

THE EFFECTIVENESS OF CONCERNS BASED STAFF DEVELOPMENT IN
FACILITATING CURRICULUM IMPLEMENTATION:

CASE STUDY OF

THE IMPLEMENTATION OF THE K-6 MANITOBA PROVINCIAL SCIENCE
CURRICULUM IN BERENS RIVER SCHOOL OF THE
FRONTIER SCHOOL DIVISION NO. 48

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SCHOOL DIVISION NO. 48

BY

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CHAPTER I

THE SEARCH FOR PRACTICAL SOLUTIONS

Introduction

One conclusion stands out clearly; many of the changes we have believed to be taking place in schooling have not been getting into classrooms; changes widely recommended for schools over the past fifteen years were blunted on the school and classroom door.

(Goodlad and Klein, 1970:97)

What Goodlad and Klein observed to be the blunting of change or the lack of congruence between the intended and actual outcomes of curricular innovation has been the focus of a great deal of recent study. ~~A variety of studies on this phenomenon of unintended or~~ unexpected curricular outcomes has resulted in the isolation of at least four accountable factors:

1. The conceptualization of change as an act rather than a process. This conceptualization assumes that change is essentially non-developmental in nature, and therefore, can be accomplished by edict (Hall and Loucks, 1979:37);

2. The inadequate attention paid to staff concerns relative to the innovation and staff development during curriculum implementation. On-going, focused, people-based support during implementation has been identified as critical to successful implementation (Berman and McLaughlin 1978: Vol. 8, 34, Fullan and Pomfret 1976:82; Leithwood et

al., 1979:53; Goodlad, 1975:167, 177-184)

3. The lack of recognition of the importance and effect of the ecology of the school in implementation (Berman and McLaughlin, 1978: Vol. 8, 34; Fullan and Pomfret 1976:68-73; Leithwood et al., 1979:56-60; Goodlad, 1975:45, 71) and,

4. The lack of clarity of the nature, scope and expectations of the innovation (Berman and McLaughlin, 1978:Vol. 8, 34, Fullan and Pomfret 1976:68-73; Leithwood et al., 1979:56-60; Goodlad, 1975:45, 71).

Without exception the factors identified were evidenced during the implementation phase of the various curriculum projects studied and were seen as responsible for unexpected project outcomes.

One promising response to this problem of unexpected curricular outcomes, which addresses each of the factors identified as having a significant impact upon effective implementation, is the Concerns Based Adoption Model (CBAM). ~~Briefly, the Concerns Based Adoption Model is a~~ change model which evolved from research conducted at the Research and Development Center for Teacher Education of the University of Texas at Austin. The CBAM represents the complex process entailed when individuals in educational institutions become involved in implementing innovations. The CBAM is a theoretical framework which links the activities of three subsystems--a resource system, a user system, and a change facilitator system--in the diagnosis of user concerns about an innovation, typical behaviours of individual users of the innovation, and an accurate description of the innovation being implemented. This diagnosis of user concerns, user behaviours, and the characteristics of the innovation provides the basis for the design of targeted or focused

staff development as the means of facilitating curriculum implementation.

The Research Problems and Data Questions

Research Problems

Generally, the purpose of this study was to field test aspects of the Concerns Based Adoption Model in a Manitoba school setting. More specifically, the concepts of the Concerns Based Adoption Model were used to analyze the curriculum implementation process and to synthesize the findings into a support structure and system for curriculum implementation. The study involved the implementation of the Manitoba Provincial K-6 Science Curriculum in Berens River School of the Frontier School Division and was concerned with the analysis of the curriculum implementation process as education innovation, the design and execution of staff development interventions in support of the implementation, and the assessment of the effectiveness of these interventions in the context of the theoretical framework of the Concerns Based Adoption Model. The research study was focused by a consideration of the following problems:

1. Can the Concerns Based Adoption Model:
 - a) facilitate the diagnosis of problems which affect successful curriculum implementation; and,
 - b) facilitate the prescription and execution of staff development interventions to address the problems?
2. Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of the curriculum implementation?

3. Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of staff development interventions in support of curriculum implementation?

4. What understanding of the curriculum implementation process does the Concerns Based Adoption Model highlight and what are the implications of the model for current practice.

In order to develop the focus it was first necessary to identify and discuss the dynamics or variables affecting curriculum implementation. Secondly, it was necessary to discuss these variables in the context of the Concerns Based Adoption Model as the framework for the research. (These discussions take place in Chapters II and III respectively.)

And lastly it was necessary to create specific research questions which would promote the generation of the quantifiable data needed to discuss the research considerations and sharpen the research focus.

Research Data Questions

The specific research questions which facilitated the collection and analysis of data relevant to the focus of the study were:

1. Did teacher concerns regarding the implementation of the Provincial K-6 Science Curriculum change during the course of study?
2. Did teacher quality of use of the Provincial K-6 Science Curriculum change during the course of study?
3. Did the nature of the adaptations made to the Provincial K-6 Science Curriculum by teachers change during the course of the study?

Significance of the Research Problems

The significance of the research problems lies in the difficulties and problems related to curriculum implementation. The outcomes of curriculum innovation are a product of the interplay among the dynamics or variables within the curriculum implementation process. There is a need to experiment with these variables to further discover and explain a means of influencing the process and the outcomes of curriculum innovation. The Concerns Based Adoption Model analyzes these variables in a systematic manner and may provide the means by which the implementation process can be influenced.

Setting

The study was conducted at Berens River School in Berens River, Manitoba. Berens River School is an isolated northern school within the Frontier School Division. The study population consisted of twelve K-6 Science Teachers. ~~The student population was Native Canadian with~~ ~~Saulteaux~~ as a first language and English as a second language. The student population was approximately 285 at the Kindergarten to Grade 6 levels.

The Innovation

For the purposes of this study any curricular innovation would have been acceptable. Since the Frontier School Division had recently adopted four new elementary school curricula for implementation, any

one of the mathematics, science, social studies or health and guidance curricula could have been selected.

Science instruction had been identified by the principal and staff as a "weakness". It was unknown at the beginning of the project by either the principal or staff what variety of science programs existed in the school. The principal and staff expressed a desire to put science instruction "in order" in accordance with the Manitoba Provincial K-6 Science Curriculum Guidelines. The innovation for implementation became the Manitoba Provincial K-6 Science Curriculum.

Methodology

Design

The study utilized a pre-intervention, intervention, post-intervention design in which data were collected, analyzed and interpreted at the pre and post intervention phases of the design with specific reference to the research data questions. The variations in the data collected at each phase provided the basis for a discussion of the research problems. The data collection instruments and analysis techniques were strictly and uniformly applied.

Data Collection

Several methods of data collection were employed at each of the pre-intervention and post-intervention phases of the study in specific reference to the research questions. Two teacher questionnaires were used to collect data describing the concerns of teachers relative to the implementation of the K-6 Science Curriculum. In addition two

teacher interviews were conducted. One interview was used to collect data on the quality of use of the Provincial K-6 Science Curriculum by the teachers and the second interview focused upon describing the adaptations the teachers had made to the K-6 Science Curriculum.

The stages of the Concern Questionnaire (Appendix A) and the Open Ended Stages of Concern Questionnaire (Appendix B) were used to collect teacher concern data. The Levels of Use Interview (Appendix C) was used to collect data on the quality of teacher use of the science curriculum while the Innovation Configuration Interview (Appendix D) was utilized to identify the adaptations the science curriculum underwent during implementation.

Data Analysis

The purposes of the data collection were two fold. Firstly to establish a pre-intervention phase bench mark against which any change in teacher concerns, quality of program use, and adaptation of program could be measured during the post-intervention phase. Secondly, to provide the diagnostic information required to plan and deliver teacher in-service training in support of the implementation of the curriculum innovation.

The data were treated statistically as well as descriptively. Statistical treatment of the Stages of Concern Questionnaire data consisted of a comparison of individual and aggregated teacher response to an established norm and the presentation of the comparison on a SoC graph (Appendix G). Statistical treatment of the Levels of Use and Innovation Configuration data consisted of frequency of response tabulations. Cross tabulations of frequency of response for the Stages of Concern Questionnaire, the Levels of Use and Innovation

Configuration interview were also utilized. Non-statistical treatment of data generated through instrument utilization consisted of identifying general trends in teacher response which could be generalized to the study group or sub group. These data were interpreted in the context of the theoretical framework of the Concerns Based Adoption Model in order to identify particular in-service needs of teachers, and design and deliver in-service training interventions for the purpose of influencing the curriculum implementation process.

Data were collected and analyzed at five intervals throughout the study resulting in a substantial data base which described the scope and nature of teacher and programmatic changes taking place during the innovation implementation process. The frequency of data collection and analysis also allowed for the notation of specific impact of particular interventions into the implementation process.

Delimitations

The study was intensive and limited to one curriculum implementation effort in a single school involving twelve (12) teachers and one principal. The study was delimited primarily by the following variables affecting curriculum implementation: teacher concerns regarding the innovation, quality of teacher use of the innovation, adaptations of the innovation during implementation and the environment in which the innovation takes place.

Limitations

Since the study focused upon a small number of teachers in one school setting, the following limitations apply:

1. The findings of the study may not be representative of curriculum implementation efforts in urban school settings;
2. The findings of the study are specific to small elementary schools and may not be generalizable to implementations efforts in larger elementary school settings; and,
3. The findings of the study are specific to an implementation effort in a K-6 elementary school and may not be applicable to similar efforts in junior or senior high schools.

Organization

This thesis is organized into Seven Chapters.

Chapter One has presented an introduction to the study comprised of a brief discussion of the phenomenon of unexpected outcomes evidenced during curriculum implementation, a statement of research problems and specific research data questions, a description of the setting of the study, a description of the innovation selected for the study, the methodology of the study, the delimitations and limitations of the study, and the organization of the study.

Chapter Two constitutes a review of selected literature on educational innovation with a focus upon the variables or dynamics of the innovation process.

Chapter Three discusses the dynamics or variables of the innovation process in the context of the Concerns Based Adoption Model and presents the theoretical and methodological framework of the study.

Chapter Four constitutes a presentation of the methodology of the study.

Chapter Five presents the research data and findings.

Chapter Six constitutes a discussion of the research data, conclusions and implications. It is in the context of the research data that the specific activities undertaken during the action or intervention phase of the study are highlighted. The research conclusions are then presented. The chapter concludes with a presentation of the implications of the study findings for present practice and future research into the curriculum implementation process.

Chapter Seven represents a summary and review of the study in which the research data questions and research problems are highlighted against the conclusions drawn for the study.

Chapter II

CURRICULUM INNOVATION: A PROBLEM OF IMPLEMENTATION

Introduction

The black box of curricular innovation (Fullan and Pomfret, 1976:3) is just being pried open. Little has been known about what happened in the user system during curriculum implementation; that magic process which took place between the stages of curriculum adoption and institutionalization (Berman and McLaughlin, 1974:8-11). It was with a great deal of surprise that program evaluators began to look behind the classroom door to see how curricular innovations were being realized (Goodlad, 1975:71). ~~What was commonly found to exist~~ was not one innovation but a multitude of variations on an innovation each of which displayed distinctive end products. These variations or "non events" (Hunt, 1978:240) represented the lack of congruence between curricular intentions and curricular outcomes which occurred during the process of implementation.

What is invariably required during the implementation phase of curricular innovation is a change in the individual responsible for operationalizing the innovation (Sarason, 1971:3). Either a role is redefined or a new skill or knowledge is required. McNergney (1980:235), building on Lewin's work, characterized this process of

innovation in behavioural terms as a reflection of the interaction between the person, the environment of the change and the nature of the change. McNergney's formula $B=f(P) (E) (T)$ may be expressed as: Behaviour characteristically exhibited by individuals involved in change is a function of the interaction of the characteristics of these people, the characteristics of the environment in which the change takes place and the nature of the change as expressed in expectations or tasks.

The purpose of this chapter is to discuss the relationship of the variables or dynamics of change in the context of the formula $B=f(P) (E) (T)$, and how the interplay of these variables during the curriculum implementation process generates problematic circumstances which nurture unintended, unexpected and often inexplicable implementation outcomes.

The Variables Influencing Curriculum Implementation

People

The discussion as to whether andragogy is sufficiently different from pedagogy to warrant a field of study of its own has brought to staff developers, curriculum developers, and change agents the awareness that adults do bring some special characteristics to the learning situation. Knowles, in Bents and Howey (1981:33) has identified the following characteristics of adult learning.

1. Adults are motivated to learn as they experience needs and interests that learning will satisfy; therefore, these needs and interests are appropriate starting points for organizing adult learning activities;

2. Adult orientation to learning is life-centered; therefore, the appropriate units for organizing adult learning are life situations, not subjects;
3. Experience is the richest resource for adult learning; therefore, the core methodology of adult education is the analysis of experience;
4. Adults have a deep need to be self-directing; therefore, the role of the teacher is to engage them in a process of mutual inquiry rather than to transmit knowledge to them and then evaluate their conformity to it; and,
5. Individual differences among people increase with age; therefore, adult education must make optimal provision for differences in style, time, place, and pace of learning. (Bents and Howey, 1981:33)

In addition to the rather generalized characteristics shared by the majority of adult learners, there are characteristics of human development which adults bring to learning. Generally, the various conceptualizations of human development can be grouped into two categories; the developmental age theories and the developmental stage theories. The developmental age theories "identify age as the major variable in the search for characteristics associated with particular periods in the lives of adults", (Bents and Howey, 1981:27). The developmental stage theorists look for invariant sequences in individual development whether it be in the areas of moral, ego, conceptual systems, intellectual or ethical development (Willie and Howie, 1980:29).

The age/stage theories present human development in general terms with little reference to context; i.e., an individual at a specific

developmental age or stage has entered a state of being in which he remains or is capable of remaining regardless of his context. Although the age/stage theories help in explaining the variety of characteristics adults may bring to any given situation, they shed no light on the characteristics exhibited by adults as a result of their interaction with a specific context.

A sub category of developmental stage theory which is emerging (Bents and Howey, 1981:29) emphasizes an individual's development in relation to a specific context; thereby suggesting, that although an individual may be at a specific life age or life stage, his reaction to or interaction with an innovation cannot be satisfactorily described in these terms alone. Hall, Wallace, Dossett (1973) found that individual interaction with an innovation is developmental in nature and is related to the concerns that individuals have regarding the innovation.

In summary, individuals involved in innovation exhibit a variety of characteristic needs. They bring particularly adult learning characteristics and specific age/stage characteristics to the innovative context, as well as exhibiting developmental characteristics which are specific to an individual involved in the change process.

Environment

Goodlad concluded that schools did not have in place the means or processes by which teachers "might have some reasonable prospect of self-renewal", (Goodlad, 1975:71); that individuals in schools could not satisfy their higher level needs in the educational setting. This is consistent with the Rand findings that the longer the teacher had taught the less likely the innovation was to be implemented and have

its desired effects (Berman and McLaughlin, 1978:32). This phenomena was explained in terms of the individual's perception of the work place and his sense of efficacy in it. The work place generally did not allow individuals to satisfy more than low level needs. Fullan and Pomfret concluded that an environment which did not promote "people based support" was not conducive to implementation (Fullan and Pomfret, 1976:82). In the context of classroom as user system Leithwood et al. (1979:54) emphasized the maintenance of an environment in which the teacher sustained self-esteem. Joyce and McKibbin (1980-253) stressed the need to provide developmental environments attuned to the teachers' psychological states.

Environmental factors such as time, space, resources, etc., can be readily manipulated if economic and political forces are in place, but other environmental factors related to school climate and culture are not as easily influenced (Fullan and Pomfret, 1976:82). The heuristic, ~~adaptive and social~~ nature of change (McLaughlin and Marsh, 1979:88) exists in a human environment. Although an innovation may be directed at individuals, those individuals cannot be plucked from the environment of the change, viewed in isolation, then re-introduced to the environment; particularly, if the innovation is to result in some organizational adaptation in role definition, behaviour or relationship (Schiffer, 1979:10). It may also be the case that other role players indirectly affected by the innovation within the environment have a significant impact upon the quality of the environment of change as a result of the peculiarity and influence of their roles (Leithwood et

al., 1979:55)

In summary, the environment of change is one variable which has a dual nature. The physical aspects of the environment may be readily manipulated; whereas, those aspects of the environment which are manifestations of human interaction are more difficult to influence and generally more significant.

Task

Major implementation studies concur that the specific nature of the innovation must be clear: the expectations must be clearly set and the tasks clearly identified. The innovation must be understood by the user system (Bennis, 1969:77). Fullan and Pomfret (1976:50) identified several elements of the innovation which require clarity. The operational characteristics, the goals to be achieved, the specific functions and tasks to be performed and the complexity of the innovation must be understood.

The lack of explicitness in defining the nature of the innovation to be implemented has contributed to the failure of many innovative projects (Sarason, 1971:3). Gros et al. (Fullan and Pomfret, 1976:48) pointed out that the majority of teachers in their case study could not identify the essential features of the innovation they were using. Clarity is not enough; the innovation and its elements must be understood and then deemed as having value in the context of the user system (Leithwood et al., 1979:52; Hall 1979).

The more complex the innovation; i.e., the "deeper" (Shein, 1969:98) the changes required of conventional behaviour, the greater

the variation in the innovation from user to user (Fullan and Pomfret, 1976:50). Leithwood, Holmes and Montgomery (1979:51-63) in their study of education innovations in Ontario schools noted this variation in the complexity of innovations and concluded that deeper changes which concentrated upon altering roles, relationships, attitudes and their concomitant behaviours required greater definition and concentrated implementation effort than did the shallow changes. Although Fullan and Pomfret (1976:51) suggested that the complexity of the innovation had a negative effect upon implementation unless accompanied by specific intervention strategies, the Rand studies concluded that the more complex the change required the less confused with conventional behaviour it became; and therefore, had a slightly positive effect upon implementation (Berman and McLaughlin, 1978:25). Berman and McLaughlin (1978:25) also noted that deeper change requirements seemed to draw upon the professional pride of teachers again with a positive effect upon the implementation. ~~Clarity of innovation is particularly~~ important for complex innovations, with this clarity often emerging throughout implementation (Berman and McLaughlin, 1978:26).

In summary, the clarity of the innovation has a directly proportionate positive effect upon implementation. This clarity, however, doesn't often emerge until implementation is well under way; i.e., as is typical of the change process, the clarity of the innovation evolves as a result of the application of the innovation by specific people in a specific context. The value, goals, operational characteristics, functions, tasks, and the complexity of the innovation must be clear to the user population.

Behaviour

Although the behavioural outcomes; i.e., the expected change in role, relationship, interaction, etc., as expressed in the tasks of change may be specified, they will not be evidenced in the user until implementation is well underway. These tasks of change or expectations stated in behavioural terms should not be confused with the behaviours that people exhibit while in the throes of innovation. What kinds of behaviours are characteristic of the individual in change?

The typical characteristics of people at various stages or ages of life and the rather general characteristics that adults bring to a learning situation may explain how adults might act on a day to day basis, but shed no light on behaviour specifically in relation to change.

