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ABSTRACT
            Drawing from an analysis of educational innovation
attempted in 200 school districts throughout the United States, this
essay describes critical aspects of the implementation process. Four
micro-level premises are critical to larger macro-level change
policies. First, external inputs into the implementation process must
be congruent with local needs, capacities, and preferences. Second,
effective implementation of significant change is characterized by
the process of mutual adaptation. This may include the modification
of goals, technologies, behavioral change in students and teachers,
and evaluation plans. Third, effective implementation depends on the
receptivity of the institutional setting to change. Indifferent and
unreceptive environments are most frequent and fail to provide
necessary support for change. Fourth, local school systems vary not
only in their receptivity to change but also in their capacity to
innovate; therefore, they can be expected to experience different
implementation problems for the same class of innovations. Suggested
implications for macro-level planning and implementation are briefly
described. (Author/DE)

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MACRO AND MICRO IMPLEMENTATION[*]

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Significant educational change requires more than the introduction
of new technologies or the alteration of traditional curricula. Signi-
ficant change cannot be accomplished without the institutionalization
of new patterns of behavior. That is, new roles and relationships for
teachers, administrators, and students need to be defined and maintained.
Implementing such change is a difficult and uncertain process, which
neither social science theory nor practical wisdom has thus far been able
to illuminate. This essay, drawing on our analysis of educational innova-
tion attempted in 200 school districts throughout the United States,[**]
describes critical aspects of the implementation process and suggests
conceptualization that might serve as a basis to guide the development
of theory and practice.

We take the perspective that educational change inevitably involves
two levels of implementation: Micro and macro. Local innovators have a
micro-problem--they must learn to implement new ideas and practices effec-
tively. Concurrently, central planners and federal policymakers face a
macro-problem--their federal plans can be implemented only as the cumu-
lated product of many micro-level, local implementations.

The Rand Change Agent Study has attempted to analyze critical ele-
ments of implementation in its local setting. Our analysis suggests

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[*]Paper prepared for IMTEC Training Course "Towards a New Secondary
School--Problems of Implementation" held in the Federal Republic of Ger-
many 4-14 June 1975.

[**]The conceptual model, methodology and results of the first year of
the Rand Change Agent Study are reported in four volumes: Volume I, *A Model
of Educational Change* (R-1589/1-HEW); Volume II, *Factors Affecting Change
Agent Projects* (R-1589/2-HEW; Volume III, *The Process of Change* (R-1589/3-
HEW); Volume IV, *The Findings in Review* (R-1589/4-HEW). Four technical ap-
pendices to Volume III describe in detail the federal program management
approach, state education agency participation, and case studies for each
of the programs in the study.

that four micro-level premises are critical to effective federal change policies:

1. Implementation--rather than the adoption of technology, the availability of information, or the infusion of money--dominates the outcomes of innovations.

2. Effective implementation of significant change is characterized by the process of mutual adaptation.

3. Effective implementation depends on the receptivity of the institutional setting to change.

4. Local school systems vary in their capacity to implement significant change.

But planners and ministries of education typically seem to be unaware of these critical premises or to be working under different, and perhaps contradictory, assumptions.

Planners and ministries of education typically have sought to produce and expedite educational change by centralized initiation, design, and administration. But these attempts usually have been disappointing. Whereas these central policies embody legitimate expectations about goals of educational change, they underestimate the local implementation process necessary to their realization. In addition, they often seem to ignore the necessity for the local institutional setting to be receptive to the proposed change--that is, for the local institutions to be interested in and indeed have a demand for change. Centralized plans recognize that the local institutions need to adapt to the proposed change but sometimes seem not to recognize that the plans must simultaneously be adapted to local conditions. Finally, these central policies fail to accommodate the variation in interests and capacities of local school systems.

This paper will examine each of these four micro-level premises in turn and, drawing on this analysis, suggest implications for macro-level planning and implementation.

IMPLEMENTATION DOMINATES OUTCOME

In the American scene, highly centralized change strategies are rare. The American tradition of pluralism precludes strong federal direction of local educational affairs. Therefore, the innovative projects we examined find no direct parallel in European attempts to promote innovation.

