C E O Center for Effective Organizations

Self-Designing Organizations: Towards Implementing Quality-of-Work-Life Innovations

CEO Publication
G 86-3 (81)

Thomas G. Cummings
Susan A. Mohrman
University of Southern California

To appear in *Research in Organizational Change and Development*, Volume 1, R. Woodman and W. Pasmore (Eds.), Greenwich, CT: JAI Press.

Self-Designing Organizations: Towards Implementing Quality-of-Work-Life Innovations

CEO Publication
G 86-3 (81)

Thomas G. Cummings
Susan A. Mohrman
University of Southern California

To appear in *Research in Organizational Change and Development*,
Volume 1, R. Woodman and W. Pasmore (Eds.), Greenwich, CT: JAI Press.

Center for Effective Organizations - School of Business Administration
University of Southern California - Los Angeles, CA 90089-1421 (213)740-9814

ABSTRACT

This chapter develops a strategy for implementing innovations requiring fundamental organizational change. Referred to as self design, the strategy is particularly suited to quality-of-work-life (QWL) innovations that cannot be fully specified prior to implementation, and consequently a great deal of experimentation and learning are needed to implement them. As an introduction to self design, the chapter first describes the more widely-used innovation-adoption perspective on organizational innovation. Although organizations prefer to emulate this rational approach to innovation, its general applicability is limited to highly-certain innovations whose implementation can be preplanned and programmed. QWL innovations are highly uncertain, and thus require a radically different implementation strategy like self design. The different phases of the self-design process are described and operationalized, and the chapter concludes with future research areas that need to be addressed to increase its success.

The 1980s can be characterized as a time of widespread organizational innovation. Organizations are faced with unprecedented foreign competition, environmental change, societal pressure for more efficient operations, and employee demands for more meaningful work lives; thus, better ways of designing and managing organizations are needed. Change programs are focusing on creating leaner, more efficient and adaptable organizations, better able to utilize human resources.

These changes often involve quality-of-work-life (QWL) techniques aimed at enhancing both organizational effectiveness and employee fulfillment, such as quality circles, self-regulating work groups, gain sharing, and job enrichment. Although the success of QWL methods is frequently extolled in the popular media, organizations can experience problems applying the change programs if they use an inappropriate implementation strategy. The techniques cannot simply be adopted like other, more clearly-specified organizational innovations, such as new accounting practices and manufacturing technology. Rather, existing research is relatively weak in offering specific prescriptions for designing QWL innovations; it provides only general guidelines for organizational improvement. Consequently, organizations need to engage in considerable experimentation and learning in order to apply the techniques to their specific situations. They need to learn how to translate the general practices into organizationally-relevant behaviors, structures, and processes.

This chapter presents a strategy for implementing QWL innovations. Called "self design," this approach is particularly suited to QWL innovations which tend to involve: organizational changes that can only be generally defined prior to implementation; an implementation process that is relatively uncertain and requires on-going adjustment and refinement of the innovation; and considerable learning in order to enact the behaviors implied by the innovation. The self-design strategy contrasts sharply with the more traditional innovation-adoption approach to implementation which underlies much of the literature on organizational innovation. This strategy is best suited to innovations which involve clearly-defined designs and relatively straightforward implementation processes.

As an introduction to the self-design strategy, the first part of the chapter examines the more widely-accepted innovation-adoption perspective and explains why that approach is ill-suited to implementing QWL innovations. Specific characteristics of innovations which impact the effectiveness of implementation strategies are identified; these can serve as contingencies in choosing an appropriate strategy. The second part of the chapter presents the self-design strategy and shows why it is more applicable to QWL programs than the innovation-adoption approach. Particular attention is directed at describing the process through which self design is carried out in organizations; so far, researchers have focused primarily on the conditions giving rise to self design while providing few actual descriptions of the process itself. This section explains what is already known about the self-design process. The last section addresses research issues that need to be addressed to increase its success, as well as the nature of action research in a self-design context. Particular attention is paid to the dynamics of the relationship between organizational members and action researchers.

INNOVATION-ADOPTION PERSPECTIVE

The extensive literature on organizational innovation has relied primarily on an innovation-adoption perspective to describe how organizations implement new ideas, practices, and technologies. This viewpoint tends to treat innovations as clearly-defined entities that can simply be adopted by organizations. The key issues in innovation adoption are to stimulate interest in change, to choose an appropriate innovation, and to replicate it within the adopting organization. According to this perspective, organizational improvements, such as new production machinery, improved accounting methods, and novel management practices, are essentially copied from early innovators or developers of the innovation (Rogers, 1983). A frequent criterion for adopting an innovation is whether other, high-status organizations are using it (Kimberly, 1981).

Much of the research on innovation adoption has focused on the diffusion of innovations, beginning with the initial conception of the innovation and extending through phases of adoption by others (e.g., Rogers and Shoemaker, 1971; Zaltman et al., 1973; Rogers, 1983). This research has assumed a decidedly "pro-innovation" bias (Rogers, 1983). It has treated an innovation as worthy of adoption and has not addressed either the possibility of a need to reject or radically alter it. Considerable research has been devoted to identifying factors which facilitate the adoption process, including characteristics of the innovations themselves and of the adopting organizations (e.g., Hage and Aiken, 1967; Corwin, 1972; Hage and Dewar, 1973; Moch and Morse, 1977; Kimberly, 1978; Kanter, 1983; Pinchot, 1984). Most of this research has been cross-sectional, and has tended to generalize poorly from one situation to another, however.

Assuming that innovations are definable entities that can be adopted by organizations, the task is to develop a strategy for introducing the innovation into the organization. A generalized innovation-adoption strategy is outlined in Figure 1, and includes four stages: (1) diagnosis and search, (2) adoption, (3) implementation, and (4) evaluation. This rational sequence conforms closely to the expectations and preferences of practitioners who are responsible for the introduction of change into organizations. The stages closely resemble the innovation-adoption procedures which are formally encouraged and reinforced in most organizations (Mohrman and Cummings, 1983).

Figure 1 about here

Diagnosis and Search

In this initial step, organizations analyze their current situation to uncover sources of problems or opportunities for improvement. This sometimes involves a comparison between desired and actual levels of functioning to detect performance gaps. Such gaps either stimulate the search for innovative courses of action (March and Simon, 1958) or provide motivation to adopt an innovation (Rogers, 1983). The contextual understanding provided by the diagnosis lends impetus and direction for searching for and adopting innovations to solve problems and/or improve organizations.

Adoption

The image conveyed by the innovation adoption framework is that innovations are well enough defined that organizations can adopt them. Based on an understanding of the situation, the organization has searched for and chosen an appropriate innovation. The design of the innovation is generally well-developed and maximally specified in advance of adoption. This includes identifying the various features of the innovation, and specifying how they should fit together to make the innovation operative. Ideally, the adoption process is guided by relatively complete knowledge of how the innovation is supposed to work when fully implemented. In this way, decision makers have a clear idea of what they are adopting, what is required to make it work, and how it will impact other aspects of the organization. They can make an "informed" adoption decision.

Implementation

Because the designs of innovations are fully specified, implementation generally involves constructing the innovation from detailed knowledge of its design features and how they should work together. This construction process typically involves specified steps for introducing the innovation into a particular situation. The implementation steps serve as instructions for constructing the innovation anew in the organization. They may include aspects as diverse as training for organizational members, installation of equipment, establishment of structures and special roles, and the development of communication techniques. All of these elements are frequently organized into an elaborate "road map" such as a PERT chart which specifies time tables, milestones, and responsibilities for "putting each of the pieces in place." This planning is often orchestrated by a staff group which then "rolls out the innovation" into the organization. Organizations typically attempt to remove ambiguity from the implementation process, and rely heavily on the authority structure of the organization to motivate and oversee implementation activities (Zaltman and Duncan, 1973).

Evaluation

Once innovations are implemented, organizations evaluate their overall effectiveness in order to find out if the innovation "worked." They assess the extent to which the innovation is performing as expected. Such understanding provides organizations with feedback about the accuracy of the initial diagnosis and/or the appropriateness of the innovation. If the innovation is ineffective, for example, organizations may undertake additional diagnosis and/or choose an alternative approach, as shown by the feedback loop in Figure 1. Alternatively, the innovation may simply be abandoned. If the innovation is judged effective, continued use and/or further dissemination are possible.

This relatively straightforward model of innovation adoption makes it appear deceptively simple for an organization to find a suitable innovation, implement it, and assess its effectiveness. It portrays the innovation process as more linear and rational than it is likely to be (Kimberly, 1981; Rogers, 1983). Rationales for innovation may only emerge retrospectively (Weick, 1979). Awareness of an innovation may stimulate discontent with current organizational performance, which may in turn lead to diagnostic activities to justify innovation adoption (Zaltman and Duncan, 1973). Organizational innovation may be characterized as a "garbage can" where an unordered assortment of organizational members, innovations, and problems interact in unpredictable ways. It may also be seen as a political process (e.g., Wilson, 1969; Pfeffer, 1981), and as an arena for idea champions or "change masters" (Kanter, 1983). In actuality, organizational innovation is probably a combination of rational problem solving, opportunism, and politics.

Despite these divergent viewpoints, organizations tend to prefer the rationality underlying the innovation-adoption process outlined in Figure 1. They seek the control and certainty inherent in innovation adoption, and encourage practices which emulate it (Mohrman and Cummings, 1983). Given this propensity to prefer an innovation-adoption process, it is important to understand where that approach can most effectively be applied and where it might encounter limitations.

INNOVATION UNCERTAINTY AND IMPLEMENTATION-STRATEGY APPLICATION

The general applicability of the innovation-adoption perspective can be explored by considering the kinds of innovations organizations can adopt successfully using this approach. Borrowing from Galbraith's (1977) information-processing model of organizations, innovations can be characterized in terms of their degree of uncertainty. This refers to how much is known about the innovation prior to implementation. The greater the uncertainty of the innovation, the more organizations need to learn about the innovation <u>during</u> implementation. If the innovation is highly certain and organizations fully understand it, much of the implementation process can be preplanned and standardized. If the innovation is highly uncertain, however, organizations must engage in considerable problem solving and experimentation in order to learn how to implement it. Thus, the degree of innovation uncertainty affects the amount of problem solving and learning that must occur during implementation if the innovation is to be implemented successfully.

