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AUTHOR	Deal, Terrence E.; Baldridge, J. Victor
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ABSTRACT

Since educational organizations must constantly change to meet the demands of a changing society, educational administrators might look to the social sciences for help in managing change and innovation. This paper argues that an organizational approach to educational innovation is likely to be more successful than an individualistic approach. After reviewing some of the shortcomings of innovation research in providing practical assistance to the administrator, it offers an organizational perspective on innovation and rules for developing effective organizational strategies. A new approach to research on education is suggested, emphasizing the underlying processes involved. (Author)

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AN ORGANIZATIONAL VIEW OF EDUCATIONAL INNOVATION

Terrence E. Deal and J. Victor Baldridge

School of Education
Stanford University
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Introductory Statement

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--Teaching Effectiveness

--The Environment for Teaching

--Teaching Students from Low-Income Areas

--Teaching and Linguistic Pluralism

--Exploratory and Related Studies

A part of the Environment for Teaching Program is concerned with innovation and change in educational organizations. This paper offers an organizational perspective on innovation and rules for developing effective strategies for innovation.

Contents

Abstract

Since educational organizations must constantly change to meet the demands of a changing society, educational administrators may look to the social sciences for help in managing change and innovation. This paper argues that an organizational approach to educational innovation is likely to be more successful than an individualistic approach. After reviewing some of the shortcomings of innovation research in providing practical assistance to the administrator, it offers an organizational perspective on innovation and rules for developing effective organizational strategies. A new approach to research on educational innovation is suggested, emphasizing the underlying processes involved.

AN ORGANIZATIONAL VIEW OF EDUCATIONAL INNOVATION

Terrence E. Deal and J. Victor Baldridge

Change and innovation have become an issue that is widely discussed in the educational world, for our schools must constantly change to meet the demands of a changing society. Students, faculty members, administrators, and the general public are increasingly concerned about the ability of educational organizations to adapt and to develop new programs. But it is the educational administrator in particular who must shoulder the responsibility for managing the course of change.

Most change management is based largely on intuition and "seat of the pants" strategy. Certainly there are no scientifically tested principles of change. We believe, however, that educational administrators may learn some useful lessons about stimulating and managing change from social science as well as from the experience of practicing change agents. At least three things are needed to manage change processes in educational organizations: (1) a comprehensive organizational perspective, i.e., an understanding of the crucial organizational subsystems and processes involved in innovation; (2) a familiarity with sound, workable change strategies; and (3) practical experience with the dynamics of educational change, to be gained either directly by actually administering a changing institution or vicariously by consulting case studies. The central purpose of this paper is to offer some basic guidelines in the first two areas. First, however, it may be useful to discuss briefly some of the difficulties encountered in applying innovation research to administrative practice.

Terrence E. Deal is a Research and Development Associate at SCRDT. J. Victor Baldridge is now Assistant Vice-President for Academic Affairs at California State University at Fresno, California.

Difficulties In Applying Research To Administrative Practice

As school principals, superintendents, headmasters, and college and university presidents plunge headlong into the stubborn obstacles and unavoidable problems change presents, they may look to the social and administrative sciences, among other sources, for assistance. They will find a wealth of material on the subject. In fact, there has been a long and distinguished history of research by anthropologists, psychologists, sociologists, economists, and social psychologists on the adoption, implementation, and support of innovations. This history, coupled with a continuing interest in innovation, has produced an enormous body of literature, one that continues to grow at a staggering rate. As an illustration, in 1962 Everett Rogers published a book in which he reviewed over 500 articles in the area of innovation diffusion. In 1971, only nine years later, he published a revised edition in which he reviewed over 1,500 articles.

As changing social and economic conditions pressure nearly all social institutions to change their policies and programs, the body of innovation studies continues to grow not only in size but in scope. Social scientists have expanded their investigations from the factors that promote or hold back innovation to include factors that maintain innovations and an evaluation of whether social inventions are accomplishing their intended purpose. Schools in particular have attracted attention as they have integrated the races, modified their curricula and methods of instruction, and altered the work patterns of teachers. In short, the entire range of the innovation process--from invention to implementation and assessment--is presently under study.

Among educational administrators in particular, however, there is a consensus that the research on innovation has not produced practical assistance in proportion to its enormous volume. This failing can be traced to several characteristics of the approach most researchers have taken so far.

