

IN-SERVICE TEACHER EDUCATION:
THE STATE OF THE ART

by

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ABSTRACT

Today's public school system faces rapid technological, societal, and economic change. Concomitantly, the school system faces declining enrollments, thereby reducing the demand for new teachers. One result of this situation is an aging and relatively immobile teaching force. Given these conditions, some type of continuous education frequently is claimed necessary to keep practicing teachers abreast of developments in their field. In the last decade, in-service education has been the primary response to this need.

The first purpose of this thesis was to survey the conceptual literature to identify components perceived essential to making teacher in-service programs effective. A model for providing effective in-service education was constructed based on the components of: needs assessment, goals and objectives, planning and implementation, reference to the literature, teacher participation, released time, relevance, a supportive climate, evaluation, and feedback and follow-up.

The second purpose of this thesis was to review critically, empirical tests of effects of in-service education programs by evaluating the internal and external validity of the reported research. Most studies evidenced one or more serious flaws in design, analysis, reporting, or interpretation. A low degree of correspondence was found

between the conceptual model and in-service practices in the research literature. Moreover, the relationship between programs' implementation of the essential conceptual features of in-service education and their actual effectiveness was inconsistent.

The third purpose of the thesis was to investigate the current status of in-service education in British Columbia. A telephone survey provided data from 36 of the school districts in the Province and five key academic institutions. Descriptive results showed a moderate to low correspondence between in-service practices in British Columbia and the conceptual model.

These analyses revealed discrepancies among the conceptual literature, the empirical research, and actual practices. A model was proposed to explain the relationships between levels of intensity of in-service programs, several moderator variables such as the participant's receptivity, and the program's effectiveness.

Implications for future research on teacher in-service education were drawn based on this model. First, research must become more focused so that interaction effects among the many variables inherent in in-service education can be determined. Second, research designs must be used that eliminate sources of invalidity found commonly in current research. Third, teachers' self-reports on their own

classroom behavior should not be used as the primary method for measuring change. Finally, teachers must be sensitized to the importance of educational research and become involved in the research process.

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CHAPTER ONE

Introduction and Overview

The public school system today finds itself in a context of rapid technological, societal, and economic change. These changes place new demands on a school system traditionally expected to reflect and meet the needs of society. These demands require that teachers develop diagnostic skills to assess academic strengths and weaknesses of children and to develop human relation and communication skills to deal with individual social and emotional needs of pupils. The demands require also that teachers have a thorough knowledge of learning theory and teaching strategies, and have a good background in curriculum in order to prescribe programs for pupils that are best suited to their learning modes and emotional needs. Teachers need organizational skills and time management skills to develop the above into manageable programs. Furthermore, teachers need to acquire evaluation skills to determine the degree of effectiveness of their efforts. Concomitantly the public school system faces declining enrollments particularly in large urban areas. With a diminishing pupil clientele, demand for new teachers has been reduced drastically (Blaney, 1978; Divoky, 1979; Keough, 1978; Thomas, 1977). Mobility of the present teaching force is hindered also since changing one's school

district often means loss of tenure. The result is an aging and relatively immobile teaching population (Brown, 1975; Jones, 1975; Minnis, 1975) which reduces opportunities for teachers' professional development through contact with newer and younger teachers and colleagues in other school districts.

Given these conditions, some type of continuous education or lifelong learning process is necessary to help keep practicing teachers abreast of changes and developments in their field. The continuous education of practicing teachers often is conducted through in-service education which includes professional development activities initiated by self, staff, district, or educational organizations, designed to enhance the effectiveness of teachers in reaching the objective of improved pupils' performance. In the last decade in-service education has frequently been used for the continuous education of practicing teachers and it continues to be on the increase (Cochran, 1975; Edelfelt, 1974; Harris, Wailand, & McIntyre, 1969; Henderson, 1978). According to Edelfelt (1974, p. 250), the "in-service education of teachers will be the major focus in teacher education for the next decade". Henderson (1978, p. 34) indicated that the United States, along with many other countries, has "witnessed the expansion of in-service training at an almost exponential rate".

The rationale for conducting in-service programs was generally agreed upon among authors of the in-service literature, i.e. to improve the quality of teaching instruction (Devore, 1971; Edelfelt, 1977; Harris et al., 1989; Mackie & Gervais, 1977; Peters & Schnare, 1976; Piper & Butts, 1976; Somers & Southern, 1974; Westby-Gibson, 1967) with hopes for subsequent improvement in the academic performance of pupils (Alvir, 1975a, 1975b; Edelfelt, 1977; Fitzgerald & Clark, 1976; Goodlad, 1972; Hart, 1974; Henderson, 1978; McPherson, 1979; Nadler, N. Y. Board of Education, 1975; Mackie & Gervais, 1971; Olson, 1975; Twiford, 1965; Westby-Gibson, 1967).

Although in-service education was not believed to be a panacea for all educational problems (Cheney, 1971), it was, however, perceived to be a major method whereby a wide range of educational objectives could be met. As such, it was claimed to be an essential component of teacher professional development. The benefits of in-service education cited in the conceptual literature typically included: updating teachers vis-à-vis changes in knowledge and technology, societal changes, changes in teaching strategies, and changes within the schools such as new curriculum and new assessment procedures; facilitating the transition between pre-service and professional service; compensating for inadequacies in preservice teacher training; articu-

lating and coordinating instructional practices; bridging communication gaps between trustees, administrators, and teachers; retraining and upgrading teachers in a rapidly increasing immobile teaching force; stimulating teachers' morale; facilitating program implementation; disseminating information on programs, ideas, practices, and research results; and encouraging teachers' self-renewal. Given rapid increases in the use of in-service education as the major vehicle whereby continuous teacher education is conducted (Cochran, 1975; Edelfelt, 1974; Harris et al., 1969; Henderson, 1978), it becomes important to investigate the parameters of this method of teacher education and its effects.

Statement of the Problem

The first major purpose of this study is to survey the conceptual literature in the field of in-service education to identify the components perceived to be essential for effective in-service programing. Second, the empirical literature describing the degree of effectiveness of current practices in in-service education will be scrutinized to see if the results warrant the extensive use of this mode of teacher education.

This review will answer the following questions:

1. What are the elements or components purported to be essential for effective and efficient in-service pro-

grams? The conceptual literature will be summarized as a set of propositions for constructing a model or template for effective in-service education.

2. Are current practices in in-service education effective? The results from the empirical literature will be summarized with respect to the effectiveness of in-service practices. These practices then will be compared to the model proposed in number one.

A third task of this thesis is to investigate the current status of in-service education in British Columbia to provide locally relevant information. The results of a provincial telephone survey are analyzed by contrasting them with current thinking and research in the field of in-service education as identified in the review of the literature. This task will attempt to answer the following questions:

1. How is in-service education in British Columbia organized and implemented?
2. Do these practices conform to the conceptual model and what is their predicted effectiveness when judged on the basis of prior research?

Significance of the Problem

Given the extensive reliance on in-service education for the continuing professional growth of teachers, and the

cost factors of both money (Henderson, 1978) and time, it is essential to examine the concept and practice of in-service education. Of critical concern is whether in-service education is effective. The last major review on in-service teacher education was conducted in 1971 by Devore. His review concentrated only on "Variables Affecting Change in In-Service Teacher Education". Prior to Devore's publication a full scale review of in-service practices was conducted by Westby-Gibson in 1967, in "In-service Education--Perspectives for Educators". A large amount of material has been written on in-service education since these reviews. The current study, therefore, is perceived to be a needed and updated synthesis of opinion and research in the field. It will provide a resource for decision makers concerning in-service education in the province and will identify areas in need of research. The collation and discussion of current in-service practices in British Columbia will be of interest to educators in the province.

Organization of the Study

This study focuses on three dimensions of in-service teacher education: the conceptual, the empirical, and a portrait of actual practices in British Columbia. Chapter Two elaborates on the first of these three dimensions. An

overview was sought in the analysis of the descriptive literature to derive an overall conceptual model or template for effective delivery of in-service programs. Thus, the conceptual work of any one author is not dealt with as an isolated entity. Rather the overview of the conceptual literature is presented such that individual components for effective in-service education could be derived and discussed. These purportedly essential components for effective in-service education are discussed in order of temporal events in a program (i.e. starting with needs assessment and planning through to evaluation and follow-up), rather than in the order of perceived priority so that a conceptual model of components may emerge. Chapter Three examines the empirical literature broadly organized according to type of research design employed. The review focuses on the quality of the research, specifically internal validity, and the generalizability of the conclusions. The review attempts to determine the degree of measured effectiveness of in-service education in meeting its objectives and will isolate some areas in need of research. The predicted effectiveness of the conceptual model developed in Chapter Two is examined in light of the research results in Chapter Three.

Chapter Four focuses on the third major dimension of this study, the current elements of in-service education in

British Columbia. It outlines the development of the survey instrument and the methodology of data collection and analysis. Chapter Four also discusses the results of the provincial survey, and specifies limitations of the study.

Chapter Five examines the extent to which actual practices in British Columbia are consistent with the model or template for effective in-service education developed in Chapter Two. Following is a discussion of possible problems or difficulties in implementing individual components of the conceptual model. Chapter Six proposes conceptual hypotheses and corollaries to explain the relationship between teacher effects and levels of intensity or duration of in-service programs. From these hypotheses conceptual models are presented to illustrate these relationships. Chapter Six concludes with implications for research in in-service education that is needed in the future. This discussion will focus on gaps in the current research and will propose a research or survey procedure based on lessons learned from collecting the provincial survey data and problems encountered in interpreting that data.

CHAPTER TWO

Review of the Conceptual Literature

Methodology of the Review

In this chapter an overview of the conceptual literature is presented such that individual components for effective in-service education could be derived and discussed. Presentation of the methodology used for the literature review is followed by an explanation of procedures used for isolating the components most frequently discussed in the conceptual literature. Operational definitions of the components follow. The perceived priority of each component is presented in a table based on how frequently the component was discussed by different authors in the conceptual literature. A synthesis of authors' perceptions of individual components are presented followed by an assessment of the accuracy of these perceptions based on survey data of teachers' opinions on in-service education. A discussion of possible implementation difficulties for each component will be reserved for Chapter Five. Chapter Two concludes with presentation of a conceptual model for in-service education based on analysis of the conceptual literature.

Materials reviewed. Material for the literature review was collected in a variety of ways. The three major sources for collection of materials were an ERIC search (Educational Resources Information Center), a hand search of the Current Index to Journals in Education (C. I. J. E.), and an annotated bibliography on in-service education prepared by the staff of the National Council of States on In-service Education (Syracuse University, 1976). The ERIC search was conducted for the years 1966-1978 and yielded 208 items using the following major descriptors: in-service teacher education, in-service programs, in-service courses, and teacher workshops. Descriptors to isolate relations for evaluation included program evaluation, evaluation methods, formative evaluation, summative evaluation, teacher evaluation, and student evaluation. To isolate relations for needs assessment the descriptors, needs assessment and individual needs, were used. To isolate relations for general effectiveness of in-service education, the following descriptors were used: program effectiveness, instructional improvement, teacher improvement, student improvement, student benefits, educational research, and research reports. The descriptors teacher participation and participant involvement were used to isolate relations for type of teacher involvement in in-service activities. Two descriptors were used to isolate relations for teachers'

perceptions of in-service programs--teacher attitudes, and opinions. To isolate relations for program implementation, the descriptors models, and course descriptions were used. For the hand search in the Current Index to Journals in Education (C. I. J. E.) only major descriptors were used including in-service teacher education, in-service programs, in-service courses, and teacher workshops. Only C. I. J. E. journals for 1978 and 1979 were examined since the previous years were thoroughly covered in the ERIC search. Other secondary sources for the review included the Dissertation Abstracts International (D. A. I.), books, unpublished works from conferences, and references from published works. The majority of works reviewed were published in the years 1970-1979 (see Appendix D for distribution). Within this range, the mode for the distribution was 1975, followed by 1974. Although a few articles were reviewed from the 1950's and 1960's, the major source of information for these two decades was published literature reviews (Devore, 1971; Henry, Ed., N. S. S. E. Yearbook, 1957; Westby-Gibson, 1967).

Identification of articles for the conceptual literature review. The development of a conceptual model for effective in-service education requires an intensive examination of the conceptual literature to determine the variables or components perceived to be essential for effective in-service education. To isolate studies which fell into the

conceptual category, a chart was used listing all articles in the literature review (see Appendix A). In addition to author, date of publication, and general topic of discussion, such as reading, video in-service, teachers' perceptions of in-service and so on, seven categories were delineated. A very liberal definition of model was used for this initial analysis. An article was considered a model for example, if it described a method or a procedure. This comprised procedures for conducting an entire in-service program from start to finish (Ritz, Wallace, Colegrove, Mahan & Wildridge, 1970) or alternatively, procedures for conducting very specific aspects of in-service education such as how to conduct an evaluation (Alvir, 1975a, 1975b). The category components was used whenever authors indicated that certain procedures or strategies were important to follow if in-service education was to be effective or improved. If an author indicated for example that lack of teacher involvement in planning in-service education resulted in failure or ineffectiveness of the program, then components was checked for that author. This category was reserved for those conceptual articles that addressed the issue of effectiveness of in-service education or improving in-service education. The category empirical was used whenever measurements were taken to determine degree of effectiveness. In this initial analysis judgments were not made about the quality of the

research or reporting, or the validity of the instruments or procedures. This category comprised testing effectiveness of a complete in-service program (for example, Anderson & Gies, 1975), testing a specific strategy for delivery of an in-service program such as use of television (Gaddis, 1973) or cartoon versus realistic films (Kauffman & Dwyer, 1974), as well as testing effectiveness or validity of specific measurement instruments, such as an evaluation instrument (Alvir, 1976) or a needs assessment instrument (McCreary, 1960). The category referenced was used whenever an author included a bibliography even if it consisted of only one item. This category was included to determine the number of authors that referred to any other literature so that testimonials based on personal experience only and research conducted without a prior literature search would be easily identified. The category pupils tested was used whenever a research article reported testing pupils. This category comprised testing pupils for the effects of an entire in-service program (for example, Robertson, 1969; Shettel, Hughes & Garee, 1975) as well as testing students to determine validity or reliability of research methodologies for in-service education (Schwartz, Cichon, McInick & Olson, 1977), evaluation strategies (Alvir, 1975a; Fitzgerald & Clark, 1976) and so on.