Because innovation uncertainty involves how much is known about the innovation prior to implementation, at least three key factors can contribute to such understanding: (1) the degree to which the innovation is clearly defined, (2) the degree to which there are specified steps for implementing the innovation, and (3) the degree to which the learning required to make the innovation operational is rudimentary. Innovations scoring high on these dimensions are highly certain. They are understood well enough that implementation can be preplanned and include relatively programmed steps to introduce the innovation into the organization. Innovations scoring low on these characteristics are highly uncertain, and require a great deal of trial-and-error learning during implementation. This involves considerable information processing and decision making as organizations learn how to enact the innovation, typically modifying it in light of information about how the implementation process is progressing.

The innovation-adoption perspective seems particularly suited to innovations falling toward the highly-certain end of the innovation-uncertainty continuum. In terms of the first factor impacting innovation uncertainty--the degree to which the innovation is clearly defined--organizations must clearly understand how an innovation is designed and supposed to work if they are to adopt it. This includes understanding the specific features of the innovation and knowing how they operate together to produce expected results. Moreover, if organizations are to choose an innovation applicable to their particular situation, they must clearly understand the conditions upon which expected results are contingent, and whether those conditions exist in their organization.

In regard to the second feature contributing to innovation uncertainty--the degree to which there are specified steps for implementing the innovation--organizations will have difficulty recreating the innovation in their own setting unless they know the precise steps for implementing it. Such knowledge enables organizations to plan and control the implementation process. It shows them how to enact the innovation and make it operational.

In terms of the third characteristic affecting innovation uncertainty--the degree to which the learning required to make the innovation operational is rudimentary--if organizations are to adopt an innovation, learning about how to operate it must be relatively straightforward. The behaviors needed to make the innovation work must be clearly understood and readily acquired, otherwise the organization will have difficulty making the innovation work in its own setting.

The three factors contributing to innovation uncertainty help to explain why organizations prefer and seek to utilize an innovation-adoption strategy. Organizations tend to perceive the myriad of technical and procedural improvements that they adopt continuously almost as a matter of course as scoring low on these dimensions. Such innovations are seen as highly certain. They are generally well understood in terms of design features, operating mechanisms, and expected results. In many cases, the innovations derive from a solid body of scientific knowledge, and have been thoroughly tested before they are considered for adoption. Also, they often include detailed steps for implementation, clearly specified operating behaviors, and training programs for learning the behaviors. Organizations have become so accustomed to perceiving innovations as displaying these features that a major criterion for adopting innovations is the degree to which they appear well-developed and packaged for easy adoption, and characterized by well-defined and limited costs (Cherns, 1979; Cole, 1982).

The innovation literature has also recognized that adoption occurs more readily to the extent that innovations are highly certain. Such innovations have been referred to as "routine" (as opposed to "radical") because they do not entail extensive alteration in the status quo (Normann, 1971). Similarly, they have been called "programmed" (as opposed to "nonprogrammed") because they can be accommodated by existing organizational routines and procedures (Knight, 1969). Such innovations have also been contrasted with those that are "discontinuous" involving the development of new behavior patterns, and "pervasive" requiring changes in many aspects of the social system (Lin and Zaltman, 1973).

Although the innovation-adoption perspective seems applicable to innovations that are highly certain, it can encounter severe limitations when applied to less certain organizational improvements. Indeed, research suggests that organizations can have problems trying to adopt even relatively routine innovations. Eichholtz and Rogers (1964), for example, found considerable resistance to the introduction of audio-visual equipment into classrooms. Even this relatively simple technical aid challenged prevailing teaching habits and practices. In her extensive studies of the introduction of computer systems into organizations, Mumford (1983a; 1983b) found that the successful introduction of even the most simple computer system is characterized by considerable on-site design by organizational members. Systems designed by external designers/inventors frequently clash with values, practices, and politics of the adopting unit. A review of research showing similar difficulties with trying to introduce various technologies into organizations led Rogers (1983) to conclude that even rather straightforward innovations undergo a great deal of "reinvention," being modified and adjusted to fit the situation.

Given these limitations of the innovation-adoption perspective, methods currently being used to improve productivity and employee well-being can be expected to pose severe problems for organizations using such as strategy. QWL innovations, such as quality circles, participative management, self-managing work teams, and job enrichment tend to be highly uncertain, falling at almost opposite ends of the continuum favoring innovation adoption. They generally lack the clarity and developed knowledge base to permit ready adoption from one situation to another.

In terms of the first factor favoring innovation adoption--clearly-defined innovation--reviews of the relevant literature suggest that QWL methods tend to be ill-defined and poorly understood (Cummings and Molloy, 1977). The key features of the innovations are often not clearly specified, and there is ambiguity about how the features should combine or interact to produce expected results. Common approaches are applied quite differently in different organizations. For example, despite the widespread application of and research about self-regulating work groups and quality circles, there is still considerable uncertainty about their necessary design features and about how they produce observed results (Cummings, 1978; Pasmore et al., 1982; Mohrman, 1983). In a comprehensive study of participative management practices in the United States, Cole (1982) found that adopting decisions regarding such techniques were characterized by lack of specification of goals and only partial understanding of the practices being considered. Moreover, because QWL innovations typically involve complex and multifaceted organizational changes, evaluative studies have had difficulty determining whether the innovations actually produced observed results, and if so, which features of the innovations were responsible for positive results (Cummings, Molloy, and Glen, 1977). In the absence of such empirical knowledge, the innovations tend to be relatively abstract and offer only general prescriptions for organizational improvement.

The second characteristic favoring innovation adoption--highly specified steps for implementation--is rarely applicable to QWL innovations. Because the innovations provide only general prescriptions for change, organizations must do considerable experimentation on site in order to implement them. They must discover how to translate the abstract concepts into specific organizational changes. This typically involves considerable monitoring and adjustment as organizations modify the change program in light of information about how it is progressing. The implementation process is relatively uncertain and often involves responding to unanticipated consequences in novel and complex ways. For example, attempts to implement a relatively straightforward innovation, such as quality circles, may lead to modifications in wider aspects of the organization, such as reward systems, selection practices, and leadership styles, in order to make the context more supportive of the innovation (Lawler and Mohrman, 1985).

The kinds of innovations used to improve productivity and employee fulfillment also do not easily fit the third feature favoring innovation adoption--requirement for only rudimentary organizational learning. Organizations tend to underestimate the amount of learning required to implement and sustain QWL innovations (Mohrman and Cummings, 1983). Most of these innovations include, either implicitly or explicitly, an underlying philosophy promoting employee participation and egalitarian practices. In order to implement the innovations, organizational members must learn both the underlying philosophy and the behaviors implied by it. For example, quality circles may be effective only when employees have the necessary skills, knowledge, opportuntiies, and willingness to participate and when managers have the skills, knowledge, and willingness to respond. Because these values and behaviors are generally quite different from those commonly found in most organizations, such learning typically requires significant changes in people's world views and work behaviors (Argyris, 1970; Cole, 1982). There is currently little understanding about how to change the way people see or respond to their environment or attach value to certain outcomes (Smith, 1982). Similarly, research suggests that changing people's behaviors is an exceedingly time-consuming and complex process (Watzlawick et al., 1967, 1974; Argyris and Schon, 1974).

The features of the QWL innovations clearly do not fit an innovation-adoption perspective. They tend to be ill-defined and not well understood; they are relatively abstract and offer only general prescriptions for organizational improvement. The innovations do not include clearly specified implementation steps, but rather involve an uncertain implementation process requiring considerable experimentation and adoption on site. Finally, the innovations entail large amounts of organizational learning; people must often change their world views and work behaviors, a time-consuming and complex change process.

Given these characteristics, organizations must rely on a strategy different than innovation adoption for implementing QWL innovations. The strategy must take into account the relatively undeveloped knowledge base underlying these innovations. It must provide a method for translating general prescriptions for organizational improvement into situation-specific change programs. The strategy must account for an inherently uncertain implementation process. It must provide guides for monitoring and adjusting the change program in light of new information and unanticipated consequences. Finally, the strategy must recognize the need for considerable organizational learning. It must help organizational members gain the necessary skills and knowledge to change values and relevant work behaviors.

The following pages develop, in a preliminary manner, an implementation strategy meeting these requirements. Called self-design, the strategy is aimed at implementing the kinds of innovations currently being used to improve productivity and employee fulfillment.

SELF-DESIGN MODEL

The strategy needed to implement QWL innovations derives from field studies with organizations trying to improve effectiveness and employee quality of work life. The research sites included manufacturing plants of firms in the glass-making, aerospace, pharmaceutical, munitions, communications, and pulp and paper industries. The authors served as action researchers, helping the organizations design and implement improvements while studying the change process itself (see Cummings et al. [1985] for a description of this action research process). The typical research project began when organizational members expressed an interest in implementing QWL innovations such as self-regulating work groups, quality circles, or gain-sharing. Each organization was able to take concepts and ideas from the experiences of other organizations. The process of implementing these concepts, however, was less an innovation-adoption strategy and more a process of the organization designing a new way of operating for itself. A major research interest for the authors was operationalizing what such a self-design strategy actually entails in an organizational setting. This contrasts with organizational theorists who have made strong conceptual arguments for self design, while leaving the operational details to more action-oriented researchers (Hedberg et al., 1976; Weick, 1977).

The self-design model is aimed at helping organizations translate general prescriptions for organizational improvement into situation-relevant change programs. Because this involves considerable experimentation and learning by organizational members, the self-design process, as the name implies, involves considerable participation by managers and employees. They essentially implement and manage the change program, typically with the help of professionals having relevant expertise. The role of OD practitioners/researchers in the self-design process is discussed in the next section of the paper. This section describes the five main phases of the self-design model as depicted in Figure 2: (1) value clarification, (2) diagnosis, (3) innovation generation, (4) implementation learning, and (5) feedback measurement.

Figure 2 about here

Value Clarification

This preliminary phase of the self-design process is concerned with clarifying the values which will guide the choice of organizational innovations. Which (whose) values will guide the process is a key element of any innovation process, having ethical, political, and practical ramifications (Taylor and Vertinsky, 1981). Multiple stakeholders, such as managers, employees and unions, are generally interested in the outcomes of QWL innovations, and consequently they introduce an expanded set of values into the design process.

Values determine which kinds of organizational outcomes are desirable or undesirable. Because they are used to judge, either explicitly or implicitly, the outcomes of organizational innovations, it is important to clarify as early in the design process as possible the values which the innovations are intended to promote or satisfy. For example, QWL innovations typically imply values of high-quality performance, innovation, and employee involvement, satisfaction and well-being.