Glasser (1965:13) contended that human behaviour resulted from the ability or inability to satisfy needs. Selye (1979) saw this ~~ability or inability to satisfy needs as the non-specific stress which~~ influenced a compensatory behaviour which Clark (1969:283) characterized as either reactive or proactive in nature. Maslow (1954:97-105) characterized human needs in a developmental hierarchy. An individual's action or reaction in relation to innovation may be said to be affected by the level of need the innovation arouses.

Lewin characterized the process of change as one of unfreezing, changing, refreezing (Schien 1969:98) in which the individual moves from a state of equilibrium to disequilibrium to equilibrium as he strives to satisfy needs in reaction to the situation. Becker

(1969:259) saw this stability resulting from situational adjustment; a conscious activity on the part of the individual to adjust to the situation.

Frances Fuller identified specific concerns pre-service teachers had in relation to the professional situation. She noted three stages of concern which seemed to be hierarchical and developmental in nature (George, 1978:1-5). She also noted that certain types of behaviour accompanied each stage of concern. A teacher preoccupied with concerns of a particular stage exhibited characteristic behaviours. As the concerns at one stage became satisfied and the concerns of another stage came to the fore characteristic behaviours changed.

Hall, Wallace, Dossett (1973) explored the relationship between concerns about an innovation and the behaviours exhibited during use of the innovation. They expanded Fuller's original three stages of concern into seven hierarchical, developmental stages of concern about the innovation. The characteristic behaviours Fuller observed in pre-service teachers at various stages of training were expanded into eight hierarchical developmental levels of use of the innovation.

In summary, although it is useful to be cognizant of predispositions and behaviours that individuals of a particular age or stage of life may bring to an innovative situation, this knowledge in itself sheds no light on the process of change. An identification of the particular needs or concerns that individuals have in relation to an innovation is useful in that a direct relationship has been established between needs and behaviour. The identification of specific individual needs or concerns relative to an innovation and behaviours concomitant with these concerns, although not explaining

why change occurs, helps describe the process and facilitate an understanding of it.

Facilitating Curriculum Implementation: A Summary of Chapter II

The nature of curricular innovation as represented in the statement $B=f(P) (E) (T)$ in which the behaviours of people involved with change is a function of the interplay among personal, environmental, and innovation characteristics, suggests that the process of implementation may be affected through an adjustment to any one or more of the statement variables. Environmental factors such as time, space, resources, etc., can be mandated. The determination of the specifics of the innovation in terms of expectations or tasks also can be readily achieved (Heck et al., 1981). It is the interface between the individual with his characteristics and a particular set of tasks in a specific human environment which requires special attention. It is perhaps this central importance of the people involved in curriculum innovation that has resulted in much of the implementation facilitation effort being directed toward the individual (Tyler, 1971:13).

Implementation can be facilitated through intervention guided by careful consideration of the variables influencing Curriculum Implementation. In review these variables are:

1. The human behaviours exhibited during the change process (B);
2. The variety of human characteristics brought to the change process (P);

3. The environment within which the innovation implementation occurs (E);
4. The clarity and complexity of the innovation being implemented (T).

CHAPTER III

THE CONCERNS BASED ADOPTION MODEL: THEORETICAL

FRAMEWORK FOR THE STUDY

Introduction

As mentioned earlier, the Concerns Base Adoption Model constitutes one particular means of analyzing the interplay of the variables affecting curriculum implementation. The Model can be viewed in the context of the general framework of curricular innovation as represented in the formula $B=f(P) (E) (T)$. The purpose of this chapter is to identify, explain and analyze the various related concepts of the Concerns Based Adoption Model as the theoretical framework for this study.

The chapter begins with the presentation and discussion of a set of assumptions regarding the change process which evolve from the analysis of the variables of curriculum implementation in Chapter II. An overview of the concerns Based Adoption Model is then represented in which these assumptions are translated into the operational concepts of the model. Finally, the model is presented in specific reference to this study.

Since the Concerns Based Adoption Model has a rather specialized vocabulary, the glossary of terms may be of assistance to the reader.

Assumptive Basis of CBAM

The discussion of the variables of curriculum implementation in Chapter II revealed the sources of the difficulties encountered by practitioners during the implementation of curriculum. The difficulties center around the incongruence of expected and actual implementation outcomes. This incongruence can be viewed as a natural outcome of the interplay of the dynamics or variables of curriculum implementation. If the outcomes of curriculum implementation are to be foreseen, even predicted, then the activities in support of the implementation must be designed to influence the interplay of these variables.

From the discussion of the variables of curriculum implementation in Chapter II, several conclusions emerged which must colour the assumptions adopted regarding the influencing of the change process. In summary, these conclusions were:

1. Individuals involved in innovation exhibit a variety of characteristics. They bring adult learning characteristics and specific age/stage characteristics to the innovative context, as well as exhibiting developmental characteristics which are specific to an individual involved in the change process.
2. An identification of the particular needs or concerns that individuals have in relation to an innovation is useful in that a direct relationship has been established between needs and behaviour. The identification of specific individual needs or concerns relative to an innovation and behaviours concomitant with these concerns, although not explaining why change occurs, helps describe the process.
3. The environment of change is one variable which has a dual nature. The physical aspects of the environment may be readily manipulated; whereas, those aspects of the environment which are manifestations of human interaction are more difficult to influence and generally more significant.

4. The clarity of the innovation has a directly proportionate positive effect upon implementation. This clarity, however, doesn't often emerge until implementation is well under way. As is typical of the change process, the clarity of the innovation evolves as a result of the application of the innovation by specific people in a specific context. The value, goals, operational characteristics, functions, tasks, and the complexity of the innovation must be clear to the user population.

Given these conclusions a set of basic principles evolves which underpin any array of activities designed to influence the outcomes of the change process. The principles are pertinent to the attitudes and behaviours of the individual involved in change, the environment and the nature of change. They describe the scope of the interplay among the variables of change rather than prescribe or restrict it. They are:

1. Change is a process not an event. It entails growth along a differentiated continuum.
2. Change is a personal experience and as such the individual should be the focal point of the change process.
3. Clarity of innovations is a key variable in the implementation process.
4. Change although an individual and personal experience, takes place in a social environment.

The assumptive basis of the Concerns Based Adoption Model is in tune with the conclusions and principles drawn from the change literature and represents the expansion of these conclusions and principles into the basis of a theoretical model for change facilitation. These assumptions are:

1. Change is a process occurring over time that is achieved incrementally and developmentally. It is not an event occurring at a single point in time (Heck and Goldstein, 1980:10).
2. The change process is not an undifferentiated continuum. Individuals involved in change go through stages in their perceptions, and feelings about the innovation, as well as their skill and sophistication in using the innovation (Hall and Loucks, 1979:38).
3. Change is a highly personal experience. The personal dimension of change is often more critical to the success or failure of the change process than either the organizational or technological dimensions (Heck and Goldstein, 1980:10). Since change is brought about by individuals, their personal satisfactions, frustrations, concerns, motivations and perceptions generally all play a part in determining the success or failure of a change initiative (Hall, 1978:4).
4. The individual is the focal point in the change process. Other approaches to change, (e.g., organizational development) view the composite institution as the primary unit of intervention, and place their emphasis upon improving communication, and other organizational norms and behaviours. CBAM rests on the conviction that institutions cannot change until the individuals within them change (Hall and Loucks, 1979:38).
5. It is possible to acquire reliable and valid information about individual behaviours and concerns relative to an innovation (Heck and Goldstein, 1980:10).
6. It is possible to facilitate the change process by means of interventions targeted to the concerns and behaviours of individuals involved in the process. (Heck and Goldstein, 1980:10).
7. The change (innovation) is appropriate. Not all innovations are positive; an innovation that might be positive in one context may have a negative consequence in another context. Underlying the CBAM is the assumption that in a particular context the innovation

that is being introduced is one that is judged to be positive and have potential for positive outcomes with the users and their clients (Bents and Howey, 1981:31).

8. The staff developers and other change facilitators need to work in an adaptive yet systemic way. They need to stay in constant touch with the progress of individuals within the larger context of the total organization that is supporting the change (Hall and Loucks, 1979:39).
9. In-service teacher training (staff development) can be best facilitated for the individual by use of a client-centered diagnostic/prescriptive model. To deliver relevant and supportive in-service teacher training, change facilitators need to diagnose where their clients are in the change process and target their interventions toward the diagnosed needs (Hall, 1978:4).
10. Full description of the innovation in operation is a key variable. All too often it appears that innovation developers have not clearly or fully developed operational definitions of their innovation. . .There must be a full description of what the innovation entails when it is fully in use (Hall, 1978:4).

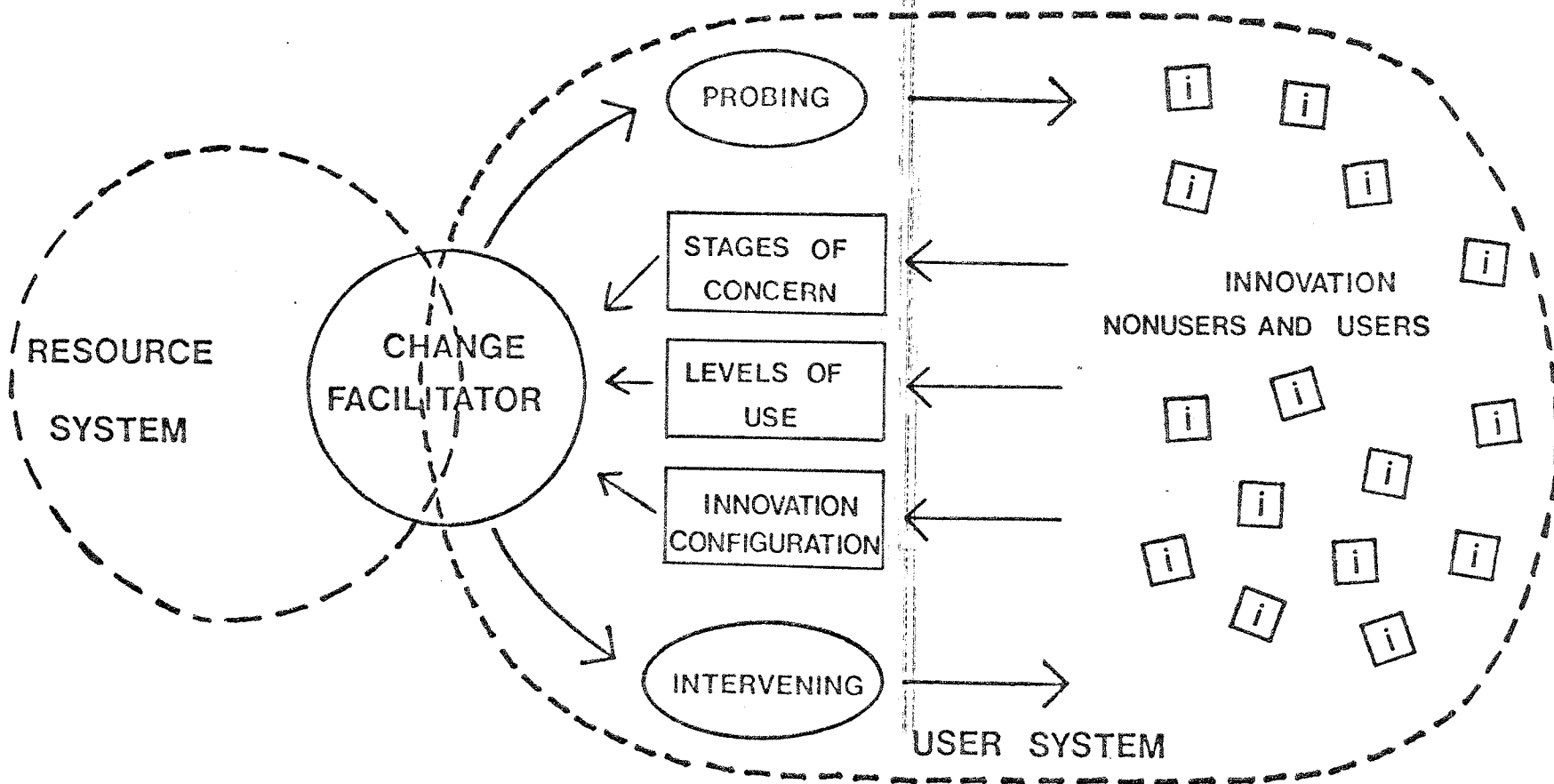
The Model: An Overview

The Concerns Based Adoption Model was developed to represent the complex process entailed when the individuals in educational institutions become involved in implementing innovations (Hall, Wallace and Dossett, 1973).

The CBAM (Figure 1) consists of three systems: a user system, a resource system and a change facilitator/staff developer system (Hall, Wallace and Dossett, 1973:4). The user system is characterized by specific behaviours and attitudes relative to a particular innovation. These specific behaviours and attitudes are characteristic of the individuals involved in the innovation process and are measurable. The various forms the innovation itself takes as it is implemented within

Figure 1

THE CONCERNS-BASED ADOPTION MODEL



the user system also can be described. The change facilitator/staff developer's role is to probe the user system to determine and monitor user and innovation characteristics, then link the user system to an appropriate resource system. The probing function consists of measuring or assessing the nature and intensity of user concerns about the innovation, the quality of use of the innovation and the nature of use as reflected in the variety of adaptations the innovation has taken within the user system. These assessments are done using specialized instruments to measure user Stages of Concerns, Levels of Use and Innovation Configuration.

Having assessed the user system for its individual and collective Stages of Concern, Levels of Use and Innovation Configuration Data the strategy employed to intervene into the implementation process is to link the user system to a matched resource system.

Each of the concepts of the Concerns Based Adoption Model; i.e., the Stages of Concerns, Levels of Use, Innovation and Configuration and Interventions have been introduced briefly in a general overview of the model. A further explanation of each of these concepts in the specific context of this study is necessary.

Stages of Concerns About the Innovation

Stages of Concern, the affective dimension of the CBAM, has been characterized in a seven stage developmental hierarchy (Figure 2) ranging from Unrelated Concerns (Stage 0) to Self Concerns (Stages 1, 2) to Task Concerns (Stage 3) to Impact Concerns (Stages 4, 5, 6). An

Figure 2

STAGES OF CONCERN ABOUT THE INNOVATION

0 AWARENESS: Little concern about or involvement with the innovation is indicated.

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.

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 of personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.

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.

4 CONSEQUENCE: Attention focuses on impact of the innovation on students 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.

5 COLLABORATION: The focus is on coordination and cooperation with others regarding use of the innovation.

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.

*Original concept from Hall, G.E., Wallace, R.C., Jr., & Dossett, W.A. A developmental conceptualization of the adoption process within educational institutions. Austin: Research and Development Center for Teacher Education, The University of Texas, 1973.

individual normally does not have concerns relative to an innovation at just one stage. Although the concerns are spread across the stages, an individual usually does have a higher concentration of concerns at a particular stage as a function of familiarity and proficiency with the innovation. Using the SoC Profile Graph (Appendix G) a profile of user concerns can be constructed to show clusters of concerns for the user system as a group.

The hypothesis that user Stages of Concern change in a developmental progression as users become more familiar with and skilled in using the innovation has been verified (Hall and Rutherford, 1976; Loucks, 1980; Hall, 1977; Hall and George, undated). The instruments used to measure user stages of concern, the Stages of Concern Questionnaire (SOCQ) (Appendix A) and the Open Ended Statement of Concern (Appendix E) have been validated and found reliable (Hall, George, Rutherford, 1979; George 1979; Hall and George, undated).

Having reliably assessed the Stages of Concern of the teachers in the study group and constructed individual and group concerns profiles it is possible to focus staff development interventions to the affective needs of the teachers as they implement the K-6 Provincial Science Curriculum.

Levels of Use of the Innovation

The Levels of Use dimension of the CBAM focuses upon describing the behaviours of the user system. L.o.U. is a measure of various states of user behaviour in relation to innovation. Eight Levels of Use have been proposed and verified (Figure 3) (Loucks 1976; Hall 1977; Loucks 1980; Rutherford and George 1978). A user progresses through

Figure 3

LEVELS OF USE OF THE INNOVATION

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.

I ORIENTATION: State in which the user has recently acquired or is acquiring information about the innovation and/or recently explored or is exploring its value orientation and its demands upon user and user system.

II PREPARATION: State in which the user is preparing for first use of the innovation.

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.

IVA ROUTINE: State in which 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.

IVB REFINEMENT: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.

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.

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.

Excerpted from: The LoU Chart: Operational definitions of Levels of Use of the Innovation. Austin: Research and Development Center for Teacher Education, the University of Texas, 1975.

the Levels of Use as familiarity and expertise with the innovation develops. George and Rutherford (1978) confirmed that a relationship existed between LoU and SoC; i.e., a change in Level of Use is anticipated by a change in Stage of Concern.

In order to organize in a manageable fashion, the behaviours that may be exhibited at each Level of Use a framework of indices or categories and decision points has been developed. The Level of Use Chart (Figure 4) in addition to defining eight Levels of Use further defines each Level into seven categories. These categories represent the key functions that users carry out when using the innovations. There are specific decision points which distinguish each Level of Use. These decision points are also identified on the LoU chart. An Overall LoU is assigned based on an individual's passage of these points. It should be noted that individuals may exhibit certain behaviours which are of different categories. For example, an individual may have crossed decision point B and be assigned an overall LoU II, by establishing a specific date to begin use of the innovation yet exhibit behaviours in the categories which are typically Level 0 or Level 1. Generally individual behaviours within each category are clustered around the overall LoU.

Having assessed the individual and aggregate Levels of Use of teachers in the study group, interventions may be focused to the requirements of individuals and subgroups at particular levels. It is not anticipated that the Levels of Use of the study group will change as rapidly at the Stages of Concern. Although a change in concern may be indicative of a change in Level of Use at time cannot be specified for this change.