This category was used to isolate research articles that tested effectiveness of in-service education as it affects

one of the two target populations, i.e. pupils, since the rationale for conducting in-service education is improved teaching instruction with concomitant improvement in pupils' performance. The category effectiveness of in-service education was used exclusively for those empirical articles that tested the overall effectiveness of in-service programs as measured by its affect on teachers or pupils. This category was used to isolate articles that would be discussed in Chapter Three, the empirical literature, examining the overall effectiveness of in-service education in meeting its objectives. This category therefore, excluded empirical studies that measured effectiveness of single components of an in-service program such as evaluation. The final category, literature review was used for any work that was a literature review. This category comprised general literature reviews of in-service education (for example, Westby-Gibson, 1967) as well as literature reviews concentrating on specific aspects of in-service education such as evaluation (Wehmeyer, 1975).

All articles that had a check mark in the components column were included in the discussion of the conceptual literature. There were three distinct types of articles in this category. Some of the articles, for example were also checked off as models (Axlerod, 1975; Bolam, 1979; Brown, 1975). These articles typically focused on procedures or

strategies for conducting in-service education but also included discussions of why certain strategies were perceived to be necessary for effective in-service education. An author might describe, for example, a formative evaluation strategy within his model, elaborating on its importance for adjusting or modifying following procedures to increase effectiveness of the model. Similarly, an author might describe a feedback strategy within his model using video equipment for example, elaborating on its importance in increasing the effectiveness of teacher behavior. Although these articles are essentially presentation of procedures (models) they do address the issue of components that are perceived to be important to increase or improve the effectiveness of in-service education. They were included therefore, in the discussion of the conceptual literature on essential components for in-service education. A second group of articles in the components category were simply descriptive, that is, they described effective or ineffective in-service education practices. These articles typically focused on pitfalls of in-service education or advanced the author's opinions about what constituted effective practices. They did not attempt to delineate strategies or procedures that could be followed as in the previous set of studies, but rather attempted to raise readers' level of awareness based strictly on their own

opinions or experiences (for example Burton, 1974; Cochran, 1975; Comras & Masterman, 1972), or based on a thorough analysis of other literature on in-service education (for example, Asher, 1967; Devore, 1971; Westby-Gibson, 1967). The third type of article in the components category comprised articles focusing on two specific in-service education components--evaluation (for example, Alvir, 1976; Fitzgerald & Clark, 1976; Harty, 1975), and needs assessment of teachers (Barlow & Timiraos, 1975; McCreary, 1960; Taylor, B., 1961). These articles were considered a third category because they also were empirical studies insofar as they conducted measurement. These articles tested evaluation or needs assessment strategies rather than testing the overall effectiveness of an in-service program, however. The decision was made to include them in the conceptual literature rather than the empirical literature since they were believed to be more relevant to a discussion of specific components of in-service education than they would have been to a discussion of the overall effectiveness of in-service education.

Identification of Major Components for In-service Education

A second chart (working draft) was constructed listing components of in-service education identified by the authors selected from Appendix A. In addition, authors

in the collected works (Beegle & Edelfelt, Eds., 1977; Edelfelt, Ed., 1977, 1978; Henry, Ed., 1957; Rubin, Ed., 1971; Watkins, Ed., 1972) were listed individually whenever they discussed components of in-service education.

Henderson (1978, p. 107) indicated that "educators do to a substantial extent, share a common professional vocabulary". His view is strongly supported based on experience of the author of this thesis in completing the task of categorizing components of in-service education.

Components were easily identified and categorized since authors consistently referred to teacher participation in those terms, or similar terms as teacher involvement.

Evaluation tended to be called evaluation or assessment of effectiveness which although not strictly synonymous, in context of the literature, were used interchangeably.

Similarly needs assessment was most frequently referred to as assessment of teachers' needs or finding out what teachers want, require, or need. School climate was

called such, or similar terms as school environment or

atmosphere. The component that had the widest range of terminology was relevance, but the meaning in context was

clear. Relevance of in-service education for example,

comprised such terminology as significance to the classroom

teacher, attacking real educational problems, applicable to the classroom setting, useful to the teacher in her daily instruction, and so on.

From the working draft of the second chart, and from thorough reading of the conceptual literature, it became apparent that some categories could be combined under a more general category. Such was the case with school climate, organizational climate, a supportive central office staff, and a supportive community. School climate received the greatest emphasis by far. Some authors however, referred to organizational or institutional climate leaving it unclear as to which they were referring--the school or the school district. A few authors stressed the importance of support by the central office staff and community if ideas from in-service programs were to be implemented. It was decided, therefore, that the broader category supportive climate would be appropriate in the belief that this general category would comprise all of the above elements without losing the intention of the authors that teachers must work in a positive and supportive environment where new ideas and experimentation are encouraged.

It also became apparent that a few categories, such as role of the school principal, and individualized instruction would be better incorporated into one of the other category headings. For example, 35% of the authors that discussed

the importance of the school principal (8 of 23 authors) also discussed the importance of a supportive school climate. This correspondence reflects the belief that principals have a "profound influence on teachers' attitudes and work climate" (Meade, 1971, p. 221). Consequently the role of the school principal was incorporated into the component school climate. Similarly the view that in-service education should be individualized to meet the needs of teachers was combined with the category consideration of and assessment of teachers' needs, since 83% of the authors (10 of 12 authors) advocating individualized instruction for teachers, also discussed the importance of conducting a needs assessment and providing in-service education that reflected teachers' needs. Because of this high degree of correspondence, individualization of in-service education was incorporated under the category heading consideration of and assessment of teachers' needs.

Any component that received less than 13% frequency of mention such as continuity, need for change agents and so on, was dropped in the final draft of the chart to focus on higher priority items. Although a natural break occurred at 20% (see Table 1) the decision was made to use a 13% figure so that the component reference to the literature could be incorporated into the set of components perceived to be important for effective in-service education.

This decision reflects the personal bias of the author, based on the belief that duplication of effort and perpetuation of ineffective practices could be avoided through a prior search of the literature.

Ten components for in-service education were isolated using the above method. Consideration of and a formal assessment of teachers' needs are operationally defined as asking teachers, through questionnaires, surveys, interviews and so on, what their in-service needs are. This was central to the authors' claim that in-service education should be individualized or geared to teachers' perceptions of their own needs rather than superimposed by agencies outside the school building unit. Prespecified goals and objectives are operationally defined as providing a written statement of what the in-service program is intended to accomplish. This was central to the authors' claim that goals and objectives provide a necessary focus for on target implementation and provide the criteria against which effectiveness can be measured. Thorough planning and implementation is defined as providing a clear and complete conceptualization of program delivery comprising method of presentation (lecture, discussion, demonstration), resource people, length of program, accommodations, and so on. This was central to the authors' belief that clear conceptualization of organizational procedures improves efficiency. Active

teacher participation is defined as teacher involvement as a contributing member in decisions affecting various areas of in-service education such as planning, delivery, evaluation, and so on. This was central to the authors' belief that active participation by teachers increases teachers' commitment to the program, with the greater likelihood that program ideas will be implemented. Relevance is defined as significant or useful to the classroom teacher, i.e. is the material or information useful or practical in the classroom setting? This was central to the authors' belief that material or information that is not perceived by the teachers to be relevant, will not be used or implemented in the classroom. A supportive climate is defined as an environment that encourages change, exchange of ideas, and is free of coercion. This was central to the authors' belief that change places a demand on teachers that could be stressful, and that a positive and supportive environment can alleviate some of the stress. Evaluation is defined as an objective assessment of the effectiveness of the in-service program to determine if goals were accomplished (summative) and to determine ways to improve the program (formative). This was central to the authors' belief that informed decision making can be based only on objective measurements of effectiveness. Feedback and follow-up is defined as any form of post in-

service contact designed to encourage teachers in their implementation of new ideas. This was central to the authors' belief that feedback improves teachers' performance and follow-up reinforces teachers' implementation of new ideas or teaching strategies. Released time is operationally defined as providing substitute teachers so that regular classroom teachers may be freed to attend or actively contribute to in-service education. This was central to the authors' claim that tired or overloaded teachers will not be receptive to changes that make even more demands on their energy and time. Reference to the literature is operationally defined as conducting a search of the literature prior to implementation of in-service programs to determine what has already been done in in-service education. This was central to the authors' belief that such practices will minimize duplication of effort and perpetuation of practices that have proved ineffective.

The frequency with which each of the above components were cited as being necessary to effective in-service education was used to generate three categories of perceived importance as indicated in Table 1.

In the following discussion components for effective in-service education are discussed in order of temporal events in a program (see time line in Figure 1), starting with needs assessment and planning through evaluation and

Table 1

Components of In-service Education by Category

Category	Components	f	%
1 essential components	evaluation	64	58%
	consideration of the needs and needs assessment of teachers	60	55%
	active teacher participation	58	53%
2 important components	supportive climate	34	31%
	planning and implementation	30	27%
	prespecified goals and objectives	29	26%
	relevance to classroom practices	28	25%
	released time for teachers	28	25%
	feedback and follow-up	24	22%
3 desirable components	reference to the literature	15	14%

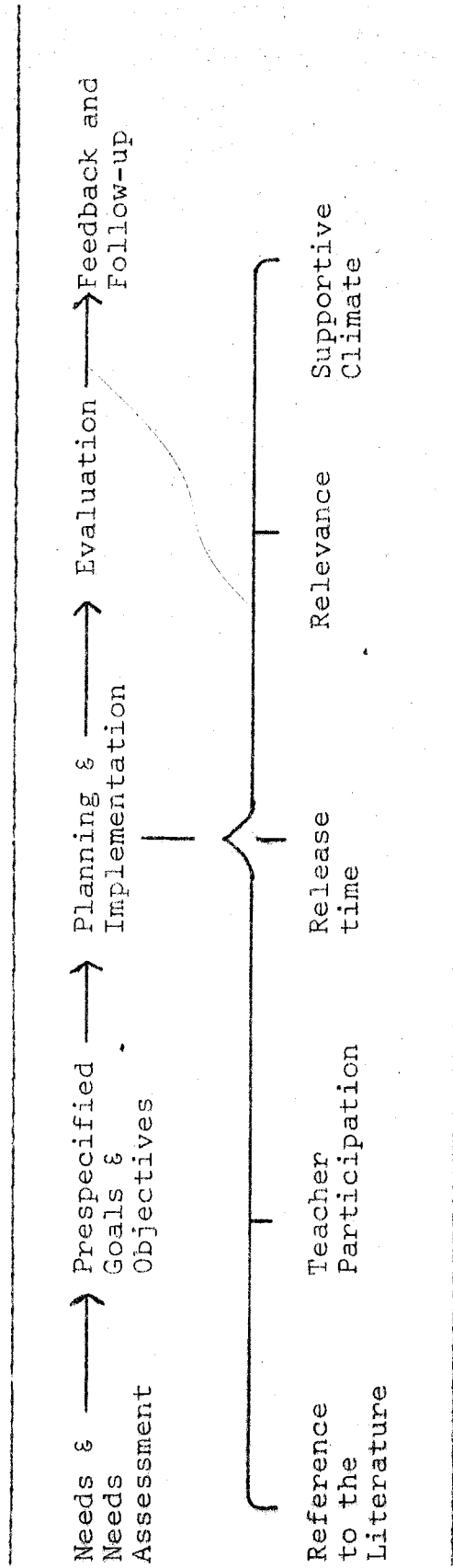
Note. Based on a total number of 110 (82 articles plus 28 authors publishing in collected works)

and follow-up, rather than in the order of perceived priority so that a conceptual model of components may emerge.

The discussion of each of the above components will synthesize authors' beliefs and elaborate on their advocacy of the component. Accuracy of the authors' portrayal will be addressed whenever possible based on survey studies of teachers' perceptions of in-service education

Figure 1

Time Line for Components of In-service Education



(Brimm & Tollett, 1974; Daly, 1977; Howey, 1978b; Reilly & Dembo, 1975; Schankerman, 1978).

Needs and Needs Assessment

"Needs" were frequently discussed in the in-service literature, particularly in conjunction with needs assessment. Consideration for the clients' needs and assessment of these needs were considered critical and top priority components of a successful in-service program, placing in category one with 55% frequency of mention. The authors were not always unanimous, however, in their opinions as to whose needs should be assessed and who should assess them.

Gleadow (1979) defined need in three ways: as lack of a specific and desirable teaching skill; as rule or regulation involving mandated change; or as disposition or a personal motive to acquire new knowledge, attitudes, or behavior. Joyce (1979) conceptualized need from three perspectives based on the source of the perceived need: the idiosyncratic perspective where need was identified by the individual, the unit perspective where need was identified by the school as a unit, and the corporate perspective where need was identified by a corporate body such as a school district or government body.

Needs assessment strategies were examined within the framework of the matrix outlined in Table 2 based on the conceptualizations of Gleadow and Joyce.

Table 2
Strategies for Needs Assessment

Need defined as ^a	Source of perspective of needs ^b			
	1 idiosyncratic (individual perspective)	2 unit (school perspective)	3 corporate (school district or Ministry)	4 7
lack of skill				
rule or regulation- mandated change				
disposition- personal motive				

^aGleadow, 1979

^bJoyce, 1979

The following discussion will focus on strategies depicted in cells 1, 3, 4, 6, 7, and 8. Strategies for the three remaining cells were infrequently or rarely addressed in the current literature. Mandated in-service education for individual teachers (cell 2) and school units (cell 5) for example, were discussed in less than 5% of the articles, while in-service education initiated at the corporate level as a result of disposition (cell 9) was discussed in less than 10% of all the articles. The decision was made therefore, not to include these in the present discussion since their infrequent mention in the conceptual literature most probably reflects actual practices. This speculation is based on the personal experiences of the author of this thesis.

