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ABSTRACT

This paper, written from an organizational perspective, begins with an examination of the deficiencies of knowledge utilization and educational change literature. It suggests the explication of descriptive and heuristic conceptual dimensions as one approach for facilitating a descriptive perspective of knowldge utilization. The efficacy of three descriptive and heuristic dimensions (systems, processes, and characteristics) are explored, along with a fourth dimension, utilization, which is the dependent variable in many studies of knowledge utilization. A framework for classifying knowledge utilization research, based on these four dimensions is constructed. The paper contains a bibliography of educational change literature. (DDO)

A CONCEPTUAL FRAMEWORK FOR STUDYING KNOWLEDGE UTILIZATION

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Studies of innovation diffusion and research utilization lack consensus on conceptual frameworks and definitions; this has, in turn, exacerbated the systematic accretion of research results. The objective here is (1) to document the confused, inadequate and inappropriate nature of much of the knowledge utilization literature, (2) to suggest descriptive and heuristic dimensions for studying knowledge utilization, and (3) to construct a framework for classifying knowledge utilization research. Given the diversity of approaches used for studying the broad issue of knowledge utilization, it should be noted that an organizational perspective is applied throughout the following discussion.

NATURE OF KNOWLEDGE UTILIZATION LITERATURE

The bulk of the literature on educational change, diffusion, and innovation reflects an absence of a coherent organizing framework. Sieber (1974) succinctly described the status of knowledge utilization research as follows:

> In approaching the field of knowledge utilization in education, one soon encounters a bewildering array of so called models and strategies. Here is one area of educational interest wherein conceptual schemes are as numerous as the schemes of the medieval scholastics, and in my opinion almost as useless (p.61).

A confused and bewildering variety of approaches of knowledge utilization, of which innovation diffusion is a part, currently exists. Sieber (1974:62-63) identified three major areas of confusion, centered on models, strategies, and schemes. Normative vs. descriptive models of knowledge utilization exist side-by-side in the literature, e.g., Guba's (1968:37-63) research, development, and diffusion model is primarily normative in nature, whereas Roger's (1962:81) social interaction model is primarily descriptive. Strategies for change are either based on

ideology stemming from social and political values, or judgement stemming from analysis and weighing of alternatives. Schemes range from administrative programs for achieving adoption to conceptual frameworks for understanding and describing knowledge utilization. Exacerbating the confusion and competition among models, strategies, and schemes is an overall low level of research quality.

Giacquinta (1973:178) identified three major deficiencies in the educational change literature: atheoretical research, inadequate methodology, and inappropriate emphasis. The majority of educational change literature does not include theory development, verification, or explanations of why organizations vary in the quantity and quality of change. Giacquinta also noted that generalizations about educational change are tenuous due to methodological and statistical inadequacies, and that emphasis on precipitating rather than studying change has obscured the need for theory development and sound methodology. A more restricted view of the shortcomings of educational change studies was outlined by Baldridge (1974).

Unsuitable paradigms, inappropriate focus, and restricted units of analysis have resulted in weak conceptualizations about the processes of change and innovation (Baldridge:1974:5-15). The early stages of diffusion and adoption models tend to be emphasized, thereby drawing attention to the spread of innovations and new knowledge in contradistinction to the implementation and concomitant structural support needed for institutionalization of new knowledge. Confounding the emphasis on the early stages of adoption is the minimal inclusion of complex organizational innovations as evidenced by the disproportionate attention given to simple, technical innovations. Baldridge noted that innovations which are technological in nature have the advantages of documented effectiveness,

short pay off time, and straight forward evaluation. In addition, the adopter of such innovations is often an individual as opposed to a complex organization. The individualistic bias in innovation research has overshadowed the importance of and need for treating the complex organization as the dependent variable in change and innovation studies. Concomitantly, Baldridge argues that organizational factors and dynamics be the major independent variables.

Eboch (1966:34) noted that in addition to the lack of a theory of change there is confusion over definitions of terms; Corcoran (1973) documented the lack of agreement in the literature about criteria important for successful change; Dragoo (1973) documented the diversity of models and programs; and Chase (1966) gave the following disquieting observation of innovation studies:

> The studies that have been done on educational innovations have led to a number of imperfectly verified generalizations which fall short of providing tight conceptual frameworks for future research, speculation, or practice (pp. 282-3).

This characterization of the knowledge utilization and educational change literature, disproportionately negative in tone and devastating in criticism, may be perceived as an exercise in self-flagellation or as a healthy examination of shortcomings encompassing a variety of avenues for improvement. Recognition of the need for conceptual development does exist. For example Lingwood and Morris (1974) state "Research on the utilization of scientific knowledge can only be as good as the concepts, models, and theories on which it is based (p.1)." Lake (1968:21) has suggested treating each component of change as a potential topic of theory, and McClelland (1968:14-18) has outlined two pre-models of change (inter-personnel and inter-organizational) for suggesting gaps in knowledge

and research on innovation diffusion. Although Moore (1963:24) has pointed out that a singular theory of social change should not be expected, McMurrin (1971) attempted to construct a theory of change revolving around the dynamic properties of organizations.

The knowledge utilization literature has been characterized as confused on one hand, and examples of constructive approaches for fulfilling conceptual and theoretical needs have been cited on the other. Distinguishing between normative models and administrative programs for effecting utilization is one small step toward unraveling the confused nature of the knowledge utilization literature. One approach for facilitating a descriptive perspective of knowledge utilization is the explication of descriptive and heuristic conceptual dimensions.