The Individualistic Bias of the Literature

First, until recently the bulk of research on innovation diffusion has been individualistic. Studies have focused on a single technical invention (e.g., a new fertilizer, a new medicine, or a new curriculum) and the factors that cause an individual (e.g., a farmer, physician, or teacher) to adopt the innovation or reject it. Quite often, the individual characteristics of the adopter are the focus of attention. What type of farmer will adopt a new fertilizer? What kind of physician will start using a new drug? Or, what personal characteristics cause teachers to accept or reject a new approach to instruction? Not only is the adopter always an individual, but the factors that produce innovative outlooks or behaviors are typically individualistic. Researchers typically ask, for example, whether the adopters are young or old, traditional or modern, rich or poor, opinion leaders or followers, of high social status or low, at the center of a communications network or isolated. (See Rogers and Shoemaker, 1971.)

The Neglect of Organizational Features

Complex organizations and their innovation problems are rarely treated in the diffusion literature, despite the fact that most major social inventions are used by organizations rather than by individuals. Educational innovations are clearly examples of social inventions adopted primarily by complex organizations, not by individuals. Even in cases where individual teachers might be considered the adopters, the fact that teachers are firmly enmeshed in the social system of the school carries strong organizational implications for both the adoption and the maintenance of new instructional techniques. Unfortunately, the literature on innovation offers little help to administrators who must confront innovation in its organizational context. In fact, Rogers' monumental study (1962) of innovation summarized the conclusions of the existing research in 52 major propositions, not one of which referred to a complex organization as the innovation adopter or to organizational features as affecting the innovation process. The revised edition (1971) reflects no improvements.

Overemphasis on Nonmanipulable Factors

Another characteristic of innovation research that has weakened its usefulness to administrators is its overemphasis on nonmanipulable factors. The individualistic bias of the research has emphasized the personal characteristics of individuals as important determinants of the adoption of social inventions. We may learn, for example, that young cosmopolitan teachers from middle-class families are more likely to adopt new instructional practices. But individual characteristics usually cannot be directly manipulated. Administrators cannot make teachers younger or control their social origins. They can provide special training to offset inexperience but this is often an expensive, time-consuming process. From research and past experience we are emphatically aware of the difficulties involved in changing a person's outlook, values, or habits. Through hiring and firing practices, administrators can control the kinds of individuals who participate in their organization. But in education today, teachers--tenured or otherwise--are almost impossible to fire, and decreasing enrollments often reduce the opportunity to add new teachers, who may be more likely to adopt innovations, to the organization.

In short, the social-psychological bias of innovation research has developed conclusions favoring administrative efforts to change individuals as a way of stimulating the adoption of new practices. Since schools are not always at liberty to hire new teachers or fire old ones, many administrators have resorted to people-changing strategies, such as T-groups, sensitivity training, and laboratory groups. But as a recent article by Bowers (1973) points out, these strategies have not been particularly effective. The administrator is therefore put in the impossible position of trying to manipulate people to bring about structural changes. The individualistic bias of research on innovation diffusion has led us to a dead end in terms of providing realistic and effective techniques for the administrator facing the problems of innovation and change.

Neglect of Complex Innovations

Much of the innovation literature has concentrated on limited kinds of technological innovations. For example, in the widely used agricultural diffusion studies, the innovation studied was typically limited in several ways. First, it was highly technical and its effectiveness had been well proved before it was disseminated (e.g., new types of seeds). Second, there was a relatively short payoff time in which the person adopting the innovation could evaluate it and decide whether or not to continue using it (one season's crops could usually convince a farmer to use a new seed). Third, the innovation's technical efficiency could be readily evaluated and its results could be easily interpreted (a farmer could readily determine the productivity of a new grain, and the advantage of higher productivity is universally acknowledged). Finally, the innovation's adopter was either an individual or a small group, not a complex organization (the individual farmer could choose a new seed without a complicated organizational process).

