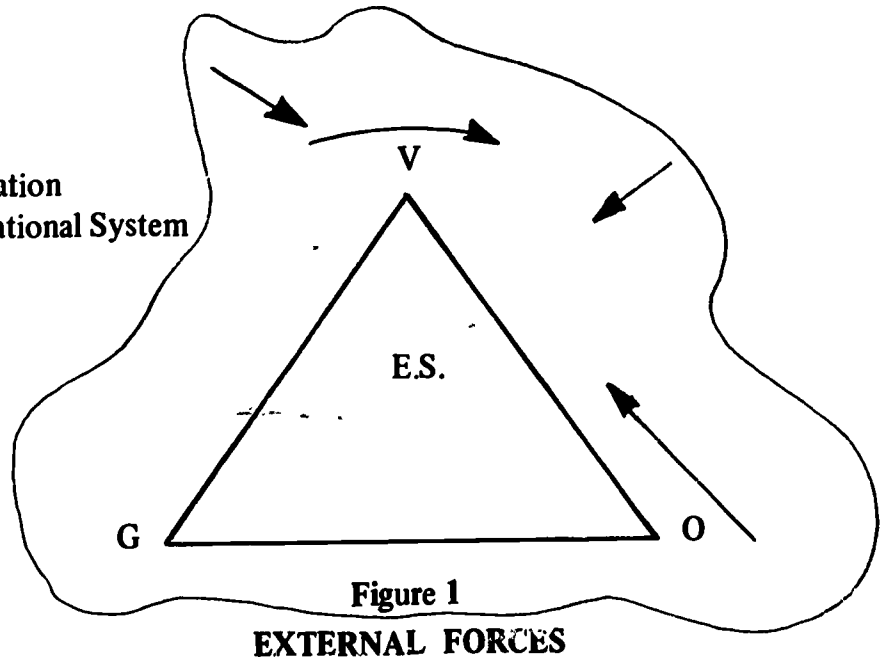


Figure 1

During the past decade I have had the privilege of serving as a consultant in educational planning to a number of large educational systems in the United States and throughout the World. Rather than continue with generalizations, I would like

to utilize a specific planning project to illustrate our attempts to move towards adequate educational-socio-cultural data when engaged in planning in one large school district - Chicago.

Table 1

TOWARDS CONTINUOUS COORDINATED EDUCATIONAL PLANNING

Staff Study	*Planning Project Description*	*Completion Date*	*Comment*
1	Review of Immediate Educational Facility Needs	August, 1967	Completed
2	A feasibility Study of the "Cultural-Educational Park"	January, 1968	Completed
3	Recommended Long-Range Educational Plan	June, 1968	In Progress
4	Guidelines for Continuous-Coordinated Educational Planning	November, 1968	In Progress
5	Continuous Coordinated Area Development Studies (25)	1-5 Years	Require Local Planning Groups
6	Annual Educational Planning Audit	Annually	Review Data Analysis, Research and Planning

In reference to the above "Plan for Planning," five planning principles should be mentioned:

1. The plan for planning starts with the local districts' definition and identification of their most crucial immediate problems - - "Immediate Educational Facility Needs" and " A Feasibility Study of the Cultural–Educational Park."

2. The plan starts with educational facility planning but quickly moves towards educational planning.

3. The plan for planning moves towards continuous coordinated educational planning requiring linkage and data outside the educational system.

4. Built into the plan is an annual audit or evaluation of the scope and quality of planning.

5. The plan moves from "outside" consultant control and direction towards Chicago staff control and direction. At all times it requires an "outside" and "inside" team with changing roles as increased planning capacity is achieved by the Chicago staff.

Educational Data for Planning

I am tempted to hypothesize an inverse ratio existing between the quantity and the quality of educational data currently available for planning. For example, in our Thailand educational planning project we are buried in sheer poundage of relatively useless but available educational data. Hundreds of civil service employees spend their entire working day accumulating tons of data. Unfortunately, little of the data has relevance or potentially significant use. Equally disasterous is the an-availablity of pertinent educational or socio-cultural data. Thailand is not much different than many of our large school districts. In fact, a number of our state departments of education seem to have adopted Thailand as their data "model."

What, then,explains this chaotic lack of relevant planning data? Obviously, there are a number of plausible explanations and possible scapegoats. The clearest and primary failure, I believe, rests with those of us who pose as trainers of educational planners and research personnel. School district planners are products of our institutions of higher learning. We trained them. And poorly. I do not believe, however, that we can ever efficiently and effectively train educational planners prior to their actively engaging in planning within their local educational systems. Greater gains are available through the continuous in-service route rather than the "Russian Roulette" system of attempting to predict who will be the future planners and attempting to train these "elite" through planning simulation at the university. We have produced and placed approximately forty educational planners during the past eight years at Michigan State University. Three of them are currently engaged (as their primary task) in the business of educational planning. I am currently working directly with some thirty to forty educational planners in large school districts. To my knowledge, none was formally trained as an educational planner.

A second major barrier to securing adequate educational data is our current inability to define what educational and external data are significant or relevant to our planning. I suspect this blockage has historical antecedents. In the past most educational planning projects focused on the school building and the school budget. Little planning concern was evidenced for what happened inside or around the building. Simple data were required for simply defined problems. For example, a school building's capacity was determined utilizing a standardized formula which ignored the impact of emerging curriculum innovations upon the building's future capacity. Enrollment estimates were developed utilizing survival ratios or cohort analysis techniques restricted to past school enrollment figures. This method simply assumes that enrollment trends will continue as they did in a past period of time. Capacity was subtracted from the enrollment estimates to determine additional space needs. The budget was checked to see if needed monies were available. Then an addition to the school and/or a new school was built. "Eureka! I have completed an educational planning project." Fortunately, the planning game is changing and the above process is usually recognized as inadequate. Incidentally, some years ago

myself and others developed instruments designed to "scientifically" measure the educational adequacy of educational facilities. Subsequently we have found that these rating instruments provide invalid measurements of educational adequacy. We have dropped the use of these rating forms -- only to discover that they are being adopted or adapted and are gaining in use throughout the United States.

Socio-Cultural Data

It is impossible to identify specific socio-cultural data needed for continuous educational planning in all large school districts. Each planning project and each school district contains enough unique conditions to negate a universal package of data. Therefore, I have attempted to outline the general socio-cultural data needed (and usually available) to assist the planners in increasing their understanding of the *changing* characteristics of the world surrounding a large school district.