DESCRIPTIVE AND HEURISTIC DIMENSIONS

One approach for explicating alternative conceptual dimensions is the recognition of three primary systems involved with knowledge utilization (1) resource system, (2) mediating system, and (3) user system. The resource system is the source of knowledge and research developments--this definition excludes those instances where the user of new knowledge is also the inventor. The mediating system is the intermediary between the source and user of the knowledge, and the user system is the implementer of the knowledge. Cutting across these systems are factors related to organizational, personnel, and innovation characteristics. These three broad factors can be expanded to include structural variables of organizations, psychological variables of personnel, and technological attributes of innovations. A third dimension, modifying systems and factors, is the process used to effect utilization and subsequent institutionalization of

the new knowledge or innovation. Figure 1 illustrates these three dimensions.

(Figure 1 here)

Although three dimensions have been identified, these conceptual distinctions do not imply phenomenological discreteness. For example, there is interaction between personnel and organizational characteristics. Studying organizational processes and structures without regard to the dispositions, attitudes, and perceived roles of personnel overlooks a dynamic aspect of organizations. In addition, the user system exists within a larger context made up of resource and mediating systems. Studying the user system exclusively may result in overlooking influence brought about by the resource or mediating systems.

Sieber's (1974) injunction against mixing normative and descriptive models appears to have been ignored when looking at the process axis, both normative and descriptive processes are included. The intent here is to distinguish descriptive and potentially descriptive utilization processes. For example, both Smith (1972) and Starling (1973) conducted case studies on the implementation of IGE/MUS (a complex organizational and administrative innovation) based on an OD approach. Although OD is a normative process, their studies described characteristics of and relationships between organizational and personnel variables vis-a-vis the adoption of the innovation. Consequently, the efficacy of OD was explored from a descriptive, as opposed to a normative perspective.

The idea of presenting the three dimensions of system, process, and characteristics emanated from Thomas (1974) who constructed a three-axis change strategy model. The objective of the Thomas model centers on advocating "the best approach for effecting change and improvement

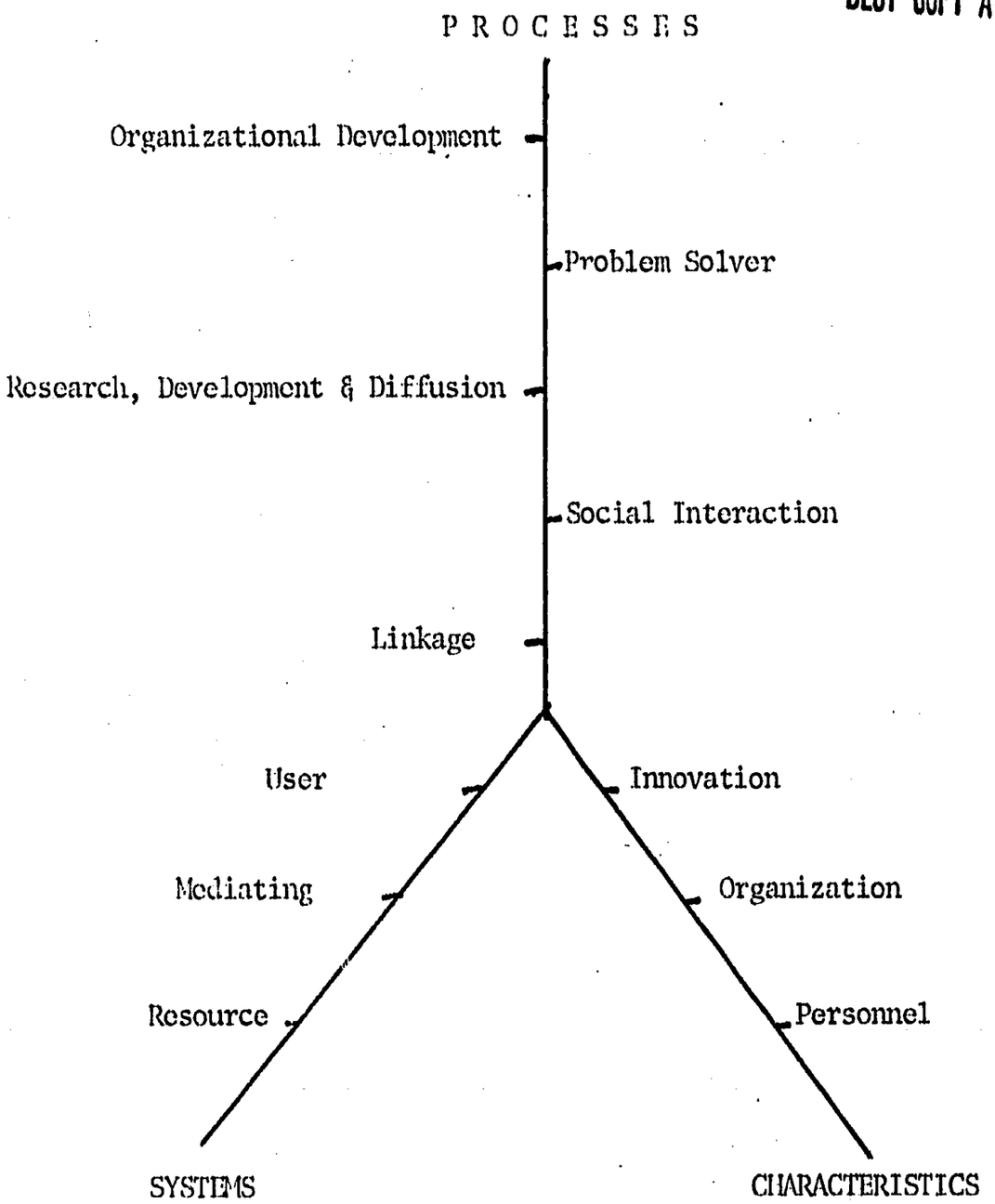

Fig. 1 -- Alternative Conceptual Dimensions for Studying Knowledge Utilization.

in educational institutions (p.25)." Figure 2 illustrates this normative approach.

