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ABSTRACT

The three diagnostic dimensions of the Concerns Based Adoption Model (CBAM) are tools that can evaluate the degree of new program implementation at the classroom level. Implementation success is a function of use/nonuse, appropriate/inappropriate practice, and user concerns about the innovation. These dimensions: Levels of Use (LoU) of the Innovation, Innovation Configurations (IC) and Stages of Concern (SoC) about the Innovation can measure and rank progress for individuals or groups, be combined for a composite ranking, and be used for exploring the relationship between implementation success and change process variables. These procedures were applied to the Principal-Teacher Interaction Study to assess implementation success across nine elementary schools in Colorado, Florida, and California. Study sites varied by principal's approach to facilitation, year of implementation, and innovation being implemented. Throughout the 1980-81 school year, data were collected from bi-weekly phone calls to principals and four on-site visits. Teacher data were collected using the CBAM diagnostic dimensions. Rankings were done during three 3-day meetings by research staff and school district representatives. Results suggest close monitoring feed back and more interventions will improve implementation success. Principal change facilitator style significantly influenced teacher classroom practice. The appendix details the three diagnostic dimensions of the CBAM. (BS)

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A MULTI-DIMENSIONAL APPROACH FOR ASSESSING IMPLEMENTATION SUCCESS

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A Multi-Dimensional Approach For Assessing Implementation Success[1,2]

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School improvement efforts, to a large degree, are based on implementation of new programs, and change in curriculum and teaching practices (i.e. innovations). The issue of innovation implementation success therefore is a crucial one when considering school improvement. School improvement is not only related to the quality of the educational innovation, but also to how well and to what degree the innovation is implemented. To state it simply, a very high quality program implemented poorly is not likely to produce the desired outcomes.

In the past, there have been numerous ways to evaluate the effects of educational innovations, but very few tools for systematically evaluating the degree of implementation at the classroom level. The three diagnostic dimensions of the Concerns Based Adoption Model (Hall, Wallace & Dossett, 1973) are such tools. These dimensions: Stages of Concern, Levels of Use and Innovation Configurations have been used to assess implementation success in a recent study of school improvement efforts.

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[1] Presented at the Annual Meeting of the American Educational Research Association, Montreal, Canada, April 1983.

[2] The research described herein was conducted under contract with the National Institute of Education. The opinions expressed are those of the authors and do not necessarily reflect the position or policy of the National Institute of Education, and no endorsement by the National Institute of Education should be inferred.

This paper will describe a process that was used to assess implementation success across nine schools in three widely separated school districts and will report selected findings about the relationship between change process variables and implementation success. This procedure can be used to compare implementation success at a given point in time across sites and across innovations and to correlate implementation success with other change process variables. It is primarily useful for comparing the implementation success of two or more innovations or of one or more innovations being implemented in two or more settings. Therefore, the procedure described in this paper has application value to researchers, evaluators and others concerned with the study of school improvement. It is especially valuable when there are multiple sites and/or multiple implementations. For these reasons, the procedure appears to be a highly promising technique.

Defining Implementation Success

Implementation success is an elusive concept. Often success seems to be based more on who is making the judgement than on any characteristics of the implementation effort, user practice or change process effects. One view of successful implementation is based solely upon evidence that the box of innovation resources is in the classroom. From another view, successful implementation would not be declared until user behaviors with the innovation resources have been extensively documented.

Most frequently implementation success is addressed in terms of use of a single innovation. Making comparative judgements across two or more innovations has been problematic and has often been equated to comparing apples and oranges. However, a procedure has been developed and tested for interpreting implementation success that is sensitive to differences in

innovations and to the inherent problems related to comparisons across innovations. After all, apples and oranges are both fruit and can be compared on that dimension.

Increasingly, factors related to implementation are being considered in planning, facilitating and evaluating change efforts. Simply placing the innovation in the hands of prospective users and then conducting pre/post tests of differences in client outcomes no longer mak sense (Charters & Jones, 1973). Change is a process, not an event. This assertion is true of institutions as well as the individual members who comprise them. It has been learned that use is not dichotomous in a change process rather there are different Levels of Use (Hall, Loucks, Rutherford & Newlove, 1976). Further innovations are not always used as the developer envisioned (Berman & McLaughlin, 1978) and each user may use a different operational form or "configuration" of the innovation (Hall & Loucks, 1978). For these and other reasons implementation has to be considered as a distinct phase and phenomenon in the life of a change/improvement process.

