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ABSTRACT

This paper comprises a revision of an earlier model of planned school change developed by the authors. The revision is based on data from several large school curriculum projects. A model explicates interactions between the roles of school-related personnel and stages of change. Eleven major stages have been subdivided into critical points, around which process data can be collected. Discussed are methodology for such data collection and some techniques for evaluating both process and product. (Author)

A REVISED MODEL OF SCHOOL CHANGE

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by

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Introduction

An earlier model[1] of school change (Leithwood & Russell, 1973) was developed to assist school people in designing reliable strategies for curriculum development, implementation and evaluation. Subsequent evaluative research and development by the original authors and others has supported the basic theoretical properties of the model and many of its operational suggestions. As a result of our experience using the model, we have been led to a revised model which constitutes an improvement over the original model in the following areas: (a) developing operational strategies for curriculum change, and (b) providing a framework for applied research on the processes of school change. The theoretical properties associated with the model, the stages in the model, and the framework for applied research on school change constitute the major foci of this paper.

Many models already exist. Accordingly, it is legitimate--quite apart from the above rationale--to ask, "Why develop another model of school change, let alone revise it?" One way of answering this question is in terms of the kind of knowledge represented by many existing models and their adequacy for the practical tasks undertaken by the authors.[2] Chin and Downey (1973) identify 3 types of knowledge about change. One type is "focused toward understanding how change occurs, especially looking at changes, their correlates and their consequences (p. 518)." Another is "focused toward understanding how the functional relationships of parts of a system fit, how the variables are interrelated both causally and especially

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1 The terms 'model' and 'strategy' are used here to indicate different levels of generality. A model may suggest or encompass many strategies all of which contain the conceptual properties suggested by the model.

2 All 4 authors work with local school districts as part of the staff of 3 OISE Field Centres. These Centres, 8 in total, are small R & D organizations located throughout Ontario.

correlationally (p. 518)." Many models of change are concerned with these 2 types of knowledge (particularly the first) especially insofar as they attempt to represent the change process. There is a third type of knowledge which Chin and Downey (1973) label Type A knowledge:

> Type A is basic knowledge focused toward intervention and deliberate, intentional and planned change. It is a set of selectively retained tentatives based on theory and research on how to bring about change, and it has an action purpose (p. 518).

Basic knowledge of this sort is underdeveloped, what does exist largely depending upon derivations from the other 2 types. However, this need not remain the case, Type A knowledge potentially contributing to other forms of knowledge on the grounds that "The best way to understand something is to try and change it." The model discussed in this paper is concerned with Type A knowledge and may be a useful tool for expanding that knowledge.

Models of the Type A knowledge variety or those which have implications for intervention often are less than satisfactory for that purpose. Some of their inadequacies can be identified using Havelock's (1971) classification of change models as Social Interaction (SI), Research, Development and Diffusion (RD&D) or Problem-Solving (PS). Perhaps the most general inadequacy is that, as guides to action, each model independently and even each classification of models by itself accounts for only some of the important variables that are part of developing, implementing and evaluating school changes.

Social interaction models for the most part limit themselves to aspects of change specific to the individual, little attention being given to the social system within which the individual functions. Perhaps more seriously, these models tend to represent the process of individual change,

basically a psychological process, without much reference to psychological theory. Rogers and Shoemaker's (1971) stages of awareness, interest, evaluation, trial and adoption, for example, closely parallel information processing stages basic to both cognitive learning and attitude change but do not draw upon that body of knowledge for purposes of explanation or prediction. Thus when concern shifts from representing to stimulating the change process (the goal of Type A knowledge), there are few conceptual handles available for building an intervention strategy.

Research, Development and Diffusion Models are molar in outlook and tend to view the recipient of change in a passive role. Although the Guba-Clark and the Miles (Havelock, 1971) models, for example, specify a place for local involvement, the action implications of that involvement are not well formulated. Roles of people and how these roles interact with one another tend to be neglected. On a similar note, a criticism of, but not confined to, the RD&D models is the inadequate attention given to the unique characteristics of the school system in contrast with other kinds of systems. These features have been identified by Schmuck & Miles (1971) as ambiguity and diversity of goals, low interdependence of staff, vulnerability of schools to short-run demands from their environment, inadequate provision of financing, ritualistic use of procedures and pressures toward processing students. Such characteristics place demands on successful intervention strategies that necessitate features significantly different from those of intervention strategies useful in non-school social systems.

Problem-solving models focus substantially on establishing working relationships between agent and client systems where the agent is often quite independent of the system prior to the change activity. This is an adequate way of characterizing the relationship of the authors with a school system, for example. But where the agent has an established relationship with the

system prior to change and/or where the agent-client roles continually shift to different members within the system, the characterization has weaknesses.

Accordingly, another model of educational change is justified to the extent that it:

1. permits the utilization of theoretical constructs vis-à-vis cognitive learning and attitude change to predict powerful intervention strategies appropriate to the complexities of educational changes;
2. takes into account unique characteristics and constraints in school systems which affect change;
3. allows for various client-agent roles to be utilized in successive stages of planned intervention.

These are areas in which one or more of the other categories of models are weak.

The first version of this planned school change model (Leithwood & Russell, 1973) was classified as a problem-solving model (Fullan, 1972). This classification is accurate for that version of the model as well as the present version insofar as the "receiver" of change, some member of the "client system" (Lippit, Watson, Wesley, 1958) may initiate the process of change by identifying an area of concern or by sensing a need for change. Elements of the social interaction and RD&D perspectives are also included, however, in both versions of the model. The social interaction perspective exists in the sense that communications between the agent and the client of change are designed to accommodate individual differences of both the cognitive and attitudinal variety. How the individual reacts to the communication and the extent to which he understands its message are concerns of the model, expressed in terms of information processing theory. The RD&D perspective is contained in the model insofar as the process of development

often is required in order to solve a problem. But in this case development occurs by or with the client system and the research, development and diffusion processes are not viewed as temporally sequential, necessarily.