(Fig. 2 here)

Thomas suggested that "psychological" assumptions with an "involving" technique could be directed at any of the four targets -- environment, organizational, group, and individual. Although the thrust of the Thomas model is programatic, it could be used as a descriptive scheme for understanding change programs. The intent rather than the content appears to differentiate the two approaches.

Before exploring a framework for catagorizing knowledge utilization research, the efficacy of the three dimensions introduced above will be explored, and reference will be made to a case study which incorporated a number of the factors subsumed by the system, process, and characteristic dimensions.

APPLICABILITY OF THE DIMENSIONS

It has been suggested that the three broad dimensions of systems, processes, and characteristics have descriptive and heuristic advantages vis-a-vis the study of knowledge utilization. This suggestion is based, in part, on the results of an exploratory case study (Paul, 1974).[1] The objective of the study was to determine the efficacy of investigating the diffusion of our innovation (IGE/MUS) in terms of the linkage relationships between resource, mediating, and user systems. The systems dimension , and the linkage process were explored; and organizational characteristics

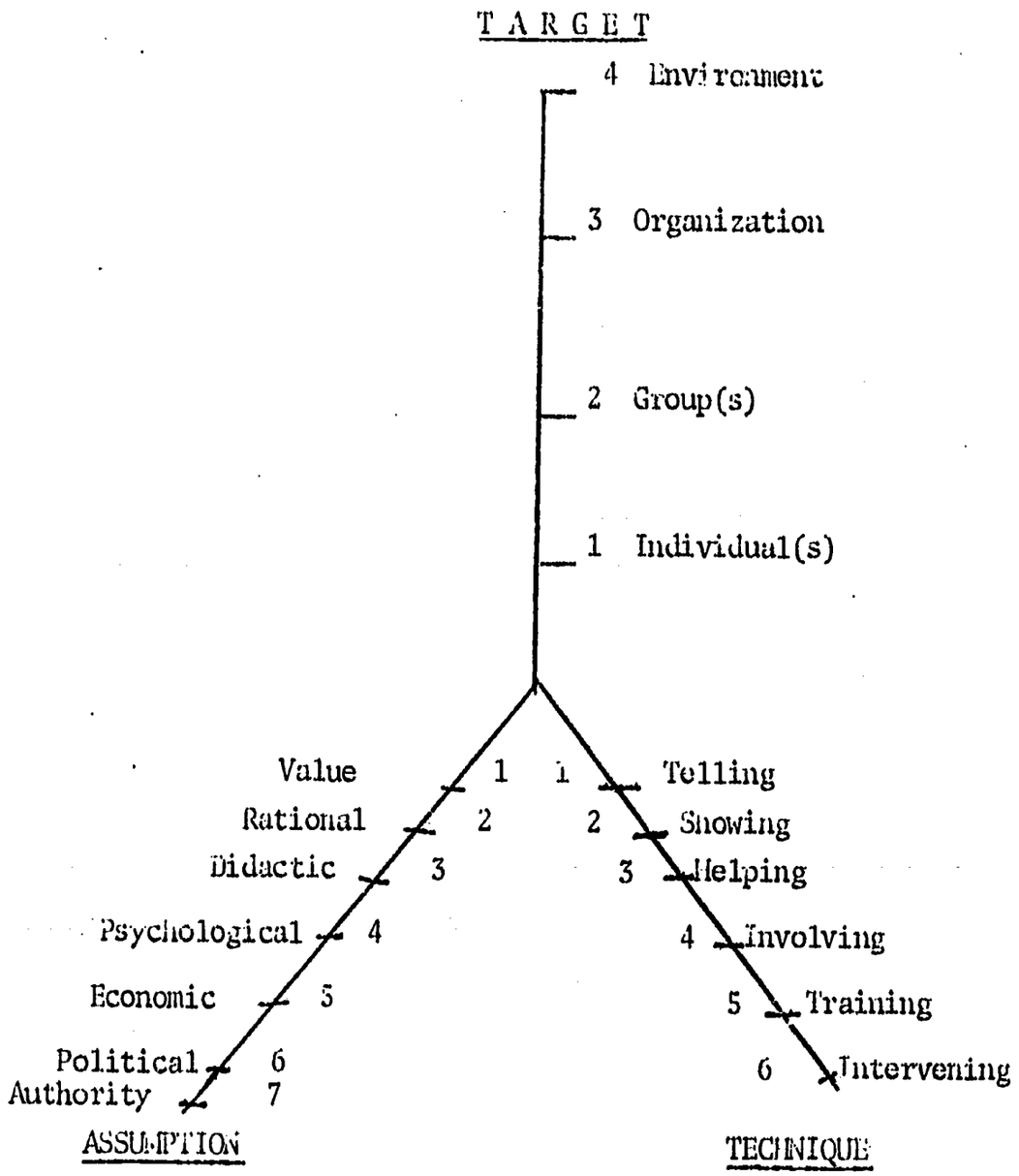

Fig. 2 -- Three - Axis Change Strategy Model
(Thomas, 1974:26)

were used to described the three systems and the linkage process. In addition to the three systems, the linkage process, and the organizational characteristics, the characteristics of the innovation IGE/MUS were implied throughout.