Of course, most major educational innovations--for example, modular scheduling, team teaching, new instructional strategies, or new procedures for advising students--are far more complex. First, educational innovations often depend heavily on professional judgment, creative insight, and practical experience in addition to or instead of a particular technological advance. Second, educational innovations rarely have a short payoff time after which their effectiveness can be evaluated. Instead it may take months or years to determine whether an innovation has proved its worth. Third, most educational innovations are difficult to evaluate. The decision base of a farmer is simpler than that of a teacher, a school, or a university. If his crop grows better, the farmer knows an innovation is working. But how does a school know whether its students have learned social studies better under a new system? How does a university evaluate a new strand of research? Finally, the adopter of most educational innovations is a complex organization--a school district, university, curriculum board, or state education agency. The complexity of the decision process and the

multiple chains of command necessary to carry out a decision make the diffusion of educational innovations entirely different from the diffusion of relatively simple innovations such as a new seed, a new drug, or a new piece of equipment.

Different analytical tools must accordingly be developed to examine the complex process of educational innovation. In order to examine the adoption of seeds by a farmer, political coalitions and organizational decision making need not be considered, but it would be foolish not to take those dynamics into account in adopting a new social studies curriculum in a public school. In examining a major change such as school integration it is critical to analyze the reward structure, the authority lines, and the decision-making processes of the large organizations involved.

Neglect of Policy Implications

Another weakness of the innovation literature is the failure of many researchers to focus sufficiently on policy questions and to develop policy implications from their studies. The problems selected for investigation in the field of innovation have originated in various social science disciplines: psychologists have studied the personality characteristics of innovators; anthropologists, the kinship patterns of innovators; sociologists, the position of innovators in social networks. The goal of this kind of research is not so much to solve the practical problems of innovation and change as to advance the development of one social science or another. The research has an academic rather than a problem-oriented focus. As a result, administrators looking for solutions to the problems of managing innovation find instead scholarly treatises written in the appropriate academic jargon with the invariable conclusion that more research is needed.

In the field of education, research and development centers were established expressly for the purpose of undertaking problem-oriented or policy research. But this purpose has not always been satisfactorily fulfilled (Baldridge et al., 1973). Many centers have continued to sponsor academically oriented research under the banner of practical

problem solving. Others have sponsored problem-oriented research without appropriate roots in academic disciplines or adequate research design and methodology. The result is that either practical implications have not been developed from important research, or inadequate research has unduly influenced administrative guidelines and policies. Few policy documents in the area of innovation and change have been placed in the hands of administrators who need assistance as they work to change their schools. The guidelines that have been available almost always suggest actions that are outside the administrator's area of control.

Overcommitment to a Specific Strategy for Innovation

Innovation research has also fallen short of administrative expectations because it has failed to systematically test alternative strategies for introducing and managing educational innovation. This failure has resulted in a regrettable tendency to seize on a few narrow insights and then apply them willy-nilly, regardless of a particular organization's real need. For example, the narrow insights of the "human relations/organizational development" approach have been developed by many educational consultants and "change agents" into specific strategies for producing change in schools and school systems. These strategies are placed in a consultant's black bag of tricks and sold at a premium to school principals and superintendents who need assistance to overcome organizational resistance to new educational ideas. To be sure, some of a consultant's strategies may indeed result in the adoption and successful implementation of new curricula, instructional techniques, teacher work patterns, new approaches to decision making, and the like. However, because innovation researchers have rarely carried the inquiry process to the stage of experimentally testing change strategies, we can never be sure whether it is the consultant himself, one strategy or another the "Hawthorne effect," or any of the many other theoretically possible explanations for the changes produced. Without the careful testing of a variety of approaches, then, administrators too easily become wedded to simplistic, narrow

strategies for managing innovation.

In a sense we are suggesting a shift in the overall orientation to the problem of innovation and change in organizations. The terminology of innovation research alone puts us in the wrong direction, for to speak of "adoption" of innovations induces thoughts of a commercial distribution of products from a manufacturer to a potential buyer. With that perspective the research and development community may be tempted to become hucksters pushing particular products, and in their urgency to sell, they may overlook the need to build problem-solving capacity into the organizations they are serving. Researchers, developers, administrators, and educators have seldom created an innovative environment in which alternatives could be considered and options explored.