FIGURE 4—LOU CHART

LEVELS OF USE		CATEGORIES		
SCALE POINT DEFINITIONS OF THE LEVELS OF USE OF THE INNOVATION		KNOWLEDGE	ACQUIRING INFORMATION	SHARING
<p>Levels of Use are distinct states that represent observably different types of behavior and patterns of innovation use as exhibited by individuals and groups. These levels characterize a user's development in acquiring new skills and varying use of the innovation. Each level encompasses a range of behaviors, but is limited by a set of identifiable Decision Points. For descriptive purposes, each level is defined by seven categories.</p>				
LEVEL 0 NON-USE: 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.		That which the user knows about characteristics of the innovation, how to use it, and consequences of its use. This is cognitive knowledge related to using the innovation, not feelings or attitudes.	Solicits information about the innovation in a variety of ways, including questioning resource persons, corresponding with resource agencies, reviewing printed materials, and making visits.	Discusses the innovation with others. Shares plans, ideas, resources, outcomes, and problems related to use of the innovation.
DECISION POINT A		<i>Takes action to learn more detailed information about the innovation.</i>		
LEVEL I ORIENTATION: State in which the user has acquired or is acquiring information about the innovation and/or has explored or is exploring its value orientation and its demands upon user and user system.		Knows general information about the innovation such as origin, characteristics, and implementation requirements.	Seeks descriptive material about the innovation. Seeks opinions and knowledge of others through discussions, visits, or workshops.	Discusses the innovation in general terms and/or exchanges descriptive information, materials, or ideas about the innovation and possible implications of its use.
DECISION POINT B		<i>Makes a decision to use the innovation by establishing a time to begin.</i>		
LEVEL II PREPARATION: State in which the user is preparing for first use of the innovation.		Knows logistical requirements, necessary resources and timing for initial use of the innovation, and details of initial experiences for clients.	Seeks information and resources specifically related to preparation for use of the innovation in own setting.	Discusses resources needed for initial use of the innovation. Joins others in pre-use training, and in planning for resources, logistics, schedules, etc., in preparation for first use.
DECISION POINT C		<i>Begins first use of the innovation.</i>		
LEVEL 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.		Knows on a day-to-day basis the requirements for using the innovation. Is more knowledgeable on short-term activities and effects than long-range activities and effects of use of the innovation.	Solicits management information about such things as logistics, scheduling techniques, and ideas for reducing amount of time and work required of user.	Discusses management and logistical issues related to use of the innovation. Resources and materials are shared for purposes of reducing management, flow and logistical problems related to use of the innovation.
DECISION POINT D-1		<i>A routine pattern of use is established.</i>		
LEVEL IV A 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.		Knows both short- and long-term requirements for use and how to use the innovation with minimum effort or stress.	Makes no special efforts to seek information as a part of ongoing use of the innovation.	Describes current use of the innovation with little or no reference to ways of changing use.
DECISION POINT D-2		<i>Changes use of the innovation based on formal or informal evaluation in order to increase client outcomes.</i>		
LEVEL IV B REFINEMENT: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.		Knows cognitive and affective effects of the innovation on clients and ways for increasing impact on clients.	Solicits information and materials that focus specifically on changing use of the innovation to affect client outcomes.	Discusses own methods of modifying use of the innovation to change client outcomes.
DECISION POINT E		<i>Initiates changes in use of innovation based on input of and in coordination with what colleagues are doing.</i>		
LEVEL 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.		Knows how to coordinate own use of the innovation with colleagues to provide a collective impact on clients.	Solicits information and opinions for the purpose of collaborating with others in use of the innovation.	Discusses efforts to increase client impact through collaboration with others on personal use of the innovation.
DECISION POINT F		<i>Begins exploring alternatives to or major modifications of the innovation presently in use.</i>		
LEVEL VI RENEWAL: State in which the user re-evaluates 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.		Knows of alternatives that could be used to change or replace the present innovation that would improve the quality of outcomes of its use.	Seeks information and materials about other innovations as alternatives to the present innovation or for making major adaptations in the innovation.	Focuses discussions on identification of major alternatives or replacements for the current innovation.

Procedures for Adopting Educational Innovations Project, Research and Development Center for Teacher Education, University of Texas at Austin, 1975, N.I.E. Contract No. NIE-C-74-0087.

FIGURE 4—LoU CHART

CATEGORIES

ASSESSING	PLANNING	STATUS REPORTING	PERFORMING
Examines the potential or actual use of the innovation or some aspect of it. This can be a mental assessment or can involve actual collection and analysis of data.	Designs and outlines short- and/or long-range steps to be taken during process of innovation adoption, i.e., aligns resources, schedules activities, meets with others to organize and/or coordinate use of the innovation.	Describes personal stand at the present time in relation to use of the innovation.	Carries out the actions and activities entailed in operationalizing the innovation.
Takes no action to analyze the innovation, its characteristics, possible use, or consequences of use.	Schedules no time and specifies no steps for the study or use of the innovation.	Reports little or no personal involvement with the innovation.	Takes no discernible action toward learning about or using the innovation. The innovation and/or its accouterments are not present or in use.
Analyzes and compares materials, content, requirements for use, evaluation reports, potential outcomes, strengths and weaknesses for purpose of making a decision about use of the innovation.	Plans to gather necessary information and resources as needed to make a decision for or against use of the innovation.	Reports presently orienting self to what the innovation is and is not.	Explores the innovation and requirements for its use by talking to others about it, reviewing descriptive information and sample materials, attending orientation sessions, and observing others using it.
Analyzes detailed requirements and available resources for initial use of the innovation.	Identifies steps and procedures entailed in obtaining resources and organizing activities and events for initial use of the innovation.	Reports preparing self for initial use of the innovation.	Studies reference materials in depth, organizes resources and logistics, schedules and receives skill training in preparation for initial use.
Examines own use of the innovation with respect to problems of logistics, management, time, schedules, resources, and general reactions of clients.	Plans for organizing and managing resources, activities, and events related primarily to immediate ongoing use of the innovation. Planned-for changes address managerial or logistical issues with a short-term perspective.	Reports that logistics, time, management, resource organization, etc., are the focus of most personal efforts to use the innovation.	Manages innovation with varying degrees of efficiency. Often lacks anticipation of immediate consequences. The flow of actions in the user and clients is often disjointed, uneven and uncertain. When changes are made, they are primarily in response to logistical and organizational problems.
Limits evaluation activities to those administratively required, with little attention paid to findings for the purpose of changing use.	Plans intermediate and long-range actions with little projected variation in how the innovation will be used. Planning focuses on routine use of resources, personnel, etc.	Reports that personal use of the innovation is going along satisfactorily with few if any problems.	Uses the innovation smoothly with minimal management problems; over time, there is little variation in pattern of use.
Assesses use of the innovation for the purpose of changing current practices to improve client outcomes.	Develops intermediate and long-range plans that anticipate possible and needed steps, resources, and events designed to enhance client outcomes.	Reports varying use of the innovation in order to change client outcomes.	Explores and experiments with alternative combinations of the innovation with existing practices to maximize client involvement and to optimize client outcomes.
Appraises collaborative use of the innovation in terms of client outcomes and strengths and weaknesses of the integrated effort.	Plans specific actions to coordinate own use of the innovation with others to achieve increased impact on clients.	Reports spending time and energy collaborating with others about integrating own use of the innovation.	Collaborates with others in use of the innovation as a means for expanding the innovation's impact on clients. Changes in use are made in coordination with others.
Analyzes advantages and disadvantages of major modifications or alternatives to the present innovation.	Plans activities that involve pursuit of alternatives to enhance or replace the innovation.	Reports considering major modifications of or alternatives to present use of the innovation.	Explores other innovations that could be used in combination with or in place of the present innovation in an attempt to develop more effective means of achieving client outcomes.

The method of assessing the LoU is the focused LoU Interview (Appendix C). The results of the LoU Interview are recorded by the researcher on a LoU Rating sheet (Appendix F). The LoU Interview has been validated and found reliable (Loucks, 1976:5; Fullan and Pomfret 1976:30). The procedures for use of the LoU Interview are described in the Interview Manual (Loucks, Newlove and Hall, 1975).

Innovation Description and Innovation Configuration

Neither SoC nor LoU assists in the specifications of the "what" of the innovation. As discussed in "The Variables affecting Curriculum Implementation", implementation studies have revealed that the operational characteristics of any given innovation vary from classroom to classroom. Field research with the CBAM (Hall and Loucks, 1978) conducted by the Research and Development Centers for Teacher Education in Austin identified the need to define minimum criteria for use in the form of an Innovation Description in order to determine whether members within a user system were indeed users of the same innovation. It became obvious that a range of acceptable operational forms of the innovation was required to accommodate the adaptive and heuristic nature of change. This range of variations emerged in the form of an Innovation configuration Checklist. The Checklist is used to identify the adaptation that an innovation undergoes during implementation in a given situation. The purpose of the Checklist is to provide information regarding the features of the innovation in use, assist in implementation and eventually implementation evaluation.

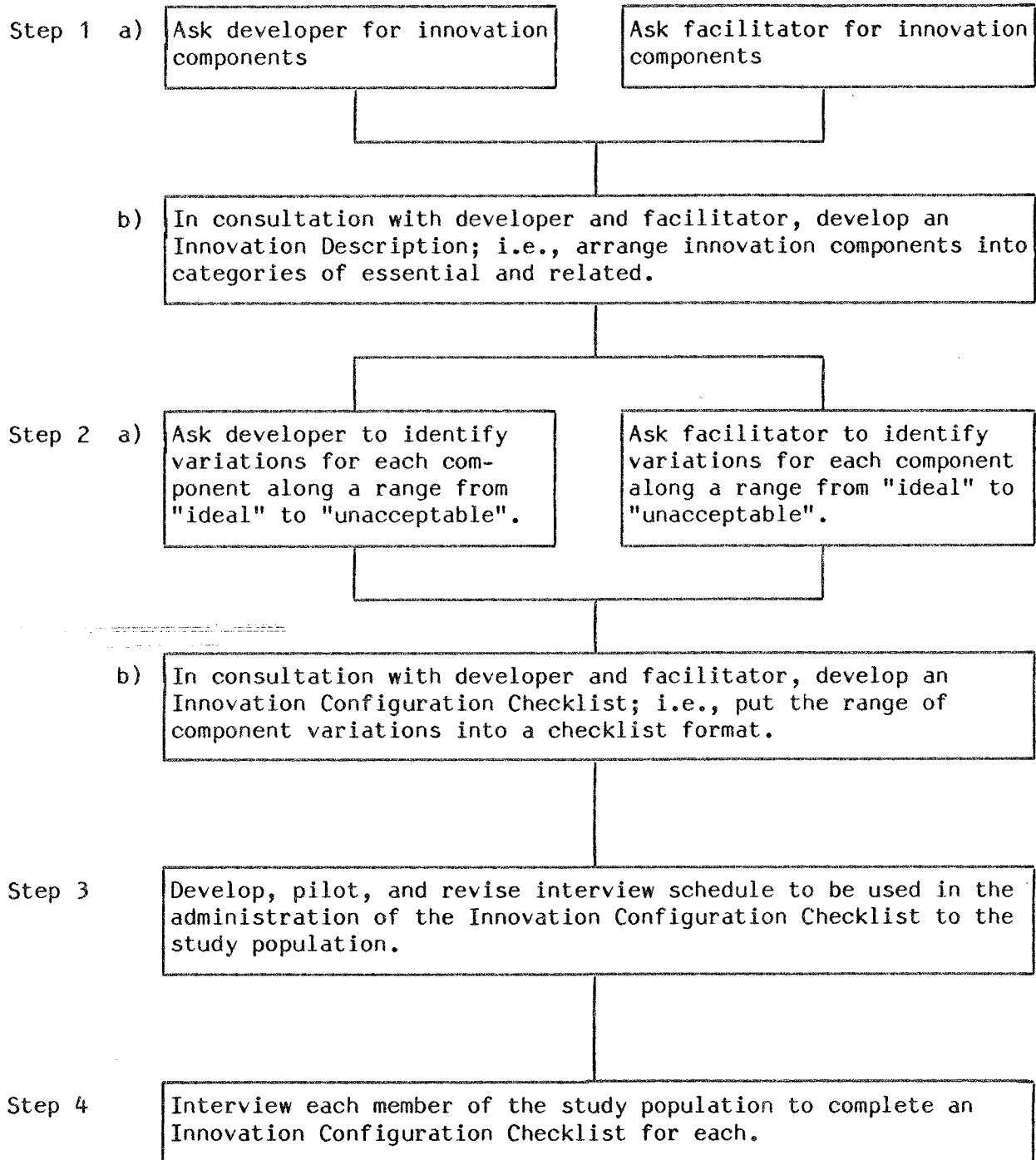
Whereas the instruments and procedures for data collection related to Stages of Concern and Levels of Use were prescribed by the Research

and Development Centre for Teacher Education of the University of Texas, Austin, the instruments related to the collection of Innovation Configuration data were developed by the researcher and require some explanation. Innovation Configuration data; that is, data concerning the adaptations the curriculum undertook in the classrooms were collected using an Innovation Configuration Interview format (Appendix D) and an Innovation Configuration Checklist (Appendix E).

The Innovation Configuration Checklist and the Innovation Configuration Interview format were developed through the 4 step process detailed in figure 5 "A procedure for Identifying Innovation Descriptions and Innovation Configurations". The first step in the process was to identify the major components of the K-6 Science Curriculum. This was achieved through discussions with Dr. S. Leith a co-developer of the curriculum and Dave Smith a facilitator responsible for implementing the curriculum within the Frontier School Division. Having identified the major features of the program an innovation description was proposed by the researcher for consideration by Dr. Leith and Mr. Smith. This description arranged the components into two categories; components which were critical or essential features of the program and components which were related but not essential features of the program. Step two of the process entailed identifying a range of variations of each component which could be evidenced during implementation. This was achieved by the researcher through discussions with Mr. Smith. The components and variations on each component were then put into a checklist format which was reviewed by Dr. Leith. Step 3 of the process involved the development of an interview schedule to assist in the interviewing of the study group to

Figure 5

A Procedure for Identifying Innovation Descriptions and Innovation Configuration



determine which variations of the curriculum were implemented in the study school. The interview questions were designed directly from the innovation configuration checklist so as to facilitate the checklisting of interviewee responses. The interview schedule was field tested on a sampling of K-6 Science teachers using the Provincial K-6 Science Curriculum in jurisdictions other than the Frontier School Division. Step 4 of the process constituted the Innovation Configuration data collection and is detailed in Chapter IV of this thesis.

Having used the Innovation Configuration Interview and the Innovation Configuration Checklist to identify the various configurations of the K-6 Science Curriculum in use within the school, staff development activities can be focused by the requirements of individuals or subgroups of staff using a particular configuration of the curriculum.

Interventions

Having assessed user characteristics of the school staff in the form of SoC and LoU and the nature of the innovation in use in the form of the Innovation Configuration Checklist, the task remains to design interventions for the purpose of facilitating implementation of the K-6 Science Curriculum. To facilitate the focusing, design and delivery of intervention, two frameworks have been developed: The Taxonomy of Interventions and the anatomy of Interventions (Hord, Hall and Zigarmi, 1980).

Taxonomy of Interventions

The Taxonomy of Interventions conceptualizes six levels of

interventions. They are: Policy, Game Plan, Strategy, Tactic, Incident, and Theme (Hord and Loucks, 1980:18). Five of the levels represent intentional actions while themes are unplanned efforts or actions which recur and have an unanticipated or unplanned effect upon implementation. An example of the theme would be the principal's repeated last minute begging out of training sessions in which he had previously agreed to participate. Although unplanned, the principal's actions would have a definite impact upon implementation.

Definitions of the five planned or sponsored levels of the taxonomy are: (Hord and Loucks, 1980:19-21).

Policy: a rule or guideline which directs the procedures and actions of an organization.

Game Plan:

an overall plan of action taken to implement an innovation. The game plan outlines all the aspects of the change effort and affects all people involved in the effort. The game plan is derived from a consideration of developing supportive organizational arrangements, training, providing consultation and reinforcement, monitoring and evaluating and communicating externally, and dissemination.

Strategy:

the framework for action which translates the game plan into concrete action.

Tactic: Tactics operationalize the strategy.

Incident:

A singular occurrence of an event or action.

The Taxonomy of Interventions is a planning tool which facilitates the description of an intervention at various levels of specificity. It is the scale to which the map of an intervention can be drawn to help in assessing and planning the level of intervention required.

Anatomy of Interventions: The Coding Schema

The coding schema for interventions provides the change facilitator with a description of the dimensions of an intervention. The six dimensions of an intervention identified are: Source, Target, Function, Medium, Flow and Location (Hord and Loucks, 1980:23). The analysis of interventions into the six dimensions allows the change facilitator to fit interventions particularly at the tactic and incident level to individual and situational requirements.

Each dimension of the anatomy of Interventions is defined as follows: (Hord and Loucks, 1980:23-24).

Source: the person(s) who act or events that occur to influence individuals to change.

Target: the person(s) toward whom intervening activity is directed.

Function: the purpose(s) of the intervening activity.

Medium: the mode or form of the intervening activity.

Flow: the direction of the intervening activity.

Location:

the site of the intervening activity.

The Taxonomy of Interventions is particularly useful in planning specific interventions since it functions as a checklist of the details that must be addressed in successful planning.

For the purposes of planning and describing the staff development interventions made as a course of this study, both the Taxonomy of Interventions and the Anatomy of Interventions as described by Hall, Hord and Loucks (1980) were utilized as guidelines and frames of references; however, interventions were not formally plotted using either the Anatomy or Taxonomy of Interventions.

Summary

The theoretical framework for this study is the Concerns Based Adoption Model. The CBAM consists of three systems: a user system, a resource system and a change facilitator/staff developer system. The basic assumptions of the CBAM are:

1. Change is a process not an event.
2. Change entails growth along a differentiated continuum.
3. Change is a personal experience.
4. The individual is the focal point of change.
5. Individual behaviours and concerns relative to an innovation can be assessed validly and reliably.
6. Change can be facilitated by interventions targeted to the concerns and behaviours of the people involved in the change.
7. The appropriateness of the change/innovation in question is a given.
8. Change facilitators/staff developers must work in an adaptive and systemic way.

9. Staff development is best facilitated through a client centered diagnostic/prescriptive model.
10. Explicit innovation configuration is a key variable in implementation.

The Concerns Based Adoption Model is comprised of the basic concepts of Stages of Concern, Levels of Use, Innovation Configuration, and Interventions. The Stages of Concern about an innovation is the developmental hierarchy of concerns in seven stages which describes the kinds of concerns the individual may experience over time in relation to an innovation. The Levels of Use of an innovation is the developmental hierarchy of behaviours of innovation users. The Innovation Configuration is the operational pattern of the innovation that results from user selection and use of different innovation component variations; that is, a description of the various adaptations the innovation has made within the user system. The Taxonomy of Interventions is the hierarchical description of the levels at which interventions may be made while the anatomy of Interventions is the framework of the dimensions of an intervention.

Interventions into the user system, may be designed in response to the needs of individuals within the user system diagnosed in terms of their concern about the innovation; their usage of the innovation and the various adaptations or configurations they have given to the innovation.

Conclusion

In the context of the formula describing the interplay of the change dynamics $B=f(P) (E) (T)$, the concerns Based Adoption Model

recommends itself. The assumptions regarding change which underlie the model are consistent with the findings of research into failed curriculum implementation efforts. The concepts of the model describe and explain the interplay of the change variables while the procedures outlined provide the means by which diagnosis and prescribed intervention into the change process is possible. The critical question is whether the application of the theory of the CBAM in the field context will indeed result in effective curriculum implementation.

CHAPTER IV

RESEARCH METHODOLOGY

Introduction

Chapter IV constitutes a presentation of the methodology of the study. The chapter begins with a description of the methodology of the project detailing the pre-intervention, intervention and post-intervention design of the study and concludes with a presentation of the various data collection and analysis techniques which were used throughout the study.

Methodology

Study Design

The study was initiated in October 1981 as a result of discussions with the Superintendent, Principal and school staff. The Principal and staff had expressed a concern that science instruction and programming within the school was not "up to standard" and expressed an expectation that the study would provide the systematic ongoing attention to science instruction that was required to put a school wide program in place. The purpose of the study was to implement the K-6 Manitoba Science Curriculum in Berens River School using the strategies and philosophy of change associated with the Concerns Based Adoption Model. In addition the effectiveness of the

implementation was to be monitored and measured using the concepts and methodologies inherent in the Concerns Based Adoption Model.