Some Theoretical Properties of the Revised Model

Communication

This model attempts to provide both a conceptual and operational framework within which change agents and clients can communicate more effectively. The premise most basic to the model is that planned change occurs as a result of effective communication. Communication is effective to the extent that it conveys information to the intended recipient in a cognitively meaningful and affectively acceptable manner. This effectiveness is inferred if it results in appropriate actions by that recipient.

Information processing theory is used to explain effective communication and assist in predicting the kinds of messages likely to be successful. According to such theory meaningful learning of cognitive content (Ausubel & Robinson, 1968) and/or affective response (McGuire, 1968) depends upon the consistency of information contained in the new message with the prior knowledge and attitudes of the recipient. Existing cognitive and affective structures (personality structures) are the basis from which the recipient begins to derive meaning from the "new" message. A new message featuring relatively high proportions of information consistent with the recipients existing cognitive and affective structures is potentially meaningful and acceptable. Too much new information will place dysfunctional pressures for accommodation on the recipient resulting in rejection of the message and lack of understanding. Too little new information is unlikely

to create enough conflict to stimulate the recipient to search for the novel and perhaps most critical features of the message. Acceptance of the information, as a basis for the recipient's actions, is unlikely if it appears to have implications which conflict substantially with the recipient's existing values. One important task of the change agent, therefore, is to design communications requiring optimal amounts of assimilation and accommodation on the part of the client. A major requirement for successfully doing this, is determination of the clients' existing personality structures. While this is a formidable measurement task, the greater the opportunity the change agent has to interact directly with his clients, the more likely he is to be able to both estimate their existing personality structures and design and modify communications that will be both meaningful and acceptable.

Successive Approximations

In terms of the characteristics of the innovation, this rationale suggests that complex innovations--and most instructional innovations tend to be subjectively complex--must be introduced in such a way that they are not perceived as too radical by the client or too inconsistent with what he presently knows and feels. A way of doing this is by introducing the change through a series of successive approximations to the ultimate goal. For example, if the initiating change agent's intent is to alter the mathematics program in a county from a fairly traditional treatment of mathematics to a program based on mastery of essential computational skills and their use in more sophisticated problem solving paradigms, he might introduce the following series of approximations (from a project the investigators are currently involved in) with accompanying teacher in-service training:

1. have the present computational program specified as a sequence of behavioral objectives, some suggested materials and techniques and example test items. This approximation contains no new mathematical content for the teacher-clients. It does imply an instructional model based on precise goal identification and diagnosis. This model and the precision begun to be introduced through the objectives is a necessary prerequisite for mastery learning strategies to be introduced subsequently;

2. revise the program based on formative evaluation and add pools of criterion-referenced test items for each objective. Add to the revision also (a) placement tests using criterion-referenced test items to complete the measurement prerequisites for introducing mastery learning and (b) a first approximation to a unit on problem solving;

3. revise the problem solving unit and introduce an experiment in a sub-sample of schools on mastery learning with a sub-sample of computational skills;

4. expand the experimental sample while increasing the instructional alternatives for each mathematical skill or objective. Publicize results and integrate more of the computational skills into the problem solving unit;

5. implement ultimate change goal.

A sequence of approximations such as this may perform several functions essential to effectively introducing a substantial change in a school system. First, it spreads the resource requirements over a period of years, in the above example, approximately 5 years. Second, it allows sufficient time to develop the necessary program tools (e.g., specific objectives, criterion-referenced test items) to implement such an innovation.

Third, it provides the system with a working knowledge and substantial data about the change to be implemented. Perhaps more important than any of these functions, however, the introduction of change in successive approximations allows the clients' knowledge and attitude to develop from a relatively unsophisticated level with respect to the ultimate goal of change to an adequately sophisticated level also in successive approximations. Under ideal circumstances, each step in the series of approximations toward the ultimate change goal should be viewed in the clients' framework as a stimulating but not radical change. Under such circumstances the complexity of the change increases in direct proportion to the clients' ability to understand and accept it. Our data suggests that few complex changes, perceived by the client as radical, are likely to be adequately implemented.

Problems that immediately come to mind in response to the procedure of successive approximations include the amount of time required to operate in this way and the possibility of draining the clients' energies or enthusiasm for change by the final approximations in the process, thus never reaching the ultimate goal. Time or rate of adoption and implementation interacts directly with the degree of implementation. Proceeding directly to the ultimate change goal where that goal is complex and expensive, as a large proportion of educational innovations are, likely results in rapid adoption by a few to a significant degree and a small number more to a lesser degree. We would speculate that 60 to 80 percent of the target population is normally uninfluenced in any important way by such procedures. The model will suggest ways of increasing rate of adoption and implementation but in most cases this will not accommodate reductions in the approximations appropriate to reach the final change goal with a large proportion of the target population.

Spent enthusiasm on the part of the clients can be minimized when the procedures for change are built, as much as possible, into the role requirements and regular working time of the clients. In part this necessitates developing a system responsive to and able to accommodate continual change as needs alter. We are aware of education systems that have been able to do this.

From the point of view of the change agent, proceeding in successive approximations allows the agent to establish credability by initially working on the immediate, system identified problems even though he may see more significant ones himself. As the agent and client work together their perceptions of which problems are most significant come closer together. Eventually, problem-solving may center on the agents' initial diagnosis, if that diagnosis was accurate.

Sliding Agent-Client Relationships

Another theoretical construct in the model is called the "sliding agent-client relationship." Such a construct appears to be a useful way of responding to the role distance which often exists between the person(s) initiating the change and the ultimate clients of change. In a number of the projects from which this model was derived, changes were and are being proposed for an entire system, often involving as many as 50 schools, 1000 teachers and 30,000 students. As might be expected, such initiatives for change typically emanate from the offices of senior administration with the intention of ultimately influencing student performance. An effective change strategy, under these circumstances, must operationalize the intent of the initiator through indirect forms of intervention, for the most part. The initiator must, in other words, work through a network of other people in order to implement change. The notion of a sliding agent-client relationship suggests that the

initiator of the change views his task as change agent as convincing those people in the network with whom he has direct contact to act as agents of change with those they come into direct contact with. The intent of the agent's communication is to effect a role change from client to agent on the part of its intended recipients.