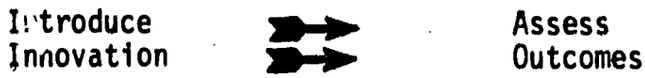
A given assumption in any discussion of implementation success is that some forms of use of an innovation are more desirable than others. Who makes this decision is different for different projects and must be determined specifically for each new project. However, in order to judge implementation success someone or group has to specify which approaches are more and less desirable. Although this seems to be an obvious step, all too frequently these criteria are not identified or are left in terms so vague that any type of use at the school or classroom level is assumed to be acceptable.

Note that the discussion here does not have to do with the desirability of fidelity oriented implementation efforts. That is another topic. In this

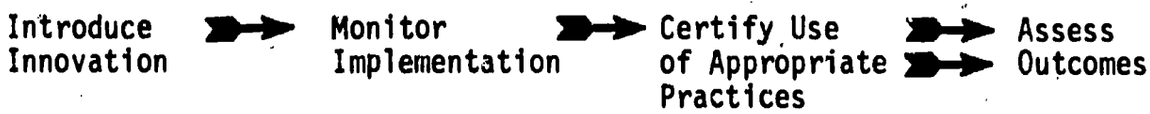
paper the focus is on how to assess and judge implementation success when it is deemed important to do so.

A Framework for Defining Implementation Success

Traditionally, at some point after an innovation is introduced to potential users, an evaluation study is done to document that desired outcomes (e.g. increased student achievement) have resulted. Other outcomes could be related to teacher morale, school climate, cost benefits and resource consumption. All of these either implicitly or explicitly assume that use of the innovation in appropriate ways has been accomplished by the prospective users. Diagrammatically this view of change would be:



A more in-depth view of change would have several additional pieces:



In this second approach assessing outcomes in order to make summative judgements about use of the innovation would not be done until there was (1) documentation that individuals (e.g. teachers) are users and (2) that what they are doing represents appropriate innovation practices. When both have been documented then implementation can be verified and summative questions about effects of use can be addressed.

At this point it is important to identify the factors involved in successful implementation. Three diagnostic dimensions of the CBAM model provide the concepts and measures for defining implementation success. In the CBAM approach Implementation Success (IS) is related to use/nonuse,

appropriate/inappropriate practice and user concerns about the innovation. The basic model is:

IS = f (LoU, IC, SoC)

LoU is Levels of Use of the Innovation, IC is Innovation Configurations and SoC is Stages of Concern about the Innovation. Each of these vectors represent established concepts and measures for considering basic dimensions of implementation as it occurs at the user level. These dimensions are briefly described in the appendix at the end of this paper.

With these dimensions it is possible to obtain systematic data about each person's use of and concerns about an innovation. Progress can be measured in terms of the implementation of an innovation for each of the three dimensions. When data from each dimension is compared for individuals or groups of staff it is then possible to rank order subjects on a scale ranging from those who have moved the least or regressed to those who have advanced the most in terms of mastering use of an innovation. The rankings for each of the three dimensions can be combined to give a composite ranking of implementation success. These rankings can then be used as criteria for exploring the relationship between implementation success and various change process variables.

Following a brief description of the Principal-Teacher Intervention study will be a description of the procedure which was developed to assess implementation success at a given point in time. In addition, the paper illustrates how the procedure was applied using the PTI study data base and reveals some illustrative findings of how implementation success correlated with various change process variables.

The Principal-Teacher Interaction Study

The Principal-Teacher Interaction Study focused specifically upon school principals to determine what they do to aid the implementation of new programs in their schools. Three major questions guided this study: (1) What do principals do as change facilitators? (2) How do the concerns of principals affect their functioning as change facilitators? and (3) What is the relationship between administrator concerns, the interventions they make and their effects on teachers?

Nine elementary school principals served as the primary subjects and informants on interventions in this study in which data were collected from May 1980 to May 1981. Three principals were selected from school districts in Colorado, Florida and California. Based on composite descriptions by the researchers, the principals were chosen by district administrators to represent three approaches to facilitating implementation. Each of the three school districts were at different points in the process of implementing a district-wide innovation. The California school district was beginning its first year of implementation of a new writing composition program; the Florida district was beginning its second year of implementation of a unified math curriculum; and the Colorado district was into its third year of implementation of a revised science curriculum. So, the study sites varied by principal's approach to facilitation, year of implementation, innovation being implemented, as well as by school district.

Study Procedures

Principals were trained on an individual basis to identify and describe interventions made by themselves and others. In these sessions, principals

were taught how to provide sufficient information in reporting interventions to allow for coding of the interventions on various dimensions.