The study consisted of three phases; a pre-intervention phase, an intervention phase and a post-intervention phase. The study time/task line (figure 6) outlines the specific steps taken during each phase of the project.

Pre-Intervention Phase

The pre-intervention phase beginning in October 1981 and concluding on May 10, 1982 was a period during which diagnostic data were collected from the K-6 teaching staff in Berens River School. The diagnostic data took the form of teacher concerns about the implementation of the K-6 Manitoba Science Curriculum, the quality of teacher use of the curriculum, and the adaptations the curriculum had taken in the classrooms of Berens River School. There were two purposes to collecting this data during the pre-intervention phase. The first purpose was to establish a bench mark against which any change in teacher concerns, quality of curriculum use and curriculum adaptations could be noted. The second purpose was to gather diagnostic information so that any activities designed to facilitate implementation of the Science Curriculum could be tailored to local needs.

Intervention Phase

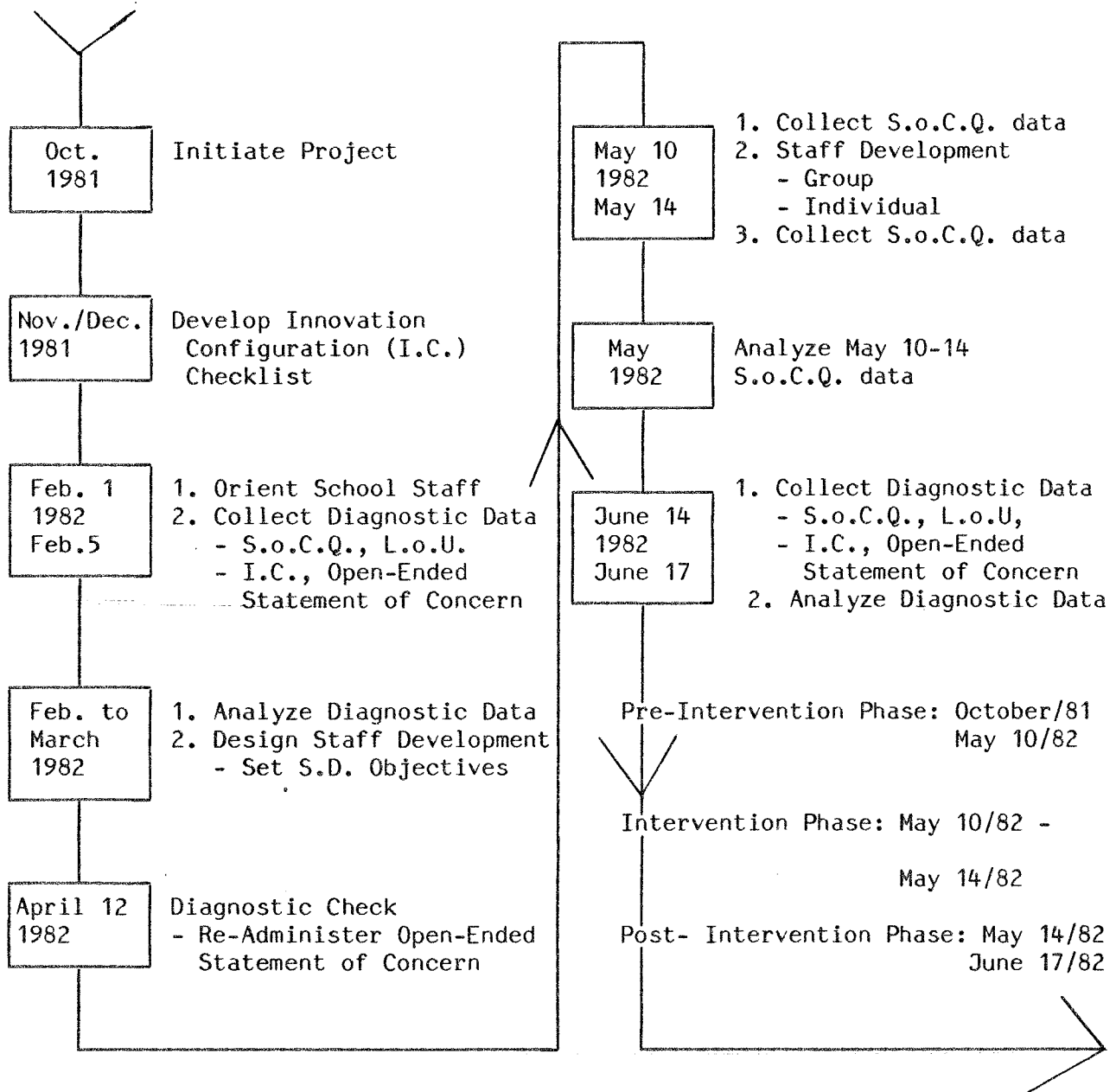
The intervention or action phase of the study consisted of a week long staff development activity designed to ease or facilitate the

FIGURE 6

PROJECT TIME/TASK LINE: MANITOBA PROVINCIAL

K-6 SCIENCE CURRICULUM IMPLEMENTATION

BERENS RIVER SCHOOL



implementation of the Science Curriculum. This week of staff development activity took place between May 10 and May 14, 1982 in Berens River School. The staff development activities were designed around the analysis of the diagnostic data collected during the pre-intervention phase and were focused upon creating changes in teacher concerns about the implementation of the curriculum, the quality of use the curriculum and the adaptations the curriculum had undergone in the classrooms.

Post-Intervention Phase

During the post-intervention phase data were collected using the same instruments utilized during the pre-intervention phase. The data collected were compared to data gathered in the pre-intervention phase to note any changes occurring during the intervention phase of the study. The post-intervention phase began in May 14, 1982 and concluded on June 17, 1982.

Data Collection

Four data collection instruments were utilized during both the pre-intervention and the post-intervention phases of the study. The data were collected for each of the variables in the change formula $B=f(P)(E)(T)$ using instruments developed to operationalize the concepts of the Concerns Based Adoption Model.

Data regarding the characteristic concerns teachers had about the curriculum implementation were gathered using two instruments; the Stages of Concern Questionnaire or SoCQ (Appendix A) and the Open-Ended Statement of Concern (Appendix B).

The SoCQ is a 35 item Likert scale response instrument in which each of the seven stages of concern is represented by 5 items. The value on the Likert scale that the respondent selects for a particular item indicates the intensity of the concern represented by the item. The responses to all five items per stage collectively indicate the intensity of the concern for that particular stage. The construction and validation of the SoCQ are discussed in Chapter III. The SoCQ was administered twice during each of the pre-intervention and post-intervention phases. The administration of the SoCQ was spaced to note any changes in teacher concerns which may have occurred as a function of time as well as treatment or intervention.

The Open-Ended Statement of Concern is an open-ended response instrument in which respondents are asked to supply 3 single response replies in priority order to the question "When you think about the Manitoba Provincial Science Curriculum, what are you concerned about?" The Open-Ended Statement of Concern was administered twice during the pre-intervention phase and once during the post-intervention phase. The initial administration of the Open-Ended Questionnaire was part of the bench mark establishment while the second administration was designed to detect any changes in teacher concerns prior to establishing staff development objectives. The 3rd and final administration was intended to identify any changes in teacher concerns after staff development.

Data regarding the characteristic curriculum usage behaviours of the study group as they progressed through the implementation effort were gathered using the Levels of Use Interview (Appendix C). The Levels of Use or L.o.U. interview is a focused interview designed to

gather information on the quality of client use of the curriculum being implemented. The construction, field testing and validation of the L.o.U. Interview are referenced to Chapter III of this thesis. The interview was conducted with each teacher once during the pre-intervention and once during the post-intervention phase. All interviews were tape recorded to facilitate accurate analysis.

Data concerning the adaptations the curriculum undertook in the classrooms were collected using an Innovation Configuration Interview format (Appendix D) and an Innovation Configuration Checklist (Appendix E). The development and use of the Innovation Configuration Interview and Checklist are described in Chapter III. In brief review the Innovation Configuration Interview is a set of questions developed by the researcher to elicit interviewee information on the configuration of the innovation presently in use. The interview questions were designed directly from the Innovation Configuration Checklist so as to facilitate the check listing of interviewee responses.

The Innovation Configuration Interview was conducted with each teacher at the outset of the project during the pre-intervention phase and again at the conclusion of the study in the post-intervention phase. All interviews were tape recorded to facilitate accurate analysis.

Data Analysis

The data collected from the Stages of Concern Questionnaire were analyzed against a norm established by the Research and Development

Center for Teacher Education, University of Texas at Austin. Individual teacher scores were recorded on a Stages of Concern Profile Chart (Appendix G). Individual scores were aggregated for the group and recorded on the "Stages of Concern Profile Chart: Manitoba Provincial K-6 Science Curriculum implementation--Berens River School" (Figure 7). Figure 7 notes the changes in the aggregated Stages of Concerns Profile for the study group at four intervals throughout the study.

The data collected from the Open-Ended Statement of Concern Questionnaire consisted of three sentence-length affective responses per teacher to the question "When you think about the Manitoba Provincial Science Curriculum what are you concerned about". The responses were analyzed firstly for each using a set of typical responses which would indicate the concerns represented. An aggregated frequency of response for the study group was prepared for each of the 3 data collection intervals and reported in "Open-Ended Statement of Concern: Manitoba Provincial K-6 Science Curriculum implementation--Berens river School (Figure 8a, 8b, 8c). Teacher responses to the Open-Ended Statement of Concern were used to double check assessments made using the Stages of Concern Questionnaire as well as to provide precise details of what was concerning teachers at particular stages.

The data collected using the Levels of Use Interview were analyzed using the Levels of Use Chart (Figure 4) and the Levels of Use Rating Sheet (Appendix F). The Levels of Use Chart categorizes typical responses to the questions posed in the interview and is used to

ascribe a level of user facility with the innovation. The Levels of Use Rating Sheet was used to record user Levels of Use. For the purpose of analysis a distinction was noted only between users and non-users of the Science Curriculum. The finer distinctions which differentiate the various Levels of Use and Non-Use were not utilized. Having conducted and tape recorded a Levels of Use Interview with each teacher in the study group, a Levels of Use data sheet was completed. Individual data sheets were aggregated and the frequency of users and non-users was noted on the "Levels of Use: Manitoba Provincial K-6 Science Curriculum Implementation--Berens River School" (Figure 9). The Levels of Use Interview was conducted once at the outset of the study and once at the conclusion of the study. Changes in the frequency of users and non-users of the curriculum were also noted on the chart "Levels of Use: Manitoba Provincial K-6 Science Curriculum Implementation--Berens River School".

The data collected using the Innovation Configuration Checklist in conjunction with the Innovation Configuration Interview were analyzed for frequency of response. The frequency of response was tabulated for the total study group on Figure 10 "Innovation Configuration: Manitoba Provincial K-6 Science Curriculum Implementation--Berens River School. The tabulated data were used to identify the variation of curriculum adaptation in the study group within a range of ideal, acceptable and unacceptable.

Summary

The study followed a pre-intervention, intervention, post-intervention design. Data were collected and analyzed during both

the pre-intervention and post-intervention phases of the study using the Stages of Concern Questionnaire, The Open-Ended Statement of Concern Questionnaire, the Levels of Use Interview and, the Innovation Configuration Checklist and Interview. The pre-intervention data were used to establish a bench mark against which change in the study group could be measured as well to identify foci for treatment during the intervention phase of the study. Data collected during the post-intervention phase were compared with the pre-intervention data and changes in the study population were noted.

Chapter V

Presentation of Research Data & Findings

Introduction

All study data are presented in the context of the research data questions and in terms of the three major concepts of the Concerns Based Adoption Model. For each research data question both the pre-intervention and post-intervention data are presented and compared.

Research Data

Question One

Did teacher concerns regarding the implementation of the Provincial K-6 Science Curriculum change during the course of the study?

Figure 7 represents the data collected using the SoCQ during the pre-intervention and post-intervention phases of the study. The data were collected on February 5, 1982 and May 10, 1982 during the pre-intervention phase and May 14 and June 15 of the post-intervention phase. The data collected on February 5, 1982 established a baseline of teacher concerns about the implementation of the K-6 Science Curriculum against which changes in teacher concerns could be noted. The data collected on May 10 indicated any changes in teacher concerns which may have taken place between February 5 and May 10 when no specific staff development intervention was planned. The data

Figure 7

STAGES OF CONCERN PROFILE CHART; MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM IMPLEMENTATION - BERENS RIVER SCHOOL

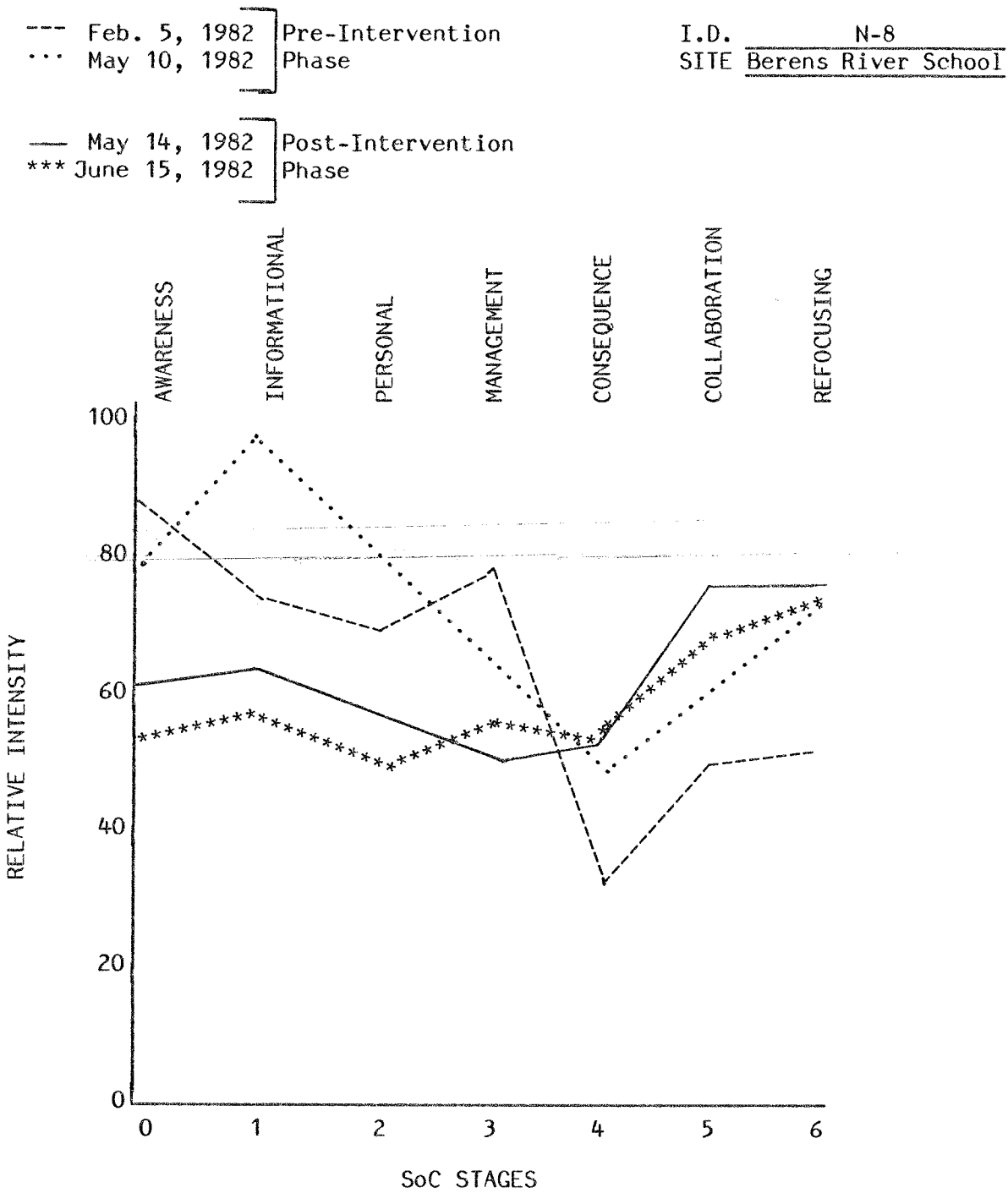


Figure 8a

Open-Ended Statement of Concern: Manitoba Provincial K-6 Curriculum
Implementation - Berens River School

TEACHER		February 5, 1982 - Pre-Intervention Phase
	SoC	Comments
A	Management	One of the things that concerns me is the lack of topics included in the curriculum. This makes the choice not only limited but quite <u>nil</u> .
B	Management	As a first year Science teacher I would be pleased if the guide was expanded to include possible teaching strategies. For those teachers who are "old hands" with the courses, they could ignore the suggestions but for new teachers it would be extremely helpful.
C	Management	I think there should be sample lesson and unit plans for each lesson. This would help beginning teachers a great deal in preparing for better use of the guides.
D	Management	My biggest concern regarding the Curriculum is that it is written in such broad terms, it requires too much preparation time on the individual teacher's part.
E	Informational Personal	I am concerned about the ideas and concepts that are being taught. They need to be simple and yet not boring.
F	Informational Personal	I would like to know if, when following the guide for a particular grade level, <u>every</u> detail or activity of each topic must be covered. In other words, how rigid is the guide? Can we add or delete certain pieces of information, and/or certain activities?
G	Informational Personal	The actual teaching strategies, ie., questioning, leading discussions, etc., for the provincial Curriculum Guide or any other Science program are of great concern to me as I have never seen Science taught.
H	Informational Personal	To what extent are teachers to follow these Curriculum Guides.
I	Management	I am concerned about not having enough time to collect materials and resources. The school doesn't have much to offer. There should be more organization of materials in school.
J	Informational Personal	I feel that some of the suggestions may not have too much relevance for students living in the northern areas of Manitoba. An example would be the unit on changes in matter and energy. I feel such a unit is too abstract for the students within my class, but if I ignore the unit will I be affecting their "sequenced" progress as stated in the Curriculum Guide?
K	Informational Personal	I have no concerns.
L	Informational Personal	About the adaptability of the curriculum for my type (special class) of students.

Open-Ended Statement of Concern: Manitoba Provincial K-6 Curriculum
Implementation - Berens River School

INTERVAL		April 12, 1982 - Pre-Intervention Phase
	SoC	Comments
A	Management	One thing that concerns me is the activities involved in each unit. The materials suggested in the activities, in most cases, are unavailable or very difficult to obtain. It would be more convenient if there were activities which made use of simple materials.
B	Management	I think that the Curriculum Guide should be expanded so as to give teachers a better selection as to what activities they might want to attempt with their class.
C	Management	There should be more detailed resources listed for every unit.
D	Management Consequence	The degree of <u>difficulty</u> of most suggested activities for my particular group of students.
E	Personal Consequence	My major concern is that the Science Curriculum is a program which is interesting and comprehensible to the students' level of understanding.
F		
G	Management	My only other concern other than those previously stated on the last survey is the lack of proper equipment, etc. to enable a teacher to use all of the ideas in a class of 21 children.
H	Informational Personal	To what extent we should be following these guides. Are students missing relevant material if a topic is left out by the choice of the teacher.
I	Management	Materials are not readily available when needed. There should be an easier access of science materials from K-6.
J	Informational Personal	I have nothing further to add to my comments already submitted in my previous interview. I could not think of anything further to add at the risk of repeating myself.
K		
L	Management	Vocabulary used is not geared for slow learners. Much time is spent trying to explain meaning instead of attacking the lesson properly.