Value clarification can make explicit the value premises underlying design choices. It can help organizations make informed choices about the values they want to guide the design process. When values are implicit, organizations are unlikely to question them. They are likely to rely on whatever values have guided past choices about organizational improvements. This may limit the range of values that designers take into account, and constrain the kinds of innovations that are considered. For example, organizations have traditionally relied on technical or economic values to judge innovations (Gerwin, 1981). This can lead to a strong technological imperative in designing organizations, and a relative neglect of important social/psychological considerations.

Value clarification is a particularly important part of the design of QWL innovations. Their implementation generally requires changes in some of the assumptions and values that are embedded, often tacitly, in traditional hierarchical modes of organizing. Evaluative differences between "managers" and "workers," for example, can lead to a myriad of differences in how these two groups of employees are treated in organizations and in beliefs about their legitimate expectations from work. Successful implementation of various participative practices may require shifts in these underlying values, as well as changes in managerial practice. Clarifying values early in the design process can make these issues explicit, and enable organizational members to become more aware of value-constrained behaviors. Actual changes in values typically begin later in the design process, but sensitization to the issues and awareness of current values should frame the entire innovation process.

There are numerous values that organizations might take into account in designing QWL innovations. Value clarification can help organizations identify and explore a wider range of values than is typically considered. This is usually accomplished in two stages. First, potential stakeholders having vested interests in the outcomes of the innovation are identified (see Mason and Mitroff [1981] for a full description of stakeholder analysis). They might include managers and employees, as well as key groups from the organization's task environment, such as labor unions, customers, regulators, and suppliers. A key point is to identify those stakeholders whose support and resources are necessary for implementing the innovation. The inclusion of multiple stakeholders with varying perspectives is likely to increase both the range of values that will be considered and the probability that the innovation will depart from the status quo (Zaltman et al., 1973).

Second, the values of these stakeholders are surfaced and potentially taken into account in the design of the innovation. Because values are deep-seated and often not discussed explicitly, it may be necessary to infer stakeholders' values from statements or observations of their behaviors and preferred modes of organizational functioning. Also, because stakeholders can have divergent values for judging the outcomes of organizational improvements, the process of arriving at an acceptable set of values can create conflict. Conflict resolution may require considerable process intervention aimed at helping the participants understand each other's values. It may also require bargaining solutions in those situations where agreement cannot be reached through informal interaction (Walton, 1969; Shepard, 1984).

A tangible outcome of value clarification is an explicit list of values that the QWL innovation is intended to satisfy. Some organizations have embodied the values in a statement of philosophy jointly created by the stakeholders; the statement communicates desirable organizational outcomes and/or a vision of the desired future state of the organization (e.g., Poza and Marcus, 1980). Because the values serve to guide the self-design process by providing standards against which to judge the current outcomes of the organization and the potential outcomes of alternative designs, all further design, implementation, and evaluation activities are referenced in terms of those values.

This initial value clarification phase does not typically resolve the value issue forever. Organizational members are generally unaware of differences between the values they espouse and those that they actually use (Argyris and Schon, 1974). Consequently, they will frequently agree to a set of values which appear somewhat noncontroversial (like "motherhood and apple pie"), but will later disagree strongly with design features or operational consequences of those values. Value clarification is thus an ongoing part of any organizational innovation. Fortunately, experience appears to shape values just as values shape action choices (Cole, 1983). As the innovation process proceeds, the new experiences to which organizational members are exposed become the basis for the development of new attitudes and values (Kelman and Warwick, 1973). Indeed, participation in new structures that are created to perform the multi-stakeholder design process can be the source of some attitude and value shaping for members who have not participated in such a collaborative effort before.

Diagnosis

The next step in the self-design process is to assess the organization in order to understand its functioning. Diagnosis provides a foundation for the identification of performance gaps as well as for the design of a transition to innovative practices (Beckhard and Harris, 1977). Diagnostic data are the stimuli for organizational members to collectively interpret how the organization is operating. Participants must share their interpretations and arrive at a sufficiently agreed upon view of the organization to proceed in self design.

Because diagnosis generally proceeds from a conceptual model or theory of organizational functioning (Nadler, 1980), organizational members must gain a basic understanding of such diagnostic frameworks if they are to gain the capacity to self design. In QWL innovations, diagnosis tends to follow a socio-technical systems perspective (Trist et al., 1963; Cummings and Srivastva, 1977). This framework includes three key organizational dimensions that have been shown to affect the success of such innovations: (1) technology, (2) task environment, and (3) people.

Technology. This dimension includes the tools, techniques, and methods for transforming raw materials into finished products or services. Researchers have identified two key technological variables as affecting whether innovative work designs, such as job enrichment or self-regulating work groups, are appropriate to the organization: technical interdependence and technical uncertainty (Susman, 1976; Cummings, 1978; Slocum and Sims, 1980). Technical interdependence refers to the relationship among the different parts of a technological process. To the extent that technical interdependence is high and employees must work together to complete an overall task, work should be designed for groups rather than individualized jobs. Technical uncertainty refers to the amount of information processing and decision making that must occur during task execution. To the extent that technical uncertainty is high and employees must process information and make decisions during task performance, work should be designed for employee self-control rather than for external forms of control, such as hierarchy, standardization, and schedules.

Task Environment. This includes those external factors impacting the achievement of organizational goals, including the demands of customers, competitors, suppliers, and regulators (Dill, 1958). Researchers have described the environment along a static-dynamic dimension (Emery and Trist, 1965; Terreberry, 1968). They have shown that as the environment becomes more dynamic in terms of complexity and unpredictable change, organizations must become more organic or flexible if they are to adapt to such conditions (Burns and Stalker, 1961; Lawrence and Lorsch, 1967). Because many QWL innovations are intended to provide employees with the autonomy, information, and flexibility to respond to changing conditions, assessing the degree to which the task environment is dynamic is an important element in diagnosis.

People. This includes those individual differences affecting how people react to QWL innovations, such as participative structures, job enrichment, and self-regulating work groups. Researchers have identified at least two personal characteristics impacting reactions to these kinds of innovations: growth needs and social needs (Hackman and Oldham, 1980; Brousseau, 1983). Growth needs refers to the desire for personal accomplishment, learning, and development. In general, the more people have growth needs the more favorably they react to enriched work providing high levels of discretion, task variety, and feedback about results. Social needs involve the desire for significant social relationships. People having high social needs generally favor working in interactive groups, while those with low social needs tend to favor working on individualized jobs.

Diagnosing these kinds of variables provides knowledge for developing innovations appropriate to the situation. The contingencies specify the technological, environmental, and personal conditions that organizational designers must take into account in developing innovations to promote particular outcomes. In effect, the situational contingencies place limits on the kinds of innovations that will result in desired outcomes. For example, if organizational designers intend to promote outcomes of high performance and employee satisfaction in situations characterized by high levels of technical interdependence and uncertainty, of environmental change, and of employee growth needs and social needs; then participative group structures, such as self-regulating work groups, will best promote those values. More traditional designs, such as standardized jobs on an assembly line, would not enhance performance or employee satisfaction in these situations (Cummings, 1985). Table 1 summarizes how innovation features fit with different combinations of the diagnostic variables, with particular examples from work design.

Table 1 about here

Innovation Generation

This step in the self-design process concerns generating alternative innovations to meet the situational contingencies and to achieve desired outcomes. Although this step involves considerable creativity, there is a growing body of organizational-design knowledge which can be used to guide this process (e.g., Cummings and Molloy, 1977; Hackman and Suttle, 1977; Nystrom and Starbuck, 1981). This design literature provides two kinds of information necessary to create effective QWL innovations: knowledge of organizational features that can be changed to achieve certain outcomes and knowledge of contingencies upon which positive results are dependent.

The first kind of knowledge involves various organizational components which can be designed to produce particular outcomes, such as productivity and employee satisfaction. Among these factors are: work design, organizational structure, reward systems, personnel practices, participative structures, selection, and training. Specific combinations of these components include such popular QWL innovations as quality circles, skill-based pay, job enrichment, self-regulating work groups, and gainsharing. Although it is beyond the scope of this chapter to review this extensive literature, two issues are particularly pertinent to generating innovations.

The first issue concerns the quality of research findings underlying the QWL innovations appearing in the literature. Ideally, existing research findings would provide specific prescriptions for organizational improvement; they would serve as a definitive blueprint for generating organizational innovations. Reviews of the relevant research suggest, however, that the findings cannot be used to maximally specify QWL improvements in advance of their implementation (Cummings and Molloy, 1977; Porras and Berg, 1978; Woodman and Sherwood, 1980; Nicholas, 1982). Plausible threats to the internal validity of the findings raise serious doubts about whether specific change programs actually produced the observed results. Moreover, most of the change programs involved multiple changes and it is difficult to disentangle either the effects of specific changes or interaction effects from the global, overall results of the change program.

Given these problems inherent in evaluating organizational improvements, existing research is relatively weak in offering specific prescriptions for designing QWL innovations. Rather, it can offer only general guidance for generating alternative innovations. The studies can provide rich case descriptions of change programs; they can help designers consider novel designs and frames of reference. The findings can provide warnings and checklists of issues to consider in designing and implementing organizational innovations. Organizational members typically want to know how innovative ideas and practices have worked in other organizations. Case studies, visitation to innovating companies, and attendance at practitioner conferences can all be useful exposure to new practices. At minimum, such exposure increases awareness that other organizations are successfully utilizing QWL approaches. Ideally, it can also help to generate minimally-specified designs to begin the innovation process. The designs can be further defined and elaborated during implementation as organizational members gain experience with the general prescriptions and learn how to enact them in their situation.

The second issue involving knowledge about organizational changes that can produce certain outcomes concerns the congruence or fit that must occur among the design components if positive results are to occur. As mentioned above, many QWL innovations include multiple changes. For example, a job enrichment program might include changes in technology, work flow, reward systems, training, and supervisory practices. A growing body of research suggests that these separate changes must be congruent with each other to achieve positive results (e.g., Nadler and Tushman, 1983; Mohrman and Lawler, 1984). This means that in generating alternative designs, the different features of the innovations must be mutually reinforcing. Designing a high-involvement plant, for example, would likely include several of the following compatible design features: a flat organization structure, enriched jobs, open job posting, realistic job previews, training in both technical and interpersonal skills, skill-based pay, and egalitarian personnel practices (Lawler, 1982; Walton, 1985). Full congruence in such an organization would ultimately entail altering most of the traditional personnel systems (Mohrman et al., 1986).