Systems

Associating the organizations involved in diffusion with the resource, mediating, and user systems had a number of descriptive and heuristic advantages. The three system catagories provided a framework for describing the roles of the organizations: a national R & D center was described as the resource system -- the creator and developer of the innovation; state education agencies (SEA) and teacher education institutions (TEI) were described as the mediating system -- facilitators for diffusion juxtaposed between the R & D Center and local schools; and local education agencies (LEA) were described as the user system -- adopters of the innovation. Augmenting the broad descriptive function of distinct system roles, was the finding that norms, attitudes, and values were also associated with each system.

The relationship between system norms and intersystem linkage was noted by Havelock (1971:ch.2, p.33) as one likely to cause blockage of two-way interaction between systems. The user system tended to be suspicious of the resource system e.g., teachers stressed their theoretical as opposed to practical orientation and persuasive as opposed to critical interaction. Resource system values centered on the primacy of user system capability for utilizing knowledge through internalization of prescribed guidelines and attendance at training sessions. Mediating system attitudes centered, in part, on their intermediary position between the resource and user systems. The SEA valued explicit roles, accountability, and feedback, The TEI on the

other hand, valued individual autonomy and discouraged control originating from either the resource system or SEA.

Observations by researchers and empirical research document the existence of restrictive system norms, attitudes, and values vis-a-vis the resource, mediating, and user system catagories. Baldridge and Johnson (1972:62,68) documented cleaveges between R & D Center academic/research staff and field relations staff, and cleaveges between R & D centers and teacher education institutions. Paisley (1970:110) noted that there is little concern on the part of researchers for the dissemination of their findings to students, practitioners, decision-makers, and the public; and Guskin and Chesler (1973:354) contended that the training of social scientists militates against concern for utilization and involvement in programs based on client needs. However, Brooke (1973:16) surveyed medical and educational sociologists and found that involvement in application was favored by the sizeable margin of 3:1. A dilemma emerges from this finding, however, application oriented researchers were found by Persell (1971:181) to be associated with low quality research.

Restrictive norms, attitudes, and values have also been associated with the role of the mediating system. Halpin (1962:195) observed that middlemen are treated with a "fatuous and condescending attitude;" and Havelock (1971: ch. 7, 37) described the linker as an in-betweener--not part of either the research or the practice worlds. Restrictive norms within the user system affect resource and mediating system influence. Corwin (1972) documented the restrictive norms of the user system with respect to teacher corps involvement; Short (1973) noted that practitioners have unrealistic expectations for research; Gross, et. al. (1971) documented the myopic perspective of administrators; and Pincus (1974) observed that the structures and incentives of public schools militate against innovation.

The systems dimension draws attention to the fact that developments of educational research primarily orginate from organizationally distinct structures. Developments may not proceed directly from their origin to their intended users, but rather, they may pass through an intermediary system which in turn, is organizationally distinct from the resource or user systems. This intermediary system may amplify messages from the resource system, translate the messages into a form understandable to the user system, and generally assist the user in the utilization process. Drawing attention to distinct systems involved in knowledge utilization introduces the concepts of interorganizational relationships, organizational interdependence, and institutional norms, attitudes, and values. Interorganizational relationships involve interdependence, which in turn involves mutual roles for achieving joint objectives. Mutually held roles are influenced by the distinct organizational norms, values, and attitudes of each system. In addition, the norms, values, and attitudes of each system influence organizational autonomy--the disposition to protect system boundaries in order to minimize and/or control externally produced influence.

System boundaries must have a degree of permeability for conducting interorganizational cooperation and collaboration. The importance attached to system autonomy will, therefore, influence interorganizational programs. Consequently, interorganizational relationships influence and are influenced by institutional norms, values, and attitudes. The system dimension draws attention to these issues--an heuristic outcome.

Characteristics

Organizational characteristics and the characteristics of the innovation were also explored in the case study. Two organizational characteristics were adapted from Havelock's (1971) linkage typology:

structure and capability.[2] By explicitly selecting organizational characteristics as independent variables, the exclusion of characteristics involving personnel was highlighted, thereby drawing attention to a significant limitation. This is a clear advantage of the scheme, viz., highlighting potentially significant concepts, factors, and relationships which may help describe knowledge utilization.

Focusing on the organizational characteristics of structure and capability revealed a variety of issues and pointed to a number of potentially significant relationships. Not only did the structural measures describe internal organizational characteristics, but they were also related to the linkage process operating between systems. Coordination, one measure of structure, was high for the TEI and the multiunit schools, moderate for the R & D Center, and low for the SEA (See Appendix A). Teamwork and frequent communication was evident in the teacher education institutions, thereby contributing to an orchestrated approach for facilitating user system adoption of the innovation. The multiunit schools also reported high coordination. However, the organizational and administrative design of the multiunit school prescribed interlocking committees to achieve coordination. Consequently the characteristics of the innovation were entwined with structure; a relationship not anticipated and therefore an heuristic outcome. Coordination was moderate for the resource system due, in part, to the distinct division of labor within the implementation unit, i.e., specialization. Some members focused on workshop activities, some on working with the mediating system, and others concentrated on long-range planning activities. These distinct roles were also associated with corresponding values, attitudes, and norms; a possible source of blockage of intrasystem relationships.