In an insightful comment, Donald Campbell suggests that the tradition of social innovation that ties itself to particular products and techniques has led to social waste and has necessitated the defense of innovations that did not deserve defending. Campbell argues instead for a risk-taking approach to solving social problems, exploring a variety of innovations and techniques:

> If the political and administrative system has committed itself in advance to the correctness and efficacy of its reforms, it cannot tolerate learning of failure. To be truly scientific we must be able to experiment. We must be able to advocate without that excess of commitment that blinds us to reality testing. . . .
>
> One simple shift in political posture which would reduce the problem is the shift from the advocacy of a specific reform to the advocacy of the seriousness of the problem, and hence to the advocacy of persistence in alternative reform efforts should the first one fail. The political stance would become: "This is a serious problem. We propose to initiate Policy A on an experimental basis. If after five years there has been no significant improvement, we will shift to Policy B." By making explicit that a given problem solution was only one of several that the administrator or party could in good conscience advocate, and by having ready a plausible alternative, the administrator could afford honest evaluation of outcomes.

> Negative results, a failure of the first program, would not jeopardize his job, for his job would be to keep after the problem until something was found that worked [Campbell, 1972, p. 189].

Researchers must broaden the scope of their investigations to include an assessment of a wide variety of strategies for managing innovation. In this way they may help administrators work in the spirit of Campbell's suggestion to build flexible organizations responsive to their environments, organizations with reserves of expertise and resources to sustain long-range problem solving.

An Organizational Perspective On Educational Innovation

The individualistic bias of much innovation research has led many educational administrators to take the human relations approach to educational innovation. The human relations approach emphasizes the importance of individual leaders in promoting change and points to attitudes and characteristics of individuals as the chief obstacles to change. By contrast, we are suggesting a perspective on educational change and innovation that focuses on organizational factors. Instead of advising the administrator to try to change people, we emphasize that educational change engages all the subsystems that together make up complex educational organizations.

Organizational Subsystems

As Figure 1 shows, an organization's subsystems include its goals, its environment, its formal structure, its technology, and the informal system of relationships among individuals and groups within it (Udy, 1965). These various organizational subsystems are related in systematic ways. Any subsystem can produce pressure on any of the other subsystems to change. A changing environment, for example, affects educational goals, technology, and the formal structure. A changing formal structure interacts with informal relationships.

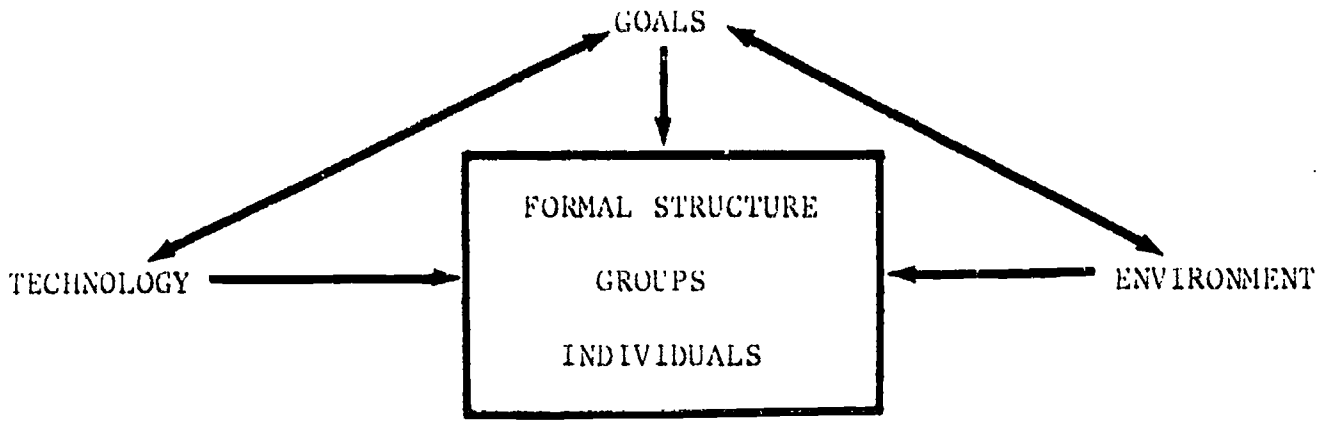

Fig. 1. Organizational subsystems. Based on Stanley Udy, Jr., "The Comparative Analysis of Complex Organizations," in James G. March (ed.), The Handbook of Organizations (Chicago: Rand McNally, 1965), p. 688.