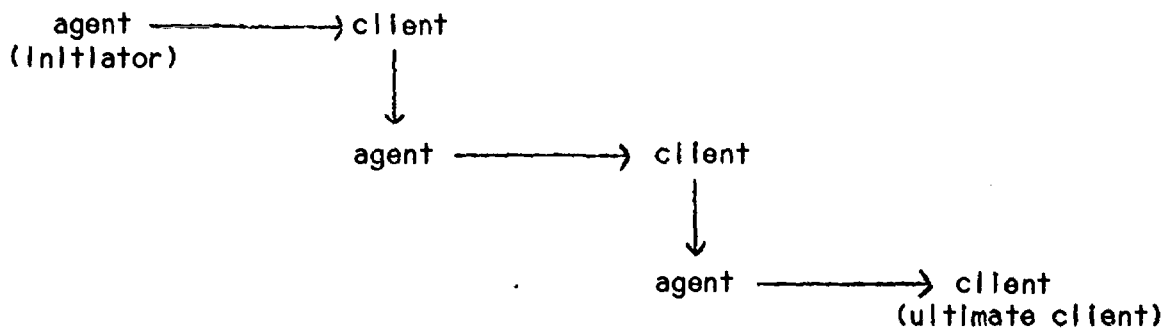

Figure 1 ... Sliding client-agent relationships

Figure 1 may be used to illustrate this function if, for example, the initiator of change is the superintendent of instruction who wishes to improve the problem solving competencies of students (ultimate clients) in his jurisdiction. His most direct contacts may be principals or a principals' association. If such is the case, his task as agent is to convince and prepare the principals to become agents of change probably with teachers in their schools. Similarly the task of the principal is to convince and prepare the teachers in his school to become agents of change (increased problem solving competency) with the ultimate clients, the students.

Recapitulation

Given this theoretical task, the obvious question is what does the agent have to do to perform it? How does one convince a person to become an agent of change on one's behalf? A general answer to this question has already

been given; design the information about the change so that it is meaningful and acceptable, first of all by diagnosing the clients relevant background personality structures. In addition, however, it would appear that the understanding and conviction of the original agent can be adequately transmitted to subsequent potential agents by having them recapitulate significant portions of the processes the initiator went through in arriving at his decision to change. Whereas, this decision-making process is likely to be quite time consuming for the initiator, a planned change strategy is useful to the extent that it is able to compress the time required for this recapitulation process with subsequent client-agents. A useful analogy would be to compare the initiator's decision-making process with the discovery process of a scientist and the recapitulation process with the process of teaching (a role comparable to the agents') and learning (a role comparable to the clients') what was discovered and how the discovery occurred.

What is being recapitulated alters in subtle but significant ways, however, the further one moves from the initiator of the change toward the ultimate client. These changes are attributable to an increase in the operational definitions of the change as, in the case of the example above, we get closer to the teacher. The superintendent must characterize the change in terms that highlight the role responsibilities of the principal, the advantages to the system and the significance of the change to the school. The teacher, on the other hand must characterize the change in terms that relate specifically to the student performance required for classroom implementation. At each stage of the planned change process, therefore, the elements of the change requiring most serious analysis and emphasis are those which must be operationalized for the client in question to assume the agent role for a subsequent population of clients. The other elements of the

change must be incorporated with less emphasis in order for the purposes of the change to be understood. In summary, at each stage in the sliding client-agent relationship, the process of recapitulation must:

1. ensure that the client understands and accepts the goals the initiator intended the change to achieve;
2. ensure that the client understands and accepts the need for these goals to be achieved;
3. enable the client to communicate (as agent) the above to his clients in terms operationally appropriate to the tasks implied for his clients.

It is important to stress that where role changes occur with greatest benefit, the person undergoing the role change is provided substantial support in fulfilling the new role. Using the previous example, the superintendent may communicate to the principals the need for a change in role from building administrator to curriculum leader in such a way that the change is well understood and at least partly accepted as desirable. The principals, however, cannot ultimately be successful agents of change with teachers, independent of desire, until they also acquire the specialized skills required for curriculum leadership. Too often changes fail to materialize as planned because the agent, in this example, in the superintendent's role, does not consider as part of his responsibility the training needs of his clients in carrying out their new role.

Screens

A long term general goal of change within the model may be to positively influence student achievement, broadly defined. The intermediate objectives of the model, as means for achieving that long term end, suggest

a middle man or series of middle men in the change process who act as selective screens between the primary change agent and the ultimate client, the student (see Figure 2).

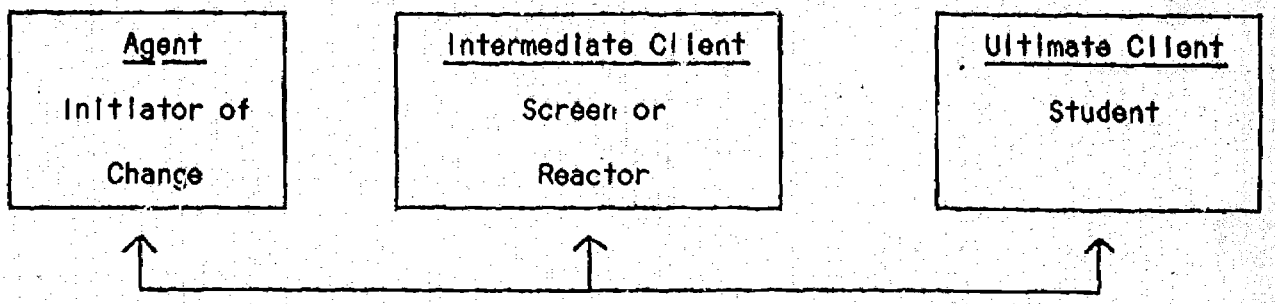

Figure 2 ... Possible sources of communications modification

The term "screen" suggests that when a change depends on communications being relayed through the necessary persons within a system for endorsement or other action, those communications are likely to be altered through a kind of filtering or screening process. Part of the process is the "leveling" or "sharpening" that each recipient performs on the message as a result of his own needs, peculiar perceptions and role responsibilities. Such alterations clearly create a different message for subsequent clients which may be more effective, less effective or unchanged in effectiveness. Theoretically, a change strategy ought to be able to capitalize on this screening process. This is possible when each recipient of the message is encouraged to alter the message prior to its relay so that (a) it is potentially more meaningful and acceptable to the next recipient given the known personality structures of those recipients and (b) the intent of the message remains unchanged. This form of alteration depends on the agent carrying out his role training responsibilities with the client to whom he is communicating. In this context, it is possible to define training needs that