Throughout the 1980-81 school year, researchers contacted study principals (and assistant principals) by telephone on a bi-weekly basis during the 1980-81 school year to collect data on interventions related to the innovations being studied. Intervention data were then coded by researchers on various dimensions including sublevel, source, target, function, medium, flow and location.

Three to four on-site visits were made to each study site. Intervention data were collected from administrators and teachers during these on-site visits. In addition data were collected from teachers using the diagnostic dimensions of the CBAM. A summary and time line of data-collection procedures is provided in Figure 1. Teachers completed the Stages of Concern Questionnaire four times during the study and were interviewed by a certified Levels of Use interviewer three times during the year. Innovation Configuration information was collected through a "configuration hunt" at the beginning of each of the three Levels of Use interviews. This information was then used to complete the IC checklist that had been developed for each site using established procedures (Heck, Stiegelbauer, Hall & Loucks, 1981).

Since in all three districts the innovations were locally developed or were local modifications of materials developed elsewhere, it was possible to go to the primary developers as key sources in the identification of configuration components and for setting criteria in terms of acceptable and unacceptable variations of components.

Figure 1

PTI Data Collection Procedures and Timeline

Principals (and Assistant Principals)	May 1980	Oct. 1980	Jan. 1981	May 1981
Intervention phone interviews		bi-weekly		
Intervention face-to-face interviews	X	X	X	X
Field note-taking	X	X	X	X
Context survey			X	
Change facilitator Stages of Concern Questionnaire	X	X	X	X
Teachers				
Intervention face-to-face interviews	X	X	X	X
Stages of Concern questionnaire	X	X	X	X
Levels of Use interview	X	X		X
Innovation Configuration interview	X	X		X
School Climate Survey			X	
District Personnel				
Intervention phone interviews		intermittent		
Intervention face-to-face interviews	X	X	X	X
Context Survey			X	

Assessing Innovation Implementation Success: A New Procedure

CBAM data that were gathered from teachers during the PTI study were the focus of project staff and representatives from each of the three research sites in a series of activities to analyze innovation implementation at the classroom and school l[illegible]s. The task was to use each CBAM diagnostic dimension to rank order the nine study schools and then to combine the rankings to establish a measure of overall implementation success. It would be possible then to correlate the degree of implementation success with a number of variables including change facilitator style of the principal.

The ranking task was done during three three-day meetings by research staff and the central office representative from each school district who had been the liaison throughout the study. The task was done in three segments: the interpretation and rankings of Stages of Concern and Levels of Use data were done in February 1982, the rankings of Innovation Configuration was accomplished in September 1982, and in November 1982 site representatives met again with project staff to examine the rank orderings and their relationship to change facilitator styles and to the initial cross tabulations of the intervention data.

Levels of Use Data

Levels of Use was the first dimension used to rank order the schools. The ten participants in the activity, each of whom had past experience in working with CBAM data, were given the LoU distributions for all data collection periods for each of the nine schools, but were not given the identity of the schools. The task was twofold: 1) to rank the schools in terms of implementation success using LoU as the criterion; and 2) to make

notes on the indicators being used as the basis for making the ranking. Each person did the task. Then the group met to summarize the individual rankings and derive a consensus ranking.

There was strong agreement across the raters on the rankings and there was minimal expression of need to have any additional information with which to perform the task. The group did point out that the task would have been easier if information about the percentage of teachers at each LoU had been provided instead of the raw counts. Some of the factors mentioned by participants that influenced their ranking were: amount of movement toward higher levels, proportion of movement toward higher levels, size of school, the final distribution, few persons at LoU III's (Mechanical Use) at the end, backward movement was a minus, and some favored having more IV B's. Nonuse to use was seen by some as more difficult to achieve than was movement from LoU III to higher LoU's and therefore was more heavily weighted.

Each rater rank ordered the nine schools that were assigned the letters of A-I. An example of two raters' rankings is shown below.

Rank Order	Rater 1	Rater 2	Etc.
1	D	D	
2	A	A	
3	G	G	
4	B	F	
5	F	B	
6	H	C	
7	C	H	
8	I	I	
9	E	E	

The LoU data were summarized school by school by adding the rank order number assigned by each of the ten participants and deriving a total number. An example of how this procedure was conducted is shown below.

Rater	School A	School B	Etc.
1	2	4	
2	2	5	
3	1	4	
4	2	3	
5	3	4	
6	2	4	
7	2	3	
8	1	4	
9	4	5	
10	2	3	
	21	39	

As can be seen in the examples above, when rater #1 rank ordered the nine schools, he ranked School A as second and School B as fourth. Rater #2 ranked School A as second and School B as fifth. By totaling the rank order numbers assigned by all 10 raters, a total score was derived. Using this procedure, the lower the total score, the more successful the school's implementation was judged in terms of the criterion being rated. The following total scores were derived for the nine study schools using the criterion of Levels of Use and are displayed by school ID number.