This systemic map of organizational change is far more complex than the popular individualistic model. It suggests that in managing innovations an educational administrator must be aware of a variety of organizational elements. These must be balanced, controlled, and manipulated to ensure the success of an educational innovation. In order to understand basic organizational change, then, it may be helpful to examine each subsystem briefly and then turn to a consideration of how subsystems may function in the change process.

Goals. Organizations are social systems set up to achieve specific goals. Often these goals are contradictory, contested by various participants in the organization, and only vaguely articulated. Nevertheless, institutional goals are a criticial starting point for many organizational changes.

Environments. Organization theorists have begun to realize that many of the most significant changes are stimulated by an organization's environment. The environment may consist of a broad collection of clients, suppliers, customers, government regulatory agencies, and a host of other organizations. No analysis of change can afford to neglect the environment's strong powers to both promote and support change--or to hinder it, as the case may be.

Technology. Every organization has procedures for carrying out its work. In industrial organizations there is usually a great deal of

technogical hardware, including processes for production and assembly lines. Other kinds of organizations also have complicated technologies, though they may not involve hardware. In service organizations such as hospitals and schools, the technology consists of treatments or programs for the patients or clients. Research on organizational change in this area has typically investigated "socio-technical" relationships--that is, the social consequences of introducing some new technology. But more to the point is the argument that the structure of an organization is at least partly shaped by its technology, much as it is influenced by its environment.

For educational organizations the technology is generally the instructional program. Educational technology has undergone particularly rapid change in the past decade, both because society's needs have changed and because extensive resources have been devoted to improving curricula and instructional methods. The administrative implication of this line of research is that when instructional changes occur, changes must also be made in the structure of the organization if the program is to function well.

Formal Structure. Every organization has a system for regulating its operation. An authority structure, a chain of command, systematic decision processes, and reward processes are all part of an organization's formal structure. The structural properties of educational organizations are highly relevant to educational change, both as characteristics to be changed and as characteristics that are changing in response to either environmental or technological pressures. Moreover, organizational structure is particularly easy for administrators to manipulate. It is the prime handle that gives administrators leverage both for promoting and for supporting educational innovation.

The research on educational organizations has revealed some important weaknesses in their basic structures. Division of labor, coordination, decision making and other structural patterns in schools and colleges show some inherent problems that are less severe or non-existent in other organizations.

Informal Relationships. One of the major traditions of organizational research has concentrated on informal relationships within organizations. Researchers within this tradition, usually social psychologists, have investigated the relationships between individual attitudes, morale, and the formal structure of an organization. In addition, group processes and group norms have received constant attention.

Subsystems and the Process of Change

Almost all the major traditions of research on organizational change have focused on one subsystem at a time. For example, researchers might examine organizational change as it relates to informal individual and group relationships, ignoring most of the other subsystems in the process. Many studies tend to overemphasize the influence of certain subsystems at the expense of others. Clark's (1972) article, for example, tends to ignore the organization's formal structure and technology. Similarly, Baldridge's (1973) paper does not deal with organizational goals. Generally, social scientists conducting research on educational innovation narrow their focus to the relationship between no more than two or three organizational subsystems in order to satisfy the scientific criteria by which their work will be judged.

The administrator attempting to introduce an educational innovation must have a broader outlook, however. In order to institute successful changes, he must take all the organization's subsystems into account, not just two or three; and he needs to have a general understanding of how organizational subsystems function in the change process. Broadly speaking, there are three principles he should bear in mind.

1. Each of the subsystems may be seen as an impetus for change or as the element that is being changed. That is, a subsystem may be considered either an independent variable or a dependent variable. For example, we might examine a change in educational goals as an independent variable and see what impact that change had. On the other hand, we might examine as a dependent variable a change in goals that are being produced by some other subsystem, such as a change in the organization's environment. In short, each subsystem can be viewed as either the

thing being changed or the thing that is causing the change. This distinction is important, for studies of educational change have often been confused when it has been unclear whether the subsystem in question was being changed or causing change.

2. A particular subsystem is usually the starting point for practical change. Generally, an organization trying to change concentrates on one subsystem as a starting point. It is rare indeed that an organization tries to change in many areas at once; instead, it is more likely to proceed piecemeal. For example, a school may try to make limited improvements in its teaching technology without attempting to deal with the accompanying changes in authority structures and morale problems. Or it may focus on faculty morale and attitudes without dealing with the environment or formal authority system. It is a normal practice to begin making marginal improvements in one area and then to adjust for the repercussions in other subsystems later. This brings up a final important point--the interrelation of the different subsystems.