are common to all persons in an agent role (e.g., diagnosing personality structures, constructing communication on the basis of such diagnosis that will be meaningful and acceptable, training others to do the same thing) and training needs peculiar to a specific agent role (e.g., curriculum leadership).

If an agent, intermediate in the communication link, is unable to alter the message in a manner appropriate for his client, it is likely that distortion will occur. This will result in loss of meaning, acceptance and/or intent.

The more screens there are between the initiator of change and the ultimate client, the greater the possibility of distortion. This would seem to argue for "grass roots" rather than "top down" change on the grounds that a curriculum change initiated by a teacher, for example, should reach the student in much its intended form. It should be pointed out, however, that potentially the same number of screens exist between the initiator of change and the ultimate client, for example, the student, independent of the role of the initiator. In the case of the superintendent as initiator, the sources of distortion of the change before reaching the student may be the principal and teacher. These are real screens since alterations in the communication about change are, in the final analysis, out of the control of the superintendent although he will certainly influence the alterations. In the case of the teacher (or even the student) as initiator, however, the principal and the superintendent are also sources of distortion--in this case perceived screens. That is to say, the teacher initiating a change may weigh very carefully the anticipated opinions of the principal and superintendent and modify the change accordingly. In such cases the roles of the principal and superintendent and their perceived implications for change act as screens even though the persons of the principal and superintendent may know nothing

of the change. It is conceivable, furthermore, that these perceived screens would in some instances result in more distortion than real screens.

Because the role of authority is a significant stimulus for distortion based on perceived screens, a relatively flat bureaucratic organization would seem an advantage in stimulating innovation with integrity.

The Multiplier Effect

Another theoretical construct in the model concerns the multiplier effect. The multiplier effect is basic to many change models and suggests that if change is adopted by a small number of people in the system, its effects will spread through other parts of the system almost like a virus. We have been unable to detect this effect in our own experience and suggest in fact that the differing information needs of people within a system create sub-system information boundaries that are relatively impermeable.

We suspect that normative models of diffusion are logically inconsistent within the boundaries of a semi-cohesive community like a county educational jurisdiction. Such models usually suggest massive expenditures of resources on a small, initial group of innovators. As they innovate, their effects are purportedly felt like a shock wave, emanating in concentric rings from a central source and requiring less investment in unique services the farther one proceeds from the source. In many instances, however, the small, initial adopter group is also the "high innovator" portion of the innovation's target population. Such groups are not only highly motivated intrinsically to innovate but typically receive substantial extrinsic motivation in the form of greater knowledge input, financial support and positive reinforcement. Subsequent adopters tend to cluster closer to the "low innovator" end of the adopter continuum suggesting less intrinsic motivation to change while at the same time receiving less extrinsic motivation to change.

Strategies for change which apply diminishing forces to increasing resistance are unlikely to be successful. Strategies which keep the forces constant or even increase them may also fail, however, depending on the nature of the forces. Much of what is known regarding how to effect school change has resulted from research and development efforts which, as pointed out above, tend to focus on the high innovator. There are 2 problems related to these data. First, the data may be quite invalid even for high innovators. This possibility can be attributed to the uncontrolled nature of research on school change in concert with the probability that any "treatment" designed to stimulate adoption among high innovators would have the desired effect. It might be difficult to prevent the desired effect from occurring. Second, even assuming the validity of data related to high innovators, there is no reason to assume that it is of any value in understanding the low innovator's needs with respect to change. There is no reason to expect that applying the same forces or more of the same forces that appear to be productive with the high innovator is likely to result in adoption by the lower innovator.

We shall briefly mention only two of the implications of this discussion. First, strategies which are to be successful in stimulating change beyond a small proportion of the intended population must contain specific forces of varying type in accord with the characteristics of each segment of that population. It seems probable that many of the high innovators and early adopters in a system make a change either because change is intrinsically motivating for them, or because, by making a particular change, they will attract favorable attention from those higher in the hierarchy. For many in a school system, however, the communications about the innovation may not generate intrinsic motivation; moreover, the extrinsic rewards of relatively late adoption are likely to be very much diluted. Many so called

diffusion strategies are in effect non-strategies for the lower innovating portions of the population, at least in relation to the complexity characterizing most educational innovations. Both the complexity of educational innovations and the lack of visibility of benefits to the user dictate that diffusion in education must take place differently from diffusion in some other areas, like agriculture, for example. One possibility for increasing the proportion of adopters is to make "enlightened" use of authority, i.e., to utilize communication from the upper reaches of the hierarchy to create first indirect, and then, if necessary, fairly direct pressures leading to adoption. (From our perspective, "unenlightened" use of authority results only in superficial acquiescence, and is therefore non-productive from the point of view of implementing change.)

Secondly, estimates of cost to implement meaningful change in schools seem to be based on the wishful thinking inherent in the diffusion models which they support.

The System's Reward Structure

One of the implications of the discussion on multiplier effects relates to the use of varied forces to effect change with different segments of the client population. Some of these forces derive from the reward structure of the system, in particular from the actions of those with bureaucratically invested authority.