The second kind of knowledge that can guide generations of innovations involves contingencies upon which the success of innovations depends. As discussed earlier, researchers have identified a variety of situational variables impacting the general applicability of QWL innovations. These technological, environmental, and personal factors can be assessed during diagnosis, and the resulting information can guide the choice of alternative designs. Reviews of the relevant literature suggest, however, that organizational designers are likely to encounter a multitude of unanticipated contingencies during implementation (Srivastva et al., 1977; Cummings and Molloy, 1977; Zaltman et al., 1973). Consequently, designers must be prepared to adjust or modify innovations as unanticipated contingencies are encountered. Again, this argues for minimally-specified designs that are flexible enough to permit on-going adaptation to the situation. The general features of such innovations are specified before implementation, and the details of these features as well as of remaining dimensions are left free to vary with the circumstances.

While designing innovations to account for certain contingencies has been advocated widely in the literature, this may inadvertently constrain the generation of organizational innovations. When contingencies are treated as design imperatives, they become fixed constraints to which innovations must be fitted or adjusted. Such constraints may limit the kinds of innovations that are considered. For example, many QWL innovations are aimed at enhancing employee participation, discretion, and flexibility. These designs would be inappropriate in situations where technology is highly certain, or where the environment is static, or where people have low growth needs. More traditional, routinized kinds of designs would better fit these situations. Rather than treat contingencies as design imperatives, organizational designers may want to consider them as design variables which can be altered if necessary. Indeed, socio-technical systems theorists have long advocated that both technology and people be treated as design variables (Trist et al., 1963; Cummings and Srivastva, 1977). This would open the design stage to a wider range of possible innovations. If existing contingencies are too constraining, they could be included as key elements of the change program. The contingencies, along with the other design features, would undergo change during implementation.

Implementation Learning

This stage of the self-design process concerns implementing organizational innovations. As discussed above, the deficiency of the existing knowledge base and the likelihood of encountering unanticipated consequences make it difficult to maximally specify designs in advance of their implementation. Rather, the general features of the innovation can be specified and implementation involves translating them into situation-relevant behaviors, structures, and processes. This translation process involves considerable experimentation and learning.

The iterative nature of the innovation process has been described in most literature on change and innovation. The introduction of one innovation as a solution to an existing organizational problem often creates new problems which become the impetus for another change, and so on (Zaltman et al., 1973). This cycle is especially prevalent when an organizational innovation stimulates learning, which in turn leads to further changes. There are at least five distinct areas in which such learning can stimulate innovation and change.

First, learning can lead to modification of the innovation itself. It is often impossible to understand fully what a change encompasses until it is experienced. For example, it is relatively easy to describe a computerized design system to an engineer, but only after trying it out will the engineer fully understand how it changes the nature of the engineering job, the information needed to perform it, and the altered interfaces with others in the organization. Managers adopting quality circles often do not realize until after the process has started that the innovation entails an alteration in the way they spend their time (Mohrman, 1982). Implementation of an innovation is often necessary for organizational members to learn what it actually entails.

Second, learning can lead to changes in the behaviors, values, and understandings required to enact the innovation. Organizational members must invariably develop new skills and behaviors in order to implement an innovation. In the example of a computerized design system, the engineer must learn how to use the new work station. In the case of quality circles, the participants must learn group process skills, and supervisors must learn to handle requests from groups. Learning these new behaviors is not a straightforward training process. Many of the requisite behaviors achieve significance only within the context of a new set of values and a new way of understanding the organization (Benne, 1985; Lewin and Grabee, 1945). Organizational members may have to engage individually in trial-and-error learning in which new behavior is tried out and the individual relies on feedback from others to determine if the behavior is congruent with the espoused values (Argyris and Schon, 1974).

Third, learning can result in discovering the situational contingencies impacting innovation success. Implementation can lead to failure. Self-regulating work groups, for example, may be ineffective when implemented without careful consideration of the contingencies determining their success. Research may not yet specify the important contingencies, and organizations may inadvertently design an innovation inappropriate for the situation. The organization may successfully implement the innovation, however, if it can first discover and then learn to alter the contextual conditions constraining the innovation's effectiveness.

Fourth, learning can lead to additional organizational changes needed to support the innovation. Work redesign, for example, may require supporting changes in personnel practices, leadership styles, and reward systems. Many QWL innovations require behavioral changes that are incongruent with most aspects of traditional organizations (Mohrman et al., 1986). Teamwork, cooperation, and risk-taking, for example, run counter to many of the control and incentive systems in large bureaucratic organizations. Traditional personnel practices, information systems, and job designs, to name a few, frequently result in individual suboptimization, competition, and low risk taking. Because the different features of an organization tend to reinforce a particular mode of operating, changing that way of functioning generally requires multiple interventions, and eventually will require alteration in most aspects of the organization (Nadler and Lawler, 1977). The transitional phase can be difficult because organizational members are likely to experience conflicting behavioral demands (Wilson, 1966).

Fifth, organizational members can learn about changes in the wider environment that require modification of the innovation. Because of the complexity of today's innovations and the rapid changes occurring in many organizations' environments, organizations may experience new pressures for adaptation before innovative practices are fully implemented. Organizational members can learn about these changes, and make necessary refinements and alterations in the innovation.

In summary, organizational learning can occur in all five areas. Thus, the implementation of an innovation is really an evolving process of learning how to enact the requisite changes through time. This means that members cannot simply adopt a well-developed innovation, but must learn how to develop it themselves in situ. Similar approaches to organizational learning have been proposed for governmental policies (Campbell, 1969; Lindblom, 1959), factory management (Box and Draper, 1969), and organizational reforms (Warner, 1981; Staw, 1978).

Implementation learning can be considered a feedback-adjustment cycle. Members start from general design prescriptions and try to enact the specific changes needed to implement the innovation. They subsequently learn how well those changes are progressing, and make necessary modifications in behaviors, structures, and processes. This feedback-adjustment cycle continues until the innovation and resultant changes are implemented sufficiently. The dynamic quality of the process is underscored by the fact that the environment itself can change, thus altering the adaptation needs of the organization. Consequently, implementation is an on-going learning process carried out by organizational members who continue to self design through time. To be capable of self design, members must be proficient at three kinds of learning.

Single-Loop Learning. The first type is called "single-loop learning" and involves detecting and correcting errors between the innovation's current and desired states (Argyris and Schon, 1978). Such learning takes place within an existing frame of reference--a set of values, cognitions, programs, and interpretive schemes (Bateson, 1972; Cyert and March, 1963; Morgan and Ramirez, 1983). When deviations from the desired state are discovered, designers must engage in inquiry to find the causes of the error and to devise appropriate actions to correct it. The outcomes of single loop learning are behavioral (Fiol and Lyles, 1985). Such inquiry can involve a complex learning cycle, especially when applied to implementing QWL innovations. Because knowledge of such innovations provides only general prescriptions for change, designers may have relatively vague understanding of what the desired or developed state of the innovation should resemble.

In such a highly uncertain change process, single loop learning is of limited benefit. For example, detection of errors may only be possible within a new frame of values, which generally has not been fully learned and is only partially adhered to during the early stages of change. Consequently, organizational members may have difficulty detecting errors; there may be ambiguity about whether particular innovation features are actually being implemented correctly. Moreover, because multiple stakeholders, such as employees, managers, and staff specialists, tend to participate in the self-design process, there may be conflicting opinions about the presence of error, the causes, and the appropriate remedies. Resolution of these ambiguities and conflicts requires norms promoting open exchange of information and active listening. Many of the process interventions prevalent in organization development, such as team building, process consultation, and conflict resolution, can facilitate the development of requisite learning norms (e.g., Huse and Cummings, 1985). Similarly, interventions aimed at group problem solving can help participants gain the skills and knowledge needed to detect and correct complex implementation errors (e.g., MacCrimmon and Taylor, 1976). Ultimately, however, the participants must progress to a new level of learning.

Double-Loop Learning

The second type of implementation learning is referred to as "double-loop learning" and is concerned with changing existing organizational values or norms (Argyris and Schon, 1978) and the development of new frames of references (Shrivastava and Mitroff, 1982), or interpretive schemes (Bartunek, 1984). It typically arises when designers encounter value conflicts during implementation. For example, in trying to implement participative management, which promotes values of employee discretion and involvement, designers may discover that providing employees with more task discretion runs counter to prevailing organizational values promoting managerial control. In order to resolve this conflict, designers must first recognize that it cannot be corrected within the framework of existing organizational norms. Rather, they must undertake inquiry that results in changing the values, either by setting new priorities and weighting of values or by modifying the values themselves. The difficulty of this inquiry has been dealt with in great detail by Argyris and others (Argyris, 1982; Argyris and Schon, 1978) who proposed that a time-consuming process of individual change must precede organization-level change. Others, such as Lewin and Grabbe (1945) and Benne (1985) suggested that change in values and cognitions is essentially a social process in which the group is the fundamental source of support.

The need to confront and resolve value conflicts seems particularly salient when implementing QWL innovations. There is evidence to suggest that some innovations may not be robust enough to promote both economic and social/psychological values (Cummings, 1985, 1981); designers may need to make trade-offs between these two kinds of values. Further, many of the innovations, such as job enrichment, participative management, and self-regulating work groups are likely to require significant changes in traditional organizational values if they are to be implemented (Mohrman and Cummings, 1983; Cole, 1982). Although designers may set new values during the value-clarification stage of self design, underlying conflicts between those values and existing organizational norms may not emerge and need to be resolved until designers attempt to implement innovations promoting the new values. Then, existing values may block implementation of innovations; they may offer strong resistance to making necessary changes in behaviors, structures, and processes. Unless designers undertake double-loop learning and confront and resolve such value conflicts, the likelihood of successful implementation seems low.

Deutero-Learning

The third type of implementation learning is called "deutero-learning" and involves inquiring into previous attempts at organizational learning so that the learning process itself can be improved (Bateson, 1972). In essence, it is concerned with learning how to learn. Deutero-learning includes discovering factors facilitating and inhibiting single- and double-loop learning and creating new strategies for more effective learning (Argyris and Schon, 1978). Because implementation learning is likely to involve many reiterations of the feedback-adjustment cycle, designers should have ample opportunities to examine their on-going learning process so they can improve it. An important norm supporting organizational learning is the surfacing of valid data which provides feedback to the organization about how well it is accomplishing its goals and enacting its values. The final aspect of the self-design process deals with that feedback process.