Figure 8c

Open-Ended Statement of Concern: Manitoba Provincial K-6 Curriculum
Implementation - Berens River School

June 15, 1982 - Post-Intervention Phase

	SoC	Comments
A	Collaboration Consequence	I am concerned with continuing to work with the other teachers to improve our program. Maybe we could set up a visitation schedule or something.
B	Refocusing	I need a good science text. The Curriculum Guide alone isn't enough.
C	Collaboration	I have really enjoyed working with the other primary teachers in planning our science - I hope this will continue next year - in other subjects too.
D	Refocusing	I am concerned that some units in Stem will not get taught if I follow the Curriculum Guide. I will be teaching Stem next year so I'll have to work hard to coordinate Stem with the curriculum.
E	Management	I still have trouble getting the kids working in groups. Now that I have a text it is easier to teach science.
F	Collaboration Informational	I want the primary team to stay together next year. Although I have improved my use of concrete materials and discussion there is still a lot to learn.
G	Consequence Refocusing	I feel that I know what I am supposed to do. I have a program and resources; now I can concentrate on enriching the program.
H	Refocusing Collaboration	I find some activities in the curriculum to be unsuitable for my students so I go to other sources for activity ideas. I would like to share and work with other teachers to do this.
I		
J	Awareness	I really don't have any concerns right now. I feel that since I have been using Stem my science is under control.
K	Awareness	I have no concerns.
L		

collected on May 14, just after the intervention phase, would identify any immediate changes in teacher concerns taking place during the intervention. Figures 8a, 8b, 8c represent the Open-Ended Statement of Concern Data collected twice during the pre-intervention phase and once during the post-intervention phase. The Open-Ended Statement of Concern required teachers to express in narrative form any concerns they had about the implementation of the K-6 Science Curriculum. Although these data are not quantifiable the nature of the narrative responses made by teachers at different intervals throughout the study were used to contrast with the SoCQ data collected.

Pre-Intervention Data

The SoCQ data collected on February 25 (Figure 7) indicated that stages of informational, personal, and management concerns were much higher in intensity than the stages of consequence, collaboration and refocusing concerns. The SoCQ data collected on May 10, just prior to staff development, differed from the February 5 data in one way. The May 10 data showed a marked increase in the intensity of the informational concerns of the teachers.

The Open-Ended Statement of Concern data collected on February 5 and April 12 reflected teacher concerns about program expectations and information, the effect of the new program upon the role of the science teacher and management of the new program. The statements were typical of the informational, personal and management stages of concern and were consistent with the SoCQ data collected.

Post-Intervention Data

The SoCQ data collected on May 14 immediately after the intervention indicated major change in the relative intensity and distribution of teacher concerns about the implementation of the curriculum. The May 14 data showed a greatly reduced intensity of informational, personal and management concerns and an increased relative intensity of consequence and collaboration concerns. The data collected on June 15, a full month after intervention, showed no change from the data collected on May 14.

The Open-Ended Statement of Concern data collected on June 15, 1982 reflected teacher concerns about their need to meet and work together to improve the science program in the school and enhance the positive effects of the curriculum upon students. The June 15 Statements of Concern are typical of the consequence and collaboration stages of concern and were consistent with SoCQ data collected.

Summary

The SoCQ data collected at two intervals during the pre-intervention phase of the study indicated that stages of informational, personal and management concerns were much higher in intensity than teacher concerns in the consequence, collaboration and refocusing stages. The one difference in the data between February 5 and May 10 was that the May 10 data indicated a heightened informational concern. This variance can be explained in terms of the group's heightened anticipation of the inservice of May 10 which was designed to provide program information and expectation. With the one

exception noted, the May 10 data varied only slightly from the February 5 data indicating no change in the concerns of teachers during the pre-intervention phase. The Open-Ended Statement of Concern data confirmed the consistency of teacher concern throughout the pre-intervention phase.

The SoCQ data collected at both intervals during the post-intervention phase indicated that the intensity of informational, personal and management concerns had been reduced within the study group and that the relative intensity of consequence and collaboration concerns had been heightened. The June 15 reading was almost identical to the May 14 data indicating that teacher concerns remained unchanged during the post-intervention period. The Open-Ended Statement of Concerns data confirmed the consistency of teacher concerns throughout the post-intervention phase.

The Concerns data, both SoCQ and the Open-Ended Statement indicated that teacher concerns about the implementation of the K-6 Provincial Science Curriculum changed as a result of intervention. Concerns that teachers shared prior to intervention did not change as a function of time, nor did the concerns shared by teachers after intervention change as a function of time.

The changes in teachers concerns about the implementation of the K-6 Provincial Science Curriculum can be narrowed to the time period of May 10-14 during which intense staff development activity took place.

Question Two

Did teacher quality of use of the Provincial K-6 Science Curriculum change during the course of the study?

Figure 9

LEVELS OF USE: MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM IMPLEMENTATION -
BERENS RIVER SCHOOL

Teacher	Classification of Use	
	February 5, 1982 (Pre-Intervention Phase)	June 15, 1982 (Post-Intervention Phase)
A	User	User
B	User	User
C	Non-User	User
D	Non-User	User
E	User	User
F	User	User
G	Non-User	User
H	User	User
I*	Non-User	*Non-User
J	Non-User	Non-User
K*	User	*Non-User
L	User	User
	7 Users and 5 Non-Users of the Manitoba Provincial K-6 Science Curriculum	9 Users and 3 Non-Users of the Manitoba Provincial K-6 Science Curriculum

*The asterisk identifies those individuals who in June, 1982, were classified as Non-Users of the curriculum since they no longer taught science as a result of a change in their teaching assignments.

Figure 9 represents the data collected using the Levels of Use Interview. The Levels of Use data were collected once at the outset of the study on February 5, 1982 and a second time at the conclusion of the study on June 15, 1982. The data collected on February 5 established a baseline measure against which any changes in teacher usage of the curriculum could be noted over the duration of the study.

Pre-Intervention Data

The Levels of Use data collected during the week of February 5-9 (Figure 9) indicated that of the 12 teachers in the study group seven were users of the Manitoba Provincial K-6 Science Curriculum and 5 were non-users. A teacher was identified as a user if (s)he taught science at least two periods per 6 day cycle and taught science using the provincial curriculum guide as a major resource document.

The interviews conducted with all 12 teachers revealed that although 7 teachers could be classified as users their use was characterized by day to day survival techniques rather than by longer range instructional strategy.

Post-Intervention Data

The Levels of Use data collected during the week of June 15-19, 1982 (Figure 9) indicated that of the 12 teachers interviewed nine were users while 3 were non-users. It should be noted that two of the three non-users had had a change in teaching assignment and were no longer teaching science. In fact, only one practicing science teacher remained a non-user of the curriculum. The interview information revealed that in June the teachers had adopted a more routine use of

the curriculum which was characterized by a longer than day to day focus upon classroom instruction.

Summary

At the outset of the study seven of twelve teachers were users of the Provincial K-6 Science Curriculum. Their use was characterized by mechanical, day to day survival within the classroom. Non-users of the curriculum had not identified a program for use and exhibited less instructional focus than users of the curriculum.

At the conclusion of the study all but one teacher were users of the science curriculum. Their usage was characterized by a longer range focus upon instruction with a routine pattern of curriculum usage being established. The one non-user did not subscribe to any identifiable program focus.

During the course of the study all but one teacher became users of the K-6 Provincial Science Curriculum. ~~The quality of use of the curriculum~~ changed from one of mechanical, day to day survival to one of longer range instructional focus. The nature of the curriculum usage in terms of the adaptations the curriculum took within the classroom will be discussed with reference to the Innovation Configuration data.

Question Three

Did the nature of the adaptations made to the Provincial K-6 Science Curriculum by teachers change during the course of the study?

Figure 10 represents the aggregated study group data collected

using the Innovation Configuration Interview (Appendix D) and the Innovation Configuration Checklist (Appendix E). The Innovation Configuration data were collected from each teacher twice during the study, once at the outset of the study on February 5, 1982 and again at the conclusion of the study on June 15, 1982. The data collected on February 5 established a baseline against which any curriculum adaptations made by teachers throughout the study could be noted.

To fully understand the data on Figure 10 reference should be made to the Innovation Configuration Checklist (Appendix E). The checklist consists of a set of 12 components of the K-6 Provincial Curriculum with each component further refined to an array of implementation variations. The variations for each component are numbered for identification purposes and easy transposition to Figure 10. In addition these variations were identified as ideal, acceptable and unacceptable in terms of their suitability with the intent of Curriculum as judged by Dr. Leith, Mr. Smith and the researcher. The variations appearing above the dotted line were judged ideal; those between the dotted line and solid line as acceptable; and those below the solid line as unacceptable.

With specific reference to Figure 10 we see that data for both the Pre-Intervention and Post-Intervention phases are reported and constitutes all the data collected using the Innovation Configuration Interview and Innovation Configuration Checklist.

In Figure 10 the twelve Innovation Configuration components are identified by title in the columns while each teacher is identified by letter in the rows. Where row and column intersect a number appears.

Figure 10

INNOVATION CONFIGURATION: MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM IMPLEMENTATION - BERENS RIVER SCHOOL

Teacher	Innovation Configuration	
	February 5, 1982 (Pre-Intervention Phase)	June 15, 1982 (Post-Intervention Phase)
A	1 (4) (3) 2 1 2 2 (3) 2 1 2 (3)	1 1 2 1 1 2 2 2 1 2 1 2
B	2 1 2 1 2 2 (3) 1 1 (3) 2 (4)	2 1 2 1 2 2 2 1 1 1 2 (3)
C	(4) 1 2 1 (4) (4) 1 2 1 2 1 2	2 1 2 1 2 2 1 2 1 2 1 2
D	(3) 1 1 1 2 (6) 1 1 1 2 1 2	2 1 1 1 2 1 1 1 1 2 1 2
E	(5) 2 2 1 (4) (4) 1 (4) (5) (5) 1 2	2 2 2 1 2 2 1 2 1 2 1 2
F	(4) 1 2 2 (4) (4) 1 1 1 2 1 2	2 1 2 1 1 1 1 1 1 1 2 1
G	(3) 1 2 1 (5) (3) 1 1 1 2 1 2	2 1 2 1 2 2 1 1 1 2 1 2
H	(4) 1 2 1 1 (4) 1 1 1 (3) 1 2	2 1 2 1 1 2 1 1 1 2 1 2
I*		
J	(4) 2 2 (3) (5) (6) 2 2 1 (3) 1 1	2 2 2 1 2 (6) 2 2 1 (3) 1 1
K*		
L*		
	✓	✓ ✓ ✓
<u>INNOVATION COMPONENTS</u>		
PLANNING MATERIALS		
INSTRUCTIONAL MATERIALS		
INSTRUCTIONAL PLANNING		
SCHEDULING		
INSTRUCTIONAL CONTENT		
INSTRUCTIONAL OBJECTIVES		
STUDENT ACTIVITY		
EVALUATION METHODS		
EVALUATION FREQUENCY		
EVALUATION CONTENT		
INSTRUCTIONAL TECHNIQUES		
INTERACTION TECHNIQUES		
PLANNING MATERIALS		
INSTRUCTIONAL MATERIALS		
INSTRUCTIONAL PLANNING		
SCHEDULING		
INSTRUCTIONAL CONTENT		
INSTRUCTIONAL OBJECTIVES		
STUDENT ACTIVITY		
EVALUATION METHODS		
EVALUATION FREQUENCY		
EVALUATION CONTENT		
INSTRUCTIONAL TECHNIQUES		
INTERACTION TECHNIQUES		

○ = Unacceptable component variations of individuals

✓ = Unacceptable component variations of the group as a whole

* = Although the study group consisted of 12 teachers, only 9 are reported on the Innovation Configuration Data Summary since 3 of the 12 teachers were not available for both Innovation Configuration Interviews as required as a part of the data collection.

This number identifies the specific variation each teacher explained as the predominant adaptation that particular Innovation Configuration component had taken during implementation. For example teacher A indicated during the Innovation Configuration Interview that he/she was utilizing variation 1 of the innovation component, Planning Materials; variation 4 of the component Instructional Materials; and variation 3 of the component Instructional Planning, etc. A circled number on Figure 10 identifies a component variation which is outside the scope or desired practice of the curriculum. Again using teacher A as an example and the February 1982 data, we see that an unacceptable variation of practice was identified for the innovation components of Instructional Materials, Instructional Planning, Evaluation Methods and Interaction Techniques.

Pre-Intervention Data

The Innovation Configuration data (Figure 10) for February 5, 1982, revealed that all individuals had wide ranging variations of practice for each component of the curriculum, many of which were identified on the Innovation Configuration Checklist as being unacceptable within the scope of the curriculum. A circled number indicates a component variation which is outside the scope of the curriculum. A group frequency of response analysis revealed unacceptable variations in 4 of the 12 components identified as critical to the innovation. These 4 critical elements in which variations were unacceptable are noted with a check mark () on Figure 10. They were Planning Materials, Instructional Content, Instructional Objectives and Evaluation Content.

Post-Intervention Data

The Innovation Configuration data collected in June contrasted drastically from the data collected in February. For the most part, all component variations identified in February as unacceptable, had moved into the acceptable range by June. The one major exception to this trend was teacher "J" who remained a non-user of the program. But even in this case, some positive change in the Innovation Configuration was evident.

Summary

The Innovation Configuration data collected indicated a major change in the adaptations of the curriculum made by teachers throughout the study. Whereas in the pre-intervention phase the teachers had adopted a wide range of adaptations most of which were well outside the scope of the prescribed curriculum, the post-intervention data revealed that individual teachers and the group as a whole had adopted program adaptations which fell within the scope of the Provincial K-6 Science Curriculum guidelines. The one exception was teacher "J" who remained a non-user of the curriculum to the end.

Summary and Conclusion

Data collected at various intervals throughout the study revealed drastic changes in teacher concerns, quality of use and configuration or nature of use of the Manitoba Provincial K-6 Science Curriculum. The study group at the outset of the study and to the point of the staff development week were concerned primarily with what the Science

Curriculum was, acquiring specific information about it in preparation for implementation, and how the implementation would affect them personally. At the conclusion of the study the group was more concerned with the impact of the implementation upon students, and working collaboratively with colleagues to increase its impact upon students. The group's awareness and knowledge of the innovation greatly increased while the concern over personal security faded. There was a drastic shift in attitude or concern consistent with a profile for successful implementation of the curriculum.

At the outset of the study seven of the twelve teachers were using the Provincial K-6 Science Curriculum in some form or another. At the conclusion of the study nine were using the curriculum, two were no longer teaching science as a subject and one remained a non-user. During the duration of the study the staff as a whole became users of the curriculum. The data on the nature of the use of the curriculum; i.e., the innovation configuration data, revealed dramatic changes in how teachers were using the curriculum. Although at the outset of the study, seven of twelve teachers were assessed as users of the curriculum the innovation configuration data indicated that all teachers whether users or non-users were teaching science in a fashion which was outside the scope of the curriculum. At the end of the study, nine of ten science teachers were teaching in a fashion well within the scope of the curriculum. In addition, the use of the curriculum became more programmatically consistent across the grades.

The dramatic changes in teacher attitudes, and the quality and nature of the use of the curriculum represent an alteration in the interplay of the dynamics or variables of implementation from the

outset to the conclusion of the study. This altered status quo is consistent with the literature in that it represents conditions characteristic of successful implementation. These changes became evident after the staff development activities undertaken during the study and must be explained in terms of the effects staff development had upon the interplay of the variables of implementation; i.e., the people, environment, behaviour and task as represented by Stages of Concern, Levels of Use and Innovation Configuration.

The changes evidenced in the data occurred during the intervention phase of the study. An analysis and discussion of the reasons for these changes must centre around the activities which took place during the intervention period. This analysis constitutes Chapter VI of this thesis.

CHAPTER VI

DISCUSSION OF RESEARCH DATA, CONCLUSIONS & IMPLICATIONS

Introduction

The data represented in Chapter V would indicate successful implementation of the K-6 Provincial Science Curriculum in Berens River School using the variables or dynamics of change as a measure of success. There were individual changes in teacher attitudes, quality and nature of use of the curriculum as well as changes in these same areas at the school-wide level. These changes were positive in that they reflected a consistently higher quality use of a defined curriculum by a group of teachers who became increasingly more concerned with the impact of the curriculum upon students.

It is the purpose of this chapter to suggest how and why these changes took place. The discussion will be limited to the variables or dynamics of the change process as reflected in the concepts of the Concerns Based Adoption Model and will be centered by the specific research problems of the study. First the research data questions and findings are reviewed to highlight the nature and degree of change which took place in the study group during the staff development week. Secondly, the activity undertaken during the staff development week is

presented in the context of the Concerns Based Adoption Model and is rationalized as the cause of the changes evidenced. Thirdly, the reasons for the evident change in the study group is discussed in the context of the research problems and conclusions. Finally, the implications of the study findings for present practice and future research are presented.

Research Data Questions and Findings

The three questions which focused the data collection were:

1. Did teacher concerns about the implementation of the K-6 Provincial Science Curriculum change during the course of study?
2. Did teacher quality of use of the K-6 Provincial Science Curriculum change during the course of study?
3. Did the nature of the adaptations made by teachers to the K-6 Provincial Science Curriculum change during the course of study?

Not only were all questions answered in the affirmative but the pre-intervention, intervention, post-intervention design of the study isolated the intervention phase of the study as the period during which the changes took place. In addition the data revealed the specific nature and scope of the changes which took place during the course of the study. In summary, teacher concerns regarding the implementation of the curriculum changed from self and management concerns to concerns regarding the impact of the curriculum upon students. The quality of use of the curriculum changed from inconsistent and faltering usage to a more directed, confident, routine utilization of the curriculum while the range of teacher made adaptations; although still varied and numerous, narrowed to within the scope and intent of the curriculum. Since the cause for these changes has been narrowed to the time of the intervention phase of the study it becomes important to describe and

analyze the activities which took place during the staff development week of May 10-14, 1982.

Intervention

The week of May 10-14, 1982 seemed to be critical to the study in that it was during this week that intensive staff development activity took place and was the week during which significant changes in the characteristics of the study group and the nature and quality of curriculum use became evident. The "goings on" of that week need clarification and analysis since they seemed to have had a dramatic positive impact upon the implementation effort central to the study.