Prior to outlining needed data, it is necessary to determine the unit of analysis: city, school district, area subdistricts, secondary school attendance areas, elementary school attendance areas, etc. If one assumes the need for data that has historical, continuous, and comparative characteristics, you have eliminated all existing subunits of the school district. School attendance areas, for example, have a history of minor modification and major change. Total district data provide useful "means" but are of little use in educational planning for the diverse and changing subareas of the large school district. Working in cooperation with demographers, city planners, and school district personnel, we develop and utilize "Educational Planning Units." These planning units (E.P.U's) are based on combinations of United States census tracts to insure historical, continuous, and comparative data on relatively small, changing, subareas of the city. In Chicago, for example, the City Planning Commission and a commercial demographer (Real Estate Research Corporation) have developed seventy-five planning units for city planning purposes. We have combined one to four of these planning units into roughly equivalent size "E.P.U's" which are closely related to existing school district organization - areas superintendents' and district superintendents' regions.

Each E. P.U. may be easily subdivided into smaller units or combined into larger units for analysis or specific planning projects. I suspect that our E.P.U's will become future school district operational units.

The following table outlines the socio-cultural data presently available for educational planning purposes. Time does not permit the illustration and explanation of how each data item may be utilized in planning. Therefore, several data items are expanded and utilized in illustrating their potential use.

Table II
SELECTED SOCIO-CULTURAL DATA AVAILABLE TO EDUCATIONAL PLANNERS

1. Historical Development of Region, City, and School District
2. Population Growth, Mobility and Future Estimates
3. Land Utilization
   a. Zoning
   b. Existing Residential-Commercial-Industrial Land Use
   c. Planned Future Residential-Commercial-Industrial Land Use
   d. Traffic Arteries and Traffic Volumes
   e. Future Transportation Plans
   f. Urban Redevelopment Plans
   g. Conditions of Blight
4. Educational Level of the Population
5. Median Family Income
6. Median Age of the Population
7. Labor Force Characteristics
8. Occupancy, Structural Characteristics, Value, and Rent of Housing Units
9. Characteristics of the Nonwhite Population
10. Negro Population Concentrations
11. Births to Residents
12. Public, Private and Parochial School Adherents

The following tables were selected to illustrate the potential use of representative socio-economic data in planning educational systems:

Table III
MEDIAN SCHOOL YEARS COMPLETED BY PERSONS TWENTY-FIVE YEARS OLD AND OVER MINNEAPOLIS AND ITS SMSA 1960

Community	*Median School Years Completed*
Edina	13.4
Minnetonka	12.6
St. Louis Park	12.6

(Table III Continued)

Community	*Median School Years Completed*
Bloomington	12.5
Richfield	12.5
Hennepin County (Total)	12.2
Anoka County (Total)	11.9
Ramsey County (Total)	11.9
Minneapolis	*11.7*
Dakota County (Total)	11.6
St. Paul	11.4
Washinton County (Total)	11.3

Table IV
MEDIAN FAMILY INCOME
MINNEAPOLIS AND ITS SMSA

Community	*Median Family Income*
Edina	$ 12,082
Minnetonka	8,180
St. Louis Park	7,808
Richfield	7,721
Bloomington	7,201
Hennepin County (Total)	6,954
Dakota County (Total)	6,843
Ramsey County (Total)	6,747
Anoka County (Total)	6,616
St. Paul	6,543
Minneapolis	*6,401*
Washington County (Total)	6,330

Table V

POPULATION TRENDS IN MINNEAPOLIS, HENNEPIN COUNTY, AND MINNESOTA

1900-1960

Year	*Minneapolis*	*Hennepin County*	*Minnesota*
1900	. . 202,718	228,340	1,751,394
1910	301,408	333,480	2,075,708
1920	380,582	415,419	2,387,125
1930	464,356	517,785	2,563,953
1940	492,370	568,899	2,792,300
1950	521,718	676,579	2,982,483
1960	482,872	842,854	3,413,864

Obviously, Minneapolis is declining in population and possesses a relatively low educational and income level when compared with its adjoining school districts. Creative educational planning would recognize these and other socio-economic data when designing educational plans and strategies.

Recent years have witnessed an increasing awareness of the importance of including racial-ethnic considerations in educational planning. The reasons for introducing this new variable are philosphical, moral, legal, politcal, economic, and educational. Adequate, accurate, continuous, and predictive socio-economic data ("external" data) have rapidly become of primary importance in educational planning. Our current Chicago educational planning project succinctly illustrates the need for adequate socio-economic data when engaged in educational planning. Selected data are extracted from our most recent planning project to illustrate the impact of external data on educational planning.(1) Data were provided by school planners, city planners, and a private demographic firm (Real Estate Research Corporation). Selected Excerpts from the Demographic Data follows:

"A. Understanding of the racial integration aspects of Chicago's Public Schools rest upon full awareness of certain basic facts about the population and housing in Chicago, with the first set of facts concerning the situation as of 1960.

1. Nonwhite, mainly Negroes, comprise 24 per cent of the city's population in 1960.
2. During the period 1950 to 1960, the nonwhite population rose 328,000 (or about 33,000 per year) but the white population declined 398,000 (about 40,000 per year) . . . Net out-migration was really 675,000 or about 67,000 per year . . . .

3. The nonwhite population is much younger than the white population and therefore has a higher rate of natural increase, and also contributes more children to the school-age population.
4. Housing patterns in Chicago are highly segregated, with most Negroes living in two major radial extensions out from the central business district towards the west and the south. . . . "

B. Real Estate Research Corporation forecasts for the future are based upon a reduction in the net immigration rate of nonwhites (to about 7,300 per year for the period 1975-1980) and fertility rates among both nonwhites and whites, and a reduction of white out-migration (to about 40,000 per year) -- yet they show the same basic trends continuing.

1. The white population will continue to fall, dropping around 200,000 persons every five years, or about 40,000 per year -- about the same as from 1950 to 1960.
2. The nonwhite population will continue to expand, as follows:

1960-65	147,000
1965-70	145,000
1970-75	130,000
1975-80	128,000

3. Therefore, the population balance will continually shift toward a higher proportion of nonwhites, *unless some drastic changes in residential settlement patterns occur.*
   The percentage of nonwhite will be:

1960	26.8
1965	31.5
1970	36.4
1975	40.9
1980	45.6

4. These trends will have very significant impacts upon the nature of the children enrolled in the public and private schools in Chicago, with the proportion of nonwhite rising very sharply in the public schools even within the next eight years . . . .