It seems probable that the high innovators and early adopters in a system change either because change is intrinsically motivating for them, or because, by making a particular change, they will attract favorable attention from those in positions of bureaucratic authority. The "high innovators" may be viewed as those who make changes for intrinsic rewards,

sometimes irrespective of either positive or negative extrinsic rewards from the system. The "early adopters" may well be those for whom extrinsic positive rewards provide a primary impetus for change, conceivably irrespective of whether the change provides high intrinsic rewards.

For those who change at an average or slightly below average rate, most of the positive extrinsic rewards for doing so are missing. In fact, from the point of view of administrators, the change may no longer be perceived as an innovation but rather as one of implementing "good" practice. This group may change when they see that there is an expectation for them to do so.

Another group, the late adopters and laggards, come under pressure to change and, to the extent that this pressure is perceived by them, it is associated with avoiding negative extrinsic rewards rather than collecting positive extrinsic rewards.

This suggests, therefore, that an education system, like some other kinds of systems, has both upper and lower limits of acceptable rate or type of change. Falling above or below these limits, as the high innovators and laggards do, creates pressures to move toward the mean. Most of the available extrinsic and positive rewards are likely to go to those who operate toward the upper end of the acceptable range.

In order that the reward structure of the system complement the changes planned, effective use of bureaucratically invested authority seems necessary. Many so-called diffusion strategies are, in effect, non-strategies for the lower innovating portions of the population, partly because there are neither intrinsic nor extrinsic, positive or negative, rewards available to them for changing.

The following are recommendations, to those in positions of authority, as ways of using that authority to implement change among the middle to low adopters:

1. Foreshadow the change that will eventually occur.

Although one communication, especially of the written kind, is unlikely to make much impact, multiple communications of varying kind suggesting that change is imminent serve to cumulatively produce a state of readiness or awareness without resulting in movement. Subsequent directional forces of a more specific type are likely to be effective if this state of awareness exists;

2. Distribute some authority among peer representatives.

When the locus of power or authority creating pressures for change is confined, in the perceptions of the client, to one source and when that source is a bureaucratically superior one, suspicion and lack of real acceptance is likely. Such lack of acceptance may be masked in the guise of quick but superficial movement which tends to be detrimental to the ultimate goals of change, the client is likely, therefore, to rationalize his lack of substantive change. When the source of authority can be decentralized, especially among some of the client's professional peers, resistance to change and rationalization is psychologically more difficult;

3. Provide training to clients in coping with the change prior to the possible legislation of change.

When change is seen as critical and when some segment of the client system does not respond to more participatory methods of stimulating change, effective forms of legislation may be called for. An important preceding step, should legislation be necessary, is to provide the clients with the opportunity to acquire the necessary skills to implement the change.

Learning cannot be legislated but anxiety over professional competence can be reduced if the client has the opportunity to acquire the skills necessary for implementation;

4. Invoke the need for change in successive approximations.

This relates to the preceding step, and to the likelihood of obtaining recognition of any inherent values in the change if each step is sufficiently simple that it can be readily implemented;

5. Highlight the educational merits of the change.

This step is designed to remove as many of the objective professionally justified forces against the change as possible.

Stages Of The Revised Model

This section describes the stages in the revised model of school change. Proceeding successfully through each stage requires development of operational strategies consistent with the theoretical constructs already elaborated. The stages have become more concrete, than was the case in the original model, the first five operationally elaborating an original stage called "Establishing The Climate For Change." Also specified are a series of sub-stages which mediate (often sequentially) completion of each major stage. Three additional features of the model require brief explanation.

First, there are many different ways of moving through the model depending, for example, on the role of the initiator of change, the kind of change being introduced, the kind of organization developed, the specific features of the strategy generated in stage 5, etc. Comparative analysis of the efficiency of specific routes involves identification of common features and an identification of the effects of areas of difference. The model can,

in fact, be compared to a road map. One uses a road map to assess one's present position, identify one's destination and determine the available alternative routes that ensure arrival at that destination. For any given destination some routes are likely to be more desirable than others (faster or more scenic) depending on one's purposes. Part of the research underlying the development of the model is based on evaluating the relative desirability of alternative routes, which we call strategies. It is also noteworthy, however, that given a road map with a desirable route indicated, many hazards remain to be negotiated. These negotiations which we call tactics, are a part of the technical expertise (about curriculum development, evaluation, research design, etc.) experience and lore involved in each of the projects from which the model derives. Some of the strategic but none of tactical skills are elaborated in the present treatment of the model, depending as they do on particular system, personnel and innovation characteristics.

Second, movement through many of the stages is a process of agent initiation followed by client action, then client assumption of the agent role with redefinition of the client. This is the "sliding" agent-client relationship referred to earlier.

Lastly, implicit in most of the stages is the possibility of recycling whenever there is failure to achieve the sub-stages or at least those considered absolutely critical to the next major stage.

I. Diagnosing the context for change.

(A) Identify current social trends that have implications for educational change (e.g., economic uncertainty);

(B) Identify the major implications for education of these current social trends (e.g., accountability);

(C) Identify the broadly-based education tools (available or needed) likely to be of value in relation to these implications (e.g., precisely defined goals, more rigorous evaluation of instructional outcomes).

This stage outlines the actions of the original initiator of the change who may be an "actor" in any of the roles relating to a school system (student, teacher, parent, principal, superintendent, director, trustee, consultant and academic). The process of identification common to each sub-stage indicates the subjective nature of this stage and implies that the original initiator is likely to have critical impact on definition of the problem and on the range of acceptable procedures to be followed.

2. Developing seminal organizations for change.

(A) Identify and engage people or categories of people possessing the required tools;

(B) Develop an organizational structure capable of integrating the skills of these people toward the change mission (e.g., curriculum coordinators reporting to superintendent);

(C) Relate this organizational structure (e.g., perhaps some form of disposable organization) to the traditional bureaucratic structure of the system in a compatible way (e.g., through a superintendent of curriculum);

(D) Make known the characteristics and broad goals of the seminal organizations and procure endorsement;

(E) Accommodate subsequent reasonable suggestions for modification.