3. Any change in an organization is likely to involve more than one subsystem. Organizational changes are complex and their effects are interwoven throughout various subsystems. Goals cannot be changed without affecting group attitudes and technology; the environment cannot shift substantially without a substantial impact on formal authority structures; major upheavals in individual or group morale will certainly have repercussions on decision processes and other formal systems. In short, a change in one subsystem will almost surely result in changes in other subsystems. This means that any research strategy or any program of organizational change must carefully allow for the interrelations between the various subsystems.

Developing Organizational Strategies For Educational Innovation

In addition to having a broad perspective on organizational change, the administrator must have a grasp of strategies for producing and managing educational innovation. These strategies may call for leader-

ship, evaluation, political maneuvering, and the use of change agents and research staff to promote organizational change. What strategy may prove effective in a given situation is contingent on a variety of factors. In any event, a strategy for innovation should reflect what is changing and what is being changed. Program changes may require one strategy, and environmental or structural changes another. Beyond these general considerations, however, we would like to suggest some specific rules for developing a good change strategy.

Some Rules for Developing Strategies

1. A serious assessment of needs is necessary. At first it seems silly to mention the requirement for a careful assessment of needs. One might assume that all change is preceded by such an analysis. Unfortunately, this is not necessarily the case, for a variety of problems often short-circuit the needs-assessment stage of organizational change.

For example, all too often administrators are "captured" by their own diagnosis of their organization's needs; and similarly, they may persist in applying the same time-worn solution to every problem that arises. Usually their preconceptions are closely related to their own sphere of control. The tendency to specialize and to concentrate our change efforts in our own sphere of activity is natural, but it may lead to a persistent bias and a persistent neglect of the needs of the organization as a whole.

Similarly, the process of diagnosis is often short-circuited by outside consultants offering preconceived solutions. We have already mentioned that many organizational consultants come with "black bags' filled with special tricks of the trade that are supposed to solve a wide range of organizational problems. Consultants, like administrators, are often captured by their own range of skills and special interests. For this reason any organization hiring consultants should thoroughly explore the particular biases and procedures they will bring with them.

The process of diagnosis may also be short-circuited by the "iceberg" phenomenon. That is, an adequate diagnosis may be made of an apparent problem, but that problem may be merely a symptom of a

deeper problem. The overt symptom may well be corrected, but the deep-seated problem will be missed.

Thus a thoroughgoing diagnosis of organizational problems must be made before any change is undertaken. Experts from throughout the organization must be drawn into the diagnostic process to counteract the inevitable biases of individuals in one position or another. Surface problems must be probed in order to get at the more basic issues. Most important, the process must take into account all the different organizational subsystems that we mentioned earlier. Difficulties in any of these subsystems may affect areas far from their original source.

2. Proposed changes must be relevant to the history of the organization. Organizations often incorporate traditions and patterns that have evolved over a long period of time. It is important to realize that organizational change is always relative to the unique circumstances of a given organization. Change simply cannot take hold if an organization's history and traditions are diametrically opposed to the proposed innovation. For example, in this period of tightened financial resources there is much outcry for greater efficiency and more scientific management in educational organizations. All too often these well-intentioned programs are undermined because they are forced on an organization without enough concern for its unique history and circumstances. Many changes that are potentially valuable must be severely modified if they are to mesh with the ongoing life of an organization. Fitting a new change into an organization's history and traditions is a complex problem, to be sure, but it is one that cannot be dismissed.

3. Organizational changes must take the environment into account. Organizational changes are almost never dictated entirely by internal factors. The environment is often a major impetus for change, for new environmental demands are a critical source of new ideas, new procedures, and new activities. Moreover, changes that are made internally must be supported by environmental connections. A change in student-discipline rules in a school district, for example, might be very popular with students and teachers but totally opposed by the surrounding community.

New accounting procedures for business firms may generate enormous hostility among clients because of their complexity. In short, the basic question "What does the environment need?" must be augmented by "What will the environment support?" The answers to these two questions are often the key to substantial organizational change.