Feedback Measurement

The last stage of the self-design process involves providing relevant measures of innovation features and outcomes to guide the learning process. This surfacing and interpretation of data is actually an integral part of implementation learning. Organizational members must have on-going knowledge about how the implementation process is progressing if they are to learn how to enact the innovation correctly. Referred to as "implementation feedback" or "process evaluation" (Stufflebeam, 1967), such information allows designers to make necessary adjustments in behaviors, structures, and processes in light of information about whether the innovation is being implemented correctly. Designers must also have knowledge about whether the innovation is having intended effects and whether it is promoting desired outcomes. Referred to as "evaluation feedback," such information helps designers decide whether to continue to invest resources in the innovation or whether to rethink the self-design process, perhaps changing values, rediagnosing the situation, or choosing an alternative innovation. The two kinds of feedback are shown in Figure 2. They are frequently collected through a systematic, action-research program, often with assistance from external action researchers.

Implementation Feedback. This information is used to guide implementation learning and consists of two kinds of data: measures about whether the different features of the innovation are being implemented properly, and information about their immediate effects. Traditionally, QWL innovators have focused on outcome measures, while neglecting to assess whether the innovations were implemented as intended, whether organizational members have mastered the new skills and behaviors, and whether there are unanticipated consequences that require additional design elements and/or implementation steps (Cummings and Molloy, 1977). This makes it difficult to determine if outcomes result from the intended innovations. Moreover, it provides little guidance for making the kinds of behavioral and organizational changes needed to implement the innovation or for adjusting the features of the innovation to situational contingencies. Consequently, effective self design relies on measures of innovation features, contextual dimensions, and outcomes. The first can be used to assess the different elements of the innovation so designers can learn whether they are being implemented as intended; the second to identify anticipated and unanticipated contextual consequences; the third to evaluate whether the features that are actually being implemented are having expected results.

Because implementation feedback is used to guide the self-design process, it must be obtained repeatedly and with little delay. Repeated and timely assessments of innovation features and outcomes help organizational members learn how to enact the innovation and make necessary on-going adjustments. This need for an almost continuous cycle of implementation feedback places heavy demands on the measurement process. Organizational designers need valid and reliable measures of innovation features and outcomes; however, all measurement techniques contain inherent biases. Therefore, several independent methods should be used to obtain valid measures, such as questionnaires, in-depth interviews, structured observations, and archival data. Less formal methods such as multi-stakeholder discussion groups can also be useful in gathering and interpreting information. The different methods can be used to triangulate on variables--if the different measures converge, the variables have likely been measured validly. Organizational members can design and validate their own measures, or they can rely on a growing number of standardized methods for measuring the features and outcomes of QWL innovations (e.g., Hackman and Oldham, 1980; Lawler et al., 1980; Seashore et al., 1983). These methods can be used in total, or they can be adapted to specific organizational circumstances with some on-site validation testing.

In order to obtain reliable measures of innovation features and outcomes, it is necessary to account for random measurement errors that are likely to occur when data are collected repeatedly at short intervals. Because these measurement errors might be mistaken for actual changes, designers can aggregate different measures of the same variable, thus averaging out much of the random error (Waters et al., 1978). For example, productivity outcomes could be observed with an index combining such elements as product quality, machine utilization, and production costs. Similarly, a job-satisfaction index might combine such components as absenteeism and questionnaire and interview responses. When using repeated, self-report measures, however, it is also necessary to distinguish between alpha, beta, and gamma changes (Golembiewski and Munzenrider, 1976). Because QWL innovations are likely to produce all three kinds of perceptual change, analytical methods for distinguishing among them should be used (see, for example, Bedeian et al., 1980; and Terborg et al., 1982).

Evaluation Feedback. This information is used to assess whether the innovation is having intended effects. It generally occurs after designers have some confidence that the innovation is being implemented correctly, and consists of longer-term evaluation of outcome measures. Such assessment helps designers determine whether the innovation is promoting desired outcomes, and thus whether it should continue to be supported. When evaluation feedback shows innovation success, designers may expend effort institutionalizing the innovation by making it a permanent part of normal organization functioning (e.g., Goodman and Dean, 1982). They may also decide to diffuse the innovation to wider segments of the organization (e.g., Walton, 1975). On the other hand, when evaluation feedback suggests that the innovation is not having expected results, designers may decide to drastically alter it or to choose an alternative innovation. They may also decide to modify the values or outcomes that the innovation is supposed to promote, either by changing their priority or weighting, or by replacing or discarding them altogether.

By the time the innovation is sufficiently implemented to enable evaluation feedback, change has likely occurred in multiple aspects of the organization. Thus, a decision to discontinue an innovation does not leave the organization as it was prior to the self-design process. In fact, abandoning the innovation implies new design efforts. It is also possible that an innovation that contributed to improved organizational effectiveness may eventually outlive its usefulness as organizational and environmental conditions change. This may call for a whole new design process, an iterative process that Schein (1970) has called an "adaptive-coping cycle."

The effective use of evaluation feedback rests on at least two requirements. The first is the need to design evaluation feedback so that it permits relatively strong causal inferences about innovation results. Otherwise, designers can draw erroneous conclusions from the information. Although randomized evaluation designs allow the strongest causal inference, they are difficult to apply in organizational settings because work units generally have a choice about implementing innovations. Furthermore, random selection of innovating units can decrease the probability that there will be sufficient levels of commitment to enact a self-design strategy. Organization designers often rely instead on quasi-experimental evaluation designs which, although not as strong as randomized designs, offer some control over threats to causal inference (e.g., Campbell and Stanley, 1966; Cook and

Campbell, 1976). A nonequivalent control-group design using time-series data is probably the strongest quasi-experimental design organizations can expect to apply to evaluation feedback (Cummings et al., 1985). Even with a well-designed, quasi-experiment, however, organizational members may have problems interpreting results because the innovation has been through a series of iterative changes, and has consisted of evolving practices and supporting changes. Thus, the most that can be concluded is that the organization has been more or less effective in achieving valued outcomes through a series of changes that it has been able to implement (Hedberg et al., 1976).

The second requirement for the effective use of evaluative feedback is the need for a strong commitment to learning how to improve organizations rather than to defending specific innovations. There is a tendency for organizational innovators to become "trapped administrators" (Campbell, 1969), and to defend their innovations regardless of the actual outcomes. They tend to eschew valid, long-term evaluation of their innovations and to defend them rigidly. Such unswerving defense of innovations arises primarily because top managers often judge designers based on the outcomes of their innovations (Cummings and Molloy, 1977), and because designers tend to commit increasing resources to failed courses of action, especially when they have publicly committed to such actions (Staw, 1976, 1981). When designers become trapped administrators, they are too concerned with appearing successful to risk the failures inherent in learning. They also become committed to the structures and mechanisms that are associated with a particular innovation, and are insensitive to the processes which enable successful performance through time. Although there is no ready solution to this problem, organizations can promote learning from evaluation feedback by explicitly separating the evaluation of innovations from the assessment of innovators. They can also promote a learning culture that views short-term innovation failures as contributions to long-term learning (Waters et al., 1978).

Summary

In summary, the self-design process differs substantially from the innovation-adoption perspective. In innovation adoption, the innovation is viewed as a well-defined entity which can be adopted by an organization that has determined that it fits a need. The major challenge is developing a willingness to try out something new. The self-design strategy approaches innovation as a process rather than as a discrete event. Innovative practices in other organizations or in the literature help the organization generate its own designs. The question is not whether to adopt an innovation, but whether the organization can use existing concepts and practices to design a situationally-relevant innovation. The innovation-adoption perspective seeks highly certain and thus easily copied innovations. The self-design process is aimed at highly uncertain innovations which provide only general prescriptions for change needing further development and refinement during implementation. The goal of innovation adoption is successful implementation of the innovation. The self-design model looks at innovative practices as design elements to enable an organization to better attain its goals. Table 2 summarizes these contrasts between the two innovation perspectives.

Table 2 about here

FURTHER RESEARCH NEEDS

The self-design process is an attempt to manage the fundamental problems of organizational change that organizations can experience trying to implement QWL innovations. The strategy is still in a development stage, and considerably more research and conceptualization are needed to increase its success. Specifically, further research is needed in at least three major areas: (1) the dynamics of self design, (2) measurement of innovation features and outcomes, and (3) the nature of action research in a self-design context.

Dynamics of Self Design

The first area for further research concerns the need to study the implementation process itself rather than simply innovation outcomes. Traditionally, most research in the QWL field focuses on evaluating the outcomes of innovations while paying relatively little attention to the processes through which they are actually implemented (Cummings and Molloy, 1977; Nicholas, 1982). Many evaluative studies measure only outcomes and assume that the innovation has been implemented as intended. This assumption is not only open to empirical question, but grossly underestimates the complexity and uncertainty inherent in implementing QWL innovations.

Research should be concerned with the underlying dynamics of designing and implementing organizational innovations as well as with the effects of those change programs. It would study innovation as a developmental/learning process involving on-going inquiry and reflection. This contrasts sharply with much of the traditional innovation research which tends to treat innovations as discrete events occurring at a single point in time. Further, such research would require abandonment of the traditional variance approach to doing research and require the further development and application of a process approach (Rogers, 1983; Mohr, 1982; Ledford, 1984). Although some conceptualization and research have proceeded in this direction (e.g., Kolodny and Stjernberg, in press; Argyris et al., 1985; Warner, 1984; Cummings, 1981; Herbst, 1966), there is considerable need for systematic theory and research on the following kinds of issues: How do organizational stakeholders come to value certain types of innovations and outcomes rather than others? What diagnostic models are most relevant for different organizational settings? How do organizational members translate diagnostic information into alternative design choices? What dimensions constitute minimal-specification designs for the different kinds of innovations considered here? How do organizational members learn how to enact the innovations? What is the role of implementation feedback in the learning process? How can innovations be realistically and honestly evaluated? This list could easily be expanded; the main point is to direct attention to the self-design process itself, in addition to outcomes.

Measurement

A second area for further research is the development of valid and reliable measures to guide the self-design process. The strategy places heavy demands on data gathering. Measures of both innovation features and outcomes must be collected repeatedly and at short intervals. As discussed earlier, these data requirements call for multiple measures in order to triangulate on specific variables, as well as indices comprised of different measures to account for the random error inherent in short-interval data.