The majority of the in-service literature that discussed needs and needs assessment focused on needs as a lack of a skill or as disposition with an idiosyncratic perspective (cell 1 and 3 respectively). The idiosyncratic perspective stressed the individuality of the teacher and the uniqueness of his/her needs (Bush, 1971). Nine percent of the authors who discussed in-service components (10 of 110 authors) proposed that in-service education of teachers must be individualized (Brimm & Tollett, 1974; Bush, 1971; Devore, 1971; Fifer & Rush, 1974; James, S., 1976; Landrith, 1977). According to these authors in-service education should be

based solely on the individual interests and needs of each participant. Devore's comments (1971, p. 58) were typical of the idiosyncratic perspective:

The involvement of the individual, the meeting of his needs through individualized instruction and directing attention to those individuals who express interest in change...according to research reports and other data, increase the effectiveness of in-service programs. Meeting these criteria requires a flexible program and assessment and evaluation procedures based on individual teacher's growth.

Several authors (Hewett, 1973; Westby-Gibson, 1967) elaborated on the idiosyncratic perspective by stressing the importance of adapting in-service education to individual needs of teachers at different stages of their careers. Draba (1975), Fifer and Rush (1974), and Harris, et al. (1969) blamed the lack of success of in-service programs on the failure to implement an idiosyncratic philosophy with subsequent failure of teachers to relate to the intent of the in-service program.

A second major perspective of need concentrated on by authors was the school or unit perspective, in conjunction with a disposition (cell 6) or lack definition (cell 4). The unit perspective was more general in its strategy than the idiosyncratic, and focused on teachers' needs--teachers as a school staff, or teachers as a professional group (Edelfelt, 1977; 1978; Fifer & Rush, 1974; Massanari, 1978;

Monahan & Miller, 1970; Ritz, et al., 1970; Westby-Gibson, 1967). Teachers as a unit may feel motivated (dispositioned) to make particular changes. Teachers in a school for example, may wish to improve parent-teacher communication and subsequently initiate an in-service program on communication skills. Similarly, as a result of variables specific to a school, such as low reading scores in school tests, teachers may feel they lack certain skills, thus initiating an in-service program in teaching reading. The Massachusetts state system of funding in-service education supported the unit definition of need (McPherson, 1979, p. 22). The philosophy of the Massachusetts system was antithetical to the idiosyncratic definition proposing that

the old mode of in-service diffused teachers' efforts into singly pursuing their own interests, careers, and salary increments. For teachers this has often been productive but it is just as often a treadmill in no way related to the central business of teachers' professional growth.

In both the idiosyncratic and the unit framework a major recommendation was that "teachers themselves should determine to a much greater extent their in-service needs" (Westby-Gibson, 1967, p. 10). This view was further supported by Lippitt and Fox (1971) and Meade (1971).

Need as rule or regulation was discussed almost exclusively within the corporate perspective (cell 8) in which the corporation was a particular school district, or

the provincial Ministry of Education. This type of need for in-service education may arise for example, when the Ministry mandates a curriculum change. In such cases teachers may require in-service training to familiarize them with the new course content and attendant teaching methodology. Similarly a low achievement in reading scores across a district may cause the district to initiate an in-service program in reading. This could take the form of mandated in-service (cell 8) or alternatively could be initiated from the point of view of lack of specific skills (cell 7). In-service education initiated at the corporate level may be for the purpose of providing information (e.g. a ministerial curriculum change) or to change teachers' performance. When the corporate perspective of rule or regulation was discussed it was generally, openly criticized, however (Edelfelt, 1974, 1977; Smith, 1975). Typical of this kind of criticism was the following:

In-service education remains a wasteland of evening, Saturday, and summer courses and workshops mandated by school districts and state departments of education. Too often it is taught in a manner that violates almost every principle of good teaching... It has not met teachers' needs (and)...it has not served the major purposes of improving professional performance. (Edelfelt, 1974, p. 250).

Smith (1975) proposed that teachers' negative attitudes inevitably resulted when in-service education was conducted

in the above manner.

Although the greatest emphasis in the literature was on the idiosyncratic and unit perspective of needs, as opposed to the corporate perspective, some authors (Fifer & Rush, 1974; Howey, 1978a) proposed that a reasonable balance between various personal and institutional needs and goals could be struck. Neither should be sacrificed for the benefit of the other in their view, presumably because each was perceived to fulfill a different purpose that could not be met exclusively by one group or the other.

In summary, the literature that did propose value to be gained by needs assessment emphasized that in-service education should be designed on the basis of teachers as individuals, although the alternative of designing in-service programs based on the school as a unit also was prominent. Whether in-service education was based on individual teachers' needs or on the needs of teachers in a school, in-service education that was selected voluntarily by teachers was most strongly favoured. Mandated in-service education by school districts or the Ministry of Education was perceived far less favourably, although the role of this strategy for disseminating information was claimed to be of value by some authors. Although no survey data was available to support the validity of the authors' claims about mandated in-service education, it can be speculated that they are

representative of teachers' perceptions, based on experiences of the author of this thesis.

Authors' claims about the critical importance of needs assessment as a prerequisite to planning and implementing in-service programs was an accurate portrayal of teachers' perceptions. Brimm and Tollett (1974) used stratified proportional sampling in their survey of all 147 school districts in Tennessee. Sixty-five percent of the teachers responded (N=7646) to the 34 item "Teacher Attitude Toward In-service Education Inventory". One of the statements that received the strongest endorsement (p. 522) was that the "teacher should have the opportunity to select the kind of in-service activities which he feels will strengthen his professional competence" with 89% of the teachers strongly agreeing or agreeing and only 4% disagreeing. Only 34% of the teachers, however, believed that in-service programs were actually designed on the basis of a study of the needs and the problems of teachers. On the same survey, over half of the teachers (55%) also indicated a preference for group in-service activities in their own school setting. It appears therefore, that authors' advocacy of the idiosyncratic and unit perspective of needs assessment, is representative of the perceptions of practicing teachers.

Prespecified Goals and Objectives

When teachers' needs for in-service education have been adequately assessed, 27% of the authors in the conceptual literature (29 of 110 authors) claimed that goals and objectives for subsequent in-service programs should be clearly specified. As such, prespecified goals and objectives were considered an important component for effective in-service education, ranking as a category two priority. Stating instructional objectives was considered an important component for the following reasons: it was the basis for appropriate design and selection of materials, methods, and content; it provided the criteria for subsequent evaluation; it encouraged participants to concentrate on intended outcomes; and it encouraged careful examination of what is worth teaching, what performance criteria are desirable, and how much time should be spent to achieve the objectives (Asher, 1967; Devore, 1971, Harris et al., 1969; Mager, 1975; Monahan & Miller, 1970; Rubin, 1971, Schwartz et al., 1977). Although a number of authors specified that the statement of specific objectives was important, they did so almost apologetically as if hesitant to state the obvious (Harris et al., 1969; Monahan & Miller, 1970). Harris et al. (1969, p. 31) for example, noted

If it weren't violated so much in practice, it would seem too obvious to require mentioning that the first task of designing a program is to get clearly in mind what the

program is to achieve. (However), it is not unusual to find an in-service program in which the only identifiable objective is to have an in-service program.

The extent of the deficiency in stating objectives was examined by Tarr (1969) in his analysis of the in-service programs in Iowa schools (99% return), including 1081 teachers (58% of 1856), 102 central office administrators (97% of 105), and 396 building principals (97% of 408). His findings revealed that 84% of the school districts in Iowa had not prepared a statement of the objectives for their in-service programs. Contrary to recommendations (Asher, 1967; Harris et al., 1969; Houmes, 1974; Mager, 1975; Rubin, 1971; Westby-Gibson, 1967), not one of the school districts in Iowa had stated their objectives in behavioral or instructional terms. The complete absence of precise objectives indicates that the "desired terminal behavior of teachers engaged in in-service activities was not specified" (Tarr, 1969, p. 9). This deficiency creates serious problems for organization of program content, program delivery, and particularly for program evaluation (Devore, 1971). Without clearly stated instructional objectives for example, planning and implementation lacks a focus for selecting most appropriate content and conceptualizing desirable performance criteria. In turn, haphazard rather than systematic and well thought out strategies for program

delivery may result.

In summary, the authors' criticisms about the lack of instructional objectives seems justified, based on Tarr's study (1969) and surveys of teachers' perceptions. Brimm and Tollett (1974) for example, reported that only 27% (N=7646) of the teachers surveyed in Tennessee school districts indicated that objectives were specific for in-service programs they attended.

Planning and Implementation

Thorough planning and implementation strategies were cited by 27% of the authors (30 of 110 authors), ranking as a category two or important component for in-service education. This figure may seem surprising since one would expect that effective in-service education, of necessity, must be thoroughly and thoughtfully planned. It is speculated that this component did not receive more emphasis in the conceptual literature, since of all the ten components identified, planning and implementation most likely occurs as an automatic process in actual practice. Its importance as a component of in-service education is reflected in the great number of proposed models or descriptions of procedures for in-service program delivery. Approximately 35% of the authors in the conceptual literature discussed procedural strategies for program planning and implementation. Two major works in this area were Harris et al. (1969) and Ritz

et al. (1970) which were basically cookbook presentations on how to plan and implement in-service programs. The remainder of the articles fell into three broad categories (see Appendix C) depending on the source initiating or organizing the in-service program--centralized, decentralized, or centrally coordinated approaches to planning and implementation (Asher, 1967).

Asher (1967, p. 13) defined a centralized approach as one in which in-service education is "initiated, managed and usually conducted by persons in the central office of a school system such as the superintendent, curriculum director, or supervisor". For the purpose of this thesis, Asher's definition was modified to include in-service education initiated by other academic institutions such as universities, the Ministry of Education and so on. An in-service program was considered centralized therefore, if it was initiated or organized by a single agency outside the school unit, such as a school district, the Ministry of Education, a university, or curriculum developers (for example, Borg & Stone, 1974; Olson, 1975; Scott-Blair, 1974). A further criterion imposed on Asher's definition of centralized in-service education was attendance at the in-service program by a heterogeneous group, that is, teachers representing any number of different schools or educational groups such as provincial specialist associations (P. S. A.s).

A decentralized approach was defined as one that basically was initiated or planned at the school level. Asher (1967, p. 13-14) indicated that the decentralized approach was based on the philosophy that "improvement is the responsibility of the individual school staff. The central office may be aware of such activity in the local school unit and it may provide consultant service, but it assumes a minimum responsibility for initiation, direction, or coordination of the program". A decentralized approach for in-service education was most strongly favoured in the in-service literature as judged by the preponderance of models employing a decentralized approach (see Appendix C). In a peer tutoring model for example (Bolam, 1979; Bush, 1971; Tillis & Laltart, 1974), a teacher needing specific skills such as classroom management skills, would work directly with a teacher who was strong in that area. In microteaching models (Phillips, 1975), teachers in a school would use video equipment to record teachers' classroom behavior for variables such as use of nonverbal reinforcement. The in-service program would focus on cooperative analysis of the behavior and recommendations for improvement.

Asher (1967, p. 14) indicated that a centrally coordinated approach to in-service education was a "combination of the other two approaches in that there is a co-ordination of local programs through the central office. The co-

ordination is shown in planning, problem solving, and the provision of resource people and consultants". Examples of in-service programs using a centrally coordinated approach can be found in Brown (1975), Fox & Griffin (1974), Jones (1975) and Luke (1972). For the purpose of this thesis a sub-category of the centrally co-ordinated approach was believed to be necessary. Teacher participation was perceived by the authors to be a critical component of in-service education (see Table 1). Since Asher's definition of a centrally coordinated approach did not address the issue of teacher participation, a sub-category for this approach was added so that the role of teacher participation was clear. A centrally coordinated approach therefore, was taken to mean central office coordination of in-service programs in which teachers participated in planning content and delivery of the program. A specific example of a centrally coordinated approach would be a district in-service program on reading in which primary teachers identified phonetic skills as the area of focus while intermediate teachers identified inferential comprehension skills as the area of focus. The central office would organize the program with the assistance of teachers, selecting resource people from within the district or from the universities. The university might become involved in developing the content or providing consultants. The added sub-category,

a collaboration approach, was taken to mean in-service programs that are coordinated and planned through the district central office, in collaboration with universities, the Ministry of Education, curriculum developers, and so on but without teacher participation in planning content and delivery of the program. A specific example of a collaboration approach would be an in-service program on reading curriculum materials initiated by the Ministry of Education but organized and presented through the efforts of the central office staff. In this example no teacher participation in selection of content would occur since a change in curriculum material would be mandated by the provincial Ministry of Education.

A centralized approach for in-service program planning and implementation was not overwhelmingly advocated by the authors and collaboration approaches only slightly more so. This may reflect the tendency of the authors to focus on the needs of the individual teacher or teachers in a school unit as discussed previously in needs assessment. A decentralized approach for in-service program planning and implementation was most strongly favoured in the current literature presumably because it claimed to meet more adequately the needs of the teachers and the school. There appeared to be some support for this claim since Asher (1967, p. 13-14) indicated that in a centralized approach

"problems chosen for community study seem to be selected because of their significance to central office personnel rather than to members of the teaching staff" while in contrast, problems reported for committee study in a decentralized approach indicated that "individuals and groups were working on problems of significance to them". Asher based his conclusions on a survey of 314 city school systems in the United States conducted by Berge, Harris, Russell and Walden (1957).

The major problem in planning and implementing in-service programs as perceived by the authors, is that in-service education programs are too centralized. There appeared to be some support for this claim based on survey data collected in 1957 by Berge et al. It is recognized that their data are dated but more current data were not available. Berge et al. used a stratified sampling procedure to survey 314 city school systems in the United States. Their results were based on the responses of 145 school systems (46% return). They reported that 36 of the 145 respondents (25%) indicated that a centralized approach to in-service program planning and implementation was used. An additional 57% used a centrally coordinated approach, leaving only 18% who used a decentralized approach to planning and implementation.