4. Serious changes must affect the organizational structure as well as individual attitudes. We noted earlier that a major shortcoming of much of the organizational change literature is that it focuses narrowly on individual attitudes. Although individual attitudes are obviously important, organizational structure must also be changed to support any changes in attitudes. For example, let us assume we wanted teachers in a school to teach differently. One strategy would be persuasion--convincing the teachers that the change was important. We could reinforce that persuasion, however, by changing organizational features such as the sanction and evaluation process. Teachers who followed the new procedure would be paid more to reinforce the change in their attitude. Other ways of supporting attitudinal change might include changing the authority structure, permitting broader participation in decision making, and providing appropriate technological support. In short, any innovation that required a change in the attitudes of personnel can be supported by changing the organizational structures to reinforce the desired attitudes.

5. Changes must be directed at manipulable factors. It makes no sense to plan organizational change around factors that simply cannot be changed. This statement sounds tautological, but it is remarkable how often plainly unworkable strategies are proposed. For example, in trying to integrate the schools it is obvious that changing the attitude of millions of people is virtually impossible, while mechanically changing the racial composition of the schools is more feasible. Either strategy theoretically would produce more integration, but the first is based on a factor that essentially cannot be manipulated. By and large, individual attitudes make bad starting points for serious organizational change, since they often remain unchanged despite the most inspired persuasive tactics. Some other factors that are very difficult to

manipulate are major environmental factors, such as the nature of an organization's clientele (e.g., clients, customers, students, patients), and the fundamental goals of an organization. Factors that are often easier to manipulate are organizational rewards, evaluations, and sanction systems; administrative and departmental structure; personnel practices such as hiring, firing, and promotion policies; and technologies and operational processes.

6. Changes must be both politically and economically feasible. Only the most foolhardy school administrators would propose a controversial innovation such as sex education classes in an utterly hostile environment. Not only is it important to have a certain amount of support from an organization's environment, but it is also important to gauge the amount of political opposition that may came from within. Powerful interest groups in an organization may fight proposed changes and they may have the leverage necessary to stop them. A vital part of a shrewd administrator's job is foreseeing the political reaction to changes under consideration. Often it is best simply not to try changes that obviously have no chance of political survival. However, if a change is so important that it must be made despite political opposition, then the marshalling of interest groups and coalitions for support is a critical link in the planning process. Rational planning often falls completely apart in the face of poor political strategy.

The political issue is frequently tied to the cost issue. Many plans fail because they are not economically realistic. Preliminary calculations of an innovation's cost should be made long before time and money have been spent in actually making the change. This preliminary work can minimize hard feelings and wasted energy. Usually expert advice is required, and a variety of opinions on the issue should be solicited. It is important to remember that personnel time is often one of the greatest expenses. Before a change is undertaken, a careful assessment must be made of the available talent and expertise in the organization. It is senseless to plan for changes without having the appropriate personnel on hand or at least the prospect of hiring them.

7. The changes must be effective in solving the problems that were diagnosed. The most cost-effective plans with the most manipulable factors in the most supportive political environment will still fail if they do not solve the problem. The critical questions in this regard are these: Will the proposed changes actually solve the problems that were diagnosed? Will they solve the problems permanently? Will the changes be structured into the organization itself, or are they overly dependent on individual personalities? Too often changes are proposed that meet every criterion except that of effectiveness. Obviously, changes that fail to solve the problems at hand are a waste of time.

The Rules in Action: A Case Study

In order to see whether the rules outlined above are useful analytical tools, let us apply them to the concrete case of a major educational change: the drive for equality of educational opportunity in the public schools.

Equality of educational opportunity was advanced as a national goal after the Supreme Court's Brown decision in 1954. In 1964 a huge research effort culminated in the government report entitled Equality of Educational Opportunity, often called the Coleman Report. This research conclusively verified that racial minorities were generally getting a much poorer education than majority groups: they were achieving at much lower levels and they had higher dropout rates. The Coleman Report identified a number of factors as causes of this problem:

1. Fate control: Minority students did not feel that they were able to control their social destinies. As a consequence, they often reported that their motivation to learn in school was much lower than that of majority students, who enjoyed more advantages in life. The minority students felt, realistically enough, that they had been cheated by their position in society and that no amount of hard work in school would reap reasonable benefits, for them.
2. Family background: A larger proportion of minority students than majority students came from broken homes. In addition, minority students often came from families where achievement in school was neither highly valued nor effectively promoted.
3. Teacher quality: Schools with a predominance of minority students often had poorly trained teachers.