The SEA reported the lowest coordination. The overall fit between activities for diffusing an innovation and the established goals and priorities of the SEA was noted by Turnbull, Thorn, and Hutchins (1974:13) as a possible limiting factor. In addition, multiple roles may have contributed to reduced coordination, e.g., SEA respondents reported responsibility for fulfilling a variety of roles of which IGE/NJS diffusion was only one. Low SEA coordination may also have been related to the high value placed on administrative authority on one hand, and the lack of an explicit program or strong priority statements by the chief state school officer on the other.

The efficacy of including structure within studies involving interorganizational relationships has been documented. Paulson (1974) verified Hage and Aiken's (1968) finding that structural characteristics influence interorganizational relationships. However, Paulson noted that external organizational factors should also be considered. Relationships between structural variables such as coordination and centralization on one hand, and boundary spanning activities on the other, have been proposed (Thompson, 1967:75), and investigated. However, they have not been extensively studied by knowledge utilization researchers.

The structural characteristics of organizations influences inter-system relationships, which in turn influences the process by which knowledge is utilized. Inter-system cooperation and collaboration may be necessary for the utilization of developments of research. The structural characteristics of the organizations involved and the structural characteristics of the inter-system linkage used to translate knowledge from its source to its users may both influence knowledge utilization. Consequently, organizational structure is entwined with systems and with utilization processes.

Capability, the second organizational characteristic studied, lacked the high descriptive and heuristic utility associated with structure. Nevertheless, it was considered a potentially fruitful characteristic for future study. Skill to fulfill role expectations was one measure of capability (See Appendix B). The skill measure not only applied to organizational capability, but it also involved attributes of personnel and the innovation; distinct system roles; and the activities required by the linkage process. For example: skills needed for effective behavior in the R & D Center implementation unit included patience when working with principal investigators, and experience in a multiunit school; skills needed by the SEA involved working with a variety of people; skills needed by the TEI were sensitivity to the needs of local schools, practical as opposed to a research orientation, and a philosophy consistent with the innovation; and skills needed by the user system were knowledge of the innovation, ability to work in groups,[3] and flexibility. Rather than providing high descriptive utility, the capability measure of skill revealed a series of behaviors considered essential for each system.

The capability of the user system was also related to the characteristics of the innovation. User system respondents indicated the need for knowledge concerning roles, attitudes, and behaviors prescribed by the IGE/MUS design (Klausmeir, 1971). Not only is there a direct relationship between user system capability and the attributes of innovations, there is also a direct relationship between the attributes of innovations and their utilization. Hull and Kester (1974), and Clinton and House (1970) documented the relationship between characteristics of innovations and adoption. Camaren (1966) found that insular innovations have more rapid acceptance, and Rogers and Shoemaker (1971) related the diffusion of

innovations to their intrinsic characteristics. Interaction between the dimensions of processes and innovation characteristics of IGE/MUS was explicitly addressed by Turnbull, Thorn, and Hutchins (1974: 35): since IGE/MUS is not a tidy package to be passed on to schools, it requires a supporting structure of networks and intermediate agents to provide assistance.

The characteristics of organizations and innovations interact with the resource, mediating, and user systems, and with the processes for utilizing knowledge. Structure and capability were explored in terms of their descriptive and heuristic utility as concepts subsumed within the category of organizations. The particular innovation addressed in the case study, IGE/MUS, was shown to have specific characteristics which influenced the utilization process. The nationwide scope of the resource system militated against frequent linkage; the traditionally regulatory orientation and the statewide scope of the SEA may have hindered frequent two way interaction with the user system; and the narrow scope and traditionally non-threatening nature of the TEI may have facilitated frequent user system linkage. The innovation under study, IGE/MUS, was complex and required the learning of new roles. Consequently, the linkage activities required for the diffusion of IGE/MUS were ones which focused on staff behavioral, and attitudinal change vis-a-vis the new roles and structures prescribed by the innovation. Face-to-face training activities at a relatively high frequency were necessary. The characteristics of the organizations influenced the linkage process. Structural variables affected the extensiveness of inter-system relationships, and norms, attitudes, and values may have influenced boundary permeability. This in turn may be related to system autonomy on one hand, and inter-system cooperation and

interaction on the other. Although the characteristics dimension is in dynamic interaction with the systems and processes dimensions, it has been treated as conceptually distinct. This artificial separation is aimed at facilitating the categorization of knowledge utilization research.

Processes

The linkage process was explored in the case study and applied to the intersystem relationships operating between the resource, mediating, and user systems.[4] One measure of linkage was the frequency of face-to-face contact. In descending order of frequency, it was found that the TEI, followed by the SEA and resource system, had face-to-face contact with the user system (See Appendix C). By describing intersystem relationships in terms of the linkage process, it was possible to differentiate between the systems and to identify factors facilitating or hindering interaction. For example: supervision of student teachers by the TEI facilitated interaction with multiunit schools by adding legitimacy to their visits. The SEA was, in some instances, perceived as a regulatory agency and linakge was hindered; and the quantity and national distribution of multiunit schools limited frequent resource system linkage. This last finding corresponds to the primacy of face-to-face contact and its concomitant relationship with geographical factors described by House (1974).

The linkage process was influenced by the distinct role of the three systems, the attributes of the innovation, and the characteristics of the organizations. By viewing linkage in terms of communicative relations it is possible to relate intra and intersystem characteristics to linkage, e.g. Hood's (1973) treatment of information networks between and within the R & D and practitioner communities. Linkage is only one process for facilitating the utilization of knowledge. The four other processes listed

in figure 1 are suggestive, not inclusive. If they encompass and describe the major approaches which have been used for studying knowledge utilization, then they will have achieved their purpose. By undertaking a categorization of the knowledge utilization literature, it may be found that the process categories selected do not reflect the major research perspectives. If this is the case, then more representative categories should be added. Organizing and categorizing research findings in terms of major knowledge utilization processes will hopefully facilitate an heuristic explication of relationships between processes, systems, and characteristics.