So far, measurement has tended to focus on innovation outcomes. Although there are increasing attempts to expand the focus to the design features comprising various kinds of QWL innovations (e.g., Hackman and Oldham, 1980; Seashore et al., 1983), there is considerable need for further measurement development in this area. Similarly, most research has relied primarily on single measures of innovation and outcome variables derived mainly from questionnaire and archival data. There is a need for multiple measures of variables, and for the development of unobtrusive measures of people's reactions to QWL innovations. Unobtrusive measures are nonreactive and could supplement questionnaire data which are so prevalent in this field (Webb et al., 1966). They could help to provide more valid measures of innovation features and outcomes, as well as to construct indices of relevant variables (e.g., Seashore et al., 1983).

Action Research and Self Design

The final and perhaps most important area for future research concerns the nature and conduct of research in QWL innovation. Research about designing and implementing QWL innovations has typically followed an action research perspective (Lewin, 1946). It has been concerned both with generating new knowledge and with helping organizational members solve important practical problems. As such, it requires that researchers bridge the epistemological and world-view gaps that traditionally separate them from practitioners (Bennis, 1983) and action from science (Sarason, 1978). Generating knowledge that is useful and applying "scientific" knowledge to action both demand of the action researcher the ability to transcend the bounds of the academic discipline and comprehend the issues of practice as seen from the position of practitioner. In short, the action researcher exists in two worlds.

Ideally, practitioners will also develop the ability to function both in the role of doer and observer. The self-design process demands the establishment of a learning community capable of taking action and learning from it. This learning community must be able to assess its own functioning, and to move between roles of implementor and assessor. The action researcher is generally called upon to help create as well as to be a part of that learning community.

Action research includes both a "content" and "relationship" component (Cummings et al., 1985). The content aspect is concerned with generating research questions, designing relevant methods, and collecting and analyzing data. The content of research about the self-design process deals only partly with the particular design choices, systems, and techniques that are applied as design components in self-designing organizations. Equally important are the process questions: How does an organization self-design? What processes are required to enact the iterative cycles of design, implementation, and redesign in a multi-stakeholder setting? Knowledge of both the process and substance of design is the goal of the action researcher and the source of his/her legitimacy as a member of the learning community. Research content is the substantive link between the action researcher and the organization.

The relationship component involves the nature of interactions between researchers and organizational members, including the role of researchers in the change process and their position vis a vis other stakeholders. Because the relationship aspect of action research is relatively tacit and serves as a context for the research content, it can easily be neglected in favor of the more tangible content component. There is considerable evidence, however, that the relationship between researchers and organizational members can have a powerful impact on the research findings as well as on the usefulness of the research for organizational members (Argyris, 1980; Kilmann et al., 1983; Lawler et al., 1985). The relationship provides a frame for interpretation of all communication between parties. For example, information provided by the researcher about design options or trends in the feedback data are likely to be interpreted differently by organization members depending on whether there is a relationship of trust or skepticism between them. The observation of a meeting will be experienced differently if the researcher is viewed as neutral or partial, as a co-learner or as an authority. The relationship issue is paramount, as it impacts the quality of information that is willingly shared, and consequently may limit the ability of the researcher to collect meaningful data. Consequently, researchers must explicitly address and manage the relationship component of action research.

When action research is applied to self-design situations, there are at least three key features of the research relationship that need to be taken into account (Mohrman et al., 1983). First, the relationship requires relatively long time commitments from researchers and organizational members. They are jointly engaged in clarifying values, diagnosing the situation, generating alternative innovations, learning new behaviors, and evaluating results. These activities generally take considerable time, and researchers must be prepared to develop long-term relationships with organizational participants.

Second, the research relationship involves high levels of psychological intensity. This is inherent in any professional relationship where one party is helping the other to change. Psychological intensity is especially prevalent in the self-design process, where researchers and members are often exploring new ground both scientifically and practically. The stakes are high for both parties, and researchers should be prepared to manage the psychodynamics underlying the research process. Third, because action research is aimed at the joint goals of producing knowledge useful to organizational members and relevant to the scientific community, multiple stakeholders are interested in the research process. Researchers must establish relationships with the interested parties; they must actively involve them in designing and executing the research. The self-design process must provide data useful to organizational members engaged in self design and useful to organization-development practitioners and researchers in learning to help organizations self design. Collaboration in the research increases the likelihood that relevant stakeholders will support the research and see it as relevant to their values and objectives (Elden and Taylor, 1983).

As might be expected, the role demands facing action researchers in self-design situations are complex and difficult (Cummings et al., 1985). Researchers must establish a legitimate and relatively active role in the self-design process. They must earn the right to engage with organizational members in joint learning, usually by establishing a "professional relationship" where privileged access to the organization is attained by providing useful services (Emery and Trist, 1973). These services might include, for example, collecting and feeding back data to members, providing expert design information, and actively intervening in the design process. A professional relationship requires an active role in the design process. Such participation not only provides legitimacy and access to the organization, but increases the likelihood that researchers will gain the depth of information necessary to understand the dynamics of the design process.

Researchers whose role is as narrowly prescribed as collecting data fit the "scientific" expectations of impartiality and non-involvement. They are likely, however, to have difficulty maintaining effective linkages with stakeholders. Data collection generally requires an on-going commitment of time and energy from organizational members, who are unlikely to continue to cooperate if they see no useful outcome and feel no ownership over the learnings. Indeed, such a hands-off research role violates the very premise of the self-design model that on-going data collection provides guidance in the iterative design process. The academically-based action researcher is thus caught between the standards of two worlds. In order to fulfill this role effectively, researchers need methodological skills appropriate to the research content as well as social/political skills relevant to establishing and maintaining the research relationship. Among the multiple skills and knowledge bases required of the action researcher are the following:

1) Exposure to a wide variety of situations and theoretical frameworks that offer a rich way of understanding organizations and viewing possible alternatives;

2) Communication skills for presenting this understanding to others in such a way that they can assimilate it into their own world views;

3) Process skills to help multiple stakeholders share their preferences, concerns, and understandings and arrive at agreement about action; and

4) Methodologies to observe and record the process systematically, and to share learnings with the professional academic community.

Because application of the full range of skills may exceed the capacity of a single researcher, a multi-disciplinary team of researchers may be needed to carry out action research in self-design situations. This requires yet another skill on the part of action researchers: the ability to create and maintain effective research teams of people who are able to challenge, yet complement, one another's viewpoints.

CONCLUSION

Organizations are increasingly undertaking change programs aimed at improving productivity and employee well-being. Despite widespread reports of success, many organizations are discovering that QWL innovations cannot simply be adopted like other types of organizational improvements, such as new machinery and accounting practices. The innovations have a number of features unsuited to an innovation-adoption perspective. They tend to be ill-defined and not well understood; they offer only general prescriptions for organizational change; and they involve an implementation process requiring considerable experimentation and learning.

This paper presented an implementation strategy that is more responsive to those conditions than the traditional innovation adoption model. Referred to as self-design, the strategy is aimed at helping organizations translate general prescriptions for organizational improvement into situation-relevant change programs. It involves considerable participation by managers and employees in an on-going process of organizational change and learning. The self-design process includes five key phases: (1) value clarification, (2) diagnosis, (3) innovation generation, (4) implementation learning, and (5) feedback measurement. Although the phases are discussed sequentially, they may overlap and interact in applications.

The self-design strategy is still in a developmental stage, and more experience and research are needed to clarify its features and application. Further understanding is needed with regard to the underlying dynamics of designing and implementing QWL innovations. Because implementation and evaluation are guided by data feedback, there is also a pressing need to develop valid and reliable measures of innovation characteristics and outcomes. Equally important, the self-design process points to the need for researchers to attend to both the content and relationship aspects of action research. They must actively engage with organizational members in a learning process characterized by long time commitments, psychological intensity, and multiple stakeholders. Researchers need to be responsive to these conditions. They need to form relationships with organizational members which allow for mutual trust, cooperation, and joint learning.

In many respects, the self-design strategy presented in this paper is not new. Academics and practitioners have long called for similar approaches to designing and implementing organizational changes. Many organizations have undoubtedly discovered similar strategies through wise practice and probably some luck. What has been missing, however, are explicit descriptions of a self-design strategy and how it works.

The relative absence of such concrete understanding leaves self-design more a metaphor than a specific change strategy. Hopefully, this chapter is a step towards translating that metaphor into a scientifically-sound approach for implementing and evaluating organizational innovations.

REFERENCES

Argyris, C. (1982). "How Learning and Reasoning Processes Affect Organizational Change." In P. Goodman (ed.), Change in Organizations. San Francisco: Jossey-Bass.

Argyris, C. (1980). Inner Contradictions of Rigorous Research. New York: Academic Press.

Argyris, C. (1970). Intervention Theory and Method. Reading, Mass.: Addison-Wesley.

Argyris, C., R. Putnam, and D. Smith (1985). Action Science. San Francisco: Jossey-Bass.

Argyris, C., and D. Schon (1978). Organizational Learning. Reading, Mass.: Addison-Wesley.

Argyris, C., and D. Schon (1974). Theory in Practice: Increasing Professional Effectiveness. San Francisco: Jossey-Bass.

Bartunek, J. M. (1984). "Changing Interpretive Schemes and Organizational Restructuring: The Example of a Religious Order." Administrative Science Quarterly, 29, 355-372.

Bateson, G. (1972). Steps to an Ecology of Mind. New York: Ballantine.

Beckhard, R., and R. T. Harris (1977). Organizational Transitions: Managing Complex Change. Reading, Mass.: Addison-Wesley.

Bedeian, A., A. Armenakin, and R. Gilson (1980). "On the Measurement and Control of Beta Changes." Academy of Management Review, 5, 561-566.

Benne, K. (1985). "The Process of Re-education: An Assessment of Kurt Lewin's Views." In W. Bennis, K. Benne, and R. Chin (eds.), The Planning of Change (4th Edition). New York: Holt, Rinehart and Winston.

Box, G., and N. Draper (1969). Evolutionary Operation. New York: John Wiley and Sons.

Brousseau, K. (1983). "Toward a Dynamic Model of Job-Person Relationships: Findings, Research Questions, and Implications for Work System Design." Academy of Management Review, 8, 33-45.

Burns, T., and G. Stalker (1961). The Management of Innovation. London: Tavistock.

Campbell, D. (1969). "Reforms as Experiments." American Psychologist, 24, 409-429.