C. Certain fundamental conclusions emerge rather dramatically from these data.

1. A crucial factor which any policy must take into account is the continued expansion of the nonwhite population, which presumably will remain focused within the city limits of Chicago.
2. The second conclusion is that any policy aimed at influencing the racial balance in public schools in the city must take effect at once -- if they are delayed in impact for thirty or even twenty or fifteen years, there will be no white students left in the city with whom to integrate.

3. The third conclusion is that no ultimate solution to achieving integrated schools is possible without shifting future nonwhite growth to the suburbs, or in some other way involving the suburban white children with non-whites now, or to be, located in the central city.
4. The fourth conclusion is that any attempt to influence these trends is really an attempt to decide through public policy where people of various races and economic levels will live, or be persuaded to live, in the future."

Obviously, a racial "tilt" from white to nonwhite averaging 4.5 city blocks per week has tremendous implications for educational planning and clearly illustrates the need for adequate socio-cultural data when attempting continuous educational planning in large school districts.

Changing Legal Data in Planning

Legal knowledge, legal information and legal predictive skills are becoming increasingly important to educational planners. In fact, the physical size, fiscal support, socio composition, and educational programs of large school systems (and their subsystems) are being shaped or modified by past, present, and future legal decisions. Therefore, educational planning must utilize another external source of data information - legal data. Data need not be restricted to numbers, tables, charts, and computer programs. One correct definition of data is: Things known or assumed; facts or figures from which conclusions can be inferred.

Creative continuous educational planning requires theoretical - - predictive skills by the planners. "External" legal data are needed to aid the planner as he attempts to understand, explain, predict, and recommend action plans for the future.

For example, a study of selected school districts in Michigan revealed wide variations in socio-economic characteristics and resultant educational needs while the existing state fiscal support system completely ignores these variations in external data.(2) Table VI summarizes a portion of the data.

If one makes the following legal-educational assumptions:

1. Education is a state function.
2. Local school districts are subsystems of the state.
3. Wide variations exist in educational needs. (See Table VI)
4. Wide variations exist (between school districts) in fiscal capacity to support education.
5. Wide variations exist (between school districts) in fiscal expenditures per pupil and in quality of education.
6. The more favored (in terms of social-cultural factors) students generally receive higher educational expenditures.
7. The less favored (in terms of social-cultural factors) students require higher educational expenditures.
8. Our constitutions (State and Federal) support equal educational opportunities.

Then - the existing state fiscal support program is obviously unequal, discriminatory, and unconstitutional. The point is that socio-cultural data are of prime importance in educational planning. Incidentally, the legal-educational issue embodied in the above data and assumptions has just been launched into our court system.

Table VI

RANK ORDER OF CITIES WITH 8000 OR MORE RESIDENT PUBLIC SCHOOL MEMBERSHIP ACCORDING TO THEIR TOTAL PER CENT ON SELECTED SOCIO-ECONOMIC CHARACTERISTICS

Rank	*City*	*Total Per Cent*
1.	Detroit	100.58
2.	Pontiac	81.84
3.	Battle Creek	76.56
4.	Flint	73.07
5.	Saginaw	65.18
	Mean - State of Michigan	
6.	Ann Arbor	63.37
7.	Jackson	61.85
8.	Kalamazoo	58.80
9.	Hazel Park	58.45
10.	Muskegon	56.35
11.	Grand Rapids	55.72
12.	Ferndale	55.11
13.	Birmingham	54.26
	Mean - 29 Districts	
14.	Dearborn	53.26
15.	Wyandotte	52.22
16.	Wayne	51.58
17.	Lincoln Park	5.12
18.	Warren	50.96
19.	Port Huron	49.42
20.	Lansing	47.62
21.	Southfield	46.65
22.	Royal Oak	45.43
23.	Roseville	44.87
24.	East Detroit	44.05
25.	Garden City	43.02
26.	Midland	42.54

27.	Berkley	42.14
28.	Livonia	41.35
29.	Bay City	32.00

SOURCE: The totals represent the sum of the per cents for the following socio-economic characteristics: (1) nonwhite; (2) family incomes less than $2000; (3) native to other state; (4) foreign born; (5) unemployed; and (6) 5-17 not in school.

Summary

This paper has fallen short of its assigned task - identifying the educational and socio-cultural data needed for continuous educational planning in large school systems. The task is impossible. Hopefully, the need for and type of "external" data has been partially identified. Assuming that needs for external data are determined, and the specific data needed are secured (in usable form), several major tasks remain. The educational planner must develop or utilize a rational and sequential method of utilizing available data. This methodology, which I call "A Plan for Planning," must operate within the existing constraints of time, money, human resources, and "knowhow." In order to develop this Plan for Planning, I find systems analysis a most useful device in forcing me to organize and plan logically. It does, however, possess the same basic limitation of computer programs - "garbage in, garbage out." The "Subnet" on the following pages illustrates a portion of one of our current planning projects.

An analysis of the "PERT" charts (Apendix A) succinctly summarizes our planning process and strategy:

1. External data (external to the formal educational system) have been added to our planning data bank.
2. Data are developed and/or contracted for in a predetermined sequential order with an assessment of time and input needs.
3. Educational planning requires a coordinated team of data and research specialists - local school system personnel, other local governmental and non-governmental agencies, external specialists, and external planning consultants.
4. Each member of the planning team has changing roles and responsibilities as the planning progresses.
5. "Wiring the system" (coordinated, continuous, educational planning) which taps external planning resources can build an improved multi-directional communication network and result in improved planning along with increased understanding and support by external groups.
6. The changing socio-economic-political-legal world surrounding educational systems should provide relevant data for educational planners.

In summary, relevant educational and external data must be identified and arranged as sequential inputs to aid planners in the challenging task of designing new educational plans and options for our large school districts. The success or failure in "recycling" our decaying central cities will be significantly impacted by the quality (not quantity) of our endeavors.