It has been suggested that the three dimensions of systems, processes, and characteristics have descriptive and heuristic utility. However, a fourth dimension, utilization, should be considered in that it is the dependent variable in many studies of knowledge utilization.

Utilization

Utilization was explored in the case study in terms of establishment of the organizational and administrative components of the multiunit school (See Appendix D). However, a major issue is involved with the measurement of utilization which in turn raises questions concerning organizational characteristics.

The major issue concerning utilization is centered on adoption vs. adaptation. Research focusing on imported innovations must be sensitive to the degree to which the prescribed characteristics of the innovation are adopted and implemented in contradistinction to adapted and then implemented, i.e., is what is being implemented really the innovation or is it something invented by the user system and called by the same name? A recent study documented the need for sensitivity to the adoption/adaptation issue. Ironside (1972:14) noted that wide variations in the implementation of the multiunit school militated against an accurate

determination of the number of adopters. Since adoption, implementation, or institutionalization is treated as an independent or dependent variable or is assumed in a large number of knowledge utilization studies, it deserves considerable attention. Adaptation of an innovation was documented by Reynolds (1971) and explained in terms of the lack of clarity in instructional change, teacher autonomy, and ineffective group decision making. One serious result stemming from the practice of overlooking the distinction between adoption and adaptation lies in the area evaluation. Gross, Giacquinta, and Berstein (1971:216) warned that many potentially useful innovations have been rejected due to the failure of evaluation designs to take into account the difference between adequate and inadequate implementation. Goodlad (1968) admonished researchers to be "aware and beware" that "There may be no relationship between the innovative practice and the innovative concept this practice is supposed to reflect (pp. 14-15)." Consequently, negative evaluation findings may curtail the diffusion of a promising innovation, when in reality what was evaluated did not correspond to the prescribed characteristics of the innovation.

Charters and Pellegrin (1972: fn. 5) raised the possiblity that deviations from well developed innovations, instituted on the grounds that local conditions are unique, may be responsible for the high failure rate of innovations. Havelock (1971: ch. 10,74) conjectured that amendments to innovations may eradicate intended effects, and Lippitt (1969:78) noted that adapting innovations may require more skill than adopting them.

Consequently, utilization is entwined with a major measurement problem viz, what is being measured? Ironside (1973:39), after a follow-up of a previous study on IGE/MUS implementation, noted that questionnaire items were not subtle enough to accurately measure implementation status.

Ironside suggested that on-site visits be used to discern implementation progress. Concomitantly, observation check lists would appear to be a promising measurement approach.

In addition, an ideological issue is present in the adoption vs. adaptation distinction. Should imported innovations, not attractive or considered to address specific user needs, be adopted in pure form, or redesigned in order to overcome resistance? Does adoption in pure form imply passivity and compliance as opposed to adaptation which may imply active and critical assessment on the part of the user system? Does a defence of innovation adaptation, based on defined user needs emanating from explicit goals, betray a rationalistic bias, i.e., that needs and actions are behaviorally independent? March (1973:420-421) contends that the distinction between goals and decisions is defined and that frequently action precedes goals. Even though the issue of adoption vs. adaptation is complex, it should be faced whenever utilization is being measured. Utilization, as the fourth dimension for categorizing knowledge utilization research, has descriptive and heuristic utility in terms of adoption and adaptation, however a third possibility should also be noted -- utilization failure.

The efficacy of the four knowledge utilization dimensions: systems, processes, characteristics, and utilization, has been described, These four dimensions may have utility for categorizing knowledge utilization research, which in turn may provide a means for spotlighting conflicting research results on one hand, and mutually supportive results on the other.

FRAMEWORK FOR CATEGORIZING KNOWLEDGE UTILIZATION RESEARCH

The approach taken for addressing the multiple factors and relationships impinging upon knowledge utilization has been organizational. Although a variety of approaches exist, an organizational perspective takes into account the fact that the user system is usually a complex organization and therefore attention should be given to the user system's organizational context (Miles and Schmuck, 1971:1; Carlson, 1968:16). In addition, knowledge utilization usually involves more than one organization, viz., resource, mediating, user systems, and therefore interorganizational concepts and models deserve attention. Hopefully, explication of this need will correct the inadequacy of interorganizational theory vis-a-vis innovation diffusion research documented by Pohland (1970).

Multiple research perspectives for studying knowledge utilization are needed (Short, 1973:284); differentiated concepts are needed (Bhola and Blanke, 1966:4); and consensus on important facts (Broudy, nd.) is needed in order to provide a foundation for the systematic accretion of research results. Broudy also observed that a vicious methodological circle has been created: lack of consensus on facts militates against theory development, which in turn serves as a guide for explicating important facts (p.16). Consequently, a framework for categorizing research results may draw attention to common findings which in turn may lead to consensus on significant facts. Figure 3 illustrates one framework for categorizing knowledge utilization research.

(Fig. 3 here)

The arrows directed inward emphasize the relationship between systems, processes, and characteristics vis-a-vis the dependent variable of utilization.