Campbell, D., and J. Stanley (1966). Experimental and Quasi-Experimental Design for Research. Chicago: Rand McNally.

Cherns, A. (1979). Using the Social Sciences. London: Routledge and Kegan Paul.

Cole, R. E. (1982). "Diffusion of Participatory Work Structures in Japan, Sweden, and The United States." In P. S. Goodman (ed.), Change in Organizations. San Francisco: Jossey-Bass.

Cook, T., and D. Campbell (1976). "The Design and Conduct of Quasi-Experiments and True Experiments in Field Settings." In M. Dunnette (ed.), Handbook of Industrial and Organizational Psychology. Chicago: Rand McNally.

Corwin, R. (1966). "Patterns of Organizational Conflict." Administrative Science Quarterly, 14, 507-522.

Cummings, T. (1985). "Designing Work for Productivity and Quality of Work Life." In D. Warrick (ed.), Contemporary Organization Development. Glenview, IL: Scott, Foresman and Company.

Cummings, T. (1981). "Designing Effective Work Groups." In P. Nystrom and W. Starbuck (eds.), Handbook of Organizational Design, Vol. 2. London: Oxford University Press.

Cummings, T. (1978). "Self-Regulating Work Groups: A Socio-Technical Synthesis." Academy of Management Review, 3, 625-634.

Cummings, T., S. Mohrman, A. Mohrman, and G. Ledford, Jr. (1985). "Organization Design for the Future: A Collaborative Research Approach." In E. Lawler, III, A. Mohrman, S. Mohrman, G. Ledford, Jr., and T. Cummings (eds.), Doing Research That Is Useful for Theory and Practice. San Francisco: Jossey-Bass.

Cummings, T., and E. Molloy (1977). Improving Productivity and the Quality of Work Life. New York: Praeger.

Cummings, T., E. Molloy, and R. Glen (1977). "A Methodological Critique of Fifty-Eight Selected Work Experiments." Human Relations, 30, 675-708.

Cummings, T., and S. Srivastva (1977). Management of Work: A Socio-Technical Systems Approach. San Diego, CA: University Associates.

Cyert, R., and J. March (1963). A Behavioral Theory of the Firm. Englewood Cliffs, NJ: Prentice-Hall.

Dill, W. (1958). "Environment as an Influence on Managerial Autonomy." Administrative Science Quarterly, 2, 409-443.

Duncan, R. (1974). "Modifications in Decision Structure in Adapting to the Environment: Some Implications for Organizational Learning." Decision Sciences, 705-725.

Eichholtz, G., and E. M. Rogers (1964). "Resistance to Adoption of Audio-Visual Aids by Elementary School Teachers: Contrasts and Similarities to Agricultural Innovation." In M. Miles (ed.), Innovation in Education. New York: Teachers College Press, Columbia University.

Elden, M., and J. Taylor (1983). "Participatory Research at Work: An Introduction." Journal of Occupational Behavior, 4, 1-8.

Emery, F., and E. Trist (1973). Towards a Social Ecology. New York: Plenum.

Emery, F., and E. Trist (1965). "The Causal Texture of Organizational Environments." Human Relations, 18, 21-32.

Fiol, C., and M. Lyles (1985). "Organizational Learning." Academy of Management Review, 10:4, 803-813.

Gerwin, D. (1981). "Relationships Between Structure and Technology." In P. Nystrom and W. Starbuck (eds.), Handbook of Organizational Design, Vol. 2. Oxford: Oxford University Press.

Golembiewski, R., and R. Munzemrider (1976). "Measuring Change by OD Designs." Journal of Applied Behavioral Science, 12, 133-157.

Goodman, P., and J. W. Dean, Jr. (1982). "Creating Long-Term Organizational Change." In P. Goodman (ed.), Change in Organizations. San Francisco: Jossey-Bass.

Hackman, J. R., and G. Oldham (1980). Work Redesign. Reading, MA: Addison-Wesley.

Hackman, J. R., and Suttle (1977). Improving Life at Work. Santa Monica, CA: Goodyear.

Hage, J., and M. Aiken (1970). Social Change in Complex Organizations. New York: Random House.

Hage, J., and M. Aiken (1967). "Program Change and Organizational Properties: A Comparative Analysis." American Journal of Sociology, 72, 503-519.

Hage, J., and R. Dewar (1973). "Elite Values versus Organizational Structure in Predicting Innovation." Administrative Science Quarterly, 18, 279-290.

Harvey, E., and R. Mills (1970). "Patterns of Organizational Adaptation: A Political Perspective." In M. N. Zald (ed.), Power in Organizations. Nasvhille, TN: Vanderbilt University Press.

Hedberg, B. L. T., P. C. Nystrom, and W. H. Starbuck (1976). "Camping on Seesaws: Prescriptions for a Self-Designing Organization." Administrative Science Quarterly, 21:1, 41-65.

Herbst, P. (1966). "Socio-Technical Unit Design." Tavistock Institute of Human Relations, Doc. No. T899.

Huse, E., and T. Cummings (1985). Organization Development and Change. St. Paul, MN: West Publishing Co.

Kanter, R. M. (1983). The Change Masters: Innovation for Productivity in the American Corporation. New York: Simon and Schuster.

Kelman, H. C., and D. P. Warwick (1973). "Bridging Micro and Macro Approaches to Social Change: A Social-Psychological Perspective." In G. Zaltman (ed.), Processes and Phenomena of Social Change. New York: Wiley-Interscience.

Kilmann, R., K. Thomas, D. Slevin, R. Nath, and S. Jerrell (eds.) (1983). Producing Useful Knowledge in Organizations. New York: Praeger.

Kimberly, J. R. (1978). "Hospital Adoption of Innovation: The Role of Interpretation into External Informational Environments." Journal of Health and Social Behavior, 19, 361-373.

Kimberly, J. R. (1981). "Managerial Innovation." In P. Nystrom and W. Starbuck (eds.), The Handbook of Organization Design, Vol. II. London: Oxford University Press.

Knight, K. (1967). "A Descriptive Model of the Intra-Firm Innovation Process." Journal of Business, 40, 478-496.

Kolodny, H., and T. Stjernberg (in press). "The Change Process in Innovative Work Designs: New Design and Redesign in Sweden, Canada, and the U.S.A." Journal of Applied Behavioral Science.

Lawler, III, E. (1982). "Increasing Worker Involvement to Enhance Organizational Effectiveness." In P. Goodman (ed.), Change in Organizations. San Francisco: Jossey-Bass.

Lawler, III, E., D. Nadler, and C. Camman (1980). Organizational Assessment. New York: John Wiley and Sons.

Lawler, E., and S. Mohrman (1985). "Quality Circles After the Fad." Harvard Business Review, 63:1, 64-71.

Lawrence, P., and J. Lorsch (1967). Organization and Environment. Boston: Harvard Business School.

Ledford, G. E., Jr. (1984). "The Persistence of Planned Organization Change: A Process Theory Perspective." Unpublished doctoral dissertation, University of Michigan.

Lewin, K., and P. Grabbe (1945). "Conduct, Knowledge and Acceptance of New Values." The Journal of Social Issues, 1:3.

Lin, N., and G. Zaltman (1973). "Dimensions of Innovations." In G. Zaltman (ed.), Processes and Phenomena of Social Change. New York: Wiley.

Lindbloom, C. (1959). "The Science of 'Muddling Through.'" Public Administration Review, 19, 79-88.

MacCrimman, K., and R. Taylor (1976). "Decision Making and Problem Solving." In M. Dunnette (ed.), Handbook of Industrial and Organizational Psychology. Chicago: Rand McNally.

March, J. G., and J. P. Olsen (1976). Ambiguity and Choice in Organizations. Bergen, Norway: Universitetsforlaget.

March, J., and H. Simon (1958). Organizations. New York: Wiley.

Moch, M. R., and E. V. Morse (1977). "Size, Centralization and Organizational Adoption of Innovations." American Sociological Review, 42, 716-725.

Mohr, L. B. (1982). Explaining Organizational Behavior: The Limits and Possibilities of Theory and Research. San Francisco: Jossey-Bass.

Mohrman, S. (1983). "The Impact of Quality Circles: A Conceptual View." Working Paper G83-5. Center for Effective Organizations, University of Southern California, Los Angeles, CA.

Mohrman, S. (1982). "Employee Participation Programs: Implications for Productivity Improvement." Paper presented at the American Psychological Association Annual Meeting, August, Washington, D.C.

Mohrman, S., and T. Cummings (1983). "Implementing Quality-of-Work-Life Programs by Managers." In R. Ritvo and A. Sargent (eds.), The NTL Managers' Handbook, Arlington, VA: NTL Institute.

Mohrman, S., T. Cummings, and E. Lawler, III (1983). "Creating Useful Knowledge With Organizations." In R. Kilman, K. Thomas, D. Slevin, R. Nath, and S. Jerrell (eds.), Producing Useful Knowledge for Organizations. New York: Praeger.

Mohrman, S., and E. Lawler, III (1984). "Quality of Work Life." In K. Rowland and G. Ferris (eds.), Personnel and Human Resources Management, Vol. 2. Greenwich, CT: JAI Press.

Mohrman, S., G. Ledford, E. Lawler, and A. Mohrman (1986). "Quality of Worklife: Implications for Industrial Psychology." In C. Cooper (ed.), Review of Industrial/Organizational Psychology. London: John Wiley & Sons.

Morgan, G. and R. Ramirez (1983). "Action Learning: A Holographic Metaphor for Guiding Social Change." Human Relations, 37, 1-28.

Mumford, E. (1983a). "Participative Systems Design: Practice and Theory." Journal of Occupational Behavior, 4, 47-57.

Mumford, E. (1983). Designing Human Systems. Manchester Business School Press.

Nadler, D. (1980). "Role of Models in Organizational Assessment." In E. Lawler, III, D. Nadler, and C. Camman (eds.), Organizational Assessment. New York: John Wiley and Sons.

Nadler, D., and E. Lawler (1982). "Quality of Work Life Programs, Coordination and Productivity." Journal of Contemporary Business, 11, 93-106.

Nadler, D., and M. Tushman (1983). "A General Diagnostic Model for Organizational Behavior: Applying a Congruence Perspective." In J. R. Hackman, E. Lawler, III, and L. Porter (eds.), Perspective on Behavior in Organizations. New York: McGraw-Hill.

Nicholas, J. (1982). "The Comparative Impact of Organization Development Interventions on Hard Criteria Measures." Academy of Management Review, 7, 531-542.