FOOTNOTES

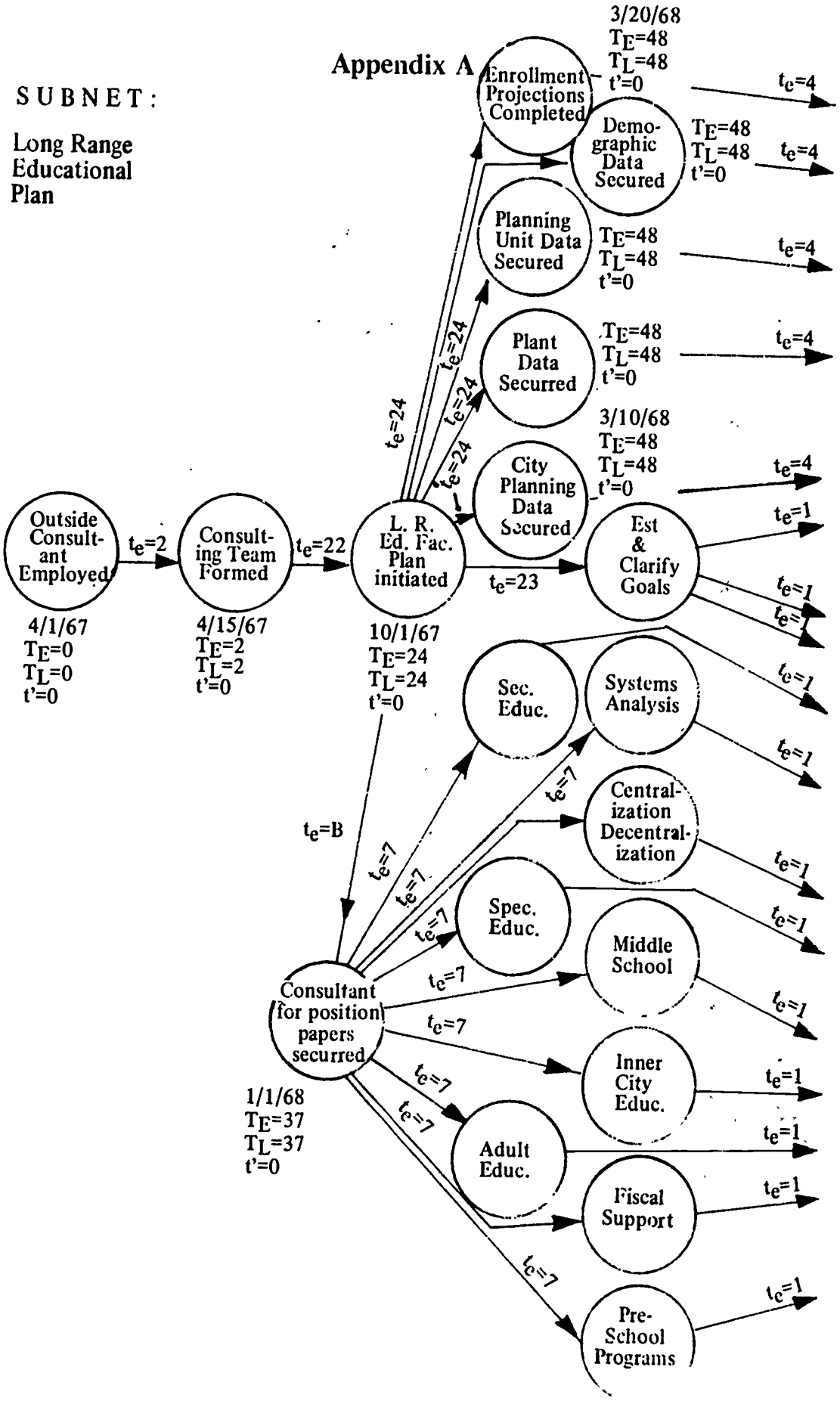
1. Donald J. Leu and I. Carl Candoli, *A Feasibility Study of the Cultural-Educational Park for Chicago* (Chicago: Chicago Board of Education, 1968), pp. C-1 to C-9.

2. Donald J. Leu, *A Look at Michigan Schools - An Anlysis of Selected Social and Economic Characteristics* (East Lansing, Michigan: College of Education, Michigan State University, 1963), 85 pp.

Appendix A

SUBNET:

Long Range Educational Plan



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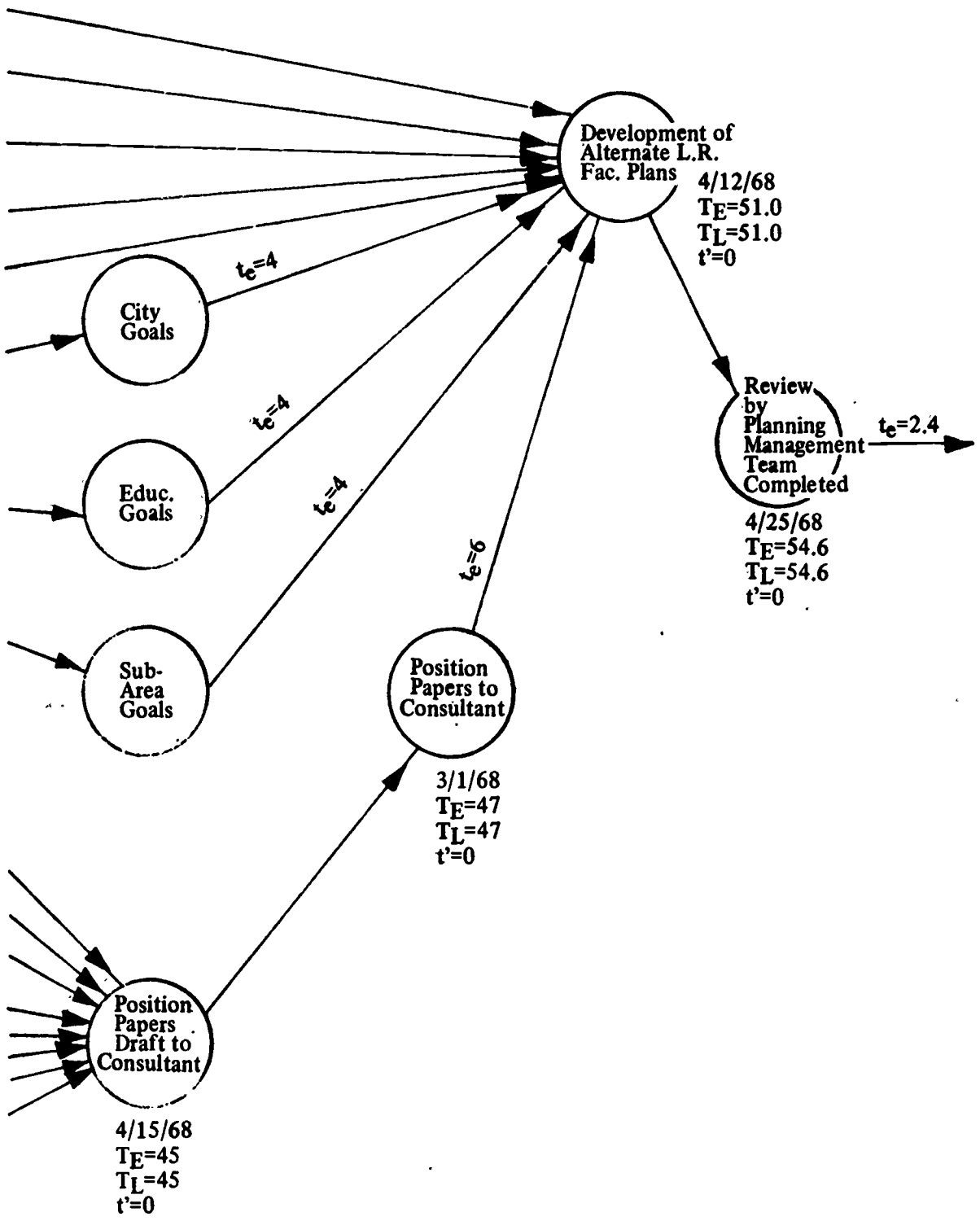