Implementation Success
As Determined by Level of Use Data

School	Score
11	48
12	58
13	37
24	26
25	12
26	82
37	63
38	51
39	73

Stages of Concern Data

The task was repeated using the SoC profiles for each school. This task was slightly more difficult for most people but still quite possible.

Instead of having a single score for each teacher like LoU, SoC data consists of several different points which make up a profile making comparison more difficult. In addition, all of the intricacies of profile interpretations had to be considered.

Again, reasonably strong agreement among raters was observed. Some of the indicators used by participants in ranking the SoC data were: valuing resolution of early concerns, especially Stage 2 Personal; arousal of impact (Stages 4, 5 and 6) concerns. Tailing up on Stage 6 Refocusing was viewed negatively, as were unresolved Stage 3 Management concerns and little or no movement. The SoC profile at the final data collection time was also weighted heavily. The SoC rankings were summarized using the same procedure used with the LoU data. The following total scores were derived using the criterion of Stages of Concern and are displayed by school ID number.

Implementation Success
As Determined by Stages of Concern Data

School	Score
11	68
12	29
13	61
24	34
25	22
26	60
37	75
38	25
39	73

Innovation Configuration Data

The ranking task continued at the September 1982 meeting. This time six staff members and the three site representatives analyzed the Innovation Configuration data. The task was first to rank the three schools within each district and then to rank all nine schools. The IC Component Checklist data

were displayed by school showing the percentage of teachers using each variation of each component.

The procedure began with the site person first reviewing the innovation and the IC Component Checklist in terms of "critical components" and "ideal," "acceptable," and "unacceptable" variations. Each member of the group then rank ordered the three schools within the district. The procedure was then repeated for the other two sites. Following each ranking task, the participants discussed the activity and the indicators that they had used to do the task. On the second day of the September session, all nine sites were ranked in terms of implementation success based on IC data. One result of extensive discussions was the identification of a basic set of guiding principles for rank ordering schools using IC data. Basically, implementation success was viewed as being comprised of two vectors, 1) the proportion of teachers whose use moved them across the minimally acceptable line in the shortest period of time, and 2) growth toward and above the minimum acceptable standard. Participants reported that rank ordering schools within the district as difficult, yet still possible. In terms of the number of variables involved in ranking, Innovation Configurations proved to be the most complex given three different innovations and IC Component Checklists that were not standardized. The varying degrees of clarity provided by the district in terms of what comprised successful implementation also contributed to the difficulty of the task.

The IC rank order data generated by the nine participants in the task were summarized in the same fashion as the LoU and SoC data. The following total scores were derived for the nine study schools using the criteria of Innovation Configuration.

Implementation Success
As Determined by Innovation Configuration Data

School	Score
11	49
12	47
13	53
24	47
25	41
26	53
37	14
38	23
39	33

Configuration Data Problematic. Compared to the LoU and SoC tasks, the overall IC rank ordering was more difficult and problematic. The concepts of SoC and LoU allow each respondent some latitude in defining the innovation whereas, in the Innovation Configuration work, this individual interpretation is restricted. SoC and LoU are generic concepts describing the individual whereas IC focuses on the specific innovation and the ways each component of it is made operational. It was difficult to compare the different innovations which had different numbers of components and variations, plus it was not possible to conduct a 'blind' activity as the checklist itself 'gave away' district identity, and thus the year of implementation it represented.

Other complications developed from the fact that each district valued certain components of their innovation more than others. Also, not all of the variations in each component of the checklist were mutually exclusive and therefore in some components one or more variations would be marked, further complicating comparison across sites. In one district especially, expectations were not made clear and each school within that district had to determine what the priorities would be. Some of the study schools within that district focused on components of the innovation that were later decided by central office personnel not to be district priorities.

From all of these complications, a great deal was learned about Innovation Configuration checklist construction. At the time of designing an IC Component Checklist there is a clear need to know how the resultant data will be used. For example, if the checklist is to be used for cross-site or cross-innovation comparisons, it needs to be designed specifically to accommodate these types of analyses whereas if it is only to be used to help facilitators in a single site, it can be more descriptive and less standardized. For component checklists that are to be used for cross-site comparisons, it is essential that each component variation be mutually exclusive in order to prevent multiple ratings within a single component.