When the overall approach to in-service planning and

implementation has been selected decisions must be made about the next five components, since they affect planning for the program and subsequent implementation. The authors believed for example that in-service program organizers must decide if a review of the literature will be conducted, and if released time will be provided for teachers participating in the in-service program. The issue of teacher participation must be considered as well as degree of relevance of the proposed in-service program to teachers' needs. Finally organizers must examine whether the organizational climate in which the target teacher population works is supportive of the proposed change or innovation.

Reference to the Literature

Reference to other literature on in-service education, learning theory, change theory and so on was perceived to be a desirable component of in-service education by 14% of the authors (15 out of 110) (Allen, 1971; Coleman, 1979; Devore, 1971; Edelfelt, 1977; Fischler, 1971; Foshay, 1956; Lutz, 1976; Mackie & Gervais, 1977; National Education Association, 1966; Scriven, 1974). That this was not perceived to be a critical component also was reflected perhaps by the fact that of all the articles reviewed in both the conceptual and the empirical literature, approximately 45% had no references at all to any other literature (see

Appendix A). Of the 55% that did refer to other literature, approximately 15% had fewer than three bibliographic citations. This lack of reference to other literature on in-service education, evaluation, learning theory, change theory and so on raises some serious concerns for educators, including duplication of effort, or more seriously, perpetuation of practices that have proved ineffective. Devore (1971, p. 34) observed the same deficiency. He was the only author who seriously addressed the problem:

Educational change and in-service programs designed to promote change have largely ignored the information already available on change. In-service programs are still designed that attempt to obtain change and innovation through several limited and doomed to failure practices.

Although some authors criticized the absence of literature reviews in in-service programs other authors appeared to perpetuate the problem in their own studies and reports. The only survey data available on actual practices were Schankerman's survey (1968) of elementary teachers in 105 schools in Indianapolis (N=181). He indicated (p. 145) that "ideally a program of in-service education would include a continuous review of research literature". Sixty-five percent of the teachers, however, indicated that literature reviews were "rarely or never offered". Schankerman further reported that 45.7% of the teachers desired a literature

review as part of the in-service education program. It appears therefore, that more serious consideration should be given to this component in the future.

Teacher Participation

Active teacher participation was considered an essential component of in-service education (category 1) with 53% frequency of mention. The authors focused on the importance of teacher participation or involvement in various areas. A number of authors discussed teacher participation in general terms only, not specifying whether it should be in planning, decision making, implementation and so on (Houmes, 1974; Longmore, 1974; Thelan, 1971; Watkins, 1973). Other authors however, were more specific about the role that teacher participation played in in-service education. Cunningham (1972), Davidson, R., (1973), Edelfelt (1977), Harris et al. (1969), Schwartz et al. (1977), and Westby-Gibson (1967) for example, stressed the importance of teacher participation in planning in-service programs. This included problem selection and decision making vis-à-vis program design and delivery. Schwartz et al. (1977, p. 6) referred to this process as "participatory decision making" which was operationalized by having teachers involved in the governance process. Edelfelt (1977, p. 13) supported this view indicating that "decision (should be) made by

the people who are affected, and the decisions (should be) made as close as possible to the situation where they will be operative". This belief led him to conclude that the school building was the largest viable unit for decision making about in-service education. His view supported the belief that in-service education should be decentralized. Devore (1971), Britton (1973), and Larson (1974) favored not only participation in decision making, but also active involvement in developing, designing, and implementing in-service programs. Devore (1971, p. 71) for example, indicated that "whether a new in-service program meets with success or failure is clearly related to whether or not those in whom behavior change is sought are integrally involved in designing and carrying out the programs attempting to change their behavior". As previously mentioned several authors (Lippitt & Fox, 1971; Meade, 1971) stressed the importance of teacher participation in the assessment of their own needs. Ritz et al. (1970) and Harris et al. (1969, p. 9) recommended that even during the in-service activity itself, teachers must be active participants rather than "merely the objects of instructional improvement efforts". This view was supported by Lippitt and Fox (1971), Westby-Gibson (1967), and Tyler (1971, p. 13) when they stressed teacher involvement in "attacking real educational problems".

The general reason advanced by authors concerning the importance of teacher participation in planning, designing, and implementing in-service programs relates to the concept of commitment and sense of ownership. Smith (1975, p. 11) indicated that "to stimulate interest and commitment, a staff must see the in-service as 'theirs' and (teachers) must be an integral part of its planning and execution". With this sense of ownership, participants "feel a personal stake in (the program's) success and work for its success" (Cunningham, 1972, p. 286). Tyler (1971) concurred with this view and related ownership to teacher governance of their own professional growth. McPherson (1979), in his description of the Massachusetts state system for in-service education indicated that some degree of centralized or state control over funding was necessary. Nonetheless, this model was essentially "a participant controlled model (which)... (decentralized)... decision making to the local level" (McPherson, 1979, p. 9). The decision making involved selection of program content. Although this model has been operative only one year, McPherson observed some interesting trends, namely that a surprising number of requests for in-service arose "from weaker school systems who rarely, if ever, had in-service programs before" (p. 16). In this context a weaker school system was taken to mean a non-innovative school system.

Active teacher participation and input into all aspects of in-service education was therefore perceived to be essential in order to ensure teacher commitment. The decentralized approach for planning and implementing in-service education provided the most opportunities for this desired level of teacher participation, as mentioned previously.

The major problem with active teacher participation as a component of in-service education is that teachers are all too often recipients of programs offered to them or imposed on them without their input. The effect of this oversight, according to the authors, is a lack of commitment by teachers, resulting in failure of the in-service program to achieve its objectives of improved teaching instruction. The authors' criticism appears valid in light of survey data collected on teachers' perceptions of in-service education. Brimm and Tollett (1974, p. 524) for example, reported that 93% of the teachers in their survey (N=7646) responded positively to the statement that "teachers need to be involved in the development of purposes, activities, and methods of evaluation for in-service programs". Furthermore, 77% of the teachers agreed and only 6% disagreed that "such involvement would form greater commitment on the part of their colleagues for in-service education programs". Although the authors focused on teacher involvement in planning and implementing in-service programs they did not

stress teacher participation as resource persons to present in-service programs. The importance of this role of teacher participation became apparent in the survey data on teachers' perceptions. Howey (1978b) in his survey of urban and rural communities in Michigan, Georgia, and California reported that the majority of teachers surveyed (N is not reported) believed that other teachers were the most effective instructors for in-service programs. Similar results were reported by Reilly and Dembo (1975). They indicated (p. 126) that "the experienced teacher was selected as the source of educational information inspiring the most confidence for both the cognitive and affective areas of teaching". In their survey of 100 elementary school teachers, experienced teachers were given the highest confidence rating based on a five point rating scale from 0 (no confidence) to 4 (a great deal of confidence). Mean confidence ratings for experienced teachers on both affective and cognitive teaching practices were 3.45. These results of teachers' perceptions seem to support advocacy of the decentralized approach to in-service education discussed previously.

Released Time for Teachers

Released time provisions for teachers participating in in-service programs was perceived to be an important compo-

ment (category 2) of in-service education, with 25% (28 of 110 authors) frequency of mention (Britton, 1973; Cane, 1973; Edelfelt, 1977; Fischler, 1971; Harris et al., 1969; Henderson, 1978; Jackson, 1971; Lippitt & Fox, 1971; National Education Association, 1966; Rubin, 1971; Westby-Gibson, 1967). Several authors proposed that released time for teachers should be built into in-service program designs (Harris et al., 1969; Lippitt & Fox, 1971; Rubin, 1971) so that teachers have adequate time and energy to devote to assimilating new ideas. They based their recommendation on the assumption that tired teachers may not be receptive to innovations that will make even more demands on their time and energy. Lippitt and Fox (1971, p. 150) for example, cautioned against scheduling on an "ad hoc, overload basis". Harris et al. (1969, p. 6) recommended that "budgetary allocations of significant amounts (be provided) for release time". The National Education Association project on instruction (N. E. A., 1963) recommended that critical consideration be given to released time for teachers participating in in-service education. Similarly, the National Education Association in their "In-service Education of Teachers Research Summary" (1966, p. 1) concluded that "the equitable, well administered plan for granting professional leaves of absence may contribute much to professional growth activities". In the United Kingdom released

time provisions for teachers participating in in-service education was perceived as important to the adequate professional development of teachers because it encouraged teachers to devote time and effort to assimilate and implement new ideas. Lord James (1973, p. 12-18) recommended that "all teachers should be entitled to release with pay for in-service education and training on a scale equivalent to not less than one school term in every seven years of service".

Surprisingly perhaps, released time for teachers, as a component for effective in-service programs was mentioned with higher frequency than feedback and follow-up and on par with relevance of programs to classroom practices. One possible explanation might be that the above two components may be perceived as already occurring, whereas released time, as a built-in component, is not perceived as occurring but should be. A second possible explanation may be an unspoken recognition of the difficulty of motivating teachers to attend in-service voluntarily without any short term payoff such as a few hours or days out of the classroom. This type of explanation, however, remains speculation.

The authors' view that released time should be provided for teachers participating in in-service education is representative of teachers' views, based on survey data of

teachers' perceptions of in-service education. Brimm and Tollett (1974) reported that 86% of the teachers in their sample (N=7646) wanted released time to participate in in-service education. Howey (1978b) reported similar results. Seventy-five percent of the teachers in his survey (N= not reported) desired released time during the instructional day.

Relevance to Classroom Practices

Relevance of the content of in-service programs to classroom practices was perceived by 25% of the authors (28 of 110 authors) to be an important component (category 2) for successful in-service education. Fifer and Rush (1974, p. 4) indicated that "if the active participation of teachers in in-service activities is important...then a practical...model for designing meaningful in-service programs must be developed and implemented". This view was based on the assumption that teachers will not become committed to programs that do not contribute to their daily work in classrooms. Relevance was seen as problem specific--addressing a specific educational issue or concern identified by teachers, and action oriented--generating alternative and viable solutions to the problem (Asher, 1967; Bush, 1971; Cane, 1973; Fifer & Rush, 1974; Rubin, 1971). Several authors (Cane, 1973; Ritz et al., 1970) cited the lack of

relevance to classroom practices as the cause for failure of many current in-service programs.

The authors' criticism about lack of relevance of in-service education to classroom practices seems to be supported by teachers' perceptions of in-service education. Brimm and Tollett (1974, p. 523), for example, reported that 73% of the teachers surveyed (N=7646) indicated that in-service activities did not "appear relevant to any felt needs of the teacher".

Supportive Climate

A supportive climate as a variable in effecting change was frequently mentioned as a component that must receive more serious consideration if the effects of in-service education are to be felt at the school level. Thirty-one percent of the authors mentioned this issue (34 of 110 authors) yielding a category two rank as an important component for effective in-service education (Fantini, 1971; Jackson, 1971; Lippitt & Fox, 1971; Rubin, 1971; Watkins, 1973). Devore (1971, p. 48) particularly emphasized the importance of a supportive school climate. The school climate that was the most conducive to change was described as one which "reduces threat and defensiveness and provides emotional support while the learners undergo the difficult process of changing patterns of thought and behavior".

Furthermore "the most effective environment for change allows for freedom of people to express their feelings and ideas, encourages self-direction, and is free of coercion" (Devore, 1971, p. 13). The importance of a supportive climate was also a major conclusion in Parker's study based on the results of the five year California Cooperative Study of In-service Education (Parker, 1957). In his view a school climate that was creative, permissive, and built on mutual respect was conducive to group processes which encouraged teachers to work together on common problems. A supportive climate also focused on community support (Westby-Gibson, 1967), institutional support (Jackson, 1971), and support from political groups within the bureaucracy (Fantini, 1971). Several authors (Devore, 1971; Lippitt & Fox, 1971) felt that utilization of ideas gained through in-service education were often hindered because of the failure of the school climate to be supportive of change. Devore (1971, p. 53) was most critical in one of his conclusions on the state of in-service education:

Environment is wholly neglected in most innovation models....the environment has the potential to multiply the effectiveness of resources or neutralize them, resulting in expenditure of resources with no gain in diffusion of knowledge.

The major responsibility for creating a supportive climate for change was perceived to reside with the school administrator. He/she provided the appropriate environment

where innovation or change was more likely to occur (Colemen, 1979; Ritz et al., 1970). Several authors (Asher, 1967; Devore, 1971; Smith, 1975) saw the principal's role as supportive--supporting experimentation, exchange of ideas, adaptation of innovations, and so on. Additionally, the role was perceived to be that of initiator (Tyler, 1971), stimulator (Ritz et al., 1970), leader (Rubin, 1971) or "catalyst who generates action, provides support, and stands by to offer any assistance necessary in the execution of plans" (Smith, 1975, p. 11). Devore (1971, p. 61) reported on the perceived importance of the principal's role in in-service education and educational change:

Rubin's research found that the school principal was by far the greatest influence on the staff's personality (p. 18). Gross (p. 259) found that one of the major causes for the inability of many school systems to demonstrate positive educational effects for their attempts to institute educational change could be attributed to the 'truncated version of the change process held by their administrators'.

One of Devore's conclusions as to the lack of impact of in-service education on classroom practices related to the conflict between administrator's attitudes and expectations and the ideas for change or innovation that in-service programs were trying to promote. Teachers who have accepted and are committed to trying out new teaching strategies as a

result of an in-service program may return to their schools only to find that new procedures and practices are antithetical to the school principal's philosophy or that funding for the program was not available. Teachers wishing to implement individualized student programs based on continuous progress, for example, might be opposed by a principal biased toward standardized tests as the basis for a pass-fail system. Although Meade (1971, p. 221) concurred with the above perceptions, he proposed that the principal cannot possibly "devote adequate attention to staff development... for a variety of reasons, and particularly because of the present structure of American education". He indicated that teacher retraining was sufficiently important to warrant a specialized leadership agent with diagnostic and performance assessment skills. Presumably because of other demands on the principal's time, such as discipline, public relations, scheduling and so on, he cannot adequately develop the diagnostic and performance assessment skills necessary to fulfill the role of a specialized leadership agent. It can be speculated also that the principal's role as teacher evaluator is in conflict with his/her role as leader of staff development (Mackay, 1971). Twiford (1965, p. 8) proposed that the school principal was responsible for the "initiation, development and maintenance of a continuing program of...in-service education". Ritz et al. (1970, p. 25)

cautioned that "there (is) however, little research data available concerning the local school principal's effect upon the installation process". Given the perceived importance in the conceptual literature of the role of the school principal, more research in this area appears warranted.