The staff development week of May 10-14 was in fact a culmination of a series of "stage setting" activities. Staff development was not an isolated, disjointed "one shot" teachers' inservice experience, but began with the first collection of data in February 1982 and ended with the final data collection and sharing of data at the school level in June 1982. Nevertheless, the week of May 10-14 was the highlight of the effort in that it was an event which teachers recognized in the traditional sense of in-service training.

Figure 11, "Staff Development Intervention: Manitoba Provincial K-6 Science Curricular Implementation--Berens River School" summarizes in chart form the activities of the week of May 10-14. The chart details the diagnosed needs of the study group, the type of interventions made by whom and to whom, as well as the purpose and content of the interventions. Figure 11 contains the implications for practice of the CBAM as it relates to this study in that all interventions or activities outlined are practical actions growing out

Figure 11

STAFF DEVELOPMENT INTERVENTIONS: MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM IMPLEMENTATION -
HERENS RIVER SCHOOL

DIAGNOSTIC CATEGORY L.o.U., S.o.U., I.C.	TYPE OF INTERVENTION	TARGET OF INTERVENTION	SOURCE OF INTERVENTION	INTERVENTION CONTENT	PURPOSE OF INTERVENTION
L.o.U., (Levels of Use) User of the Manitoba Provincial K-6 Science Curriculum.	A. Large Group Session. B. Small Work Groups. C. Individualized Consultation.	All users of the Manitoba Provincial K-6 Science Curriculum N=7	A. Inservice Leader. B. Each member of group including Researcher and Math/Science Consultant. C. Researcher and Math/ Science Consultant.	A. Large group inservice session conducted by co-author of curriculum and practising teacher, detailing teaching techniques designed to facilitate overcoming mechanical problems of usage. B. Small group work sessions in which users and non-users met to complete tasks to facilitate use of the curriculum - resource organization was one major task; unit planning was another task. C. Individual formal and informal conversations between teacher and Researcher and the Math/Science Consultant during which teachers were reassured in their tasks and the Researcher and Math/Science Consultant aided teachers in their tasks.	To facilitate usage of curriculum by present users. A. To provide accurate information regarding expectations related to the use of the curriculum. B. To mobilize staff into smaller work-study groups. C. To provide mechanism for "comforting and caring".
Non-user of the Manitob Provincial K-6 Science Curriculum.	A. Large Group Session. B. Small Work Groups. C. Individualized Consultation.	All non-users of the Manitoba Provincial K-6 Science Curriculum N=5	A. Inservice Leader. B. Each member of group including Researcher and Math/Science Consultant. C. Researcher and Math/ Science Consultant.	A. Large group inservice session conducted by co-author and practising teacher of the curriculum detailing the ease of usage, expectations of usage, support for usage and incentives for usage. B. Same as B above. C. Sharing and discussion of L.o.U. Interview data and the identification and discussion of steps that could be taken to become users of the curriculum. (Individual goal setting sessions)	To facilitate and promote usage of curriculum by non-users. A. Same as above. B. Same as above. C. Same as above.
S.o.C., (Stages of Concern). Informational, Personal and Management Concerns	A. Large Group Session. B. Small Work Groups. C. Individual Consultation.	A. All teachers. B. All teachers in each small working group: -K-3 Group -4-6 Group C. All teachers individually.	A. Inservice Leader. B. Each member of group including Researcher and Math/Science Consultant. C. Researcher and Math/ Science Consultant.	A. Large group session conducted by co-author and practising teacher of the curriculum in which teachers: -were assured that this inservice experience is in no way meant as a threatening experience. -discussed what use of the curriculum detailed. -were reinforced in their present teaching practises within the scope of the curriculum. -discussed and addressed management concerns related to teaching technique and resource organization. B. Small group work sessions in which teachers: -cooperatively planned instructional units (in diads). -identified blockages to usage or in the case of present users, enhanced usage and established action plans to remove these blockages. Lack of resources was one blockage so resource committees at the K-3 and 4-6 levels were established to organize and order resources. C. Individual consultation with each teacher promoting identification with small group and task completion, positively reinforcing teacher activity which was task oriented, and assisting in the completion of group set tasks with individual teachers.	To address the relatively high intensity of Stage 1, 2, 3 Concerns shared by the staff generally.

Figure 11

STAFF DEVELOPMENT INTERVENTIONS: MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM IMPLEMENTATION -
BERENS RIVER SCHOOL

DIAGNOSTIC CATEGORY L.O.U., S.O.U., I.C.	TYPE OF INTERVENTION	TARGET OF INTERVENTION	SOURCE OF INTERVENTION	INTERVENTION CONTENT	PURPOSE OF INTERVENTION
<p><u>I.C. Innovation Configuration</u></p> <p>-Use of Planning Materials.</p> <p>-Instructional Content</p> <p>-Teaching to Instructional Objectives.</p> <p>-Evaluation Content.</p>	<p>A. Individual Consultation.</p> <p>B. Small Work Groups.</p> <p>C. Classroom visitation observation, and participation.</p>	<p>A. All teachers individually.</p> <p>B. All teachers in each small working group: -K-3 Group -4-6 Group</p> <p>C. All teachers.</p>	<p>A. Researcher and Math/ Science Consultant.</p> <p>B. Each member of group including the Researcher and the Math/Science Consultant.</p> <p>C. Researcher and Math/ Science Consultant.</p>	<p>A. Individual consultation with each teacher to: -discuss and check accuracy of data collected from Innovation Configuration interview. -highlight teacher practises which are outstanding or acceptable within the scope of the curriculum. -identify teaching practises which could be improved upon. -detail what is expected in the use of the curriculum guide using the innovation configuration as a guide. -discuss on an ongoing basis changes in teaching practise and set personal action plans, re: changing teaching practise using the I.C. Checklist as a guide.</p> <p>B. Small work group meetings and activity in which individuals as part of either a K-3 or 4-6 group, identify and complete tasks which facilitate acceptable use of the curriculum guide as identified in the I.C. Checklist. Specifically in the area of evaluation content both the K-3 and 4-6 groups established a student evaluation checklist to be used to monitor student progress.</p> <p>C. Classroom visitations were set up during which the Math/ Science Consultant and/or researcher would participate or observe the science class depending on the wish of the requesting teacher. Follow-up discussion of the visitation was focused by the Innovation Configuration Checklist.</p>	<p>To assist all teachers in assessing personal teaching practises and improve teaching practises in those areas identified as weaknesses on the Innovation Configuration Checklist.</p> <p>To provide in class assistance to teachers in the assessment of teaching practises as per I.C. Checklist.</p>

of a concerns based consideration of the needs of the study group. The chart itself is organized to include all the concepts of the CBAM described in Chapter III of this thesis and represents one field operational form of the model.

The diagnostic category column in Figure 11 is used to identify the various diagnostic descriptions of the study group either as a group, subgroup or individuals which emerged from the data collected using the various data collection instruments. The diagnostic categories are Level of Use, Stages of Concern, and Innovation Configuration. Under each of these categories is described the nature of the study group during the pre-intervention phase. In the Levels of Use category, we see that 7 teachers were users of the curriculum, while 5 were not. In the Stage of Concern category we find that all individuals had similar informational, personal and management concerns relative to the curriculum. The information in the Innovation Configuration category reveals that the group shared four major undesirable curriculum usage characteristics.

The information in each of the diagnostic categories implies that a particular intervention is required to satisfy the need. The information in the diagnostic category influences the type of the intervention activity, who is going to participate in the activity, who is going to provide the activity, the nature of the activity and its purpose. This information is detailed in the remaining columns of the figure under Type of Intervention, Target of Intervention, Source of Intervention, Intervention Content and Purpose of Intervention and constitutes a description of the intervention phase of the study.

To read the chart, select a diagnostic category; i.e., LoU, SoC or IC, in the diagnostic category column. Follow the row headed by the diagnostic category selected. The cell where row and column intersect contains information on the type, target, source, content or purpose of interventions. The diagnostic column contains all data summarized in advance of the staff development week using the various associated data collection instruments while the type, target, source, content and purpose columns contain a description of the intervention activity undertaken to meet these diagnosed needs.

In planning the interventions, it was necessary to establish goals and purposes for the interventions based on the diagnosed needs. The data revealed that all teachers shared common needs as well as individually unique needs. The Stages of Concern Questionnaire and Open-Ended Statement of Concern Questionnaire showed that all teachers whether users or non-users, wanted accurate information regarding expectations related to the use of the curriculum, to work cooperatively with other teachers, and a secure supportive non-threatening environment in which to initiate implementation of the curriculum.

The difference between the users and non-users in the Levels of Use category was essentially one of commitment. Users were committed to the use of the curriculum and had begun limited use and were prepared for assistance in implementation while non-users had yet to commit to the curriculum.

The innovation configuration data revealed that four areas of emphasis were required by the group in order to bring the teaching of science within the scope of the curriculum. Although most

configurations of the use of the science curriculum were not ideal only four components of the group innovation configuration were thought to be contrary or outside the aims of the curriculum. The four components of the group configuration thought to be outside the aims of the curriculum are highlighted on Figure 10 with a check mark (✓) and are Planning Materials, Instructional Content, Instructional Objectives, and Evaluation Content. Staff Development activity had to address improving teacher performance in each of the identified components.

It should be noted that all diagnostic categories were addressed in all intervention activities. A session was not planned to address one need in isolation of other needs held by the group. The chart is represented as it is, for reading convenience in matching a typical intervention activity or strategy to a particular need. In actual practice, intervention activities were designed around the three diagnostic categories simultaneously.

The large group activities were planned as the means of addressing the needs or concerns held by the total study group. Large group activity is the most efficient forum for the dissemination of clear information and expectations as well as for establishing a supportive environment by assuring the group in its efforts and guaranteeing support in future activity. The major large group activity consisted of a half day in-service session during which a co-developer and pilot teacher of the curriculum outlined the curriculum guide, critical expectations for use as well as some helpful strategies in getting started with use of the curriculum.

The small group activities were designed for work in which two to six individuals with a common interest or focus could pool energies to accomplish implementation tasks deemed valuable by the group. Small group activities were also valuable in developing inter-individual bonding and sub-group solidarity on a professional basis. Small working groups provided the infra-structure needed in the school to maintain implementation efforts of individual teachers. Small group activities included resource organization, unit planning, the identification and pursuit of acceptable teaching strategies consistent with the curriculum guide and the identification of additional staff development activity.

Individual teacher consultations were designed to meet the specific concerns of individuals and to provide "one on one" encouragement, reinforcement and assistance. The term "coaching" as popularized by Bruce Joyce, is best used to describe these "one on one" consultations. ~~Consultation more often than not led toward a small~~ group consideration of individual needs during which the group found itself able to assist individuals with concerns or difficulties blocking their successful implementation of the curriculum. Some individual consultation activities included conversations between the researcher, math/science/computer consultant and teacher during which the teacher was reassured and aided in his/her activity or task. Innovation configuration data was shared for the purpose of identifying instructional strengths and weaknesses and the necessary support needed to improve implementation efforts. Classroom visitations were also a part of the consultation process. The researcher and/or math/science/computer consultant visited classrooms and co-taught or

acted as a "second pair of eyes" depending on the desire of the teacher.

All interventions whether large group, small group or individual, were focused by the diagnostic data gathered and were collaborative in nature in that the purposes and means of the interventions were determined cooperatively. This collaborative posture assumed by the researcher and the math/science/computer consultant of itself became an intervention in that this strategy was elected once the diagnostic data revealed that teachers wished to work cooperatively with other teachers and resource personnel.

The interventions themselves when listed are not different from what has happened during staff development activities in the past in Berens River School. The difference in this case being that the interventions were tied to a larger ecological consideration of how people affect and are affected by change over an extended period of time. The interventions were keyed to human concerns, and were directed at creating specific behavioural changes. The interventions were designed to impact upon the variables of the change process and guide and monitor the interplay of these variables over time.

The interventions as described had impact for they resulted in positive change in each of the variables or dynamics of the change process. The interventions were task oriented, specific in nature, pegged to the affective status of the teacher, executed in an environment which was reassuring, non-threatening and supportive and designed to result in changes in teacher concern, behaviour or use of the Provincial Curriculum. To note what was effective and what the effects were is a matter of reporting and description. To explain why

these effects were evidenced requires a return to the analysis of what Goodlad called curriculum "non-events".

In Chapter One, four factors were identified as being the most significant contributors to failed implementation efforts. In review these factors were:

1. The conceptualization of change as an act rather than a process;
2. Inadequate attention paid to staff concerns relative to the innovation and staff development during curriculum implementation;
3. A lack of recognition of the importance and effect of the ecology of the school in implementation; and,
4. The lack of clarity of the nature, scope and expectations of the innovation.

Each of these factors is a manifestation of the interplay of the operational variables or dynamics of the change process as expressed in the formula $B=f(P)(E)(T)$. Where one or more of these variables is left unaddressed in the implementation process one or more of the factors cited manifests itself in implementation outcomes which are different than expected. Since it is impossible to hold any of the variables constant in the field, the need to describe the interplay of these variables in a context, at a given point in time, becomes significant if there is to be planned influence upon the interplay and its consequences.

The reason that significant changes were evidenced during the study may be the existence of a means by which the status of the dynamics of the change process could be assessed. Upon this assessment could be built a strategy for influencing the outcomes of the interplay of these dynamics. Given the affective characteristics of the individuals involved in change, a specific description of the change to

take place and the characteristic behaviours of individuals involved in the change it becomes possible to provide resource support which is tailored to the population involved in the change.

The Concerns Based Adoption Model provides the means by which each of the variables can be assessed and provides the change facilitator with sufficient data to plan significant linkages with a resource system which can be utilized to meet the needs of the client group.

Research Problems and Conclusions

Given the research data which identifies specific change within the study group and a specific time during which these changes were initiated, as well as the discussion highlighting the specific nature of the interventions which precipitated the identified change several conclusions can be drawn with specific reference to the research problems.

Problem One: Can the Concerns Based Adoption Model:

- a) facilitate the diagnosis of problems which affect successful curriculum implementation? And,
- b) facilitate the prescription and execution of staff development interventions to address the problems?

The Concerns Based Adoption Model does facilitate the diagnosis of problems affecting successful curriculum implementation and does facilitate the prescription and execution of staff development interventions to address these problems. The Concerns Based Adoption Model constitutes a practical description and explanation of the interplay of the key variables or dynamics of the change process and

subsequently addresses these factors identified as having impact upon the outcomes of curriculum implementation.

Problem Two: Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of curriculum implementation?

The Concerns Based Adoption Model can be used to evaluate the effectiveness of curriculum implementation. The CBAM describes and explains the status of the change variables and the status quo of the interplay among these variables within a given context at a given point in time. A comparison of these descriptions and explanations at different points in time during an implementation effort highlights changes which have taken place throughout the effort and provides concrete data for evaluating the quality of these changes.

Problem Three: Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of staff development interventions in support of curriculum implementation?

The Concerns Based Adoption Model can be used to evaluate the effectiveness of staff development interventions into the implementation process. Given that the model makes it possible to describe and explain the status of the implementation effort at a given point in time in terms of the variables or dynamics at play in the effort, changes in the status of the implementation effort as a whole or in any of the variables individually, can be explained in terms of the interventions made into the implementation process.

Problem Four: What understanding of the curriculum implementation process does the Concerns Based Adoption Model highlight and what are the implications of the model for current practice?

The Concerns Based Adoption Model conceptualizes in operational terms the organismic nature of the change process by providing the framework and means by which the dynamics of the change process can be described individually and in relation to one another. The model does not presuppose that any one of the variables can be held constant, but rather supposes that the influenced interplay of the dynamics of change is to be expected in the field context. The model highlights the understanding of change as a process which is organismic and multi-variate in nature.

Implications of the Study

This study into the nature of the curriculum implementation process and how it may be affected has highlighted several practical and conceptual possibilities which have import for the student of change. In summary they are:

Firstly, the factors which have been identified as affecting curriculum implementation outcomes are manifestations of the interplay among the variables of the change process as expressed in the formula $B=f(E)(E)(T)$.

Secondly, the description and explanation of this interplay as expressed in the formula $B=f(P)(E)(T)$ is possible using the concepts and measures of the Concerns Based Adoption Model.

Thirdly, it is possible to describe in diagnostic terms the interplay of the variables of the change process in a field context.

Fourthly, the diagnosis of the status of the interplay of the variables of change can be used to plan interventions to influence this interplay and its outcomes.

Fifthly, significant changes in the status quo of the interplay of these variables is possible through planned intervention.

Sixthly, the degree of effectiveness of a curriculum implementation effort can be judged using the degree of change evidenced in the status of each of the variables and the status quo of the interplay among the variables.

Seventhly, the effectiveness of the interventions into the interplay of the change variables can also be judged by the changes evidenced in the status of each of the variables and the status quo of the interplay among the variables.

Implications for Practice

Given these possibilities the implications of the Concerns Based Adoption Model for current practice in curriculum implementation are various. The greatest implication is the conceptualization of change as a process involving the interplay of several variables none of which can be held constant in the field context. The effect upon practice will be a leaning away from the clinical, laboratory approach to curriculum implementation and a focusing upon a developmental, field based approach designed to describe and influence change variables. This conceptualization of change as a multi-variate process will also influence the nature of teacher in-service training. Although the specific "in-service" or staff development activities for teachers may not change, they will take on a more developmental orientation and begin to be viewed in a larger than single event context. The viewing of curriculum implementation as a process entailing a time consideration more than the offering of an administrative edict or a

one shot support service will put curriculum implementation into the longitudinal perspective which is necessary if the effects of curriculum implementation; i.e., impact upon students, are to be studied.

Implications for Research

The implications for search are also significant. If the Concerns Based Adoption Model brings a longitudinal perspective to curriculum implementation in which the process of curriculum implementation can be described, assessed and influenced, then the impact of the curriculum upon clients may be studied with greater reliability. Research is lacking in reliable assessments of the effects of curriculum implementation upon learning outcomes. Studies assessing the impact of various approaches to curriculum implementation upon client learning outcomes do not exist.

Summary

The study data indicates a successful implementation of the K-6 Provincial Science Curriculum in Berens River School. The evidence exists in the form of changes in teacher attitudes and the quality and nature of use of the curriculum by individual teachers and the staff as a whole. These changes reflected a consistently higher quality use of a more clearly defined curriculum by a group of teachers who were becoming increasingly more concerned with the impact of the curriculum upon students.

The study design which called for frequent assessment and description of the implementation process brought focus to the causes

of these changes. Changes occurred after planned staff development activities. The staff development interventions were planned with the purpose of affecting the status of the interplay among the variables in the change formula $B=f(P)(E)(T)$. Using the guiding concepts and related measures of the Concerns Based Adoption Model to assess the status of the variables, staff development activities were designed. The affective needs of the teachers, the quality and nature of the use of the curriculum as manifested in the context of Berens River School determined the type, target, source, content and purpose of all staff development interventions.

It was concluded that the changes evidenced in teacher attitudes, and quality and nature of curriculum use were a function of the staff development interventions undertaken. It was further concluded that the Concerns Based Adoption Model provided an affective applied theoretical orientation to facilitating curriculum implementation, the assessment of the effectiveness of implementation, the design and execution of staff development interventions in support of implementation, and the assessment of the effectiveness of staff development interventions.