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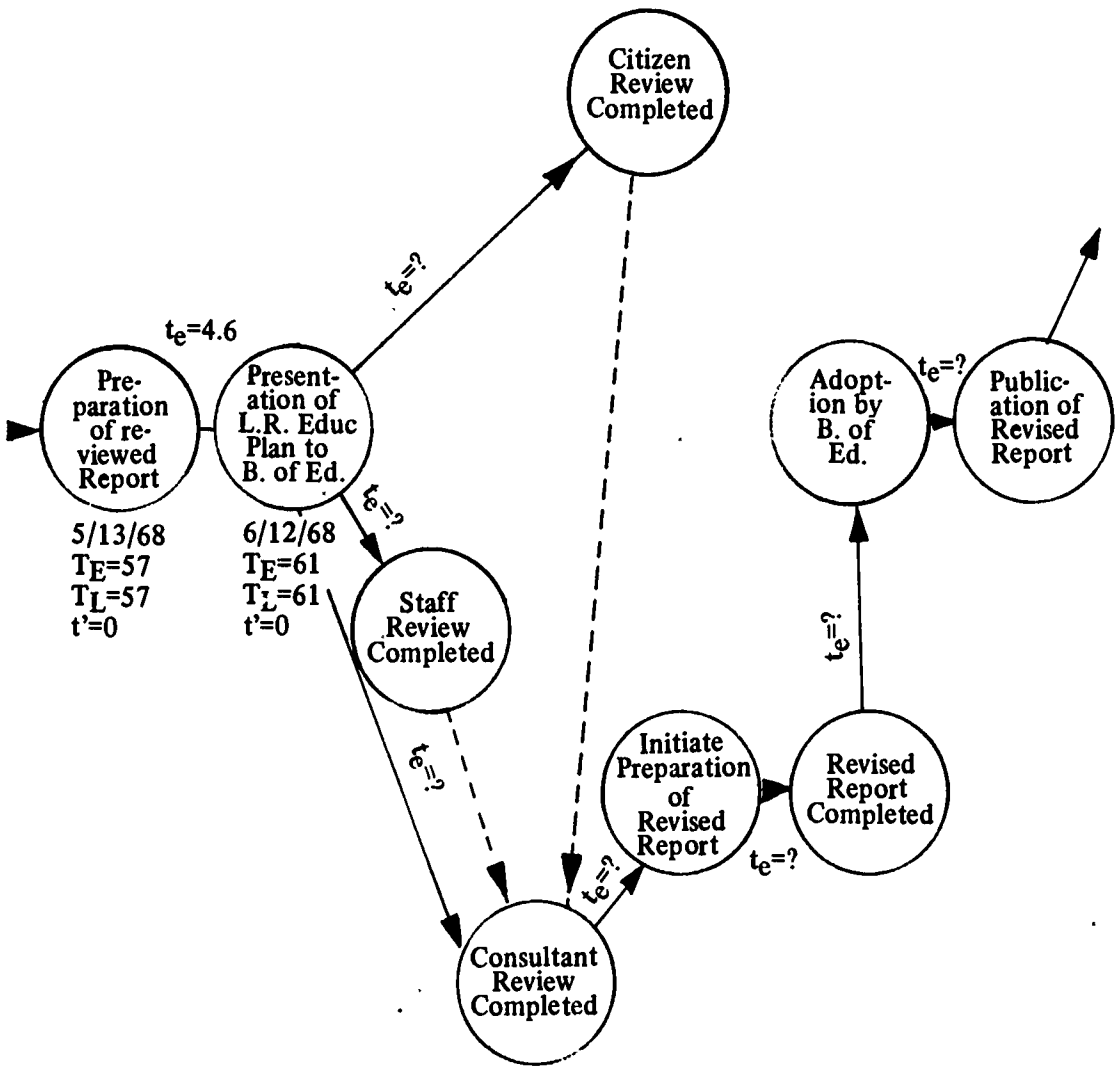
Citizen Review Completed
t_e=?
t_e=4.6
Pre-paration of re-viewed Report
Present-ation of L.R. Educ Plan to B. of Ed.
t_e=?
5/13/68
T_E=57
T_L=57
t'=0
6/12/68
T_E=61
T_L=61
t'=0
Staff Review Completed
Adopt-ion by B. of Ed.
t_e=?
Public-ation of Revised Report
t_e=?
t_e=?
Initiate Preparation of Revised Report
Revised Report Completed
t_e=?
t_e=?
Consultant Review Completed

IMPACT OF RESEARCH FINDINGS AND RECOMMENDATIONS IN URBAN SCHOOL DISTRICTS: A CASE ANALYSIS

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We might point with pride to the increase during the past few years in competition for space in professional journals, in scholarly papers presented at national meetings of learned societies, and in the impressive number of in-house publications of university-based institutes and R & D centers that reflect the growth of the practice of educational research.

A real sense of accomplishment, however, is lacking in terms of our efficiency in translating the fruits of our research into viable educational programs. While it is true that not all research has immediate practical significance, or indeed should have, it is also true that within all the research specialties represented here today there exist a wealth of theoretical formulation, empirical findings, and attendant generalizations which could conceivably benefit the practitioner.

Unfortunately, the findings and recommendations of distinguished scholars appear to have little effect on the organizational behavior of people in schools. Indeed, one might comment that the only real benefit of published research has been its usefulness in aiding specialists in organization to study the homeostatic mechanisms of urban school systems.