3. Developing working organization(s)

(A) Develop a "support" structure to facilitate the work of the people identified in 2(A) above with programing and coordinating arms and functions;

(B) Procure approval for operation of the support structure (e.g., from the trustees);

(C) Communicate the working organization in a way so as not to unduly arouse expectations to all those coming under its influence;

(D) Obtain endorsement and willingness to actively participate from those coming under its influence (possible recycle if this is not achieved).

Sub-stage (C) is designed to begin to create a climate for change among a larger number of intermediate clients than has been the case to this point. Such communication should create optimal conflict or disequilibrium among those clients and a subsequent search for maximizing benefits of the conflict rather than an escape route. For example, if a communication from the seminal organization announced the formation of a task force to review the programs in a particular subject, that announcement would create some disequilibrium which could be aimed in the desired direction if the communication also stated that clients would be making an input to the review, that existing programs and program changes were unlikely to be rejected, and that the intent was to move forward from the program base already laid. To the extent that this is successful, the clients of this stage become agents for the next stage. If success is dubious the stage should be recycled. Sub-stages (C) and (D) may occur as part of the tasks in stage 4, rather than as separate prior steps.

4. Defining general problems and goals (The working organizations).

   (A) Identify the general goals requiring action;

   (B) Determine the relationship (or priorities) among the general goals;

   (C) Communicate the general goals to the client;

   (D) Stimulate and receive client reaction;

   (E) Revise general goals as required on the basis of client reaction.

Many of the communications from agent to client in this stage are designed, in part, to have the client assume the agent's role for some subsequent stage. When this is a purpose, the communication should contain a review of all of the stages of the model already completed as specifically applied to the change in question. It is unlikely that an agent can be effective without such understanding but it is unrealistic not to seek ways of speeding up the process through which he must go to acquire that understanding. This is particularly important when there are a series of agents involved in the change.

The identification of goals might be partly based on a needs assessment using one or more of the methods listed by Sanders & Cunningham (1973), for example.

5. Generating a strategy for implementing the general goals with the client.

   (A) Identify means whereby the previous organization can work with the clients in developing (or choosing), evaluating and implementing necessary changes;

   (B) Communicate the strategy to the clients;

   (C) Stimulate and receive client reaction;

   (D) Revise the strategy as required by client reaction.

6. Assessing specific needs with the client.

   (A) Identify needs of greatest concern within previously defined domain of concern;

   (B) Rank these needs.

7. Developing or choosing solutions to meet identified needs with the client.

   (A) Review already developed solutions to meet needs;

   (B) Select, where possible, a solution compatible with the resource constraints of the client;

   OR

   Generate a solution. The term "solution" in this case may be misleading in the sense that it is clearly only a "first approximation" solution or partial solution. In almost all cases further work is required by the client in order to make the solution operable in a meaningful way.

8. Implementing the solution with the client.

   (A) Prepare the client for the initial task of implementation;

   (B) Meet additional needs identified by agent and client for implementation and use.

9. Evaluating the solution with the client.

   (A) Identify weaknesses in the solution;

   (B) Identify strengths in the solution;

   (C) Identify means whereby weaknesses can be remediated;

   (D) Report evaluation results to other potential users of the solution.

This stage has received much attention in our own research and development activities and continues to deserve such attention. Miles (1964), for example, found in a review of a number of studies that educational innovations were almost never evaluated on a systematic basis.

10. Revision

(A) Modify the solution in response to evaluation data so as to retain strengths and minimize weaknesses.

This stage might involve recycling back as far as stage 3. At this point it becomes possible also to modify the working organization(s) developed in stage 3, something unlikely to happen prior to stage 10 because of the formal approval required for these working organizations. The formality of such approval dictates against rapid change of what is approved.

11. Assess the climate for change.[1]

This stage has been added on the grounds that opening up the system for further change would be an important goal of the change process described. Assessments of the climate for change at stages I and II would provide some estimate of achievement of this goal and provide direction for subsequent changes.

The Model As The Basis Of A Research Methodology

The problems associated with developing a research methodology for the school change process which will meet rudimentary standards of validity and reliability are functions of the phenomenon being studied and the position of the authors in change projects leading to evaluation of the model. Investigating the process of school change combines both the limitation on experimental manipulation inherent in functioning social systems (perhaps especially school systems) as well as the difficulty of examining a phenomenon (change) that by definition does not remain stable even for short periods.

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[1] This stage was added at the suggestion of Michael Fullan (personal communication).

The occupational mandate of the authors, furthermore, requires that they intervene as participants in the change process. There must be an awareness of the role played by characteristic members of the school system as well as the atypical role of the authors and its influence on the actions of others. In this context it is important to note that it is "planned" school change being studied, the authors being one of the planning and planned-in components.

Change may be measured by comparatively examining a phenomenon at 2 or more points in time. While change of an undefined sort cannot be prevented, the notion of planned change suggests conscious intervention in the process for the purpose of altering the direction and/or rate of that change. Planned school change dictates a specific sub-set of variables as appropriate to intervene with. A model of change assists a research methodology designed to investigate planned school change if it:

(A) provides a rational basis for choosing the points in time most productive for comparative examination;

(B) defines the critical features of the intervention plan;

(C) identifies the sub-set of variables through which the intervention plan primarily acts.

Insofar as the change model performs these functions, it serves not only as an operational guide to planned school change but also as a basis for further development and elaboration of the model. It provides, as well, a systematic framework within which relatively soft evaluation procedures of the transactional sort (Rippey, 1973) can be carried out.

The stages and sub-stages of the model depict a complex, ongoing process as a series of discrete steps. Achievement of these steps represents a form of stability in time (the "points" referred to in (A) above) open to analysis. There are 2 major forms of interaction in the model.