This study was limited to the implementation of one curriculum by a small group of elementary school teachers in a small isolated rural school. These limiting factors become problematic when the model which provides the theoretical framework for the study focuses upon the organization and management of the innovating institution and requires a large study group for reliability. These limiting factors however do not constitute a problem when the model and theoretical framework for the study focus upon the individual within the organization as the unit

of change.

In settings where a consideration of the organizational nature, managerial process or system operation is really a consideration of individuals, their attitudes and activities, the Concerns Based Adoption Model is best suited for facilitating the change process. In settings where a system consideration is possible and feasible the CBAM is also appropriate in that it allows for the aggregation of individual data. The CBAM has application to all settings if the focus of the change effort being facilitated is the individual rather than the system involved in the change.

CHAPTER VII

STUDY SUMMARY

Introduction

Chapter VII summarizes the factors associated with the lack of anticipated outcomes of change efforts in education as identified in recent research on educational change and cites the Concerns Based Adoption Model as one conceptualization of the change process which addresses these factors. Secondly, the application of the Concerns Based Adoption Model in facilitating curriculum implementation effort in Berens River School is reviewed. Finally, Chapter VI focuses upon the conclusions and implications of the Berens River K-6 Manitoba Provincial Science Curriculum Implementation Project for the purpose of identifying directions for needed research into the applications of Concerns Based Adoption Model to curriculum change efforts specifically and educational change efforts generally.

Review of Factors Affecting Outcomes of Curriculum Innovation

What Goodlad and Klein (1970:97) observed to be the blunting of change or the lack of congruence between the intended and actual outcomes of curricular innovation has been the focus of a great deal of

recent study. A variety of studies on this phenomenon of unintended or unexpected curricular outcomes has resulted in the isolation of at least four accountable factors:

1. The conceptualization of change as an act rather than a process. This conceptualization assumes that change is essentially non-developmental in nature, and therefore, can be accomplished by edict (Hall and Loucks, 1979:37);
2. The inadequate attention paid to staff concerns relative to the innovation and staff development during curriculum implementation. On-going, focused, people-based support during implementation has been identified as critical to successful implementation (Berman and McLaughlin, 1978:Vol. 8, 34; Fullan and Pomfret, 1976:82; Leithwood et al., 1979:53, Goodlad, 1975:167, 177-184);
3. The lack of recognition of the importance and effect of the ecology of the school in implementation (Berman and McLaughlin, 1978:Vol. 8, 34; Fullan and Pomfret, 1976:68-73; Leithwood et al., 1979:56-60; Goodlad, 1975:45, 71);
4. The lack of clarity of the nature, scope and expectations of the innovation (Berman and McLaughlin, 1978:Vol. 8, 34; Fullan and Pomfret, 1976:48-51; Leithwood et al., 1979:56-60; Goodlad, 1975:45-71).

Without exception the factors identified were evidenced during the implementation phase of the various curriculum projects studied and were seen as responsible for unexpected project outcomes.

Review of the CBAM

One promising response to this problem of unexpected outcomes evidenced during curriculum implementation, which addresses each of the factors identified as having a significant impact upon effective implementation, is the Concerns Based Adoption Model (CBAM). Briefly, the Concerns Based Adoption Model is a change model which evolved from research conducted at the Research and Development Center for Teacher Education of the University of Texas at Austin related to the concept of Stages of Concern developed by Hall, Wallace and Dossett (1973). The CBAM represents the complex process entailed when individuals in educational institutions become involved in implementing innovations. The CBAM is a theoretical framework which links the activities of three subsystems--a resource system, a user system, and a change facilitator system--in the diagnosis of user concerns about an innovation, typical behaviours of individual users of the innovation, and an accurate description of the innovation being implemented. This diagnosis of user concerns, user behaviours, and the characteristics of the innovation provides the basis for the design of focused staff development as the means of facilitating curriculum implementation.

Review of Berens River School Implementation Project:

Research Problems, Conclusions and Implications

Research Problems and Conclusions

The application of the Concerns Based Adoption Model to the implementation of the Manitoba Provincial K-6 Science Curriculum in

Berens River School yielded a set of concrete conclusions in response to the research problems which focused the study.

Problem 1

Can the Concerns Based Adoption Model facilitate the diagnosis of problems which affect successful curriculum implementation, and facilitate the prescription and execution of staff development interventions to address the problems?

The Concerns Based Adoption Model does facilitate the diagnosis of problems which affect successful curriculum implementation and does facilitate the prescription and execution of staff development interventions to address these problems. The Concerns Based Adoption Model constitutes a practical description and explanation of the interplay of the key variables or dynamics of the change process and subsequently addresses those factors identified as having impact upon the outcomes of the curriculum implementation.

Problem 2

Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of curriculum implementation?

The Concerns Based Adoption Model can be used to evaluate the effectiveness of curriculum implementation. The CBAM describes and explains the status of the change variables and the status quo of the interplay among these variables within a given context at a given point in time. A comparison of these descriptions and explanations at different points in time during an implementation effort highlights

changes which have taken place throughout the effort and provide concrete data for evaluating the quality of these changes.

Problem 3

Can the Concerns Based Adoption Model facilitate the evaluation of the effectiveness of staff development interventions in support of curriculum implementation?

The Concerns Based Adoption Model can be used to evaluate the effectiveness of staff development interventions into the implementation process. Given that the model makes it possible to describe and explain the status of the implementation effort at a given point in time in terms of the variables or dynamics at play in the effort, changes in the status of the implementation effort as a whole or in any of the variables individually, can be explained in terms of the interventions made into the implementation process.

Problem 4

What understanding of the curriculum implementation process does the Concerns Based Adoption Model highlight and what are the implications of the model for current practice?

The Concerns Based Adoption Model conceptualizes in operational terms the organismic nature of the change process by providing the framework and means by which the dynamics of the change process can be described individually and in relation to one another. The model does not presuppose that any one of the variables can be held constant but

rather supposes that the influenced interplay of the dynamics of change is to be expected in the field context. The model highlights the understanding of change as a process which is organismic and multi-variate in nature.

Implications

Implications for Practice

The implications of the Concerns Based Adoption Model for current practice in curriculum implementation are various. The greatest implication is the conceptualization of change as a process involving the interplay of several variables none of which can be held constant in the field context. The effect upon practice will be leaning away from the clinical laboratory approach to curriculum implementation and a focusing upon a developmental, field based approach designed to describe and influence the change variables. The conceptualization of change as a multi-variate process will also influence the nature of teacher in-service training. Although the specific "in-service" or staff development activities for teachers may not change they will take on a more developmental orientation and begin to be viewed in a larger than single event context. The viewing of curriculum implementation as a process entailing a time consideration more than the offering of an administrative edict or a "one shot" support service will put curriculum implementation into the longitudinal perspective which is necessary if the effects of curriculum implementation; i.e., impact upon students, are to be studied.

Implications for Research

The implications for research are also significant. If the Concerns Based Adoption Model brings a longitudinal perspective to curriculum implementation in which the process of curriculum implementation can be described, assessed and influenced, then the impact of curriculum upon clients may be studied with greater reliability. Research is lacking in reliable assessments of the effects of curriculum implementation upon learning outcomes. Studies assessing the impact of various approaches to curriculum implementation upon client learning outcomes do not exist.

Conclusion

The implementation of the Manitoba Provincial Science Curriculum in Berens River School was regarded as a success in that the implementation effort resulted in anticipated outcomes in terms of program implementation and staff development. The Concerns Based Adoption Model proved to be a very powerful conceptualization of the change process which permitted and promoted a diagnostic/prescriptive approach to the implementation of curriculum through developmental and ongoing staff development activities focused by user concerns and behaviours relative to the innovation as well as the configuration of the innovation.

Within the context of the formula $B=f(P)(E)(T)$ in which the characteristic behaviour (B) exhibited by individuals involved in a change process is a function of the interaction of the affective characteristics (P) peculiar to the people involved, the characteristics of the environment (E) in which the change takes place,

and the nature of the change expressed in expectations or tasks (T) which define the change, the CBAM provides a strong diagnostic methodology for assessing behavioural patterns (B) in terms of Levels of Use, affective characteristics (P) in terms of Stages of Concern, and a definition of the innovation (T) in terms of Innovation Configuration, and environmental impact (E) as reflected in the affective characteristics of the individuals involved in the change process. In combination the SoC, LoU and IC diagnostic data provide a strong base from which to prescribe change agent interventions that are relevant to the behavioral and affective characteristics of individuals within the context of a specifically defined innovation and environment.

Interventions into the innovation process guided by the concepts of the Concerns Based Adoption Model have been shown to be effective and have resulted in the successful implementation of the Manitoba Provincial K-6 Science Curriculum in Berens River School. The Concerns Based Adoption Model is a powerful applied theoretical conceptualization of the change process which when applied in the context of curriculum implementation heralds a major break with current widespread practice in that the model demands an active ongoing consideration of identified variables affecting the process and product of curriculum implementation.

POST SCRIPT

If I Were To Do It Again

In any future application of the CBAM in a strictly non-research context I would apply the data collection and analytic measures accompanying the model with greater discrimination. I found that for the practical purposes of designing and evaluating staff development it was sufficient to know that a client was either a user or non-user of the innovation and at either the self, task, or impact stage of concern. Although the more detailed information which is available through a comprehensive application and analysis of the measures of the CBAM is valuable in describing the needs of a large client population which may be greatly varied, I found that for the small and familiar population of my study, the range of needs to be so narrow and uniform that it was unnecessary to concentrate upon the finer analytical categories present in the model. This was particularly true in the consideration of levels of use.

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GLOSSARY

- Anatomy of Interventions: A framework of the dimensions of intervention. (Hord and Loucks, 1980:23)
- Change Facilitator/Agent: A person who facilitates planned change/innovation. (Havelock, 1973:5)
- Components of an Innovation: The major features of an innovation. Components are usually either materials, teacher behaviours, student activities, or how materials are used. CRITICAL COMPONENTS are those which must be used if the innovation is to be considered implemented. RELATED COMPONENTS are those which are not required or critical. Which components are designated critical and related often depends on who is doing the defining: developer, change facilitator, user, or evaluator. (Heck et al., 1981:12)
- Component Variations: The different ways in which the components can be operationalized; e.g., programmed materials, teacher-made materials, or commercial textbook; homogeneous grouping, heterogeneous grouping, or individualization. Components can simply be present or absent; e.g., bilingual teacher or no bilingual teacher. (Heck et al., 1981:17).
- Concerns: The composite representation of the feelings attitudes, thoughts, ideas or reactions an individual has related to an innovation. (Hord and Loucks, 1980:4)
- Concerns Based Adoption Model (C.B.A.M.): An empirically-based conceptual framework which outlines the developmental process that individuals experience as they implement a new innovation and participate in attendant staff development. (Hord and Loucks, 1980:1).
- Implementation: The change process that occurs when an (innovation) innovative project impinges upon an organization (setting). (Berman and McLaughlin, 1974:13).
- Innovation/Change: Broadly refers to any process, product, program or idea that is the focus of a change effort. (Loucks, Newlove and Hall, 1975:iv)
- Innovation/Change Process: How change or innovation comes about. (Havelock, 1973:5)

- Innovation Configurations: The operational patterns of the innovation that result from selection and use of different innovation component variations. (Heck et al., 1981:17)
- Implementation Requirements: The training, support services, and materials needed by individual users to implement an innovation. These would have to be in place for use in the innovation to proceed. (Heck et al., 1981:17)
- Interventions: Actions or events which influence use of an innovation. (Hord and Loucks, 1980:2)
- Intervention Taxonomy: Hierarchical description of the levels at which intervention can be made. (Hord and Loucks, 1980:18)
- Levels of Use of the Innovation (L.O.U.): Developmental hierarchy of behaviours characterized in eight levels describing the variety of behaviours of the innovation user. (Hall, et al., 1975)
- Resource System: An interrelated set of people and organizations capable of providing resources. (Havelock, 1973:5)
- Staff Developer: An individual involved in a leading role in staff development.
- Staff Development: A process designed to foster personal and professional growth for individuals within an organizational climate. (Dillon Peterson, 1981:3)
- Stages of Concern About the Innovation (S.O.C.): Developmental hierarchy of concerns in seven stages which describes the kinds of concerns which the individual may experience across time related to the innovation. (Hord and Loucks, 1980:5)
- Use: Behavioural indicators of user interaction with innovation.
- User System: The users or potential users of an innovation. (Hord and Loucks, 1980:2)

APPENDICES

APPENDIX A

STAGES OF CONCERN QUESTIONNAIRE (S.o.C.Q.)

SoC QUESTIONNAIRE INTRODUCTORY PAGE

Manitoba Provincial Science Curr.

Concerns Questionnaire

Name (Please print) _____

In order to identify these data, please give us the last four digits of your social insurance number.

The purpose of this questionnaire is to determine what people who are using or thinking about using various programs are concerned about at various times during the innovation adoption process. The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years experience in using them. Therefore, a good part of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time. For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

This statement is very true of me at this time.	0	1	2	3	4	5	6	7
This statement is somewhat true of me now.	0	1	2	3	4	5	6	7
This statement is not at all true of me at this time.	0	1	2	3	4	5	6	7
This statement seems irrelevant to me.	0	1	2	3	4	5	6	7

Please respond to the items in terms of your present concerns, or how you feel about your involvement with the Manitoba Provincial Science Curriculum. We do not hold to any one definition of this innovation, so please think of it in terms of your perception of what it involves. Since this questionnaire is used for a variety of innovations, the name Manitoba Provincial Science Curriculum never appears. However, phrases such as "the innovation", "this approach", and "the new system" all refer to the Manitoba Provincial Science Curriculum. Remember to respond to each item in terms of your present concerns about your involvement with the Manitoba Provincial Science Curriculum.

Thank you for taking time to complete this task.

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SoC QUESTIONNAIRE ITEMS

0	1	3	4	5	6	7					
Irrelevant	Not true of me now	Somewhat true of me now		Very true of me now							
1.	I am concerned about students' attitudes toward this innovation.			0	1	2	3	4	5	6	7
2.	I now know of some other approaches that might work better.			0	1	2	3	4	5	6	7
3.	I don't even know what the innovation is.			0	1	2	3	4	5	6	7
4.	I am concerned about not having enough time to organize myself each day.			0	1	2	3	4	5	6	7
5.	I would like to help other faculty in their use of the innovation.			0	1	2	3	4	5	6	7
6.	I have a very limited knowledge about the innovation.			0	1	2	3	4	5	6	7
7.	I would like to know the effect of reorganization on my professional status.			0	1	2	3	4	5	6	7
8.	I am concerned about conflict between my interests and my responsibilities.			0	1	2	3	4	5	6	7
9.	I am concerned about revising my use of the innovation.			0	1	2	3	4	5	6	7
10.	I would like to develop working relationships with both our faculty and outside faculty using this innovation.			0	1	2	3	4	5	6	7
11.	I am concerned about how the innovation affects students.			0	1	2	3	4	5	6	7
12.	I am not concerned about this innovation.			0	1	2	3	4	5	6	7
13.	I would like to know who will make the decisions in the new system.			0	1	2	3	4	5	6	7
14.	I would like to discuss the possibility of using the innovation.			0	1	2	3	4	5	6	7
15.	I would like to know what resources are available if we decide to adopt this innovation.			0	1	2	3	4	5	6	7
16.	I am concerned about my inability to manage all the innovation requires.			0	1	2	3	4	5	6	7
17.	I would like to know how my teaching or administration is supposed to change.			0	1	2	3	4	5	6	7
18.	I would like to familiarize other departments or persons with the progress of this new approach.			0	1	2	3	4	5	6	7

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	0	1	2	3	4	5	6	7					
	Irrelevant	Not true of me now	Somewhat true of me now			Very true of me now							
19.	I am concerned about evaluating my impact on students.					0	1	2	3	4	5	6	7
20.	I would like to revise the innovation's instructional approach.					0	1	2	3	4	5	6	7
21.	I am completely occupied with other things.					0	1	2	3	4	5	6	7
22.	I would like to modify our use of the innovation based on the experiences of our students.					0	1	2	3	4	5	6	7
23.	Although I don't know about this innovation, I am concerned about things in the area.					0	1	2	3	4	5	6	7
24.	I would like to excite my students about their part in this approach.					0	1	2	3	4	5	6	7
25.	I am concerned about time spent working with nonacademic problems related to this innovation.					0	1	2	3	4	5	6	7
26.	I would like to know what the use of the innovation will require in the immediate future.					0	1	2	3	4	5	6	7
27.	I would like to coordinate my effort with others to maximize the innovation's effects.					0	1	2	3	4	5	6	7
28.	I would like to have more information on time and energy commitments required by this innovation.					0	1	2	3	4	5	6	7
29.	I would like to know what other faculty are doing in this area.					0	1	2	3	4	5	6	7
30.	At this time, I am not interested in learning about this innovation.					0	1	2	3	4	5	6	7
31.	I would like to determine how to supplement, enhance, or replace the innovation.					0	1	2	3	4	5	6	7
32.	I would like to use feedback from students to change the program.					0	1	2	3	4	5	6	7
33.	I would like to know how my role will change when I am using the innovation.					0	1	2	3	4	5	6	7
34.	Coordination of tasks and people is taking too much of my time.					0	1	2	3	4	5	6	7
35.	I would like to know how this innovation is better than what we have now.					0	1	2	3	4	5	6	7

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SoC QUESTIONNAIRE DEMOGRAPHIC PAGE

PLEASE COMPLETE THE FOLLOWING:

1. What percent of your job is:

teaching _____% administration _____% other (specify) _____%

2. Do you work: full time _____ part time _____

3. Female _____ Male _____

4. Age: 20-29 _____ 30-39 _____ 40-49 _____ 50-59 _____ 60-69 _____

5. Highest degree earned:

Associate _____ Bachelor _____ Masters _____ Doctorate _____

6. Year degree earned: _____ 7. Total years teaching: _____

8. Number of years at present school: _____

9. In how many schools have you held full time appointments?

one _____ two _____ three _____ four _____ five or more _____

10. How long have you been teaching the Provincial Science Curriculum, not counting this year?

never _____ 1 year _____ 2 years _____ 3 years _____ 4 years _____ 5 years or more _____

11. In your use of the Provincial Science Curr., do you consider yourself to be a:

nonuser _____ novice _____ intermediate _____ old hand _____ past user _____

12. Have you received formal training in the use of the Provincial Science Curr.?
(workshops, inservice, courses, etc.)

yes _____ no _____

13. Are you currently in the first or second year of use of some major innovation or program other than the Provincial Science Curr.?

yes _____ no _____

If yes, please describe briefly.

14. Please check to see that you have written the last four digits of your Social Security number on the front page of this questionnaire. Thank you for your help.

APPENDIX B

OPEN-ENDED STATEMENT OF CONCERN

Open-Ended Statement of Concern

Name (Please print) _____

It is very important for continuity in processing this data that we have a unique number that you can remember. Please use:

last four digits S.I.N. # _____

The purpose of the open-ended question on the next page is to determine what people who are using or thinking about using innovations are concerned about at various times during the innovation adoption process.