In an attempt to assess where the blame lies, professional researchers have tended to point to the classroom teacher or school administrator. According to one representative critic:

> A twenty-five year lag between research findings and their application is commonplace in our schools, and some studies never receive proper consideration. This situation suggests that teachers are unaware of educational investigations made by competent scholars, unwilling to apply the outcome of research in the schools, or unable to put the knowledge into effect owing to inadequate facilities and restrictive administrative policies.(1)

Notwithstanding the desirability of having teachers, as well as more of our colleagues, read and contemplate the professional literature, our current experience with the well advertised suppositions of cancer researchers and their effects on the incidence of smoking should make us somewhat pessimistic with regard to the *possession* of information and its effect on behavior, even in the face of an undesirable and ultimate consequence.

Our experience has led us to question the assumption that it is the lazy or disinterested practitioner who is retarding the advance of progress. A perusal of the content of journals which conceivably could be of value to the teacher or school administrator leads one to question their usefulness. Oftentimes contradictory, written in, shall we say, a highly stylized language and usually devoid of suggestions for the *application* of generalizations stemming from research findings, the journal article offers little to the practitioner.

This gap between the "knowledge producer" and the "knowledge user" was well documented by Horvat in a paper delivered to the Collegiate Association for the Development of Educational Administration.(2) In developing his argument he cited two important statements of Guba's which are germane to this discussion.

> 1. There is a tremendous gap between knowledge production and knowledge utilization that cannot be spanned *either* by the producer or by the utilizer himself, or even by these two acting in concert, at least in the typical situation. New mechanisms and agencies, using special techniques, are required to perform this bridging or linking function.
> 2. Knowledge (in the form of theory or research findings) is at best only one of a number of input factors in any practical situation. No practical problem can be solved using knowledge alone -- a whole host of economic, social, political, motivational, cultural, and other factors must be considered.(3)

The second point is well taken and we cannot quarrel with it. Too many times have we seen desirable procedures or products shelved because they required a readjustment of power relationships or because they ran counter to commonly held values and beliefs and hence were not politically acceptable. Conversely, we have seen reorganizations carried out and hardware or administrative procedures introduced under the mantle of science and progress as a means of attaining purely political objectives.

It is with Guba's first point that we take issue, not because we disagree with the quality of his argument but because of the improbability of the attainment of his proposed solution. We cannot wait for "new mechanisms and agencies." Those new agencies that have been created to span "the gap" have assumed roles for themselves that, curiously enough, resemble university graduate centers rather than the educational counterpart of Western Electric.(4) There is a clear need, however, for action -- for someone to bridge the gap -- now!

Our major thesis is that in the absence of an extraordinary increase in the supply of professional change agents or an unanticipated proliferation of applied development centers, it is the researcher himself or his surrogate, the professional consumer and transmitter of knowledge (the professor), who must act in concert with teachers and administrators in utilizing the fruits of research to "engineer" the solution of vexing educational problems.

It is not that we feel that the professor has too much time on his hands. Our colleagues are busy reading, teaching, writing, and generally carrying out their

professional functions. Our personal reflections, however, have led us to question whether or not our own activities are actually having any impact on the practice of education in fun city - - - laugh if you will. It occurred to us that, of the many roles the professor is expected to assume, that role which is interstitial between producers and consumers of knowledge is the one most critical at the present time if school organizations are to become more effective in meeting their complex problems.

Bennis, Argyris, Miles (5) and others have pointed out that there are essentially two strategies in attempting to improve the effectiveness of organizations:

1. *Work activity changes:* In schools these typically include the introduction of such things as new curricula, programmed instruction, new ways of grouping classes, and electronic scheduling of classes.

2. *People changes:* The emphasis here is on the development of freer, more authentic interaction between participants in the organization. The supposition underlying this strategy is, of course, that this process is a prior condition to the release of the full potential of the participants - - their energies, their creativity, their ingenuity. Although the history of attempts to improve schools abounds with examples of efforts to institute changes in work activity, our own interest is especially upon this second technique. It is our feeling that interventions designed to develop the adequacy of school staffs to cope with their own problems in an increasingly effective way have great potential power for change and have been largely overlooked as possible answers to contemporary educational crises.

As professors of educational administration in the City University of New York, viewing the educational scene in our urban environment, we are aware that "crisis" seems to be an increasingly appropriate appellation for contemporary situations. From our vantage point it seems self-evident that many of the conventional responses of the administrative hierarchy of the city schools, which may formerly have been highly effective, are now of relatively low potency in meeting current social and educational challenges. City school administrators, drawing upon their time-honored repertoire of techniques with increasing vigor and determination, are themselves discouraged by their inability to break through the problems with fresh answers and significant results. The swift onrush of change seems to be producing a psychological and even physiological state not unlike that which we experience when we jet from our familiar surroundings to a dramatically different culture. Indeed, it is speculated that we may be observing, not *culture shock,* but a remarkably similar phenomenon described as *future shock.* (6)

Perhaps we can be forgiven, perhaps not, but we felt that we might, in a small way, have something to offer in this situation. We were anxious to show that theory and research, so often associated with the abstract, *do* have some utilitarian value. We were interested, too, in exploring the practical problems of stim-

ulating and guiding effective change in New York City schools. Thus, in 1965, we were looking for an opportunity to work directly with public school personnel on a change-oriented project.

Every casual observer knows that New York City is a very difficult place in which to produce meaningful change. Its size, its numbers, its complex bureaucratic organization, its deeply entrenched interests -- these and more -- stand in the way. In working with the public school system there is an additional syndrome which presents special problems to the professor who is interested in trying out some of his ideas. This is typified by the gap -- one could properly say antagonism -- between the researcher and the school practitioner. A view commonly held by school personnel in New York City, based on their perceptions from experience, is that professors come to the school situation in a judgmental frame of mind prepared to be negatively critical. Not a few practicing school administrators in New York City feel that their profession has been harassed, harangued, and belittled in the public press by reports of studies and surveys conducted by professors in the name of research. Often these efforts have led to little real change. Some professors are seen as having profited professionally by releasing exposes to the press rather than by using the fruits of their research in a constructive way in the schools. There is, in short, a serious lack of confidence on the part of many New York City public school personnel regarding the motives, the intent, and even the ability of the professor as he seeks to stimulate and guide change in the schools.