Nonetheless, we believe that an important lesson can be drawn from our research that is relevant to educational change generally: external inputs are utilized during the implementation process in ways that are congruent with local needs, capacities and preferences, not federal intent.
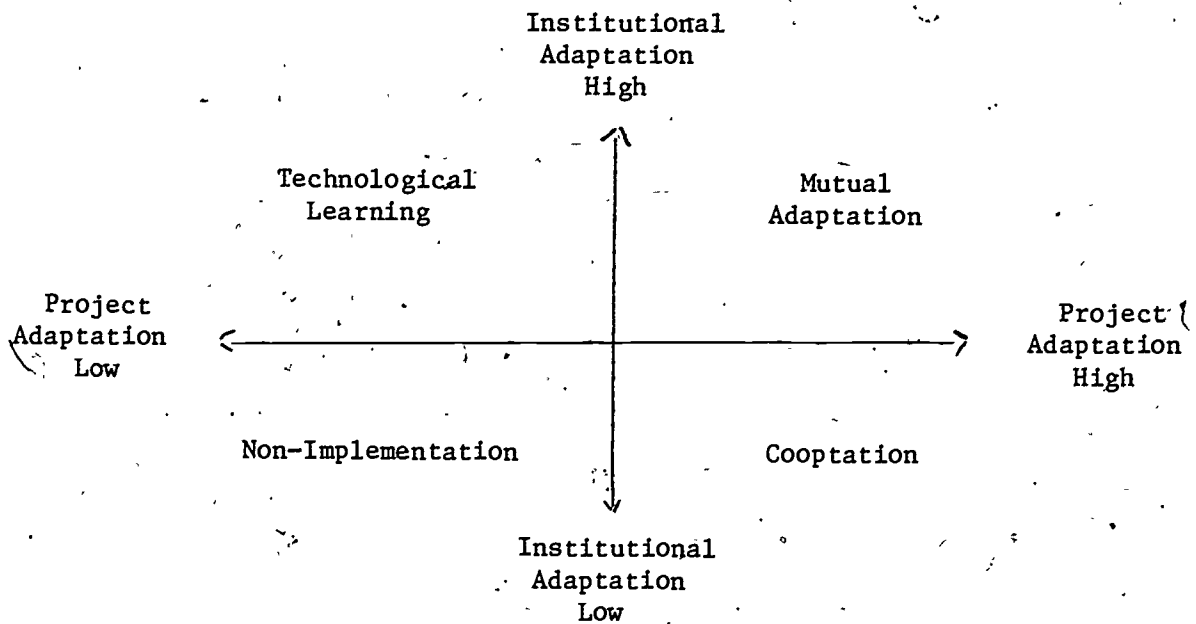
Even in the most centralized projects we examined, the macro plans developed at the central or federal level were ineffective unless they were in accord with prior local commitments and capacity. In one program area, these federally conceived and designed plans comprised management packages to guide local installation of an innovative approach to reading. They were typically ineffective or counterproductive for one of two reasons. One, local school personnel often treated these federal packages as "road maps" to be strictly followed. In these cases, projects were disappointing because these "road maps" could not anticipate the inherently local personalities, events and crises. Further, because local personnel used these packages as a "crutch," they were unable to develop their own ability to adapt to the exigencies of the local situation. A second reason these packages typically failed is that they were ignored by local actors. In sum, we found that external inputs had only marginal or insignificant effect on the outcome of local projects. These outcomes were determined by implementation--an inherently local process.

At the micro level, the implementation process consists of an interplay between the innovative plan and the institutional setting in which the plan may adapt to the setting or the setting to the plan. Or both may occur simultaneously. More specifically, we believe that four implementation patterns or paths can occur (see Figure 1):

1) technological learning in which participants adapt to the new technology but the technology is not adapted to the setting;

2) non-implementation in which new project practices are not implemented at all, or only implemented symbolically;

3) cooptation in which the project is adapted to the setting but participants do not alter their usual behavior or practice;

Figure 1

PATTERNS OF MICRO-LEVEL IMPLEMENTATION

Institutional
Adaptation
High

Technological
Learning

Mutual
Adaptation

Project
Adaptation
Low

Project
Adaptation
High

Non-Implementation

Cooptation

Institutional
Adaptation
Low

4) mutual adaptation in which the innovative project and institu-
    tional setting adapt to each other.

Central planners often assume that innovation is characterized
by the first implementation pattern, technological learning. They as-
sume that people can learn to use a complex educational practice or
strategy as workers learn to use new machinery. But this analogy is de-
ceptive. The type of individual learning that occurs in the machine
situation primarily requires the mastery of new cognitive skills and ac-
tivities; most importantly, such learning is a routine and legitimate
extension of the job. In contrast, significant educational change re-
quires new role relationships and new ways of seeing oneself in relation-
ship to others and to the job. Internalizing these new relationships is
not simply a routine extension of the teaching job. Nor do individual
teachers always believe that these required changes are legitimate. In
short, they need to be "motivated" to change their traditional behavior.