Please respond in terms of your present concerns, or how you feel about your involvement or potential involvement with the innovation The Manitoba Provincial Science Curriculum. We do not hold to any one definition of this innovation, so please think of it in terms of your own perceptions of what teaching the Science Curriculum involves. Remember to respond in terms of your present concerns about your involvement or potential involvement with The Manitoba Provincial Science Curriculum.

Thank you for taking time to complete this task.

RESPONSE SHEET

WHEN YOU THINK ABOUT THE MANITOBA PROVINCIAL SCIENCE CURRICULUM,
WHAT ARE YOU CONCERNED ABOUT? (Do not say what you think others
are concerned about, but only what concerns you now.) Please
write in complete sentences, and please be frank.

(1)

Do not write in
this space.

(2)

(3)

Please place a check by the statement that concerns you most.

APPENDIX C

LEVELS OF USE INTERVIEW

LoU Interview

0-II/III-VI Are you currently using _____?

If yes, turn page. If no, continue.

NO

Have you ever used it in the past? If so, when? Why did you stop?

-If yes, go to PAST USERS (Below)

If no, continue.

→ 0/I-II

Have you made a decision to use _____ in the future?

I/II

If so, when will you begin use?

Knowledge

Can you describe _____ for me as you see it?

Acquiring
Information

Are you currently looking for any information about _____? What kinds? For what purposes?

Knowledge

What do you see as the strengths and weaknesses of _____ in your situation?

Assessing

At this point in time, what kinds of questions are you asking about _____? Give examples if necessary.

Sharing

Do you ever talk with others and share information about _____? What do you share?

Planning

What are you planning with respect to _____? Can you tell me about any preparation or plans you have been making for the use of _____?

Final Question
(Optional)

Can you summarize for me where you see yourself right now in relation to the use of _____?

PAST USERS ←

Can you describe for me how you organized your use of _____, what problems you found, what its effects appeared to be on students?

When you assess _____ at this point in time, what do you see as the strengths and weaknesses?

NOW, GO TO ABOVE SECTION, STARTING WITH QUESTION MARKED 0/I-II.

YES

- Open-ended ✓ Please describe for me how you use _____. (Ask sufficient questions to cover minimal criteria for use.)
- Assessing/ Knowledge ✓ What do you see as the strengths and weaknesses of _____ in your situation? (Have you made any attempt to do anything about weaknesses? Probe those they mentioned specifically.)
- Acquiring Information ✓ Are you currently looking for any information about _____? What kind? For what purposes?
- LoU V ✓ Do you work with others in your use of _____? Do you meet on a regular basis? Have you made any changes in your use of _____ based on this coordination?
- If yes, go to LoU V Probes (Below)
- Sharing ✓ Do you ever talk with others about _____? What do you tell them?
- Assessing ✓ (Have you considered any alternatives or different ways of doing things with the program?) Are you doing any evaluating, either formally or informally, that would affect your use of _____? Have you received any feedback from students that would affect the way you're using _____? What have you done with the information you got?
- III/IVA/IVB ✓ Have you made any changes recently in how you use _____? What? Why? How recently? Are you considering making any changes?
- Planning/Status Reporting ✓ As you look ahead to later this year, what plans do you have in relation to your use of _____?
- III-V/VI ✓ Are you considering or planning to make major modifications or replace _____ at this time?

LoU V Probes ←

1. Please describe for me how you work together. (What things do you share with each other?)
2. What do you see as the effects of this collaboration?
3. Are you looking for any particular kind of information in relation to this collaboration?
4. Do you talk with others about your collaboration? If so, what do you share with them?
5. Have you done any formal or informal evaluation of how your collaboration is working?
6. What plans do you have for this effort in the future?

If you have enough evidence to place the person at an LoU V, go to Question III-V/VI.

If you do not think the person is an LoU V, go to Question Sharing.

APPENDIX D

INNOVATION CONFIGURATION CHECKLIST INTERVIEW SCHEDULE:

MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM

Manitoba Provincial K-6 Science Curriculum
Innovation Configuration Checklist Interview Schedule

The basic procedure followed for the interview is to initiate with an open ended question requiring a description of the interviewee's activity in regard to the innovation component; then, if necessary follow up with specific probe questions to elicit responses in relation to individual component variations.

Introduction

Do you presently teach Science using the Manitoba Provincial Science Curriculum? Briefly describe how you use the curriculum.

1. Scheduling of Science Instruction.

initial question: Please describe for me how you have time-tabled your science?

probes: Do you have science scheduled _____?

2. Instructional Materials and Resources.

initial question: Please describe for me the kinds or types of materials your students use during science class.

probes: Do they use _____
What do they use most often?

3. Student Activity.

initial question: In a typical science class what do your students do? Briefly describe their activities during a typical class-from beginning to end.

probes: Would they _____
Which Activities do they do the most of? The next most?

4. Instructional Planning

initial question: How is your science planned?

probes: Do you plan _____?

5. Materials Used for Instructional Planning

initial question: What materials do you use to help you plan your science program?

probes: Do you use _____?

6. Instructional Content.

initial question: Do you teach all the units in the guide?

probe: How do you decide which units to teach and which to leave out?

7. Instructional Objectives

initial question: In the units you teach do you cover all the objectives for that unit?

probes: Please explain.
How do you decide which objectives to teach?

8. Evaluation

a) Evaluation Methods

initial question: Describe for me what techniques you use to evaluate your students?

probes: Do you use _____?

b) Evaluation Frequency

initial question: When do you evaluate?

probes: Do you evaluate _____?

c) Evaluation Content

initial question: What do you evaluate your students on?

probes: Please explain how you do this evaluation.

or

Do you evaluate your students on _____?

How do you do this?

9. General Instructional Technique

initial question: Could you describe for me what you do as a teacher during your science classes. Briefly describe your activities during one of your classes from beginning to end.

probes: What do you do the most of? The least of?

10. Interaction Techniques

initial question: Do you have the opportunity for discussions during your science classes? Please describe one of these discussions for me? What happens?

probes: How do you manage to start these discussions? How do you keep these discussions going? What do you do with the kids who don't talk much?

APPENDIX E

**INNOVATION CONFIGURATION CHECKLIST:
MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM**

I.D. _____

NAME: _____

Innovation Configuration Checklist:

Manitoba Provincial K-9 Science Curriculum*

Component 1. Planning Materials

_____ (1) A variety of materials including the curriculum guide; teacher's manual from Addison-Wesley Science; teacher's manual from other science programs such as Maps, Houghton-Mifflin, E.S.S., Science 5/13, etc.; and other materials.

_____ (2) Curriculum guide plus teacher's manual from Addison-Wesley Science.

Variations

_____ (3) Teacher's manual from Addison-Wesley Science.

_____ (4) Curriculum guide plus teacher's manual and/or materials other than Addison-Wesley Science.

_____ (5) Curriculum guide.

_____ (6) Other materials.

Component 2. Instructional Materials

_____ (1) A wide variety of instructional materials and resources including concrete/hands-on material; community based or "out of classroom" resources; A/V materials such as slides, overhead projections, charts, graphs, pictures, filmstrips, films; texts; worksheet/dittosheet; reference materials.

Variations

_____ (2) Concrete/hands-on materials plus two or more other types of materials.

_____ (3) A variety of materials excluding concrete/hands-on materials.

_____ (4) Primarily one type of material.

*Practices above interrupted line are ideal
Practices between solid and interrupted lines are acceptable
Practices below solid line are unacceptable.

onent 3. Instructional Planning

Variations

- _____ (1) Plan teaching one unit at a time.
- _____ (2) Plan teaching generally one unit at a time; then specifically for a week at a time.

- _____ (3) Plan teaching for a week at a time.
- _____ (4) Plan teaching for one or two days at a time.

onent 4. Scheduling

Variations

- _____ (1) Science is taught on a regularly scheduled (distinct or integrated) basis with the following time specifications:
 - K-3 - more than 15 minutes/day or 75 minutes/cycle
 - 4-6 - more than 30 minutes/day or 150 minutes/cycle
 - 7-9 - more than 30 minutes/day or 150 minutes/cycle

- _____ (2) Science is taught on a regularly scheduled (distinct or integrated) basis with the following time specifications:
 - K-3 - 60-75 minutes/cycle
 - 4-6 - 90-150 minutes/cycle
 - 7-9 - 120-150 minutes/cycle

- _____ (3) Science is taught on a regularly scheduled (distinct or integrated) basis with the following time specifications:
 - K-3 - less than 60 minutes/cycle
 - 4-6 - less than 90 minutes/cycle
 - 7-9 - less than 120 minutes/cycle
- _____ (4) Science is not scheduled (distinct or integrated).

onent 5. Instructional Content

- _____ (1) Teach units from Addison-Wesley Science for the four themes identified in the curriculum guide plus additional enrichment interest units.

- _____ (2) Teach units from Addison-Wesley Science for the four themes identified in the curriculum guide.

onent 5. Instructional Content (cont'd)

Variations

- _____ (3) Use Addison-Wesley Science but do not teach units for the four themes identified in the curriculum guide.
- _____ (4) Teach units from series other than Addison-Wesley Science for the four themes identified in the curriculum guide.
- _____ (5) Do not teach units in accordance with themes identified in the curriculum guide.

onent 6. Instructional Objectives

Variations

- _____ (1) Teach to objectives specified for each unit taught from Addison-Wesley Science or the curriculum guide.
 - _____ (2) Select objectives from those specified in each unit from Addison-Wesley Science or the curriculum guide on the basis of perceived student needs.
-

- _____ (3) Select objectives from those specified in each unit taught from Addison-Wesley Science or the curriculum guide on the basis of teacher preference, interest, time considerations, etc.
- _____ (4) Teach to objectives from a source other than the curriculum guide or Stem.
- _____ (5) Do not teach to objectives.
- _____ (6) Teach activities rather than to objectives.

onent 7. Student Activity

Variations

- _____ (1) Students are involved regularly and primarily in a wide variety of learning activities including concrete/hands-on experience followed by oral discussion and/or written reporting; discussions; group work; independent work; project and/or research work; experimentation.
-

- _____ (2) Students are involved regularly and primarily in a limited variety of learning activities (two or more different types) one of which is concrete/hands-on experience followed by oral discussion and/or written reporting.
-

- _____ (3) Students are involved primarily in activities such as reading assigned materials, completing assigned work/ditto sheets, attending to teacher demonstration.

Component 8. Evaluation

a) Evaluation Methods

Variations

_____ (1) Evaluate student learning using a variety of methods; some of which may be checklists, anecdotal observation and records, written and oral tests, task performance.

_____ (2) Evaluate student learning using two or more different methods.

_____ (3) Evaluate student learning using primarily one method.

_____ (4) Do not evaluate student learning.

Component 9. Evaluation Frequency

Variations

_____ (1) Evaluate student learning continuously or frequently throughout each unit.

_____ (2) Evaluate student learning at the end of each unit.

_____ (3) Evaluate student learning toward the end of each term.

_____ (4) Evaluate student learning toward year end.

_____ (5) Do not evaluate student learning.

Component 10. Evaluation Content

Variations

_____ (1) Evaluate student learning in terms of:

a) Knowledge of science content.

b) Application of science knowledge, principles and skills to problem-solving in new situations.

c) Science process skills.

_____ (2) Evaluate student learning in terms of two of the following:

a) Knowledge of science content.

b) Application of science knowledge, principles and skills to problem-solving in new situations.

c) Science process skills.

onent 10. Evaluation (cont'd)

Variations

- _____ (3) Evaluate student learning in terms of one of the following:
 - a) Knowledge of science content.
 - b) Application of science knowledge, principles and skills to problem-solving in new situations.
 - c) Science process skills.
- _____ (4) Evaluate student learning in other areas.
- _____ (5) Do not evaluate student learning.

onent 11. Instructional Techniques

Variations

- _____ (1) Primarily or frequently employ instructional techniques which require student activity and involvement. Such techniques may include discussion, group work, research or project work, student experimentation, student reporting, etc.

- _____ (2) Employ infrequently or on an irregular basis techniques which require student activity.

- _____ (3) Employ almost exclusively techniques which require student passivity. Such activities may include lecture, teacher demonstration, assigned questions based on lecture demonstration or reading, etc.

onent 12. Interaction Techniques

Variations

- _____ (1) Employ frequently a variety of discussion techniques such as redirecting, refocusing, clarifying, paraphrasing, etc., so as to broaden the scope of communication during science discussions.

- _____ (2) Employ frequently a limited number of discussion techniques.

- _____ (3) Employ discussion techniques infrequently or irregularly.
- _____ (4) Limit interaction to the asking and answering of specific questions, giving of directions, etc., so that most science-related communication is narrow in scope and/or from teacher to student.
- _____ (5) Limit interaction or discussion to non-science related topics.

APPENDIX F

LEVELS OF USE RATING SHEET

LEVEL OF USE RATING SHEET

Tape #: _____
Date: / /

Site: _____
I.D. #: _____

Interviewer: _____
Rater: _____

Level	Knowledge	Acquiring Information	Sharing	Assessing	Planning	Status Reporting	Performing	Overall LoU
Non-Use D.P. A	0	0	0	0	0	0	0	0
Orientation D.P. B	I	I	I	I	I	I	I	I
Preparation D.P. C	II	II	II	II	II	II	II	II
Mechanical Use D.P. D-1	III	III	III	III	III	III	III	III
Routine D.P. D-2	IVA	IVA	IVA	IVA	IVA	IVA	IVA	IVA
Refinement D.P. E	IVB	IVB	IVB	IVB	IVB	IVB	IVB	IVB
Integration D.P. F	V	V	V	V	V	V	V	V
Renewal	VI	VI	VI	VI	VI	VI	VI	VI
User is not doing:	ND	ND	ND	ND	ND	ND	ND	ND
No information in interview:	NI	NI	NI	NI	NI	NI	NI	NI

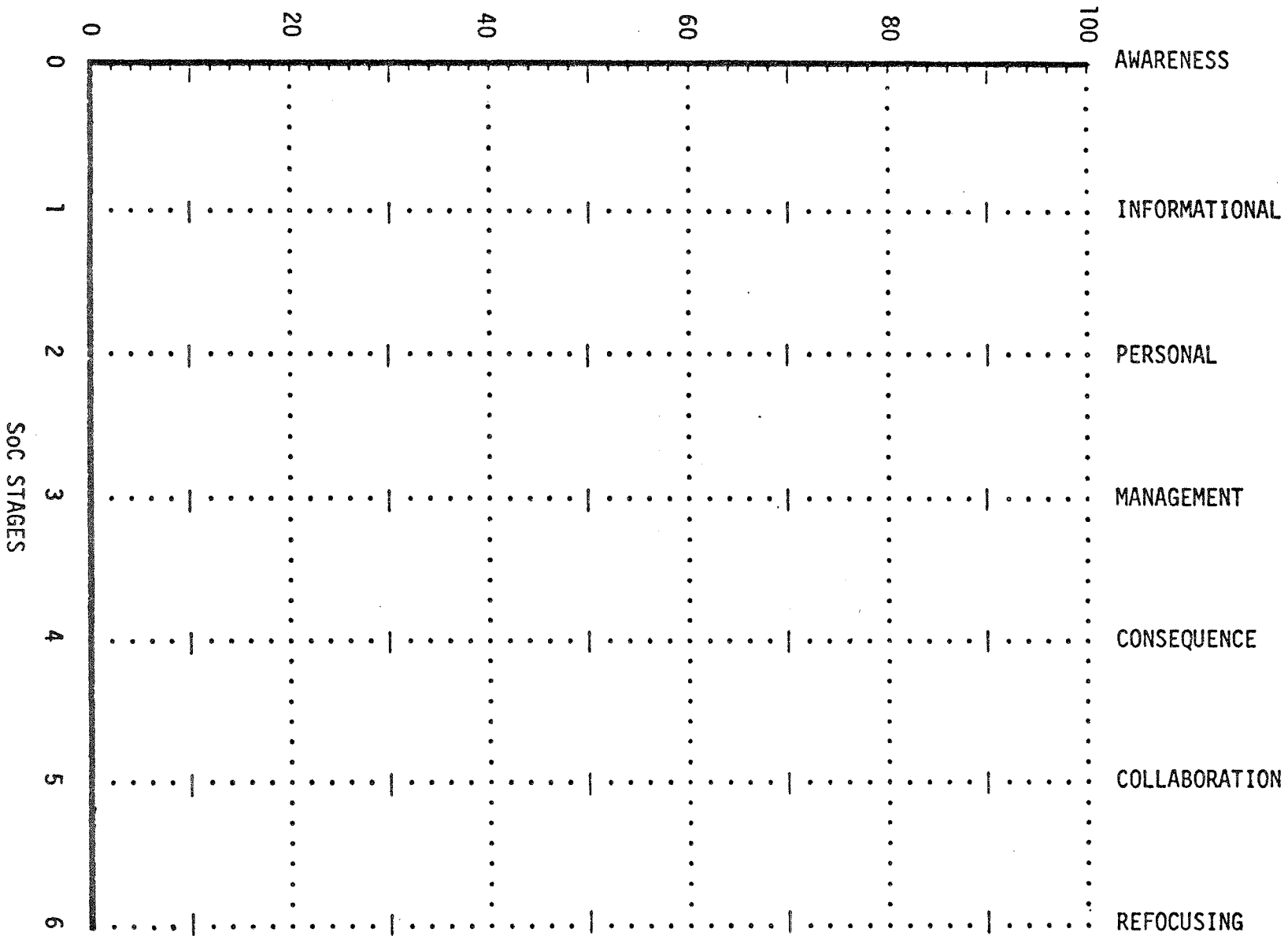
Past User _____ Estimated past LoU _____

The amount of information in the interview was:	insufficient for rating	1	2	3	4	5	6	7	very adequate for rating
The interviewee:	does not fit on the chart	1	2	3	4	5	6	7	fits well on the chart
The interviewee:	was very difficult to interview	1	2	3	4	5	6	7	was no problem to interview

APPENDIX G

S.o.C. PROFILE GRAPH

RELATIVE INTENSITY



S.o.C. Profile Graph

APPENDIX H

INNOVATION DESCRIPTION:

MANITOBA PROVINCIAL K-6 SCIENCE CURRICULUM

INNOVATION DESCRIPTION: MANITOBA PROVINCIAL K-9 SCIENCE CURRICULUM

To be considered a user of the Manitoba Provincial K-9 Science Curriculum, an individual must be doing the essential components as a minimum.

ESSENTIAL

1. Teach science on a regularly scheduled basis.
2. Plan instruction in blocks in advance.
3. Use the curriculum guide in the planning of science instruction.

COMPONENTS

RELATED

-
4. Provide students with a variety of science experiences (learning activities) designed to facilitate concept and process development. "Concrete/hands-on" learning experiences are a regular feature of student activity.
 5. Evaluate student development (learning) in each instructional unit.
 6. Teach all units identified in the curriculum guide.
 7. Employ a variety of instructional techniques designed to promote student involvement and activity in concept and process development; i.e., techniques other than lecture, note giving, assigned reading, and worksheets.