In future studies, if sites are to be ranked, there is a strong need to determine and express the criteria for success at the beginning of a change effort. It is important that critical components be identified at the beginning and that clear criteria for success for each component be articulated. Though the IC data analyses task was problematic, the overall conclusion of the group was that the Innovation Configuration concept is even more critical to understanding and facilitating successful implementation than they had initially realized. The innovation specific focus in combination with the articulation of criteria for each component make the IC data very sensitive in reflecting effects of interventions and local conditions.

Overall Implementation Success

A score for overall implementation success was derived for each of the nine study schools by summarizing the scores of each of the three criteria used to rank order the schools. The following overall scores were derived for the nine study schools using the criteria of Levels of Use, Stages of Concern and Innovation Configuration and are displayed by school ID number.

School	LoU Score	SoC Score	IC Score	Overall Score
11	48	68	49	165
12	58	29	47	134
13	37	61	53	151
24	26	34	47	107
25	12	22	41	75
26	82	60	53	195
37	63	75	14	152
38	51	25	23	99
39	73	73	33	179

Again, it is important to remember that the lower the score, the greater the implementation success as determined by criteria used in each rank ordering task. Therefore, school 25 was judged to have the greatest degree of overall implementation success and school 26 was judged to have the lowest degree of implementation success.

Several trends can be noted in this set of data. An obvious one is that year of implementation was not the determining predictor of implementation success. The top ranked school (25) and the bottom ranked school (26) were from the same district and in the first year of implementation. Also, neither the district nor the innovation is a controlling factor in determining implementation success, as the scores do not "clump" according to district. An additional point demonstrated by these analyses is that implementation success can be defined in terms of teacher and innovation use variables and that implementation success can be compared across sites involved with different innovations.

Correlating Implementation Success With Other Variables

Since this procedure places the various dimensions of implementation success on an interval scale, it becomes possible to easily correlate these rankings with other variables.

A Pearson Product Moment Correlation was used to determine the relationship between implementation success and numerous variables in the PTI study data set (see Hord, Huling & Stiegelbauer, 1983, for a description of the PTI data base). One important analysis explored the relationship of implementation success to principal Change Facilitator Style. Using other procedures the research staff assigned a score ranging from 0-100 to each principal based upon their Change Facilitator Style (see Hall and Rutherford, 1983, for a complete description of the procedure). A number of significant correlations were discovered. Variables which correlated most highly with each of the dimensions of implementation success and overall implementation success are shown in the tables that follow.

Table 1: Variables Correlating Most Highly With Levels of Use Implementation Success

	Correlation	Probability
Principal Style	.91	.001*
N of Incidents Targeted At Teachers in Groups (Targets 3B and 4B)	.76	.009*
N of Incidents Occurring in Location 1C	.58	.051*
N of Incidents Occurring in Function 3D	.55	.062

*indicates statistical significance

Table 2: Variables Correlating Most Highly With Stages of Concern Implementation Success

	Correlation	Probability
N of Incidents Occurring In Location 1C	.69	.019*
N of Incidents Occurring In Function 3D	.52	.074
Principal Style	.47	.103

*indicates statistical significance

Table 3: Variables Correlating Most Highly With Innovation Configuration Implementation Success

	Correlation	Probability
Principal Incidents Targeted At Teachers As Individuals	.79	.006*
Principal Incidents Occurring in Function 4A	.77	.007*
Incidents Occurring in Function 4C	.73	.013*
Incidents Occurring in Function 4A	.66	.028*
N of Principal + Second CF Incidents	.62	.037*
N of Principal Incidents	.61	.042*
Principal Incidents Occurring in Function 8	.60	.043*

*indicates statistical significance

Table 4: Variables Correlating Most Highly With Overall Implementation Success

	Correlation	Probability
Principal Style	.74	.011*
N of Incidents Occurring in Location 1C	.69	.019*
N of Incidents Occurring in Function 4C	.60	.043*
Principal Incidents Occurring in Location 1C	.57	.055*
N of Incidents Occurring in Function 3D	.55	.061

*indicates statistical significance

Discussion of Findings From First Use of the Procedure for Assessing Implementation Success

The preceding tables indicate those variables that were found to correlate most highly with the dimensions of implementation success. As was explained earlier, the lower the implementation success score, the greater the

success. Therefore, when the implementation success score is correlated with various change process variables, most of the significant correlations are negative (i.e. the more that happened, the greater the implementation success the lower the score for implementation success). In order to not confuse the reader unnecessarily, the negative sign has been removed from the correlations in the preceding tables. It is also important to note that correlations do not indicate cause and effect, only that there is a relationship between two variables. However in the data used here, there is a lot of detail known about the implementation process that unfolded in each school. A discussion and interpretation of the variables that correlated highly with each dimension of implementation success and overall implementation success will be made in the following subsections.