It is convenient to think of three motivations or reasons why teach-
ers might be willing to change. First, they might be complying with an
order. Yet our analysis of the Change Agent innovations suggests that
when people simply "comply," they generally do so in a pro forma or sym-
bolic way that results in non-implementation.

Second, teachers might be willing to change their traditional behav-
ior if such behavior is in their own self-interest, narrowly defined.
That is, they might be willing to follow a plan if they received incen-
tives for doing so. Yet our analysis indicates that such incentives as
career advancement or extra pay were either ineffective or, in the absence
of other motivations, led teachers and administrators to coopt the proposed
change to fit their traditional behavior.

Only the third type of motivation, belief in the value of the new
practice, seemed to be effective in enabling people to devote themselves
to the usually painful process of change. This belief in the value of the
new practice often required that project people develop a sense of "owner-
ship" about the proposed change and that they participate in planning and

everyday decisions about implementation. As we shall discuss in detail, they could do so by adapting the original project plans to their own needs as they simultaneously adapted their behavior.

In sum, whether or not mutual adaptation was an "efficient" process, it was characteristic of the implementation of projects that did, in reality, result in significant change in teacher behavior.

MUTUAL ADAPTATION AND IMPLEMENTATION STRATEGIES

Mutual adaptation could involve a variety of adjustments in the original innovative plan--e.g., reduction or modification of idealistic project goals, amendment or simplification of project treatment or technologies, revision of ambitious expectations for behavioral change in the staff or impact of the project on students, initiation of a new evaluation plan, or changes in standard practices or relationships. These adjustments often caused difficulties and did not invariably lead to full achievement of the project's goals. But they typically increased the likelihood of significant and enduring changes in teacher and organizational practices.

Adaptation on the part of participants typically involved the development of new behavior and attitudes, the formulation of new roles and relationships, or the acquisition of new skills.

We identified a number of implementation strategies that individually or together promoted mutual adaptation. A project's implementation strategy results from many choices about how to carry out its goals and educational treatment, and is distinguishable from educational method. For example, the same reading project could be implemented in a number of different ways in different sites. Decisions about the type and amount of planning, the location of the project and about who should participate (and to what extent they should participate) are examples of such choices, and define in effect how an educational treatment is put into practice. Specifically, the following implementation strategies were found to be important to mutual adaptation:

- o adaptive planning
- o staff training keyed to the local setting
- o local materials development
- o critical mass

Our research suggests that each project employed its own combination of strategic choices that defined in effect its particular implementation strategy. Thus, it is more meaningful to discuss how--and why--the various individual strategic choices interact with each other to form a "successful" implementation strategy.

Adaptive Planning

Projects varied considerably in the amount of planning they did, and it would appear that in their first year the more successful projects avoided the extremes of virtually *no* planning and of *almost all* planning. But otherwise, the amount of planning was not significantly related to project outcomes. Indeed, it appears that the amount of planning seemed less important than whether the quality of planning matched the needs of the project and its participants.

Though the resources spent on planning had little effect on project outcomes, the *nature* of the planning process had a major effect. Planning activities that were flexible, adaptive, and congruent with the nature of the project were more likely to result in well-implemented innovations. By "flexible" and "adaptive" planning we mean planning that established channels of communication, set forth initial goals and objectives with the assistance of a representative group of prospective project participants, and maintained a continuing process of planning. Frequent and regular staff meetings contributed significantly to project success because they made planning an on-going process. These meetings provided a forum for reassessing project goals and activities, monitoring project achievements and problems, and modifying practices in light of institutional and project demands. Planning, in this instance, had a firm base in project reality, so that issues could be identified and solutions determined before problems became crises. Meetings also strengthened staff morale, established a sense of project cohesiveness, and broke down the traditional isolation of the classroom teacher.

Staff Training Keyed to the Local Setting

Projects also differed greatly in the amount, timing, and type of training for project staff. Training was significantly related to project outcomes

only when it was tied to the specifics of project operation and to the
practical day-to-day problems of the project participants. For example,
we saw that the effectiveness of training was conditioned by the train-
ing format and by who did the training. Teachers strongly preferred very
concrete "how-to-do-it" workshops given by local personnel (as opposed to
a more general, inspirational lecture.) The projects that were implemen-
ted most smoothly had either a project director or district resource per-
sonnel whose understanding and experience (both in project methods and in
the local setting) enabled them to make specific suggestions to help
teachers implement the project. Teachers said that outside technical assist-
ants performing a similar consulting role were ineffective and disappointing.