The immediately obvious interaction, between roles and stages, defines the critical features of the intervention system referred to in (B) above. Such features relate primarily to the role outcomes appropriate for each stage and include such things as the commitment of teachers to classroom innovations, the principal as an agent of change in his school, the superintendent as facilitator of development. These role outcomes sometimes change with each stage and in many cases the initiator of change defines the appropriate role outcomes for a stage by his actions at the outset. In reality, the hierarchical social structure of a school system suggests that if the initiator is a superintendent, role outcomes are more likely to be as traditionally defined. Teachers, for example, might run into difficulty redefining the superintendent's role for him, but they could modify it.

A less obvious interaction is between the roles in the model and the professional functions through which change effectively manifests itself. The earlier version of the model identified curriculum development and evaluation as two examples, although labelling them components. Other examples include professional development, in-service training, university training and staff promotion systems. This interaction defines the sub-set of variables through which the intervention system primarily acts ((C) above). These variables provide functional structures within which professional role relationships can be coordinated. Such coordination is the basis of an intervention system for the achievement of clearly defined, sometimes temporally sequenced steps in the achievement of long range goals for educational change.

Using the model as a basic framework for a research methodology, the present tasks are to:

(A) Develop methods for accurately recording, in project settings, procedures used to achieve the stages and sub-stages and analyze their relationship to procedures suggested by the model. This task requires determining the network of actions and reactions among people and groups of people as they make decisions regarding change. These actions are the objective properties of the system (Riley, 1963) and are best reflected in some form of observation;

(B) Develop methods for evaluating the effectiveness of mediating procedures in achieving the sub-stages of planned change, as suggested by the model. In this case the primary concern is with perceived knowledge and attitude change or the subjective properties of the change system--data best collected through questioning;

(C) Develop methods for assessing achievement of the terminal goals of planned change, as suggested by the model. Insofar as these goals often relate to student performance, our methodology has been reasonably well explicated elsewhere and can be labelled direct performance sampling.

Recording and Analyzing Procedures

A means of classifying the behaviors of people or groups of people as they attempt to define a procedure or means of achieving a sub-stage is necessary. Of the alternatives available, a classification system that focuses on the elements of problem solving or rational decision making is at least consistent with important features of the model. Also, because the model relies heavily on information processing theory in relation to the acquisition of cognitive skills as well as attitude change, a problem solving classification is likely to improve construct validity. If variables being measured

are imbedded in a theoretical framework, then certain predicted relations that should exist can be assessed (Kerlinger, 1964, p. 507).

The specific behaviors to be classified and recorded are those of the actors in the change process designed to be instrumental in the development of procedures for goal achievement, as defined by the model. Robinson, Tickle and Brison (1972) offer a classification of behaviors that is appropriate. They define problem solving as consisting of:

1. Question or problem identification;
2. Generation of alternative solutions;
3. Obtaining and evaluating information to decide which alternative gives the "best" answer to the question;
4. Synthesis or adding up this information;
5. Choosing the best alternative.

A superimposition of this classification system over each sub-stage in the model reflects the network of actions and reactions among people and groups of people, the objective properties of the system (or process).

Given the kinds of data to be collected, the classification system developed and the field setting of the authors' research, observation of some sort would appear to be the most appropriate means of data collection. While we have just begun to use the recording system outlined in this paper, formally, in the past we have used observation methodology. It is important now to indicate past observation methodology and analyze its strengths and weaknesses when combined with the newly derived recording system. This system, performs two essential functions of observation (Riley, 1963) that we have not performed well to this point. It identifies more precisely what is being observed and it assigns behavior to categories which, at this point, may or may not be exhaustive and mutually exclusive.

Much of our present work is done with and through groupings of people with relatively well specified functions. These groups are often committees, such as county curriculum committees, and the authors normally have official membership on these committees. For the most part, these committees assume an agent role and may be either the seminal and/or working organizations in stages 2 and 3 of the model. The decisions they make effect large numbers of clients and the process of change is well reflected, for our purposes, by their deliberations and actions. Direct observation of their actions yields primary data about the agents' role in the change process. Because the membership of these committees is often carefully representative of client groups, these persons, although often atypical members of the group they represent, perform in the role of "informants," as well, most of them possessing characteristics considered essential to the good informant (Bach, 1960). In this way they are a suitable secondary source of data regarding client reaction, although certainly not one to be relied on exclusively. Both their strength and weakness is their functioning as a selective, interpretive screen for information. For purposes of the committee as a whole, each representative member is asked, in effect, to be a participant observer. When these people are good observers and through committee interaction become good informants, the richness of the available data increases and the burden of inference on the observer, with respect to client reaction, decreases since many others are also engaged in inferential behavior on the same data although for a slightly different purpose. One problem under these circumstances is to record the data accurately. Lack of a coherent recording system in the past has undoubtedly caused us to commit a class of error Riley (1963) refers to as "the biased viewpoint effect."

When categories of behavior being observed are not well specified, the observer is more likely to selectively expose himself to the data in a manner that changes over time. This shift in calibration of the observation measure is a threat to validity that should be at least partly minimized by systematic recording categories. Further, this tendency to shift calibration, often as a result of increased familiarity with the culture, is minimized by the intimate familiarity now possessed by the authors with some of the cultures in which they work.

Often (but certainly not always) two R&D persons are present at a given meeting. One of these observers is always a committee participant, in the complete sense of the word, whereas the other may be a passive observer, often in the role of recording secretary from the committee's point of view. While the task of recording is essentially that of the passive observer, the record is discussed and modified by both passive and participant observers after each session. This serves to reduce the burden of inference on the one passive observer, a large one where molar units of behavior are being observed, as they are here (Riley, 1963, p. 508). It also should improve reliability, defined for practical purposes as agreement among observers (Kerlinger, 1964, p. 507).

A further method for increasing reliability and decreasing the burden of inference is employed. Each recorded meeting session is seen as an event which:

(A) can be recorded in a relatively objective manner;

(B) can be partly explained by preceding events;

(C) leads to fairly obvious short term action;

(D) may have more profound, long term consequences.