Levels of Use

The most significant correlation with Levels of Use as a criterion for implementation success (see Table 1) was principal Change Facilitator style. The principal CF style score was assigned by the research staff using a scale of 0-100 which represented the Responder-Manager-Initiator continuum (see Hall & Rutherford, 1983). This correlation indicates that the more that the study principals functioned as an Initiator, the higher the Levels of Use.

The second most significant correlation dealt with interventions being targeted at teachers in subgroups as opposed to teachers as individuals or as a whole staff. This correlation suggests that working with teachers in specialized subgroups was associated with higher Levels of Use. A significant correlation was also found with the number of incident interventions that occur in location 1C, implementation site--other. Many interventions occurred in locations such as the teacher's lounge, the resource center or the school library and it is hypothesized that these interventions account for the

correlation between Levels of Use implementation success and incidents occurring in location 1C. A high, but not statistically significant, correlation was found between Lou implementation success and the number of incidents occurring in function 3D, Consulting and Reinforcing -- information sharing. Theory and practice would agree that providing teachers with information is helpful; this analysis tends to support this position.

Stages of Concern

The only variable to correlate significantly with Stages of Concern as a dimension of implementation success (see Table 2) was the number of incidents occurring in location 1C, Implementation Site--other. Again, interventions that were coded as 1C for the location are those that occurred at the school in some place other than the office or in classrooms. These include interventions that occurred in the teacher's lounge, the resource center or the school library. Apparently in some more successful schools there were more interventions in some of these locations. High, but not significant correlations, were found between Stages of Concern implementation success and the number of incidents occurring in function 3D, Consulting and Reinforcing -- information sharing, and the principal's change facilitating style. Providing information seems to be important in theory and in practice for the arousal and resolution of Stages of Concern.

Innovation Configuration

The variable correlating most significantly with Innovation Configuration implementation success (see Table 3) was the number of principal incidents targeted at teachers as individuals, as opposed to teachers as groups or as a whole. Significant correlations were also found with the number of principal incidents occurring in function 4A, Monitoring and

Evaluating -- information gathering, and in function 8, Expressing and Responding to Concerns. Significant correlations were also found in the number of incidents (all sources) occurring in functions 4A, Monitoring and Evaluating -- information gathering, 4C, Monitoring and Evaluating -- reporting, the number of principal incident interventions and the number of principal plus second change facilitator incident interventions. Most of the correlations suggest relationships that make sense in theory and practice. In combination they suggest that close monitoring feedback and doing more interventions will help implementation of more acceptable configurations of an innovation.

Overall Implementation Success

Principal change facilitating style was the variable that correlated most significantly with overall implementation success (see Table 4). This was a key finding from the PTI study and further supports the hypothesis that principal change facilitator style is a viable concept and that the principal's change facilitator style does significantly influence the classroom practice of teachers (Hall & Rutherford, 1983). Other variables that correlated significantly were the number of incidents (all sources) and the number of principal incidents occurring in location 1C, Implementation Site--other.

The frequency with which Location 1C appears as a significant variable suggest that in future studies additional locations at the school site should be assigned specific location codes. Some of those sites in need of a specific code include the Teacher's Lounge, the Resource Center and the school library.

Another variable correlating significantly with overall implementation success was the number of incidents occurring in function 4C, Monitoring and

Evaluating -- reporting. A high, but not significant, correlation was found between overall implementation success and the number of incidents occurring in function 3D, Consulting and Reinforcing -- information sharing. Again, doing more interventions and monitoring with feedback seem to be important. However, the major finding continues to be the difference that the change facilitator style of the principal appears to make in influencing implementation success.

Summary

Viewing implementation success as a function of Levels of Use, Stages of Concern, and Innovation Configuration makes good conceptual sense in light of all that has been learned about the implementation process. In the past, it has been problematic to 1) agree on what is meant by the term "implementation success" and to find tools to assess implementation success, 2) compare implementation success across sites or across innovations, and 3) correlate implementation success with other change process variables.

The procedures described in this paper accomplish all three tasks. Further, it has been tested using actual data from the Principal-Teacher Interaction Study. The various dimensions of implementation success and overall implementation success can be rated on an interval scale and thus can be correlated with other change process variables. When applied to actual data, the correlations reveal meaningful relationships.

The procedure is practical, manageable and cost-efficient. For these reasons, the procedure promises to be a useful technique for the future study of school improvement.