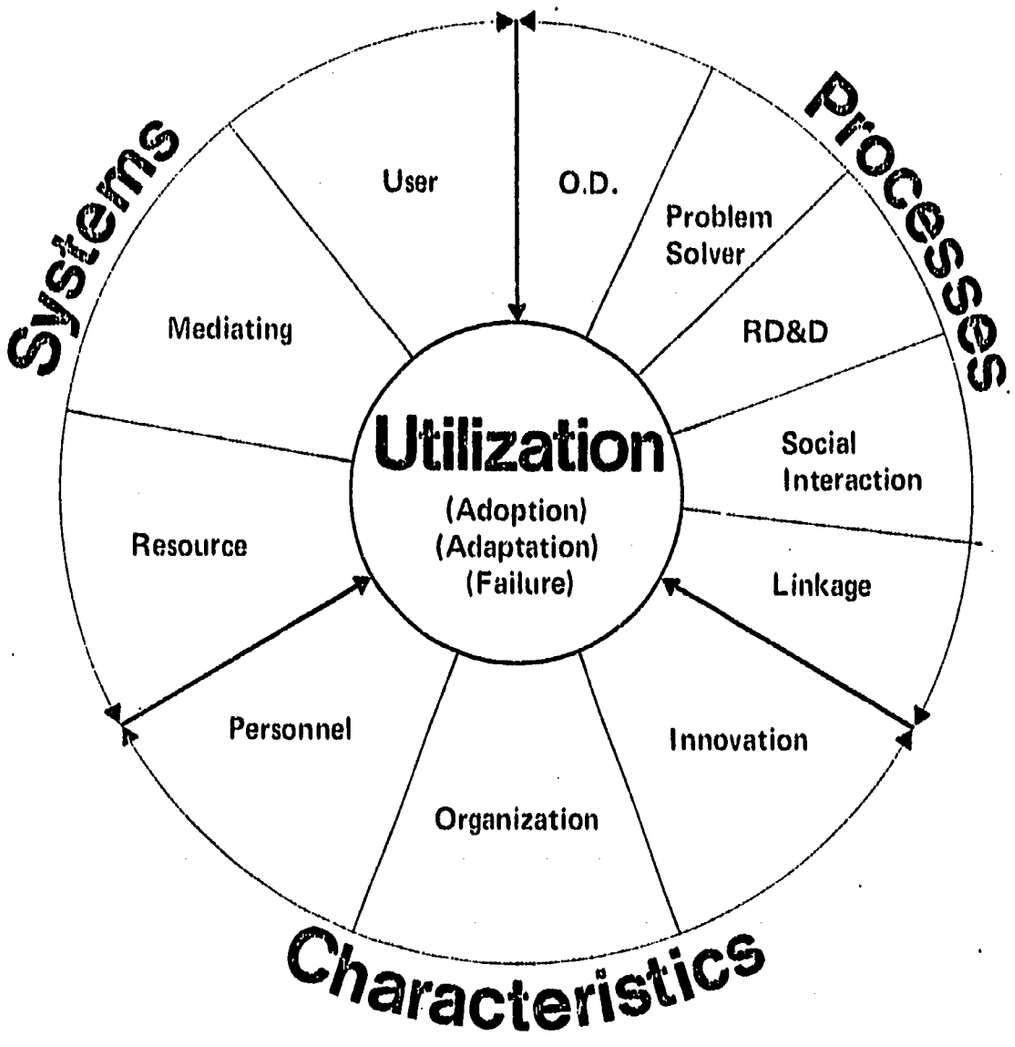

Fig. 3--A Conceptual Framework For Categorizing Knowledge Utilzation Research

The arrows surrounding the dimensions illustrate a dynamic interaction. By categorizing research according to the dimensions, the factors subsumed by the dimensions, and the relationships within and between the dimensions an accretion of contradictory and complementary results is possible.

The macro-system perspective suggested by the framework aims at inclusiveness on one hand and flexibility on the other. The intent of the framework is heuristic and is aimed at promoting (1) debate on the efficacy of the dimensions, (2) examination of multiple factors and relationships, and (3) categorization of disputed and proven relationships. Hopefully, through debate, examination, and categorization of knowledge utilization research, it may be possible to address some of the inadequacies documented by Sieber (1974), Giacquinta (1973), and Baldridge (1974).

NOTES

1. The case study explored intra and intersystem relationships between a national R & D Center, three state education agencies, three teacher education institutions, and seven multiunit schools. An interview schedule consisting of fifteen semi-structured items was used for exploring the relationships; 33 respondents were interviewed for approximately 90 minutes each. Interrater reliability was determined by comparing percent agreement for codification of responses between three independent raters and the researcher -- 95 percent agreement. The sampling procedures used for selecting SEAs and TEIs followed explicit criteria, but procedures for identifying LEAs were biased in favor of teacher education respondents, viz., the TEI nominated multiunit schools in their vicinity. This assured opportunities for exploring TEI/user system contact.

2. Havelock identified capacity as the "ability to summon and invest diverse resources (ch.11,p:22). The capacity factor was adapted and labelled capability and was measured by (1) time allocated to diffusion activities, (2) skills possessed for fulfilling role, (3) influence perceived for altering decisions, (4) needs of the systems to achieve objectives, and (5) past innovative performance. Structure was described by Havelock as "a rational sequence of steps, compartmentalization and coordination, division of labor (ch.11,pp.23-25)", and it was operationalized as (1) coordination, (2) hierarchical communication, (3) specialization, and (4) role clarity.

3. Problems associated with working in groups is related to the minimal interdependence within schools described by Miles (1967). This problem is also discussed and documented by Bentzen (1974). It appears to be a significant capability need within the user system.

4. Havelock's (1971) definition of linkage "the degree of interpersonal or intergroup connection; the extent to which mutual communicative relations exist among two or more parties (ch. 11, p.21)," was operationalized according to three categories: type, mode, and frequency. Type of linkage referred to consulting, training, or conveying; mode of linkage referred to face-to-face, telephone, or written material interaction; and frequency of linkage referred to the quantity of face-to-face, telephone, and written material interaction.