The authors believed that lack of a supportive climate during the implementation phase was a major problem affecting in-service programs. No survey data on teachers' perceptions were available to support their claims, however. It seems reasonable that teachers who receive encouragement for their efforts will be more effective in implementing new ideas or programs than teachers who are discouraged in their efforts.

If authors' claims are accurate that a supportive climate is important for effective in-service education, then the decentralized approach to in-service education appears most viable, since it requires commitment by the whole school staff with subsequent opportunities for peer support. The importance of the role of the school principal does not meet with consensus, although the majority of authors believed that his effect on the installation process was important. His role as in-service program initiator, coordinator, leader and so on may be viable but his role as an instructor or resource person to conduct in-service programs is not sup-

ported by survey data of teachers' perceptions. For example, Reilly and Dembo (1975) reported that elementary teachers' (N=100) mean confidence ratings of principals as instructors was 2.62 for affective teaching practices and 2.73 for cognitive teaching practices. Recall that a rank of 4 indicated a great deal of confidence. Furthermore, it has been proposed that the increasingly important role of the principal as evaluator of teachers' performance is in conflict with the role of assisting teachers to improve their teaching performance (Mackay, 1978). Ritz et al.'s proposal that further research be conducted vis-à-vis the school principal's effect on school climate and teacher attitude appears warranted.

Evaluation

The most frequently mentioned component of in-service education considered to be a critical component of program design (category 1) was evaluation with 58% frequency of mention (64 of 110 authors). This section focuses on evaluation as an integral part of in-service education, its importance in program effectiveness and the general deficiency of evaluation practices as a program component.

A number of authors indicated that evaluation should be an integral part of in-service education and should be built into the program design (Allen, 1971; Devore, 1971;

Edelfelt, 1977; Fischler, 1971; Harty, 1975; Lippitt & Fox, 1971; Mackie & Gervais, 1977). Mackie and Gervais' observation (1977, p. 42) typified sentiments in this regard: "evaluation is an integral part of any in-service activity. Failure to effectively evaluate is probably a main factor for the poor results of many in-service programs". Allen (1971, p. 122) considered evaluation a "pivotal point" in in-service education and proposed that it be used for diagnostic purposes to determine strengths and weaknesses of the program so that future in-service programs could build on the strengths while trying to eliminate the weaknesses. Harty (1975, p. 14) suggested not only post hoc evaluation, but also descriptive evaluation, designed to "assess professional competence, values and attitudes, project strengths and weaknesses and the goals of all groups involved". This type of descriptive evaluation seems related to needs assessment. It appears that Harty is suggesting that teachers' values, attitudes, and professional competence be assessed so that in-service programs can be designed to complement these variables.

The major reason stated for the importance of conducting evaluations was to determine program effectiveness (Allen, 1971; Cunningham, 1972; Fischler, 1971; Hoyle, 1973; Landrith, 1977; Lippitt & Fox, 1971; Lutz, 1976; Massanari, 1978; Otto & Erickson, 1973). Landrith (1977) suggested

that post in-service education be used to decide if the predetermined goals and competencies had been achieved. Otto and Erickson (1973) supported this view and suggested that the objectives established at the initiation of the program be used as criteria for determining the effectiveness and impact of the activities. Knowledge about program effectiveness was felt to be essential to make informed decisions about program modification (Cunningham, 1972) and for overall program flexibility (Allen, 1971). Several authors (Allen, 1971; Fischler, 1971; Lutz, 1976) contended that wise decisions about in-service education and planned change are impossible without an evaluation process. Lutz (1976) for example, suggested that the results of the evaluation could be used to ascertain the extent and direction of change resulting from the educational experience. Devore (1971, p. 64) proposed that without the knowledge available from evaluation, we were not in adequate control of the situation as:

without the knowledge of where we are, we opt for being controlled by the situation rather than controlling the situation. One's actions become purposeful and efficient when he is aware of what his actions actually do. The development of this awareness is an important factor in the evaluation process, particularly for educators concerned with people and behavior.

Although many of the above authors did not specify how evaluation was to accomplish all these objectives, they

recommended that pretest-posttest evaluation designs be used.

While advocating the necessity of evaluation for in-service education, the authors simultaneously lamented the lack of evaluation as an automatic process (Fitzgerald & Clark, 1976; Harris et al., 1979; Henderson, 1978; Hoyle, 1973; Ritz et al., 1970; Westby-Gibson, 1967). Westby-Gibson (1967, p. 44) reported in her review that "in-service education has suffered from a lack of sound evaluation and research ... what exists are largely descriptive reports of programs undertaken without systematic evaluation". Fitzgerald and Clark (1967) and Ritz et al. (1970) also expressed concern over the lack of systematized efforts in evaluation. Their concern focused on the tendency of organizers to make subjective decisions about the effectiveness of their in-service programs rather than making objective decisions based on valid data. Fitzgerald and Clark's comments (1976, p. 194) were typical

Little effort has been made to evaluate many in-service programs. When an evaluation has been made, it has often taken the form of a series of questions asking the participants to indicate the perceived degree of enjoyment, interest or value in the in-service activity. Few programs have used a product evaluation in order to link student achievement to teacher training.

The above authors criticized lack of evaluation as a

component of in-service education but did not cite any survey data to support their claims. Their claims, however, do seem to receive some support as reflected by the paucity of research literature on effectiveness of in-service education. In Chapter Three for example, only 19% of the articles (30 of 159 articles) in the literature review were research studies evaluating the effectiveness of in-service education. Hoyle (1973) proposed that since little is known about the effectiveness of our efforts in in-service education no extension of in-service programs should proceed without an accompanying program evaluation.

In terms of evaluation techniques, the most commonly used device when evaluation did occur was the post in-service questionnaire or checklist. This method, when used exclusively for evaluating the effectiveness of an in-service program came under severe attack (Alvir, 1976; Harty, 1975; Henderson, 1978; Katz, 1974; Mackie & Gervais, 1977; National Education Association, 1966; Ritz et al., 1970). The National Education Association, in their National Commission on Teacher Education and Professional Standards conducted a survey in 1965 called "Current Practices in In-service Education" (1966, p. 13). They concluded that "nearly all programs have subjective evaluations that include questionnaires, reaction sheets or verbal comments by the participant and directors, but well organized sta-

tistical evaluations are evident in only a few instances". It was precisely the subjective nature of these evaluations that the authors criticized. Alvir (1976, p. 2), for example, stated that reaction sheets or questionnaires conducted after an in-service program provided only "analysis of significant agreement or disagreement with opinions of expert judges. Since the input data is still basically opinion expressed in generalities, such evaluation can be called into question". Ritz et al. (1970) urged workshop directors to broaden their evaluation endeavours. Other authors advocated the collection of data vis-à-vis the process involved (Henderson, 1978) or the "total learning experience" (Mackie & Gervais, 1977, p. 42) so that future decisions about in-service education could be based on objective measurement of effectiveness. They indicated that this type of data was almost impossible to collect by administering a post in-service questionnaire on participants' attitudes which rely on subjective perceptions. Henderson (1978, p. 109) additionally cautioned against the use of repeated questionnaire administration, which was "likely to result in a 'response set'". Bush (1971, p. 65) was one of the few authors who favoured the use of post in-service questionnaires. He felt that questionnaires were valuable sources of data and that evaluators "should not underestimate the honest and thoughtfully given judgments

of teachers". Mohan and Hull (1975) proposed that post in-service questionnaires may be useful in assessing program limitations. Their concern in evaluation, however, was determining the degree of change in teachers as a result of participation in in-service education. As well as questionnaires, therefore, they recommended the use of "a series of cognitive tests at the end of each presentation to determine the degree to which participants have attained objectives of the program" (Mohan & Hull, 1975, p. 44). Although Mohan and Hull favored the use of questionnaires, they concurred with previous authors about its limitations. Otto and Erickson (1976) proposed that a number of techniques for evaluation be employed, including observation of outcomes (somewhat subjective), paper and pencil tests, work sample analysis, and performance tests. Cunningham (1972, p. 487) favored an experimental design for evaluation with pre and post testing of teachers and pupils. He insisted that scientific evaluation, including possible use of "reliable and validated attitude questionnaires, and interaction matrixes" were necessary. Cunningham, however, did not explain what interaction matrixes were and how they could be used.

In general terms the type of evaluation recommended in the conceptual literature was summative evaluation-- evaluation on which decisions about what constitutes

effective practices for in-service education could be based. However some recognition was also given to the importance of formative or "process" evaluation (Asher, 1974, 1967; Fitzgerald & Clark, 1976) designed to improve delivery of in-service programs.

Evaluation of in-service education was perceived to be a top priority component of in-service education. Although survey data was not available to support the author's claims, it is speculated that their criticisms are warranted, based on the band wagon syndrome evident in educational practice. It is speculated that programs whose effectiveness are based solely on subjective testimonials are less likely to endure than programs whose effectiveness have been empirically validated. If the authors' criticisms are warranted, it becomes important that high quality research and testing of evaluation models and instruments occur in the near future so that evaluation of in-service education can be conducted confidently by school districts. Perhaps a first step would be the raising of standards vis-à-vis statistical and procedural reporting in the educational research journals. This would allow duplication of effective practices. In-service programers might also be held responsible and accountable for evaluating the effectiveness of their programs and reporting their results based on the stated objectives of the program. Without adequate evalua-

tion it is proposed that feedback and follow-up strategies may become inadequate since they may not be based on valid and reliable data.

Feedback and Follow-up

Although not frequently mentioned as a high priority component of in-service education, feedback and follow-up provisions for teachers participating in in-service education were perceived by some authors (22% frequency of mention) to be important (category 2) if longitudinal benefits of in-service education were to be realized (Cunningham, 1972; Devore, 1971; Draba, 1975, Hodges, L. & Hodges, R., 1975; Houmes, 1974; James, G., 1976; Lutz, 1976; Mackie & Gervais, 1977; Mohan & Hull, 1975; Olsen, 1975; Smith, 1975; Waynant, 1971; Westby-Gibson, 1967). Devore (1971) and Westby-Gibson (1967) particularly reported on the perceived importance of feedback and follow-up for the realization of the goals of the in-service program over the long term. McClelland's comments (1969, p. 33) were typical in this regard:

Obviously a plan for maintenance and feedback is essential if the planned change is to persist. Training aides and devices are today gathering dust in storerooms throughout the country. Teachers and managers have reverted to their former practices.

It seems obvious, based on current knowledge of learning

theory (Fantino & Reynolds, 1975; Tarpy, 1975), that any in-service program designed to change teachers' behavior, must have a thorough and well planned feedback and follow-up component built into the design. Bessent (1971, p. 52) indicated for example, that effective and efficient learning is more likely to occur "when there is immediate feedback to the consequence of (teachers') behavior" and when teachers' "reactions to the learning activity are reinforced by the reactions of others". Follow-up can provide the critical feedback and reinforcement necessary for behavior change. Perhaps the greatest failure of the one-shot in-service programs is providing this necessary follow-up. Santelli (1978, p. 29) indicated that "practically all (in-service) programs (that) have been one-shot affairs with no follow-up and no long range goals (have) in short, no permanence".

Feedback and follow-up of in-service programs are related to or somewhat dependent upon other components having been met. Feedback and follow-up would be difficult to initiate for example, if goals of the in-service program were not clearly specified because reinforcement, to be effective, must be contingent upon specified behavior (Tarpy, 1975). It must be clear in advance, therefore, what the program is intended to achieve. Active teacher participation in planning, relevance to the classroom, and

particularly, a supportive school climate, would similarly be a precondition to an effective follow-up program if teachers are to perceive the follow-up as cooperative planning or assistance rather than intervention. For in-service programs designed to change teachers' behavior on a longitudinal basis follow-up may be one of the major sources of data for program evaluation. Therefore, in terms of ultimate success of in-service education over time, feedback and follow-up for participants becomes an important component of any program for change. It needs, therefore, more consideration than it is currently receiving. The authors' criticisms seem justified based on survey data of teachers' perceptions of in-service education. Brimm and Tollett (1974) reported that a mere 13% of the teachers in their survey (N=7646) indicated that follow-up to in-service education was adequate. Howey (1978b, p. 8) reported similar results in his survey of teachers in three states of the United States. He indicated that "very few teachers report...follow-through on any type of regular basis, from a low of only 6% in one state to a high of only 23% in the federally funded Urban/Rural Project".