Appendix A

The Three Diagnostic Dimensions of the Concerns Based Adoption Model

The CBAM is based on several assumptions about change. First, change is not an event, but a complex process requiring a considerable investment of time and energy. Second, each individual experiences change in a different way, at a different rate, and with a different intensity. Third, there are basic characteristics of the change process that apply to both process and product innovations. These involve individual growth in two dimensions: the concerns the individual has about the change and how he or she uses the program, product, or idea (i.e. innovation) being implemented. An additional assumption is that when those responsible for facilitating change (principals, deans, staff developers) have information about where individuals are in the process, they are better able to provide appropriate aid and support to each individual as he or she needs it. The model includes three diagnostic dimensions, Stages of Concern, Levels of Use and Innovation Configuration, each of which addresses a key vector of how individuals are progressing relative to implementation of a particular innovation.

Stages of Concern

One major dimension of the CBAM focuses on the "concerns" of individuals as they are involved in change. This dimension, Stages of Concern About the Innovation (SoC) (See Figure 2), describes seven kinds of concerns that individuals experience with varying intensities as they experience the change process. These range from early concerns about "self," to concerns about "task," and finally to concerns about "impact." A reliable and valid instrument for measuring Stages of Concern, the SoC Questionnaire, as well as methods for interpreting the measures, (Hall, George & Rutherford, 1977), have

Figure 2

STAGES OF CONCERN ABOUT THE INNOVATION*

	STAGES OF CONCERN	DEFINITIONS
IMPACT	6 REFOCUSING	The focus is on exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of the innovation.
IMPACT	5 COLLABORATION	The focus is on coordination and cooperation with others regarding use of the innovation.
IMPACT	4 CONSEQUENCE	Attention focuses on impact of the innovation on student in his/her immediate sphere of influence. The focus is on relevance of the innovation for students, evaluation of student outcomes, including performance and competencies, and changes needed to increase student outcomes.
TASK	3 MANAGEMENT	Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.
SELF	2 PERSONAL	Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision making, and consideration of potential conflicts with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.
SELF	1 INFORMATIONAL	A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner such as general characteristics, effects, and requirements for use.
SELF	0 AWARENESS	Little concern about or involvement with the innovation is indicated.

Hall, G. E., George, A. A. & Rutherford, W. L. Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire. Austin Research and Development Center for Teacher Education, The University of Texas, 1977.

been developed and applied in a number of cross-sectional and longitudinal studies (Hall, 1976; Hall & Rutherford, 1976; Loucks, 1977; Huling, 1981).

The SoCQ consists of 35-items which the respondents rate by using an eight point Likert scale. There are five items representing each of the seven Stages of Concern. Estimates of internal reliability (alpha coefficients) range from .64 to .83. Test-retest correlations range from .65 to .86. Percentile tables have been established for converting the raw scale scores and interpretation procedures have been developed for both quantitative and qualitative analyses. The most useful interpretations are derived from analysis of the profiles that are made from displaying the percentile values for each scale on a grid. The various analysis and interpretation procedures can be applied to individual and group data.

A further strength of the SoCQ is that the questionnaire items are written so that they can be applied to any educational innovation. The items remain the same, thereby preserving the factor structure. The only change that is required for different applications is to change the name of the innovation on the cover page.

Levels of Use

The second diagnostic dimension of the CBAM, Levels of Use of the Innovation (LoU) (See Figure 3), describes how performance changes as the individual becomes more familiar with an innovation and more skillful at using it. The Stages of Concern dimension focuses on perceptions of feelings about the innovation. Levels of Use focuses on whether or not the teacher is using an innovation. Eight distinct Levels of Use have been identified (Hall, Loucks, Rutherford & Newlove, 1975). Typically an individual begins with LoU 0 "nonuse" of the innovation, then moves to LoU I "orientation" about the innovation and LoU II "preparation" for use. Initial use is usually at LoU