Normann, R. (1971). "Organizational Innovativeness: Product Variation and Reorientation." Administrative Science Quarterly, 16:2.

Nystrom, P., and W. Starbuck (eds.) (1981). Handbook of Organizational Design, Vols. 1 and 2. Oxford, England: Oxford University Press.

Pasmore, W., C. Francis, J. Halderman, and A. Shani (1982). "Socio-Technical Systems: A North American Reflection on Empirical Studies of the Seventies." Human Relations, 35, 1179-1204.

Pinchot, G., III (1985). Intrapreneuring. New York: Harper and Row.

Porras, J., and P. O. Berg (1978). "The Impact of Organization Development." Academy of Management Review, 3, 249-266.

Rogers, E. M. (1983). The Diffusion of Innovations, 3rd Edition. New York: The Free Press.

Rogers, E. M., and F. F. Shoemaker (1971). Communication of Innovation: A Cross-Cultural Approach. New York: The Free Press.

Sarason, S. B. (1978). "The Nature of Problem solving in Social Action." American Psychologist, April, 370-380.

Schein, E. (1970). Organizational Psychology, Second Edition. Englewood Cliffs, NJ: Prentice-Hall.

Seashore, S., E. Lawler, III, P. Mirvis and C. Camman (1983). Assessing Organizational Change. New York: John Wiley and Sons.

Slocum, J., and H. Simms. "A Typology of Technology and Job Redesign." Human Relations, 33, 193-212.

Smith, K. K. (1982). "Philosophical Problems in Thinking About Organizational Change." In P. Goodman (ed.), Change in Organizations. San Francisco: Jossey-Bass.

Srivastva, S., P. Salipante, T. Cummings, W. Notz, J. Bigelow, and J. Waters (1977). Job Satisfaction and Productivity. Kent, OH: Kent State University Press.

Shrivastava, P., and I. Mitroff (1982). "Frames of Reference Managers Use: A Study in Applied Sociology of Knowledge." In R. Lamb (ed.), Advances in Strategic Management. Greenwich, CT: JAI Press.

Staw, B. (1981). "The Escalation of Commitment to a Course of Action." Academy of Management Review, 6, 577-587.

Staw, B. (1978). "The Experimenting Organization: Problems and Prospects." In B. Staw (ed.), Psychological Foundations of Organizational Behavior. Santa Monica, CA: Goodyear.

Staw, B. (1976). "Knee-Deep in the Big Muddy: A Study of Escalating Commitment to a Chosen Course of Action." Organizational Behavior and Human Performance, 16, 27-44.

Stufflebeam, D. (1967). "The Use and Abuse of Evaluation in Title III." Theory Into Practice, 6, 126-133.

Susman, G. (1976). Autonomy at Work. New York: Praeger.

Taylor, R. N., and I. Vertinsky (1981). "Experimenting with Organizational Behavior." In P. Nystrom and W. Starbuck (eds.), The Handbook of Organizational Design, Vol. II. London: Oxford University Press.

Terborg, J., G. Howard, and S. Maxwell (1982). "Evaluating Planned Organizational Change: A Method for Assessing Alpha, Beta, and Gamma Change." Academy of Management Review, 7, 292-295.

Terreberry, S. (1968). "The Evolution of Organizational Environments." Administrative Science Quarterly, 12, 590-613.

Trist, E., G. Higgen, H. Murray, and A. Pollack (1963). Organizational Choice. London: Tavistock Publications.

Walton, R. (1985). "From Control to Commitment in the Workplace." Harvard Business Review, 63, 76-84.

Walton, R. (1975). "The Diffusion of New Work Structures: Explaining Why Success Didn't Take," Organizational Dynamics, 3, 3-21.

Warner, M. (1984). Organizations and Experiments: Designing New Ways of Managing Work. New York: John Wiley and Sons.

Warner, M. (1981). "Organizational Experiments and Social Innovations." In P. Nystrom and W. Starbuck (eds.), Handbook of Organizational Design, Vol. 1. London: Oxford University Press.

Waters, J., P. Salipante, and W. Notz (1978). "The Experimenting Organization: Using the Results of Behavioral Science Research." Academy of Management Review, 3, 483-492.

Watson, G. (1973). "Resistance to Change." In G. Zaltman (ed.), Processes and Phenomena of Social Change. New York: Wiley-Interscience.

Watson, G. (1971). "Resistance to Change." American Behavioral Scientist, 14, 745-766.

Watzlawick, P., J. Beavin, and D. Jackson (1967). Pragmatics of Human Communication. New York: W. W. Norton.

Watzlawick, P., J. Weakland, and R. Fisch (1974). Change. New York: W. W. Norton.

Webb, E., D. Campbell, R. Schwartz, and L. Sechrest (1966). Unobtrusive Measures: Nonreactive Research in the Social Sciences. Chicago: Rand McNally.

Weick, K. E. (1979). The Social Psychology of Organizing. Reading, Mass.: Addison-Wesley.

Weick, K. E. (1977). "Organization Design: Organizations as Self-Designing Systems." Organizational Dynamics, 6:2, 30-46.

Wilson, J. Q. (1966). "Innovation in Organization: Notes Toward a Theory." In J. D. Thompson (ed.), Approaches to Organizational Design. Pittsburgh: University of Pittsburgh Press.

Woodman, R., and J. Sherwood (1980). "The Role of Team Development in Organizational Effectiveness: A Critical Review." Psychological Bulletin, 88, 166-186.

Zaltman, G., and R. Duncan (1977). Strategies for Planned Change. New York: Wiley-Interscience.

Zaltman, G., R. Duncan, and J. Holbeck (1973). Innovations and Organizations. New York: John Wiley and Sons.

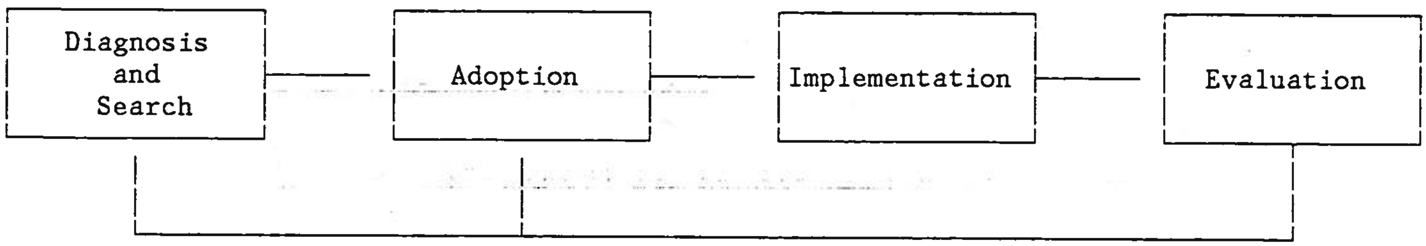

Figure 1: Innovation-Adoption Perspective

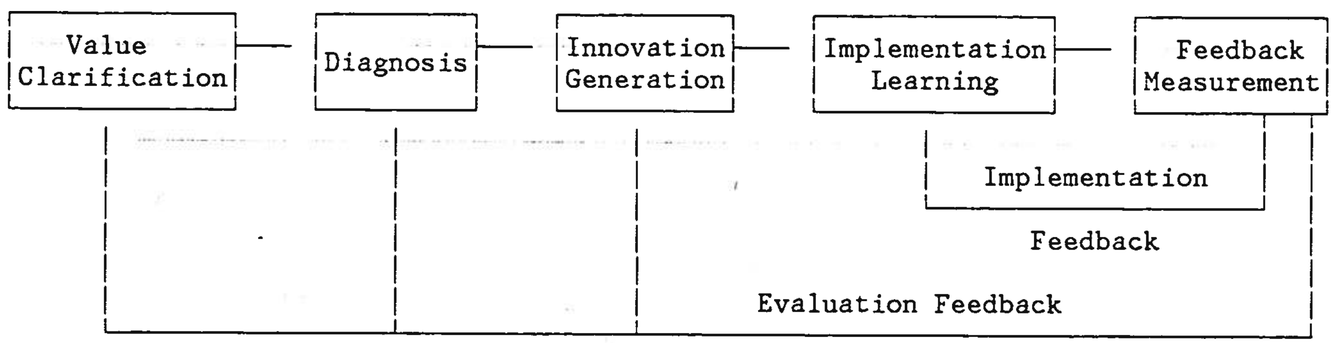

Figure 2: Self-Design Process

Table 2: Contrasts Between Innovation Adoption and Self Design

	Innovation Adoption	Self Design
Stages	Diagnosis and Search	Value Clarification
	Adoption	Diagnosis
	Implementation	Innovation Generation
	Evaluation	Implementation Learning
		Feedback Measurement
General Applicability	Clearly-Defined Innovation Knowledge	Poorly-Defined Innovation Knowledge
	Highly-Specified Implementation Steps	Highly-Uncertain Implementation Steps
	Rudimentary Learning	Complex Learning

BIOGRAPHY

SUSAN A. MOHRMAN

Susan A. Mohrman is a Senior Research Scientist at the Center for Effective Organizations at the Graduate School of Business Administration, University of Southern California. She received a Ph.D. in Organizational Behavior from Northwestern University. She has been a Visiting Lecturer at the Ohio State University, and has taught on the Faculty of Organizational Behavior at USC. Dr. Mohrman's research and publications are in the areas of innovative management practices, change and organization development, participative design, and innovative research methodologies. She is an editor of Research for Theory and Practice.

BIOGRAPHY

THOMAS G. CUMMINGS

Thomas G. Cummings is Professor of Management and Organization at the Graduate School of Business Administration, University of Southern California. He received a Ph.D. in socio-technical systems from the University of California at Los Angeles. Dr. Cummings was previously on the faculty at Case Western Reserve University. He has co-authored or edited seven books: (1) Job Satisfaction and Productivity; (2) Management of Work; (3) Improving Productivity and the Quality of Work Life; (4) Systems Theory for Organization Development; (5) Labor Relations: A Multi-Dimensional Perspective; (6) Organization Development and Change; and (7) Research for Theory and Practice. Dr. Cummings has also written over 30 scholarly articles. He is Associate Editor of the Journal of Occupational Behavior, Past-President of the Western Academy of Management, and Past-Chairman of the Organization Development Division of the Academy of Management. Dr. Cummings' major research and consulting interests include designing high-performing organizations, planned organization change, transorganizational systems, and occupational stress.