Local Materials Development

Material on development activities ranged from careful assessment and
"repackaging" of existing products to producing from scratch a wide range
of project materials. These development activities were seen to play an
important role in successful project implementation and, subsequently, in
project outcomes. The value of producing one's own project materials may
not lie principally in the merits of the final product, but in the activity
of development itself. The exercise of "reinventing the wheel" can provide
an important opportunity for staff to work through and understand project
precepts and to develop a sense of "ownership" in project methods and goals.
Without this "learning by doing," it is doubtful that projects attempting
to achieve significant teacher change would be effectively implemented.*

Critical Mass

Although project participants did not show much resistance to innova-
tion, particularly where there was a strong commitment on the part of the
district, nonproject personnel sometimes impeded project implementation.
Where project teachers felt "isolated" (and unappreciated), negative or in-
different attitudes from non-participants eroded staff morale and constitu-
ted a pressure for the project teacher to "give up."

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*We do not have direct evidence as to whether the quality of locally
developed material "improved" the curriculum. However, project partici-
pants consistently reported that locally developed materials were better
for their needs than those which they replaced.

A critical mass of project participants is necessary in order to build support and morale of project staff. This critical mass of project staff encourages the establishment of a norm for change in the setting so that project teachers can take risks without feeling deviant.

In sum, these components--adaptive planning, staff training keyed to the local setting, local materials development, and the establishment of a critical mass--form key elements of an implementation strategy that promoted mutual adaptation. Innovations that employed these elements often had a slower start-up and difficult implementation, but they were more likely to result in significant and enduring teacher change.

RECEPTIVE INSTITUTIONAL SETTING

The preceding discussion of mutual adaptation and of implementation strategies foreshadows a major conclusion of the Change Agent study: the local institutional setting has a major influence on the prospects for the effective implementation of an innovation project. Though we could not collect data on all aspects of the institutional setting, our statistical analysis as well as our fieldwork clearly showed that project outcomes depended more on the characteristics of the project's setting than on any other factor.

In particular, the local organizational climate and the motivations of project participants had major effects on the perceived success of change agent projects and on the amount of change in teacher behavior. More specifically, high morale of teachers at a school, the active support of principals (who appear to be the "gatekeepers" of change), the general and explicit support of the superintendent and district officials, and the teachers' willingness to expend extra effort on the project all increased the chances of teacher change and perceived success. The attitudes of administrators in effect tell the staff how seriously they should take project objectives. Unless the project seems to represent a district and school priority, teachers may not put in the effort and emotional investment necessary for successful implementation. Thus, when these elements were not in evidence, projects were likely to break down or be implemented routinely without significant change.

Because the school organization must adapt if significant change is to take place, the receptiveness of the institutional setting to the change agent project seemed to be a necessary condition for successful implementation. Naturally, implementation was difficult in a hostile environment, but indifferent settings also failed to provide necessary support.

Indifferent and unreceptive environments were frequent in our sample of projects attempted in upper-level schools. Innovations in primary or elementary schools were more likely to be successfully implemented and to result in teacher change than projects in upper-level schools, or those that cut across all school levels. Change agent projects that included the higher grade levels experienced severe management and administrative problems as well as teacher resistance. For example, reading projects that spanned all grade levels consistently encountered resistance at the upper-level schools as they attempted to persuade science or history teachers to view themselves as teachers of reading. Project managers could generate little interest in "new ideas" among secondary school teachers of "solid subjects" who perceive themselves as having large intellectual and emotional investments in academic purity. In short, this tendency towards strict professionalism among upper-level school teachers (along with the compartmentalization of the curriculum and classroom scheduling) may not have provided the organizational conditions necessary for significant change efforts.

On the other hand, a receptive institutional setting provides explicit, steady support for change agent efforts. As such, a receptive institutional setting is a necessary but not a sufficient condition for effective implementation. Mutual adaptation—which we believe is the key to serious change—requires an implementation strategy that takes advantage of institutional support. Indeed, the components of a micro-level implementation strategy that we found to be most effective—adaptive planning, staff training keyed to the local setting, and local materials development—were those that enabled the support and commitment of administrators and staff to be fully engaged.

HETEROGENEITY OF LOCAL SCHOOL SYSTEMS

Local school systems vary not only in their receptivity to change but also in their capacity to innovate. School districts differ in their demand for change, in their ability to plan and carry out plans, and in their needs and problems. Therefore, they can be expected to experience different implementation problems for the same class of innovations. In particular, the pace of, and not surprisingly, the outcomes would differ for the same innovation attempted in different settings. A clear implication for central change policy is that the allocation of resources, the timing of the introduction of change, and the expectations for change should be differentiated according to the reality of local variation.