Figure 3

LEVELS OF USE OF THE INNOVATION

LEVELS OF USE	DEFINITION OF USE
0 NONUSE	STATE IN WHICH THE USER HAS LITTLE OR NO KNOWLEDGE OF THE INNOVATION, NO INVOLVEMENT WITH THE INNOVATION, AND IS DOING NOTHING TOWARD BECOMING INVOLVED.
Decision Point A	Takes action to learn more detailed information about the innovation.
I ORIENTATION	STATE IN WHICH THE USER HAS RECENTLY ACQUIRED OR IS ACQUIRING INFORMATION ABOUT THE INNOVATION AND/OR HAS RECENTLY EXPLORED OR IS EXPLORING ITS VALUE ORIENTATION AND ITS DEMANDS UPON USER AND USER SYSTEM.
Decision Point B	Makes a decision to use the innovation by establishing a time to begin.
II PREPARATION	STATE IN WHICH THE USER IS PREPARING FOR FIRST USE OF THE INNOVATION.
Decision Point C	Changes, if any, and use are dominated by user needs.
III MECHANICAL USE	STATE IN WHICH THE USER FOCUSES MOST EFFORT ON THE SHORT-TERM, DAY-TO-DAY USE OF THE INNOVATION WITH LITTLE TIME FOR REFLECTION. CHANGES IN USE ARE MADE MORE TO MEET USER NEEDS THAN CLIENT NEEDS. THE USER IS PRIMARILY ENGAGED IN A STEPWISE ATTEMPT TO MASTER THE TASKS REQUIRED TO USE THE INNOVATION, OFTEN RESULTING IN DISJOINTED AND SUPERFICIAL USE.
Decision Point D-1	A routine pattern of use is established.
IVA ROUTINE	USE OF THE INNOVATION IS STABILIZED. FEW, IF ANY, CHANGES ARE BEING MADE IN ONGOING USE. LITTLE PREPARATION OR THOUGHT IS BEING GIVEN TO IMPROVING INNOVATION USE OR ITS CONSEQUENCES.
Decision Point D-2	Changes use of the innovation based on formal or informal evaluation in order to increase client outcomes.
IVB REFINEMENT	STATE IN WHICH THE USER VARIES THE USE OF THE INNOVATION TO INCREASE THE IMPACT ON CLIENTS WITHIN THE IMMEDIATE SPHERE OF INFLUENCE. VARIATIONS ARE BASED ON KNOWLEDGE OF BOTH SHORT- AND LONG-TERM CONSEQUENCES FOR CLIENTS.
Decision Point E	Initiates changes in use of innovation based on input of and in coordination with what colleagues are doing.
V INTEGRATION	STATE IN WHICH THE USER IS COMBINING OWN EFFORTS TO USE THE INNOVATION WITH RELATED ACTIVITIES OF COLLEAGUES TO ACHIEVE A COLLECTIVE IMPACT ON CLIENTS WITHIN THEIR COMMON SPHERE OF INFLUENCE.
Decision Point F	Begins exploring alternatives to or major modifications of the innovation presently in use.
VI RENEWAL	STATE IN WHICH THE USER REEVALUATES THE QUALITY OF USE OF THE INNOVATION, SEEKS MAJOR MODIFICATIONS OF OR ALTERNATIVES TO PRESENT INNOVATION TO ACHIEVE INCREASED IMPACT ON CLIENTS, EXAMINES NEW DEVELOPMENTS IN THE FIELD, AND EXPLORES NEW GOALS FOR SELF AND THE SYSTEM.

From: The LoU Chart. Austin: Research and Development Center for Teacher Education, The University of Texas, 1975.

III "mechanical," but as experience increases, innovation users move to a LoU IVA "routine" level of use and eventually may reach various "refinement" levels (LoU IVB - VI), where changes are made based on formal or informal assessments of student needs. A focused interview procedure has been developed to measure Levels of Use (Loucks, Newlove & Hall, 1976) and has been used in a number of research and evaluation studies (Hall & Loucks, 1977a; Hall & Loucks, 1977b; Loucks, 1976).

The LoU interview takes fifteen to thirty minutes and is generic in design, as is the SoCQ, so that it can be applied to different innovations with no change in the basic interviewing process. When conducted by trained and certified LoU interviewers the interview process appears to the interviewee as an interested and comfortable conversation about what they are doing or not doing with the innovation. The interviewer uses the LoU concept and operational definitions along with a set of decision points to conduct a focused interview that branches in varying ways as more is learned about what the interviewee is doing. These interviews are tape recorded, so as to be available for further analyses. The interviewee is rated as performing at one of the Levels of Use. The individuals rated can be displayed in a table that reflects the number of persons that were identified at each LoU.

Training procedures and a series of steps that lead to certification as a valid and reliable LoU interviewer have been established by R&D Center staff. Inter-rater reliabilities typically range from .87 to .96 and 66 percent agreements between the first two raters is commonly observed.

Innovation Configurations

The third diagnostic dimension of the CBAM that is important in understanding and describing the change process is Innovation Configurations (IC) (Hall & Loucks, 1978; 1981). This concept is used to describe the

various operational forms of an innovation that result as users adapt it for use in their particular situations. With this concept, the major operational components of an innovation are identified and the ways that each of the components can vary are described. These descriptions are summarized on an Innovation Configuration Components Checklist. The IC Component Checklist is innovation specific and can be used to record in what ways each potential user is using the various parts of the innovation.

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