Summary of the Conceptual Literature

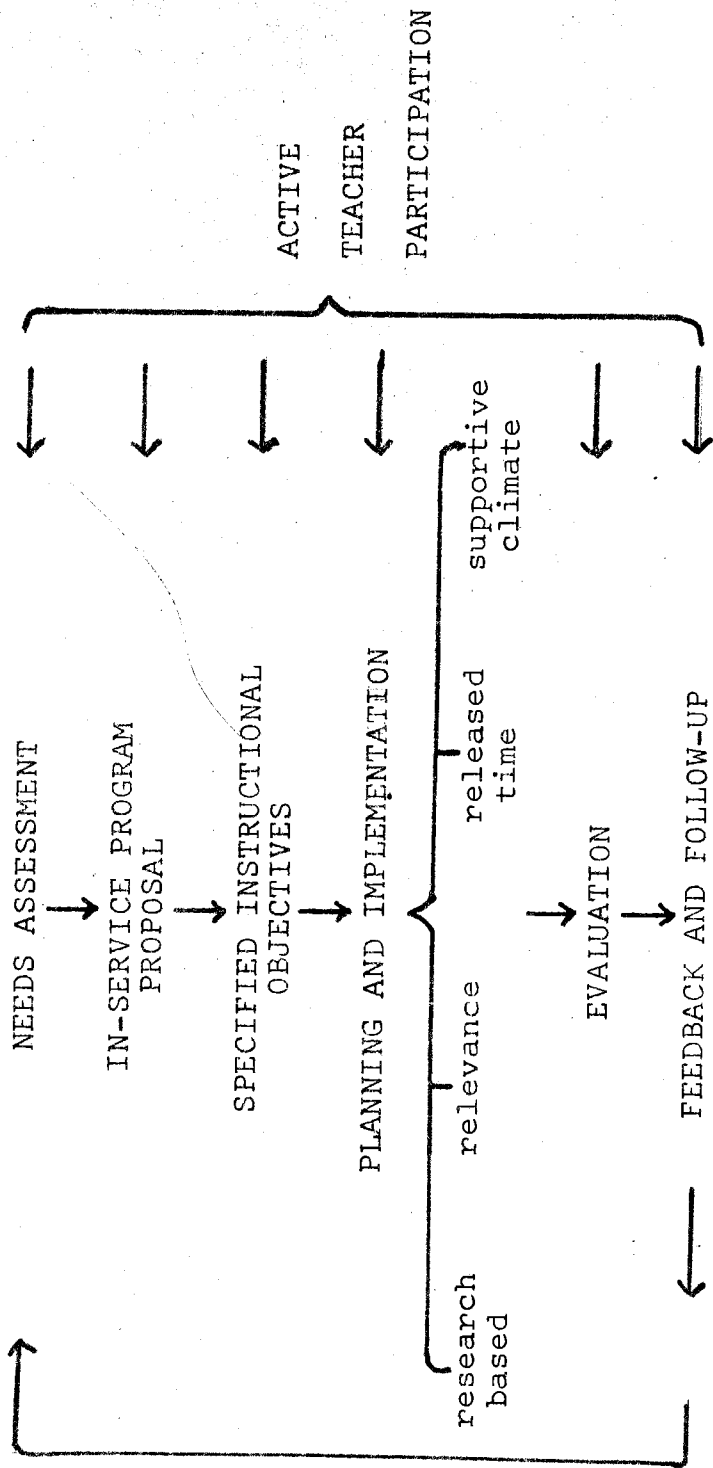
In-service teacher education is obviously considered to be an important vehicle for educational improvement, particularly as regards teaching competence. It is evident

from this review of the conceptual literature that a number of components are claimed to be essential for effective in-service education. The conceptual model or template for in-service teacher education that emerges appears to require at minimum the three following components: a formal assessment of teachers' needs, active teacher participation and input into planning and implementation, and a formal evaluation of program effectiveness. Six additional components are perceived to be important for the conceptual model, including a statement of clearly specified instructional objectives, thorough planning and implementation, relevance to classroom practices, released time for participating teachers, a supportive climate in which new ideas are encouraged, and feedback and follow-up. Reference to the conceptual and empirical literature in the field of in-service education is perceived to be a desirable component in the conceptual model. The resulting model is represented in Figure 2.

It is immediately apparent that teacher participation plays a major role in the proposed model. The model is cyclical, encouraging systematic, long term planning. As suggested throughout the previous discussion, components should not be perceived as separate entities. Although some components were perceived by authors to be more important than others, as judged by their frequency of men-

Figure 2

Conceptual Model or Template for In-service Programs



tion, it is recommended that the model be conceptualized as a whole with interdependent components. The interdependence of the components was demonstrated in the previous discussion on evaluation for example, in which it was indicated that evaluation should be based on the instructional objectives of the in-service program, which in turn should be based on the needs of teachers. Other relationships between components were demonstrated in the discussion on relevance, and feedback and follow-up. Based on the perceived interdependence of components, therefore, it is recommended that the conceptual model be adopted in its entirety for in-service programs designed to change teachers' behavior.

The authors' advocacy of the components in this model are generally supported by teachers' perceptions of in-service education (Brimm & Tollett, 1974; Daly, 1977; Howey, 1978b; Reilly & Dembo, 1975). The predicted effectiveness of the conceptual model however, should be judged also on the basis of research. The task of the next chapter is to examine research on in-service education to isolate practices that have proved effective as measured by changes in teachers or pupils. The chapter on the empirical literature will conclude with an examination of the viability of the conceptual model, based on the findings in the empirical literature.

CHAPTER THREE

Review of the Empirical LiteratureIntroduction

The search procedures that were described in the introduction to Chapter Two were the same procedures that were used for the review of the empirical literature. Specifically, to isolate relations for measurement of effectiveness of in-service education, the descriptors program effectiveness, instructional improvement, teacher improvement, student improvement, student benefits, educational research, and research reports were used in conjunction with the major descriptors in-service teacher education, in-service programs, in-service courses, and teacher workshops.

Chart I (see Appendix A) was used to isolate articles for review of the empirical literature. All articles that had a check mark in the empirical column and in the effectiveness of in-service education column were included in this chapter. Recall that empirical was defined as studies in which measurements were taken to determine degree of effectiveness. The category effectiveness of in-service education was used exclusively for those empirical articles that tested the overall effectiveness of in-service programs as measured by its effect on teachers or pupils. Using Chart I, 30 articles were isolated.

The primary objective set for in-service education as mentioned earlier is to improve teachers' competence with subsequent improvement in pupils' performance. Only 30 articles (19%) were found which measured in-service effectiveness regarding one or both of these objectives. Indicators of effectiveness included changes in any combination of the following: teachers' knowledge, teachers' attitudes, teachers' classroom behavior, pupils' academic performance, pupils' attitudes, and pupils' behavior.

The research designs used in these empirical studies fell into three broad categories: pre-experimental designs (50%), quasi-experimental designs (27%), and true experimental designs (23%), comprising three pretest-posttest control group designs (10%) and four factorial designs (13%). Each of these will be discussed within the following framework: the general properties of the research design; a detailed analysis of a representative study within the category to illustrate limitations vis-à-vis internal validity and generalizability; and a discussion of the overall results and conclusions of studies within the category. The chapter concludes with a discussion of the predicted effectiveness of the conceptual model based on the research findings.

In the review of the conceptual literature, three approaches to planning and implementing in-service education

were identified--a decentralized approach, a centralized approach, and a centrally coordinated approach comprising also the subcategory collaboration approach. For each study, wherever reporting procedures were sufficiently detailed, the approach to planning and implementing the in-service program will be identified. Recall that the authors in the conceptual literature favored the decentralized approach to planning and implementing in-service education in the belief that the decentralized approach met more adequately the needs of teachers, was more relevant to classroom practices and provided more opportunities for teachers' participation, a supportive climate, and feedback and follow-up. If the conceptual model or template proposed in Chapter Two is to be judged for its predictive effectiveness against research results in the empirical literature, it becomes necessary therefore, to identify which approach to planning and implementing in-service education is being used in the research studies.

A summary table will be included for each set of research studies identifying important features of each study. Because each study will not be discussed in detail, the table will summarize important features so that information on which the conclusions were based, is readily available. Each summary table will report the following information. The approach used in planning and implementing the in-

service program will be identified wherever possible. The time at which data were collected to test the effectiveness of the in-service program will be reported so that conclusions about the longitudinal effects of in-service education can be made. The grade level for which the in-service program was designed will be reported in the event that grade level is a variable contributing to the effectiveness of in-service education. Results will be reported for changes in teachers' acquisition of knowledge (cognitive), teachers' changes in attitude or classroom behavior, as well as changes in pupils' acquisition of knowledge, and pupils' changes in attitude or behavior. These results will be reported as z scores whenever statistical reporting is detailed enough to allow this to be done. Z scores were chosen as the unit for reporting because they indicate effect size. Assuming that a pre in-service program z score (or a control group z score) of zero falls on the 50th percentile then degree of change as a result of the in-service program can be expressed as percentile scores by comparing the post in-service or treatment group mean to the pre in-service or control group mean and dividing this difference by the pre in-service or control group standard deviation. This procedure allows for comparisons of all the studies on a percentile scale. Practically significant versus statistically significant differences can then be

discussed. The criterion for practical significance was set at a z score difference of .52. This corresponds to a change from the 50th percentile to the 70th percentile. Alternatively, a z score change of .52 would correspond to a change in I. Q. from 100 to approximately 108. Such a change was believed to be sufficient to warrant attention.

Pre-experimental Designs

Two types of studies fell into this category, four one-shot case studies and eleven one-group pretest-posttest studies.

Characteristics of the one-shot case study research design. Four authors used a one-shot case study design to measure in-service effectiveness (see Table 3). In the one-shot case study an in-service program is applied to a single group of teachers with a subsequent observation or measurement of the effects of the in-service program. The lack of a control group that does not receive the treatment and the lack of information about persons who experience the treatment violate most of the requirements for internal validity in a design. On the basis of a one-shot case study there is no justification for concluding that the treatment caused whatever was observed to follow it since a host of rival hypotheses cannot be ruled out (Tuckman, 1972).

A representative one-shot case study. The study by Phillips (1975) is typical of this group of studies since it

Table 3

Procedures and Results of the One Shot Case Studies X 0

Gaddis (1973)

Approach: centralized
 Test time: immediate - at end of program
 Grade level: secondary
 Results: teachers (N = 68) behavior - no change
 Comments: Data for behavioral change was collected by teachers' self-reports on a follow up questionnaire. Results cannot be converted to z scores or percentiles since no baseline data on teachers' behavior were collected.

Hammons (1975)

Approach: cannot be determined from the information
 Test time: delayed - 6 months after termination of program
 Grade level: college
 Results: teachers (N = 155) behavior - no change
 Comments: Data for behavioral change was collected by interview questionnaire. Results cannot be converted to z scores or percentiles since no baseline data on teachers' behavior were collected.

Phillips (1975)

Approach: centralized
 Test time: immediate - at end of program
 Grade level: primary
 Results: teachers (N = 40) cognitive - unsubstantiated gain
 Comments: The author claims positive results, but gains are unsubstantiated because no statistical data are reported in the study. Results were based on teachers' responses to a questionnaire, the format, contents, validity, and reliability of which are unspecified.

tested a centralized approach to in-service education and evaluation was achieved by administering a teacher questionnaire immediately upon completion of the series of workshops. The study involved in-service training using videotaping to support microteaching analyses. The population consisted of 40-45 primary Greek Cypriot and Turkish Cypriot teachers of English. Neither background data such as prior education or competency level of the participants nor selection procedures were reported. This limited the generalizability of the conclusions to other groups of teachers since there was no information for comparing this group to other populations of teachers.

The in-service program for bilingual education lasted for two weeks involving approximately 30 hours of work including demonstration lessons, methodology, pronunciation, films, and so on. Phillips reported that a questionnaire was administered at the conclusion of the last session, but no data was reported on the results of the questionnaire, nor was the format of the questionnaire or its contents described. Furthermore, no statistical information such as frequencies or percentages were reported. Nonetheless, Phillips made the following claims.

The importance of providing models during the course is I think obvious (p. 123).

The level of competence achieved by the majority of course members was quite high (p. 128).

Some improvement in some teachers' pronunciations was certainly noted (p. 127).

It seems reasonable to expect that a technique that involves genuine activity is more likely to produce some change of attitude (p. 128).

The insufficient reporting of procedures and findings in Phillips' research coupled with merely subjective treatment of the data collected forces the conclusion that this in-service program lacked validated empirical support.

Results and conclusions of the one-shot case studies.

No clear picture as to the effectiveness of the in-service education classified in this group emerged from an analyses of the one-shot case studies (see Table 3). Only two studies tested effectiveness in terms of gains in teachers' cognitive skills (Phillips, 1975; Popham, 1975). Phillips' perceptions can be regarded only as subjective. Although Popham (1975) used a one-shot case study design he did report, however, early in course and late in course scores. He reported positive gains in teachers' cognitive skills (86th percentile) and also positive changes in teachers' attitudes (96th percentile). Changes in teachers' attitudes were based on teachers' self-reports of interest. Popham failed to describe his subject population adequately, however. Generalizability to other populations therefore, was attenuated. Two of the four studies tested effective-

ness of in-service education in terms of teachers' classroom behavior (Gaddis, 1973; Hammons, 1975). Both found no statistically significant changes in teachers' behavior as determined by teachers' self-reports on a follow-up questionnaire. Again, percentiles could not be calculated because baseline data on teachers' behavior had not been collected. None of the one-shot case studies measured in-service effectiveness in terms of effects on pupils.

All of the one-shot case studies measured effectiveness immediately after the in-service program with the exception of Hammons (1975). He reported no changes in teachers' behavior as gauged by an interview questionnaire after a six month time lapse. It would appear that changes in teachers' behavior that may result from the in-service program may not be sustained over time.

Summary of the one-shot case studies. The three most essential components identified for effective in-service education included program evaluation, active teacher participation, and a needs assessment of teachers. All of the one-shot case studies did attempt to evaluate their programs. Contrary to recommendations in the conceptual literature, however, three of the four studies relied exclusively on the questionnaire as the method for evaluation which was frequently questioned as to its validity for evaluating an in-service program. Wehmeyer (1975, p. 106) in her litera-

ture review on effectiveness of in-service education pointed out that "most questionnaire studies assume that a supportive response to a workshop is an indicator of subsequent implementation of the ideas presented". This assumption was challenged in the conceptual literature.

None of the authors of one-shot case studies reported that a needs assessment was conducted. Because a centralized approach was used in three of the four studies, active teacher participation in planning and implementation was minimal or nonexistent. No authors discussed the role of the teacher in their study except as mere recipients of the in-service program.

Characteristics of the one-group pretest-posttest studies. Eleven authors used a one-group pretest-posttest design to measure effectiveness of in-service education (see Table 4). In this design some information is known about "the initial state of the selected subjects on the dependent variable" since a pretest or pre-observation occurs before the in-service intervention is carried out (Tuckman, 1972, p. 129). After the in-service program, observation or tests are again conducted so that scores from pre and post in-service may be compared. This design, however, is considered pre-experimental since it still fails to control many sources of internal validity such as maturation, history,

Table 4

Procedures and Results of the One-Group Pretest Posttest Studies $O_1 \times O_2$

Billeh & Hanson (1975)

Approach: collaboration

Test time: immediate - at end of program

Grade level: secondary

Results: teachers (N = 171) cognitive - positive results (79th percentile)

Comments: Data for teachers' cognitive scores were taken from the Nature of Science Test (NOST) - content validity and reliability were reported.