A subtle but more significant implication of the heterogeneity of local districts is that central policy might be directed toward developing the capacity of local districts to implement educational change. Our data provide no direct evidence about such policy because U.S. federal programs seldom aim at strengthening institutional capacity. Nonetheless, we can suggest, based on our research, a conceptual approach that could guide such policies.

It is useful to think of school districts varying along a dimension that might be called the capacity to adapt to change or, for short, adaptiveness. The limiting case of no adaptiveness can be characterized by school districts that either cannot survive change attempts or totally resist them. They are reactive rather than proactive. They do not have internal institutional mechanisms that anticipate needs and plan for change. They react only to exogeneous shocks and then do so by the type of pro-forma implementation or cooptation that constitutes movement without change. For such school districts, change efforts represent short-term "coping" behavior and innovation is illusionary.

In contrast, the ideal adaptive school system has developed institutionalized mechanisms that initiate, implement, and sustain innovative

efforts. In the area of initiation, these mechanisms constitute what might be called a "problem-solving" approach to adopting innovations.* The problem-solving that characterizes the initiation of change for the ideal adaptive school system has three main elements:

1. The response to _external_ pressures for change is _proactive_ in the sense that it typically anticipates external demands and prepares a local solution before "exogeneous shocks" become local crises.

2. Internal demand for change is continually stimulated and considered legitimate. Needs are assessed and problems are identified on an on-going basis.

3. The formulation of proposals in response either to external pressures or indigenous demands and needs consists of a process of mobilizing political as well as organizational resources. The crucial ingredient of this process is the participation of staff at all levels in proposal development. By so doing, they can develop a sense of ownership in and commitment to the specific planned change, and, more importantly in the long-run, a sense of trust in the organization's willingness to change.

In the implementation area, the ideal adaptive school system is one that has institutional mechanisms that promote mutual adaptation. Though the specific institutional mechanisms that are best suited depend upon particular organizational structures, their general role is to create a climate of support that routinely assists staff in adapting plans to local conditions and vice versa. One institutional arrangement we observed involved a separate

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*The literature on organizational problem-solving draws heavily on the Research and Development activities of industrial firms who are typically engaged in market behavior. Unfortunately, a great deal of the educational literature has accepted these R & D problem-solving concepts in toto, even though education neither has market mechanisms nor similar incentive structure. Therefore, we use the term "problem-solving" advisedly because the R & D model did not conform to the reality of school district behavior that we observed. For example, school personnel seldom "searched" outside their district for better treatments; nor did outside information about promising practices seem to stimulate them to look outside of their districts.

organizational line structure of specialists in curriculum areas whose only function was to assist staff in implementing change and where their effectiveness depended upon their ability to create a demand for their services.

In the area of sustaining innovation, many of the institutional mechanisms that enable special projects or innovative efforts to be incorporated into standard district practices parallel those that underlie proactive (rather than reactive) district response to external pressures.

That is, the ideal adaptive district not only regards the need for change as a "fact of life" (rather than an unanticipated crisis), but it also views the solutions to both internal and external demands as long-term solutions, not temporary "coping" measures. Thus, at the outset of an innovative effort, institutional means are employed to sustain and incorporate the innovation. For example, district budgetary decisions are made in light of a project's short-term and continuing costs. Moreover, plans are made for new practices to replace traditional ones rather than simply add-on to them.

The ideal adaptive district also acts to sustain innovative practices by establishing means such as district-wide inservice training whereby an innovative practice can be spread beyond its original site or core of participants.

Similarly, adaptive districts are able to sustain a general climate of innovation through structural devices. Routinized district practices such as the award of small discretionary funds to "grass roots" innovators not only generates new practices on an on-going basis, they also serve to legitimize innovation and risk-taking. Such practices operate to encourage local practitioners to view innovation as part of their regular professional activities, rather than as "special," unusual or merely ancillary to on-going practice.

Our research suggests that most school districts lie somewhere between the extremes of no adaptiveness or the ideal adaptiveness we have sketched

above. Further, we believe that these micro-structures are the heart of the variance we observed in local response to change and implementation of centrally conceived plans and priorities. Thus the macro problem of implementing centralized plans involves both differentiating between local capacities to change and formulating policies that can promote the developing of adaptive structures and strategies at the local level.