The professor's ability comes into question partly because he is viewed as a dilettante who need not face the full range of nitty-gritty problems which make the New York City schools so very difficult to administer effectively. The school principal can, understandably, view himself as an elite individual uniquely qualified by virtue of having passed, over the years, a series of examinations so exhaustive and rigorous that not more than a handful of professors in the entire world could even hope to pass.(7) *That* handful would be limited to those few professors who have had extensive work experience in New York City schools. The New York City school system is a relatively closed one which tends to see its problems as distinctively unique and capable of being understood only by "insiders." It is this homeostatic phenomenon which we were especially interested in exploring precisely because of the defense it erects against agents of change.

In this chronology of the three steps we have taken to learn our trade as change agents, the first opportunity arose with the so-called "More Effective Schools" (MES). This, very briefly, was a demonstration project which has been invented by a joint committee comprised of representatives of the United Federation of Teachers (UFT), which is local chapter number 2 of the American Federation of Teachers (AFL-CIO), and representatives of the administrative hierarchy of the school system.(8) The committee's task was to recommend a

program to produce more effective elementary schools. The recommendations focused on making basic changes in four areas:

1. Pupils and curriculum
2. Personnel
3. School plant and organization
4. Community relations (9)

More specifically, it thrust some important changes upon the twenty-one schools designated to participate. Among them were:

- heterogeneously grouped classes with a maximum size of twenty-two;
- the assignment of four teachers to every "cluster" of three classes;
- the assignment of a large number of specialists, supervisors, and school aides to each school;
- a pre-kindergarten program;
- a stepped-up community relations program.

One of the important staff changes was the assignment of five assistant principals (AP) to each MES school. Their responsibilities were primarily supervisory, thus creating the possibility of developing a significantly different role for the AP. In the typical elementary school the AP has been so overburdened with a host of chores, many of them clerical, that it is an accepted fact of life that he has time only to perfunctorily perform an essential minimum of supervision of instruction. In the MES situation he would be supervising perhaps a single grade and would have adequate time to do the job reasonably thoroughly. The challenge would be to develop an approach to supervision which would make maximum use of the new and, by conventional standards, almost lavish assignment of personnel in the attempt to make the MES schools actually more effective.

During 1965-66, the Brooklyn College faculty in educational administration and supervision launched a one year in-service institute for the AP's of the More Effective Schools which had been planned cooperatively with the MES administration. (10) In retrospect it seems obvious that in this effort *we tended to do, ourselves, the thing which we knew best* -- teaching, in a rather conventional sense. The 105 AP's were divided into groups, with each group organized into a series of five two-hour seminar sessions. Lectures, case studies and roleplaying, plus discussion, were the principal teaching techniques utilized. While it was our impression that the overall impact of the institute was favorable, we became increasingly concerned about the extent to which it was actually affecting change in the schools themselves. Careful appraisal of discussions with the AP's, plus observations in the schools, led us to realize that we were not taking into full consideration the organizational setting in which these people were working. Frequent statements seemed to indicate either that (a) the AP's superordinate, the principal, held certain role perceptions which limited the AP's latitude, or (b) there was, in the schools, a climate which limited the effectiveness of the AP's. We then thought that exposure to prominent researchers would stimulate learning, and promptly

arranged a conference for the assistant principals and principals in which two of the nation's luminaries in the area of organizational behavior agreed to participate.

The format of the conference featured talks by these professors, one on organizational climate and one on informal organization, which were followed by discussions. It readily became evident that, firstly, this exposure *did* achieve its objective of stimulating the conferees to acquire new knowledge and insights, and, secondly, it served to reinforce the practitioner's antipathy for the "ivory tower" researcher. This may be viewed as unfortuante because it reduced the likelihood that the research concepts being presented would be accepted as having practical value in the practice of school administration. Indeed, one professor, widely acclaimed for his original work in organizational climate and leader behavior, responded to a principal's plea to go to the schools and experience firsthand the realities of life there by saying that it was not necessary for him to get into the "muck and mire" of the schools in order for him, as a researcher, to know reality. To many of the practicing administrators present, this was taken not only as reinforcement of their perception of the researcher as an ivory tower dweller, but also as a declaration of class distinction in a situation that should call for collegial relationships between professor and practitioner.

Our next attempt at involvement came the following year, during 1966-67, during which we were involved with the MES principals in a year-long institute. Taking advantage of their interest in organizational climate, which had been stimulated by our earlier efforts, we decided to eschew the conventional teaching patterns and conferences in favor of a data-feedback strategy similar in nature to the procedures described by Miles.(11) The basic data-gathering technique we used was the Stern-Steinhoff Organizational Climate Index,(12) a questionnaire which was applied to the teachers in the twenty-one MES schools. (13) The analysis and interpretation of this survey was fed back to the principals for their study and reactions. This feedback process was the central aspect of this in-service institute.

While this effort seemed to be more meaningful to the participants, and therefore a better learning experience for them, we gathered some practical "nuts and bolts" learning of our own which, we expect, will make us more effective change agents in the future. For example, it turned out that we were very naive regarding the UFT and the effect it can have on such activities. In asking the MES teachers to repond to the OCI questionnaire, we were repeating a process that we had used successfully in another city and was in use in school districts throughout the country. In New York, however, we found ourselves in a postition wherein the school principals (who are nonunion) had asked for the data to be furnished by the teachers (who are unionized). We soon learned that researchers who do not first seek the cooperation of the UFT in New York City can be in difficulty when it comes to getting even a modicum of cooperation from the teachers. A second phenomenon that we discovered was the difference it makes when data are fed back

to principals in (a) situations where superordinates are not present, and (b) situations in which superordinates are present. In our case we were dealing with twenty-one school principals and an administrator in the MES program. When our organizational climate data and analysis were first fed back to the principals, the administrator was unable to be present due to illness. The tenor of that meeting was excellent - - discussion was stimulating and fruitful, there were many insightful questions asked, and it appeared to be an optimal learning situation. At the second feedback session, however, the administrator was not only present but was the first person to open the discussion and, as it happened, took a rather dim view of our data. Picking up the cue at this point, the principals dutifully got into line and, contradicting their original behavior, seemed to be in competition to see who could belittle the concept the most.

After these Institutes our concern continued to be focused on the "behavior gap," (14) i.e., we wanted to move away from teaching about organizational climate, away from mere description, and closer to methods through which such information and concepts would become relevant to our learners. We wanted it to be meaningful to them. It was not, we felt, that school personnel need to know about organizational climate per se, but that they begin to search for what they can do to improve existing conditions.