Borg & Stone (1974)

Approach: centralized

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 12) behavior - positive results

Comments: Data on teachers' behavior were collected through analysis of audiotapes to determine frequency of use of encouragement and use of extension as a questioning technique. Z scores could not be calculated because of inadequate statistical reporting.

Degroote (1973)

Approach: decentralized

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 12)

affective - positive results (74th percentile)
 behavior - positive results (74th percentile)

pupils (N = 313)

affective - positive results (intermediate - 62nd percentile)
 behavior - positive results (primary - 68th percentile)

Table 4 (continued)

Comments: Data for teachers' behavior were collected from teachers' self-reports on the Actual Science Classroom Environment instrument. Data for teachers' attitudes were collected from teachers' responses on the Ideal Science Classroom Environment instrument. Data for pupils' attitudes and behavior were collected from pupils' responses on the Student Perceived Science classroom instrument. In primary grades pupils' scores were based on a modified form of the primary level School Sentiment Index. Scores for attitude and behavior were combined in the author's report, hence only one z score or percentile score for attitude and behavior were collected.

Fowler (1960)

Approach: centralized
 Test time: immediate - at end of program
 Grade level: elementary
 Results: teachers (N = 45) cognitive - positive results
 Comments: Data for teachers' cognitive scores were taken from the Read General Science Test forms AM and BM. Z scores could not be calculated because of inadequate statistical reporting.

Granum (1975)

Approach: decentralized
 Test time: immediate - at end of program
 Grade level: elementary
 Results: pupils (N = 19) behavior - positive results
 Comments: Data for pupils' behavior were based on teachers' observation using the Walker Problem Behaviour Identification checklist. Z scores could not be computed because of inadequate statistical reporting.

Koch (1973)

Approach: centralized
 Test time: not reported
 Grade level: K-12
 Results: teachers (N = 31) behavior - positive change

Table 4 (continued)

pupils (N = 1500) cognitive - unsubstantiated gains affective - no change

Comments: Data for teachers' behavior were collected from teachers' self-reports of frequency of number of days of small group or independent study for pupils in mathematics. Frequencies were reported only, therefore z scores could not be calculated. Data for pupils' cognitive scores were collected from the California Test of Basic Skills. Changes in mean scores from pre to posttest were reported only. Since standard deviation was not reported and raw scores not given, z scores could not be calculated. Data for changes in pupils' attitude were collected from survey data on pupils' attitudes toward mathematics. Z scores could not be calculated since standard deviation was not reported. An unsubstantiated gain was reported for pupils' cognitive scores since statistical tests comparing control group and experimental group were not conducted.

Martin (1973)

Approach: decentralized

Test time: immediate - at end of program and delayed - 18 weeks after termination of the program

Grade level: Grades 7 and 8

Results: teachers (N = 21) behavior - unsubstantiated gain pupils (N not reported) behavior - no change

Comments: Behavioral data on teachers were based on frequency of teachers' approval and disapproval reported by observers. Behavior data on pupils were based on on-task behavior. Percentage increases in pre and post measures were reported only, hence z scores could not be calculated. The author reported strongest affects immediately after the in-service program, diminishing at 18 weeks. Pupils' on task behavior regressed. Scores for teachers' behavior were reported as an unsubstantiated gain since no statistical tests were conducted on the data.

Table 4 (continued)

Mayer et al. (1975)

Approach: collaboration

Test time: delayed - measured upto 3 years later

Grade level: secondary

Results: teachers (N = 32)

cognitive - positive results
(97th percentile)

behavior - positive results
(76th percentile)

pupils (N = not reported)

cognitive - positive results
(75th percentile)

Comments: Data for teachers' knowledge were collected from authors' paper and pencil cognitive tests. Data for teachers' behavior were collected from pupils' reports on teachers' classroom behavior, i.e. Science Classroom Activity Checklist. Data for pupils' knowledge were based on tests of factual information. For pupils' cognitive data, different tests were used with different groups of pupils over the three year period.

Piper & Butts (1976)

Approach: collaboration

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 76)

affective - positive results
behavior - positive results

Comments: Z scores could not be calculated since no standard deviation was reported. Data for teachers' attitude and behavior were collected by teachers' self-reports on a semantic differential questionnaire.

Schmid & Scranton (1972)

Approach: centrally coordinated

Test time: immediate - at end of program

Grade level: multi (special education)

Results: teachers (N = 23)

cognitive - positive gains

behavior - unsubstantiated gains

Table 4 (continued)

pupils (N = 23) behavior - unsubstantiated gains
 Comments: Statistical significance was reported only, hence z scores could not be calculated. Data for teachers' cognitive scores were collected from a paper and pencil survey instrument. Data for teachers' behavior and pupils' behavior were collected from teachers' self reports. Authors' reports of positive gains were unsubstantiated because of a 35% mortality rate for measures of teachers' and pupils' behavior, combined with possible experimenter bias since no blind scoring procedure was evident.

Trincherro (1974)

Approach: centralized

Test time: immediate - at end of program, and delayed - 9 months after termination of program

Grade level: secondary

Results: teachers (N = 20)

behavior - positive results (immediate - 94th and 93rd percentile) delayed - 93rd and 91st percentile

pupils (N = 30)

cognitive - no change (immediate z = -.12 - 45th percentile)
 affective - no change (immediate z = -.07 - 47th percentile)

Comments: Data on teachers' behavior was collected by 2 observers for teachers' use of nonverbal reinforcement, and analysis of audiotapes for teachers' use of positive verbal reinforcement. Data for pupils' cognitive scores were taken from tests of verbal comprehension and general reasoning. Data for pupils' affective scores were collected through survey data on pupils' perceptions of teacher-pupil rapport (Pupil Inventory Rapport Scale).

statistical regression, and testing effects.

A representative one-group pretest-posttest study. The Schmid and Scranton study (1972) is typical of this group insofar as collection of data followed immediately after the in-service program. In this study the effectiveness of the in-service program was determined by measuring teachers' acquisition of knowledge (cognitive), application of knowledge as represented by teachers' behavior in the classroom, and effects of teachers' behavior on pupils' behavior. Behavior modification was the topic for the in-service program which involved understanding behavior theory, identifying key techniques in applying behavior theory, and applying the techniques to a target pupil to modify the behavior. The authors reported that seventeen special education teachers and six regular classroom teachers were participants. No information was given as to how these teachers were selected, however. Consequently some threats to external validity resulted due to possible selection bias, or interaction effects of selection bias with teaching position as regular classroom teacher, teaching special class, or grade level taught. The authors indicated that the program was planned and directed by a doctoral student in special education in conjunction with the local school board, thereby reflecting a centrally coordinated approach to the program.

Three program objectives were identified for evaluation:

(a) to have each teacher identify key elements of behavior theory that were applicable in her classroom, (b) to have each teacher identify key techniques from behavior theory that were applicable in her classroom, (c) to have each teacher participate in a supervised practical application demonstrating the modification of a selected child's behavior (Schmid & Scranton, 1972, p. 195).

Baseline data were collected in two phases. In phase one, eight of the 23 teachers were observed for 11 days prior to the in-service program to determine what, if any, behavior modification techniques were already being used. No information was given as to how these eight teachers were selected from the larger group of participations for pre-program observation, however. No collection of relevant background data such as academic experience or previous exposure to behavior modification techniques appeared to have been conducted at this point. Without background data of these kinds it is questionable whether this group of eight teachers was representative of the total group. Hence the representative validity of the baseline observational data was undermined. Similarly no information was given on the number of observers, or about the reliability of the observation instrument.

Subsequent to the baseline observations (phase 1),

phase two consisted of a pretest of the teachers' knowledge about behavior modification. Description of the pretest instrument was minimal. It was designed to measure teachers' understanding of vocabulary of behavior theory as well as teachers' knowledge of concepts involved in behavior theory. The validity and reliability of the pre-test instrument appears not to have been tested thereby threatening confidence in the final results. Phase three was a training session comprised of defining, observing, and recording pupils' behavior. In this phase also baseline data on target pupils' behavior were collected by classroom teachers while under supervision of the program director. Phase four consisted of evaluating pupils' baseline data and designing an intervention program for target pupils.

The final phase focussed on the collection of post in-service data in which each teacher participating in the program completed a survey identical to that used in Phase 2. Both the pre and post in-service data were used to determine achievement of objectives one (teacher identification of key elements of behavior theory) and objective two (identification of key techniques of behavior theory). A Wilcoxin matched-pairs signed ranks test was used for the statistical analysis. The authors reported that the "results indicated that the post-survey scores improved significantly beyond the .05 level, thus supporting an

interpretation that objectives one and two were satisfactorily attained" (Schmid & Scranton, 1972, p. 196). Conversion of the results to percentiles was not possible since the authors failed to report mean scores and standard deviations. Several problems arose that inhibited complete acceptance of the authors' conclusions. Two major sources of internal validity occurred, i.e. instrumentation and testing effects. No information, for example, was given about the survey used for the pre and post assessment. It did not appear that a standardized survey was used and no validity and reliability measures on the instrument were reported. It can only be assumed that it was accepted on face validity. Similarly, since the identical survey was used in both the pretest and the posttest, the possibility of testing effects allow the possibility that changes in scores may reflect sensitization to what was being evaluated rather than the effects of the in-service program.

Objective three (application of behavior theory to modify the behavior of one pupil) was evaluated by analyzing material submitted by teachers on one pupil in their classroom. Of the total sample of 23, only 15 participants submitted data for analysis. The authors reported that "successful modification of a selected student's behavior was reported by 14 of the 15, thus supporting the interpretation that objective 3 was satisfactorily attained" (Schmid &

Scranton, 1972, p. 197). Again problems affecting the internal validity prevented complete acceptance of this conclusion. The major source of invalidity was mortality since 35% of the participants did not submit material for this analysis. One may wonder whether the remaining eight teachers chose not to submit their data because it reflected negatively on their performance. If this were the case, the proposition of teachers transferring the in-service skills to their teaching repertoire was only 61% instead of a very highly valued 93%. An alternative explanation might be that the required material was submitted at the last in-service session which was held on a Saturday. Teachers simply may have decided not to attend. The collection of the material and the actual analysis of the data were also very subjective. No blind scoring procedure occurred at any state of the analysis, leaving open the possibility of experimenter bias. Also, the nature of the analysis of teachers' self-reports was not specified so that one cannot judge the reliability or the validity of the conclusions. Furthermore it is not possible to replicate the study since procedures and criteria for analysis of the data were not reported adequately.

The authors concluded that "the longitudinal in-service model offers a staff training program superior to the traditional or laboratory models now prevalent" (p. 198).

Without further research this conclusion could not be accepted fully because of problems related to the experimental design that blurred interpretation of the observed changes in teachers' and pupils' behavior. Since this was a longitudinal model for in-service education the application of quasi-experimental time series design could have provided better control or at least minimized history and testing effects. Alternatively, an equivalent time series design would have isolated order effects or assessed differential changes over time. Measurement of differential changes over time would have been appropriate for a longitudinal study.

Results and conclusions of the one-group pretest-posttest studies. Ten of the 11 one-group pretest-posttest studies tested effectiveness of in-service education in terms of effects on teachers. Of these 11 studies, two (see Table 4) measured effectiveness only in terms of teachers' acquisition of knowledge (Billeh & Hasan, 1975; Fowler, 1960). Both reported statistically significant gains in teachers' knowledge as a result of the in-service program. In Billeh and Hasan (1975) the percentile rank of 79 indicated sufficient gains in teachers' knowledge to be considered practically significant as based on the criterion level of the 70th percentile for practical significance.

Two of the studies in this category examined effectiveness of in-service education in terms of changes in teachers' attitudes and subsequent changes in teachers' classroom behavior (Degroote, 1973; Piper & Butts, 1976). Degroote's results showed statistically significant as well as practically significant changes in teachers' attitude and behavior (74th percentile). Although Degroote reported statistically significant changes in pupils' attitude and behavior the results for pupils were not accepted as practically significant. The percentile scores of 62 for intermediate pupils and 68 for primary pupils were below the 70th percentile criterion level for practical significance. Piper and Butts (1976) also reported positive changes in teachers' attitudes and behavior but percentile scores to determine practical significance could not be calculated since reporting of data was inadequate.

Eight of the 11 studies tested effectiveness of in-service education by measuring changes in teachers' classroom behavior. All of these with the exception of Martin (1973) reported statistical data to support their claims of positive and statistically significant changes in teachers' classroom behavior as a result of in-service education. Martin's study also claimed positive results from changes in teachers' classroom behavior but data was recorded as percent only. It did not appear that statistical tests were

conducted in Martin's study to determine significance of changes in teachers' behavior. Changes in teachers' behavior in this set of studies were measured by different methods. Trincherro (1974) for example, used observation by two raters to determine frequency of positive nonverbal reinforcement and analysis of audiotapes to determine frequency of positive verbal reinforcement. Martin (1975) also used observation to collect data on teachers' behavior. Borg and Stone (1974) analyzed audiotapes of teachers' lessons to determine degree of change in teachers' use of encouragement and use of extension as a questioning technique. Mayer et al. (1975) used pupils' reports on teachers' classroom behavior. The remaining four studies (50%) reported positive and statistically significant changes in teachers' behavior based on some form of teachers' self-report such as checklists, surveys, or questionnaires relating to teachers' perceptions of activity in their classrooms. Although these studies seem to show that in-service education is effective when effects on teachers are measured, changes in teachers' behavior based on their self-reports are open to bias (Hook & Rosenshine, 1979). In only three of the eight studies measuring effectiveness of in-service education vis-à-vis teachers' classroom behavior was it possible to calculate percentile scores (Degroote, 1973; Mayer et al., 1975, Trincherro, 1974).