For these reasons a report of a meeting consists of the objective record as well as interpretation of its utility in reaching intermediate goals and its impact toward long range goals. This analysis is done first by the

observers at and immediately after each meeting and then by R&D staff members collectively examining the records of a series of from 4 to 8 meetings. This collective analysis helps derive both the theoretical and action implications from the data, in units amenable to easier integration.

At this point, analysis suggests that the observation techniques used to date, in combination with the recording system developed, attend reasonably well to the issue of reliability defined either as observer agreement or in a more fundamentally accurate sense. It also suggests that threats to validity caused by too great an interpretive burden being placed on the observer are usually minimized. However, Webb et al (1966), indicate that the visibility of observers may produce changes in behavior that diminish both internal and external validity. Clearly the authors are visible and can do nothing about it. But the threat to validity as a result of our visibility may not be disastrous for several reasons. First, observer effects erode over time and in all instances the authors are present long enough to become a familiar part of the landscape. Second, reasons for being there are primarily as actors in the change process rather than observers of it, from the point of view of most of those being observed. This reduces possible reactive effects. Third, Kerlinger (1964) cites evidence to suggest that reactive effects are often overrated on the grounds that since people cannot act in ways they have not learned to act, their observed behavior is unlikely to be deceptively abnormal, even initially. Lastly, in all circumstances where a passive observer is recording, there is a legitimate reason for her so doing which is acceptable to those being observed, other than for purposes of our theoretically oriented investigations.

The Robinson et al (1972) problem solving model can be used as a basis not only for recording data but for defining the role of R&D staff in

their interaction with decision-making groups. In some instances R&D staff will have substantive content inputs to make with respect to group decisions. Another important role, however, is to ensure that a decision-making group follow an adequate problem solving strategy in arriving at their decisions. Even if the authors have nothing to contribute to the content of a decision, the Robinson et al (1972) model may be used in helping guide the decision-making process along efficient lines.

Evaluating Procedures For Goal Achievement

The existence of intermediate clients in the model suggests that the agent, to stimulate optimum use of an innovation, needs to acquire at least the support of all the intermediate clients and both the support and understanding of those clients closely involved with implementation. The intermediate objectives of the model, therefore, although stated in more operational language, are concerned with attitude diagnosis (sometimes leading to attempts at attitude change) and knowledge diagnosis often leading to knowledge transmission. As such, evaluating achievement of these intermediate objectives involves assessment of the system's subjective properties--the ideas, knowledge and attitudes of participants in the change process. Riley (1963) identifies questioning as an appropriate method of getting at these subjective properties. For our purposes this means formal and informal questionnaire and interview data collection. With the objectives we have for data collection questioning methodologies may sometimes be of a non-standard variety. Glaser and Strauss (1967) suggest that, in the development of grounded theory, theoretical sampling to saturation is appropriate. Where hypotheses are being generated this is our methodological direction.

Where established hypotheses are being verified our taste is to remain with random sampling in quasi-experimental designs where possible. Although useful for our research purposes, such data will typically be seen by project participants as formative and transactional evaluation data and must serve that purpose, first of all.

Evaluation of the system's subjective properties should attempt to determine:

(A) the fact of intermediate goal attainment including attitude and knowledge modification of intermediate clients;

(B) the relative contribution or effectiveness of each of the specific procedures employed toward that end;

(C) an explanation of the effectiveness or lack of effectiveness of each procedure.

Both (A) and (B) above lend themselves to fairly direct analysis, the questions posed to clients relating closely to specific actions, recorded through our observation system, taken by the agents with the intermediate client. For example, objective 5(B) is "To communicate the strategy to the clients." Attainment of this goal could be assessed by sampling the client population's knowledge of this communication. The effectiveness of the procedures for such communication could be assessed by determining, from the client population, the most and least meaningful sources of that communication. The observation record of actions taken by agent groups toward the intermediate clients, therefore, serves as the basis for questions regarding (A) and (B).

Explaining the effectiveness of each procedure (C) requires data much more precise than we are able to collect in our research setting.

Barring the possibility of collecting such data, explaining consequences consistently in terms of the same set of theoretical constructs (information processing) would seem a useful thing to do.

Conclusion

This discussion has elaborated the theoretical properties, and discrete stages of a model intended to be used by those planning to introduce change into a school system. It has also outlined how the developers of the model are beginning work with it to more precisely formulate general principles of school change while at the same time providing direct assistance to practitioners in the solution of system-specific problems. Far from being incompatible, these two foci have proven to be highly complementary. On very few occasions have the data generated for the solution of system-specific problems required supplement beyond the kinds of unobtrusive observations made by the authors and their staffs. These observations place no added burden on personnel in the school system and this is essential if the authors are to be optimally useful to and accepted in the system.

This dual focus has, of course, necessitated developing a research methodology different from typical experimental methodologies. However, we are sympathetic toward the Glaser and Strauss (1967) position with respect to the purposes of our research. For effecting real school change, few powerful theories or models are available. Formal theories of social change and related hypotheses testing tend to describe much of research now applied to the issue of school change. The development of grounded theory must take place for this aspect of educational theory and research to ever be useful to the would be change agent. It is not enough to characterize the problem as

one of "knowledge utilization" or "putting theory into practice." We must be prepared to admit that existing knowledge and theory is woefully inadequate, in this area. Education is a purely practical endeavour; educational change theory ought to be very directly related to the task of guiding the development of reliable change strategies. With a few notable exceptions (e.g., Smith & Keith, 1971), educational researchers tend to avoid the tedious tasks associated with development of grounded theory.

Our field activities and research methodology are intended to result in a substantive grounded theory. Only direct involvement in helping to solve system-specific problems will enable this intention to be realized. Such involvement, however, places demands on the researcher to acquire skills often considered unnecessary for him and certainly frequently not possessed by him. These skills include those associated with an effective consultant; the ability to relate to the practitioner in a manner acceptable to him, the ability to understand and respect the political pressures within a system, the ability to develop practically feasible development and evaluation methodologies from traditional research methodologies and the ability to analyze the implications for reliability and validity of extremely messy field research settings in order to understand the meaning of events.

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