4. Segregation: Segregation was shown to have a number of harmful side effects, including lower self-esteem and fewer middle-class role models.

5. Resource allocation: Because of discrimination by middle-class school boards, minority schools did not get the same per capita expenditure for their pupils as middle-class schools. It is a reasonable assumption that less money meant a lower-quality education.

The Coleman Report, then, diagnosed the problem and identified five factors as essential causes. If we wanted to design a program of organizational change that would help solve the problem, which of the five factors would we try to manipulate, and what changes would be likely to succeed in light of our change-strategy rules?

Both fate control and family background seem to be very influential factors; if we changed them it would certainly make a difference, but they would be extremely difficult to manipulate. There is nothing we can really do, in the short run at least, about the students' family backgrounds and general attitudes toward their social environment. As a consequence, we would probably rule out these two factors as the focus of an effective strategy.

The other three factors are somewhat more promising. Teacher quality meets most of the criteria set forth in the rules: it is a manipulable factor; it is probably an influential factor; changes relating to it are politically feasible in light of the political power of teachers' groups; and improvements in this area would be supported by the environment. The major difficulty in manipulating teacher quality is the extremely high cost. Teachers' salaries account for the bulk of school system budgets, and to manipulate this factor in any serious manner might bankrupt half the school districts in the country. As a consequence, only marginal changes would probably be made in this area.

Segregation also meets many of the requirements for the focus of a good change strategy. It is probably a significant factor that has an impact on student learning; it is a factor that can be manipulated with the help of busing and redistricting; it is probably amenable to cost-

effective measures that are well within the financial resources of most districts; and changes in this area would affect the structure of the school system itself as well as individual attitudes. There are some serious drawbacks to an integration strategy, however. The political cost of efforts toward integration would be great, and it is doubtful that the environments around most school districts would be very supportive of integration attempts. Thus in some ways segregation appears to be a promising area for change, but in others it does not.

Finally, resource allocation also offers mixed opportunities. The equalization of resources under court-mandated plans emerging from decisions such as California's Serrano v. Priest should be relatively effective in improving minority education. To be sure, there has been considerable debate about whether merely adding dollar resources actually improves pupil performance. Nevertheless, it seems obvious that equalizing financial support might help equalize educational opportunities. Resource allocation is a readily manipulable factor, and changes in this area would probably be financially feasible. Again, the drawbacks are political. There has been strong opposition to equalizing school expenditures because it essentially means redistributing money from wealthier areas into poorer ones, a process that is invariably met by political opposition.

To summarize, our example teaches us something about applying our rules for developing successful change strategies. First, any strategy must focus on factors that are manipulable and have a significant effect; otherwise there is no sense in making the effort. Second, almost any strategy has some liabilities, often economic or political. It is important, however, not to be so concerned about liabilities that we are paralyzed into inaction. The basic lesson, then, is to evaluate any strategy in terms of all of these rules, and then to act on the most feasible possibilities. Usually a complex mix of alternative strategies can help balance liabilities and maximize opportunities for effective change.

Conclusions

Educational change is incredibly difficult, but it is a necessary and continuous process in our contemporary society. As soon as one innovation is successfully installed, we must be considering another. We have argued in this paper that since educational innovations are adopted primarily by complex organizations rather than by individuals, an organizational approach to educational innovation is likely to be more successful than an individualistic approach. Educational administrators must therefore have a broad understanding of the interrelated functioning of all of an organization's subsystems: its goals, environment, technology, and formal structure, and the informal relationships among individuals and groups within it. Moreover, they must understand some basic principles of developing a successful strategy for organizational change.

We have offered some basic guidelines for understanding the fundamental processes involved in organizational innovation and for developing strategies with a reasonable probability of success. But a true administrative science cannot be developed until school administrators begin to test systematically a variety of approaches to innovation in schools, while social scientists begin to investigate systematically the conditions under which successful administrative changes are produced. In this way the foundation for a new approach to change and innovation in schools can be laid--one that makes allowances for the difficulties of administrative efforts while simultaneously and persistently working toward the development of new and workable solutions.

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