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TABLE 1

INTERNAL FACTOR OF STRUCTURE
AS REPORTED BY RESOURCE,
MEDIATING AND USER
SYSTEMS

System	STRUCTURE														
	Internal Coordination			Hierarchical Communication			Specialization			Role Clarity			% Mean Response		
	% Response			% Response			% Response			% Response					
	High	Mod.	Low	High	Mod.	Low	High	Mod.	Low	High	Mod.	Low	High	Mod.	Low
Resource (N5)	40	20	40	60	20	20	100					100	50	10	40
Mediating (N10)															
SEA (N3)			100	33	34	33		34	66	33	34	33	16	34	50
TEI (N7)	86		14	72	14	14	100			14	14	72	68	07	25
User (N18)	72	22	06	56	22	22	38	18	44	72	18	10	60	20	20
% Mean Response	64	15	21	58	21	21	58	12	30	45	15	40	56	17	27

Appendix A

TABLE 2

INTERNAL FACTOR OF CAPABILITY
AS REPORTED BY RESOURCE,
MEDIATING, AND USER
SYSTEMS

System	CAPABILITY															
	F.T.E.	Skill & Experience			Influence			Needs			Past Innovative Performance			% Mean Response		
	% of Day	% Response			% Response			% Response			% Response					
		High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low
Resource (N5)	61	60	40		80		20	60	20	20	100			75	15	10
Mediating (N10)																
SEA (N3)	58	34	66		66		34	100				34	66	50	25	25
TEI (N7)	66	29	42	29	72	14	14	100			43	14	43	61	17	22
User (N18)	61	17	77	06	67	11	22	44	28	28	22	11	67	38	33	29
% Mean Response	62	27	63	10	69	10	21	64	18	18	36	13	51	49	26	25

TABLE 3

LINKAGE WITH RESOURCE SYSTEM
AS REPORTED BY MEDIATING
AND USER SYSTEMS

	LINKAGE									
	Type			Mode			Mean Annual Frequency per Respondent			
System	Convey	Consult	Train	Face	Tel.	Print	Face	Tel.	Print	Total
Mediating (N10)										
SEA (N3)	X	X		X	X	X	25	21	21	67
TEI (N7)	X	X		X	X	X	24	30	8	62
User (N18)	X		X	X	X	X	1.2	1.7	12	14.9
Total	X	X	X	X	X	X	50.2	52.7	41	143.9

TABLE 4

LINKAGE WITH MEDIATING AND USER SYSTEMS AS REPORTED BY RESOURCE SYSTEM

System	LINKAGE									
	Type			Mode			Mean Annual Frequency Per Respondent			
	Convey	Consult	Train	Face	Tel.	Print	Face	Tel.	Print	Total
Mediating (N10)										
SEA (N3)	X	X	X	X	X	X	7	12	16	35
TEI (N7)	X	X		X	X	X	8	24	16	48
User (N18)	X	X	X	X			.5			.5
Total	X	X	X	X	X	X	15.5	36	32	83.5

TABLE 5

LINKAGE WITH USER SYSTEMS AS REPORTED BY MEDIATING SYSTEM

System	LINKAGE									
	Type			Mode			Mean Annual Frequency Per Respondent			
	Convey	Consult	Train	Face	Tel.	Print	Face	Tel.	Print	Total
Mediating (N10)										
SEA (N3)	X	X	X	X	X	X	41	52	17	110
TEI (N7)	X	X	X	X	X		52	29	0	81
Total	X	X	X	X	X	X	93	31	17	191

TABLE 6

LINKAGE WITH MEDIATING SYSTEM
AS REPORTED BY USER
SYSTEM

System	LINKAGE									
	Type			Mode			Mean Annual Frequency Per Respondent			
	Convey	Consult	Train	Face	Tel.	Print	Face	Tel.	Print	Total
Mediating (N10)										
SEA (N3)	X		X	X		X	1.2		4	5.2
TEI (N7)	X	X	X	X		X	10.5		1.7	12.2
Total	X	X	X	X		X	11.7		5.7	17.4

TABLE 7

LINKAGE BETWEEN MEDIATING SYSTEM AS REPORTED BY SEA AND TEI

	LINKAGE									
	Type			Mode			Mean Annual Frequency Per Respondent			
System	Convey	Consult	Train	Face	Tel	Print	Face	Tel	Print	Total
Mediating (N10)										
SEA (3)	X	X		X	X	X	46	29	3	78
TEI (N7)	X	X		X	X	X	12	14	3.7	29.7
Total	X	X		X	X	X	58	43	6.7	107.7

TABLE 8

DIFFUSION OF IGL/IDS-E AS REPORTED BY RESOURCE, MEDIATING, AND USER SYSTEMS

System	DIFFUSION											
	I & R Units			IIC			SPC			% Mean Response		
	% Response			% Response			% Response					
	YES	NO	DON'T KNOW	YES	NO	DON'T KNOW	YES	NO	DON'T KNOW	YES	NO	DON'T KNOW
Resource (N5)	37	0	63	34	0	66	23	11	66	32	03	65
Mediating (N10)												
SEA (N3)	42	0	58	42	0	58	42	29	29	43	10	47
TEI (N7)	88	0	12	93	0	07	65	35	0	79	13	08
User (N18)	94	06	0	100	0	0	88	0	12	94	02	04
% Mean Response	62	12	36	64	0	36	44	20	36	55	07	33