A more recent attempt, our third, to develop for ourselves a useful role as change agents in New York City's public schools took place in the context of the School-University Teacher Education Center (SUTEC). This is a federally-funded, five-year joint project of the New York City Board of Education and the Department of Education of Queens College of the City University of New York. It is actually a demonstration project in Public School 76, located in Long Island City in the Borough of Queens.(15) It is intended to demonstrate the best possible urban elementary school programs that can be developed through the cooperative efforts of (1) the school system, (2) the college, and (3) the community. The school structure itself was built specifically for SUTEC; it provides housing for the college staff involved in the project as well as for the regular school staff. The personnel involved in the project were very much aware of the need to develop effective interaction between the people in the living system of the school organization. They were also cognizant of the fact that their project creates stresses and challenges to effectiveness simply by putting the two staffs of the school (school staff and college staff) together, not only territorially but in a collegial sense that had not previously been experienced.

Drawing upon our experience, we made sure that four conditions were present as we became involved in SUTEC. We have learned that in New York City, at least, these are crucial to the success of the temporary social system created by our presence in the school.

1. *We were invited in.* It appears to us that there is a phenomenon, in dealing with what amounts to problems of organizational health in schools,

somewhat akin to that encountered in dealing with individual emotional and behavioral problems. The patient who is forced into therapy will receive no benefit from it. The patient must first recognize a need for help. In the same fashion, the professor who seeks out opportunities to test his concepts in the schools may well find it to his advantage to be patient and deal only with those who are ready to seek his help.

2. *We dealt with a vertical slice of the social system.* With all levels of the school's hierarchy involved, from the principal to the youngest teachers on the faculty, the result is a more realistic attempt to get a forthright confrontation of problems, facts, and issues.

3. *Teachers were paid for "extra" time devoted to the project.* As seasoned schoolmen, we brought with us to New York a number of expectations and procedures that we had used successfully many times before in suburban communities and smaller cities. We soon learned that today, at least in New York, not all of these are effective. We found, for example, that militant unionized teachers are not willing to give the time needed to fill our researchers' questionnaires. It appears that a necessary aspect of research financing is to have sufficient funds to "buy" time from those individuals from whom data are needed.

4. *The time for planning, communicating, and feedback was increased.* A practical problem for the professor who would be a consultant on problems of organizational effectiveness in a school is that of finding sufficient time to work with the teachers -- time to identify problems, search for alternatives, discuss behavior, analyze data, and plan next steps. In the SUTEC project, we find that a representative steering committee can be helpful in this work without tying up the entire school staff. We are also beginning to understand the desirability of accepting a long-term view; it is helpful if the school faculty and the outside consultants are prepared to provide opportunites *over a period of time* for the interactive processes to develop and be productive.

At this point we would like to restate our original thesis, which is simply this: that the gap between researcher and practitioner may be filled by the university professor. We do not suggest that comprehensive programs and institutes for change, or applied development laboratories, or the creation or change agent positions in school systems are not desirable; indeed, they are sorely needed. But they do not now exist in sufficient number to create an impact on the educational enterprise nor does it seem likely, to us, that the situation will change in the near future.

Our position may be summed up by recalling a recent statement by David Fox who commented in the *Urban Review* that:

> I do not believe that researchers can maintain their traditional isolation from implementation by arguing that their function is to evaluate in an objective way, leaving to others the responsibility for implementation. We are working in such complex areas with such difficult problems of data interpretation that we must begin to insist upon the right to participate in the decision-making process when it involves the interpretation and the application of our own findings. We must recognize that we are studying an issue about which people are concerned. We have finally become

> social scientist in a vivid sense of the term. Since our problems and our data now have social, economic, and political implications, I feel that the intelligent researcher must insist upon being involved in the use of these data.(16)

Fox was writing from the specific point of view of the researcher concerned with evaluation research, but his views may be generalized to the profession at large. Perhaps objectivity turns to disengagement when one is confronted with the "muck and mire" of reality.

Our experience has led us to believe that it is possible for individual professors to be effective in helping to bridge the gap between research and practice. Clearly a substantial degree of readiness on the part of both scholar and practitioner is necessary for such a cooperative enterprise.

We think this is one of the many interesting and satisfying facets of our own professional role and we heartily encourage others to share in this experience.

FOOTNOTES

1. Deobold B. Van Dalen, *Understanding Educational Research* (New York: McGraw Hill, 1962), p. 14.

2. John J. Horvat, "Educational Improvement and the Role of Educational Administration." Presented at the Collegiate Association for the Development of Educational Administration in New York State. September 30, 1967.

3. Egon G. Guba, as quoted in Horvat, *Ibid.*, p. 6.

4. *Ibid.*

5. A description of this point is found in: Barbara A. Benedict, *et. al.*, "The Clinical Experimental Approach to Assessing Organizational Change Efforts," *J. Applied Beh. Sci.*, 1967, *3*(3).

6. Alvin Toffler, "The Future as a Way of Life," *Horizons,* Summer, 1965.

7. This comment on the New York City licensing examinations specifically circumvents reference to the level or power of the examinations.

8. Calvin Gross was the superintendent of schools who appointed the committee. Bernard Donovan had succeeded him by the time its recommendations were reported.

9. *Report of the Joint Planning Committee for More Effective Schools to the Superintendent of Schools.* New York City Public Schools, May 15, 1964.

10. The Institute was financed by the Collegiate In-Service Institute Program of the New York State Education Department under a grant proposed by Professor Stephen H. Lockwood, Coordinator, Advanced Certificate Program in Administration, Brooklyn College.

11. Benedict, *op. cit.*

12. For a description of the rationale and an application of this instrument, see: Carl R. Steinhoff, *Organizational Climate in a Public School System,* USOE Cooperative Research Program Contract #OE-4-10-225 (Project #S-083), Syracuse University, 1965.

13. Carl R. Steinhoff and Robert G. Owens, "Organizational Climate in the More Effective Schools." Presented at ERANYS, Albany, N.Y., November 15, 1967.

14. Mario D. Fantini and Gerald Weinstein discuss the notion of "behavior gap" in another context in their article "Reducing the Behavior Gap," *NEA Journal,* 1968, pp.23-25.

15. Descriptions of the SUTEC Project may be obtained by writing to Dr. Thelma Adair, Co-Director, SUTEC, Public School 76, 36-36 10th St., Long Island City, N.Y.

16. David J. Fox, "Issues in Evaluating Programs for Disadvantaged Children," *Urban Rev.*, 1967, *2*, p. 19.