Percentile scores for teachers' behavior in Degroote, and Mayer et al. were 74 and 76 respectively. Both were considered practically significant based on the criterion of the 70th percentile. Four percentile scores on teachers' behavior could be calculated for Trincherro's study, teachers' use of positive verbal reinforcement (94th percentile) and positive nonverbal reinforcement (93rd percentile) immediately after the in-service program as well as teachers' use of positive verbal reinforcement (93rd percentile) and positive nonverbal reinforcement (91st percentile) nine months after the termination of the in-service program. These percentile scores on teachers' behavior are rather incredible since a percentile score change from 50 to 84 would represent, for example, an equivalent change in I. Q. from 100 to 115. Although nine months after the termination of the in-service program the results were slightly lower they remained impressive (93rd and 91st percentile) indicating that the positive effects of the in-service program on teachers' behavior had been sustained at least for a nine month period. Trincherro reported, however, that positive changes in teachers' behavior did not produce desired changes in pupils' attitude (45th and 35th percentile) nor significant changes in pupils' academic achievement (47th and 46th percentile).

When effects on pupils were measured, the effectiveness of these in-service programs was not readily apparent.

Seven of the studies in this category examined effects on pupils (see Table 4). In terms of pupils' cognitive gain, Koch (1973) found positive results. His conclusions are weakened, however, because "growth in MICA (Mathematics Inquiry in the Conrad Area) pupils appears better than district growth...although statistical tests were not conducted" (Koch, 1973, p. 37). This exclusion encouraged the reader to accept the authors' subjective conclusions, since there was no basis whereby the reader could judge the statistical or the practical significance of the authors' results. Mayer et al. (1975) reported statistically significant results on pupils' acquisition of knowledge in science. Their results were also practically significant (75th percentile). Data for pupils' must be interpreted with caution, however, since different tests were used with different groups of pupils over the three year period. Trincherro (1974) found no significant gain in pupils' cognitive scores (45th percentile). He indicated that "increased use of the technical skill of positive reinforcement (by the teacher) is not demonstrated as effective when effectiveness is expressed as concomitant increases in overall class performance, i.e. mean class achievement" (Trincherro, 1974, p. 125).

As for changes in pupils' attitudes, Koch (1973) and Trincherro (1974) reported no significant positive changes

in pupils' attitudes as a result of their teachers' participation in in-service education. In fact, both authors reported that pupils' attitude scores regressed. In Trincherro's study, for example, the percentile score for pupils' attitude was 47. Only Degroote (1973) reported statistically significant changes in pupils' attitudes. When percentiles were calculated, however, results were not found to be practically significant (62 and 68 for intermediate and primary pupils respectively). His study was conducted at the elementary school level while the previous two studies were at the secondary school level. The effects of grade level on pupils' attitude as a moderator variable for effectiveness of in-service education may require further research.

Four studies examined the effectiveness of in-service education in terms of changed pupils' behavior (see Table 4). Although Granum (1975) claimed positive results, the lack of appropriate control in collecting the data made it uncertain whether the pupils' behavior changed or whether only the teachers' perceptions of pupils' behavior changed. The author acknowledged the possibility of this rival hypothesis since data on pupils' behavior was collected through teachers' self-reports. As indicated in Hook and Rosenshine (1979) self-reports are subject to bias. Degroote (1973) obtained measures of changed pupils' behavior by comparing

pre and post test scores on the Student Perceived Classroom instrument for the intermediate grades and a modified version of the primary level School Sentiment Index for the primary grades. He reported statistically significant changes in pupils' behavior as a result of teachers' participation in the in-service program. His results however, were not accepted as practically significant since percentile scores for changes in intermediate pupils' behavior was 62 and for primary pupils' behavior was 68. These were below the pre-determined criterion of the 70th percentile for practical significance. Schmid and Scranton's claims (1972), as mentioned previously, must be dealt with cautiously because of serious problems with loss of data. Martin (1973) reported no positive changes in pupils' behavior. In fact pupils' behavior as measured by observation of on-task time, regressed.

It appears, therefore, that effectiveness of in-service as measured by changes in pupils' academic performance, attitude, and behavior is not supported conclusively by the one-group pretest-posttest studies. On the other hand these studies do tend to verify the effectiveness of in-service programs as measured by gains in teachers' knowledge and changes in teachers' attitude and behavior. Caution must be used in drawing conclusions, however, based on these results because of the research design employed and because of the

sampling techniques. Since the research design did not use a control group, the possibility of rival hypothesis being true cannot be discounted. For example, positive changes could have resulted because of test sensitization since the research design used a pretest-posttest procedure. Teachers could have determined from the pretest what behavior was expected and performed accordingly. Positive changes then would be the result of test sensitization rather than the effects of the in-service program. Furthermore, maturation and history are rival hypothesis in the one group pretest-posttest research studies. Without a control group, the possibility that the expected change would have occurred simply as a result of some uncontrolled variable in the environment such as a change in school district policy, cannot be discounted. Similarly, the absence of random selection of participants for the in-service program creates the possibility of another rival hypothesis. Perhaps teachers volunteering for in-service education have a common and unique set of characteristics (such as commitment to academic change or improvement) that contributed significantly to their subsequent change in attitude or behavior. In this example, it would not be clear whether the in-service program produced the desired changes or whether uncontrolled teacher variables were responsible for the changes.

A majority (90%) of the one-group pretest-posttest studies measured the effectiveness of in-service education at the termination of the program. Mayer et al. (1975) were the exception. They reported positive effects of in-service on teachers' knowledge and behavior and pupils' knowledge after a three year time lapse. Caution must be used in interpreting data for pupils, however, since it appeared that different pupils were tested on different variables (cognitive, attitude) at different times throughout the three year period. The procedural reporting on pupils was inadequate since the reader remained confused as to exactly what selection procedure was used in measuring effects on pupils.

Summary of the one-group pretest-posttest design studies. In terms of the three most critical components for effective in-service education as identified in the conceptual literature, this group of studies only attended seriously to program evaluation. The instruments used for evaluation varied, with greatest emphasis on formal tests, followed by video/audio and observational strategies. Only two studies (Granum, 1975; Schmid & Scranton, 1972) appeared to have reflected the specific needs of a group of teachers although a formal needs assessment was not conducted. Both studies reported positive results which tends to support the viability of the conceptual model on the importance of

needs assessment.

As with the one-shot case studies, no definite conclusions can be drawn from this set of studies. It would appear that positive gains in teachers' acquisition of knowledge and changes in teachers' classroom behavior are effected through both centralized and decentralized in-service programs although the decentralized approach was poorly represented. Subsequent effects on pupils was not supported consistently, however. The results suggest the possibility of affecting pupils' performance, attitude or behavior at the elementary level but not at the secondary level.

Quasi-Experimental Studies

Characteristics of the quasi-experimental studies.

Eight authors used a non-equivalent control group design to test effectiveness of in-service education (see Table 5). This design uses two groups in the study--an experimental group that receives the treatment and a control group that receives no treatment.

The procedures for this design are the same as for a true design except that intact groups rather than randomly assigned ones are used, creating a control problem in terms of selection bias. This problem mandates the use of a pretest to demonstrate initial equivalence of the intact groups on the dependent variable. (Tuckman, 1972, p. 142)

Table 5

Procedures and Results of the Quasi-Experimental Designs O₁ X O₂

 O₃ X O₄
 (Nonequivalent Control Group)

Anderson & Gies (1975)

Approach: centralized
 Test time: immediate - at end of program

Grade level: university

Results: teachers (N = 41) cognitive - positive results
 (71st percentile)

Comments: Data for changes in teachers' behavior were taken from scores on a Cognitive Behaviour Scale.

Boeck & Foster (1975)

Approach: centralized

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 43) cognitive - positive results

Comments: Data for changes in teachers' knowledge were taken through inventory and questionnaire. No z scores were calculated since authors reported statistical significance only, i.e. no mean scores or standard deviation.

Carline (1970)

Approach: centralized

Test time: immediate - at end of program and delayed - three months after termination of program

Grade level: elementary

Results: teachers (N = 43) behavior - positive results

pupils (N not reported) cognitive (author mentioned that pupils' knowledge was tested but no further information was reported).

Table 5 (continued)

Comments: Data for teachers' behavior were collected through observation by members of board office staff (interrater reliability .80). Z scores could not be calculated since statistical significance was reported only, i.e. no mean scores or standard deviation.

Flanders (1962)

Approach: centralized
Test time: immediate - at end of program

Grade level: secondary

Results: teachers (N = 55) behavior - unsubstantiated gain
pupils (N not reported) cognitive (author mentioned that pupils' knowledge was tested but no further information was reported)

Comments: Data for teachers' behavior were collected through observation. Positive results were unsubstantiated since statistical and procedural reporting was inadequate, hence judgments could not be made about validity. Z scores could not be calculated since statistical significance was reported only, i.e. no mean scores or standard deviation were reported.

Nadler (1973)

Approach: centralized

Test time: immediate - at end of program

Grade level: secondary

Results: teachers (N not reported) cognitive - unsubstantiated gain

pupils (N = 332) cognitive - positive results
(72nd percentile)

behavior - unsubstantiated gain

Comments: Data for teachers' acquisition of knowledge were taken from teachers' self-reports. The author indicated that a criterion level of 90% was not met but that a criterion of 60% would have been more realistic. Data for pupils' acquisition

Table 5 (continued)

of knowledge were based on results of the Linguistics Capacity Index test. NOTE, z scores were calculated from pre and post test scores of the experimental group rather than difference between means of the experimental and control group since data for the control group were not reported. Data for pupils' behavior was based on pupils' drop-out rate. Author's claims of changes in pupils' behavior were not substantiated because of a small percentage of return rate for submission of the data (recognized as a problem by the author).

Robertson (1969)

Approach: centralized

Test time: immediate - at end of program and delayed - 1 year after termination of program

Grade level: elementary

Results: teachers (N = 20) affective - no change
behavior - no change

pupils (N not reported) cognitive - positive results
affective - no change

Comments: Data for teachers' behavior were collected through analysis of videotapes and teachers' self-reports. Data for teachers' attitude were collected through the Halpin Croft Organizational Climate Description Questionnaire. Data for pupils' knowledge were collected from Stanford Achievement Test in reading. Data for pupils' attitudes were collected from EPIC Attitude Inventory. Z scores could not be calculated since standard deviation was not reported.

Shettel, Hughes,
& Garee (1975)

Approach: centralized

Test time: delayed - 3 months after termination of program

Grade level: K-12

Results: teachers (N not reported) affective - no change
pupils (N not reported) affective - no change

Table 5 (continued)

Comments: Data for teachers' affective scores were taken from the Minnesota Teacher Attitude Inventory. Data for pupils' affective scores were taken from the Minneapolis Student Opinion Questionnaire. Z scores could not be calculated since mean scores and standard deviation were not reported.

Thornton & Vredevel
(1977)

Approach: centralized

Test time: immediate - at end of program

Grade level: secondary

Results: teachers (N = 37) cognitive - unsubstantiated gain
pupils (N = 562) cognitive - unsubstantiated gain

Comments: Data for teachers' acquisition of knowledge were taken from scores on the Hybrid Test of Understanding in College Economics (TUCE). Data for pupils' acquisition of knowledge were taken from scores on the Test of Economic Understanding (TEU). Gain scores were unsubstantiated since authors reported that mortality may have affected validity of the study. Z scores could not be calculated since mean scores and standard deviation were not reported.

Note. N = 8

A representative quasi-experimental study. The study by Thornton and Vredevelde (1977) was typical of this group of studies insofar as it used a centralized approach and measured effectiveness of in-service education immediately after the in-service program. The authors tested the effectiveness of an information dissemination model for economics teachers by measuring teachers' knowledge of economics and subsequent pupils' academic achievement in economics. Teachers from 12 different sites in Missouri participated in a five month in-service program consisting of five three-hour seminars. The in-service program was centralized since it was organized and directed by an institution (the University of Missouri) outside the individual school unit, and was attended by a heterogeneous group of teachers, i.e. teachers from 12 different school sites. Delivery of the in-service program comprised video and audiotape presentations, discussions, and question and answer periods via an amplified telephone system. Follow-up to these activities consisted of a monthly newsletter sent to each participant. Twenty-five of the 165 teachers participating in the program were randomly selected for evaluation. To obtain a control group, a questionnaire, identical to that received by the experimental group was mailed to secondary school teachers in Missouri. From the 500 returned questionnaires, a control group (N=25) was selected

by the authors. Criteria for selection of the control group were based on similarity of background data with the experimental group. For example, matching between the experimental and control group was done for "training in economics, formal education, teaching experience, size of school at which (teachers) taught, and the grades taught" (Thornton & Vredevelde, 1972, p. 94). Subsequent to the selection of control and experimental groups, teachers were administered a hybrid Test of Understanding in College Economics (TUCE). The Test of Economic Understanding (TEU) was also administered to one class of pupils for each of the teachers participating in the study. The authors selected which of the classes were to be tested but the selection procedure was not specified. Hence, the possibility of the experimenter bias cannot be discounted.

Background data on pupils also were collected, including socioeconomic standing, grade point average, sex, age, and grade level. The authors indicated that "the empirical analysis in this study is based on the assumption that the TUCE and the TEU were valid measures of the teachers' and the students' understanding of economics respectively" (Thornton & Vredevelde, 1977, p. 98). Mortality may have affected the internal validity of the study since the authors reported that

The control group initially consisted of 25 teachers. However, due to inaccurate reporting by both teachers and students we were unable to identify important socioeconomic and demographic characteristics of some of the students in this group. As a result, data on 16 teachers and 236 students in the control group were used in this study. Also, 4 teachers, and 79 students were dropped from the initial experimental group. Of course, the extent to which these missing observations biases our results, if at all, is impossible to determine. (Thornton & Vredevelde, 1977, p. 98)

The reason for dropping the additional teachers and pupils in the experimental group was not stated. Without this information the reader cannot judge the degree to which the lost data affected the validity of the results.

The statistical analysis of the data was a least squares regression analysis. The authors reported that pupils' scores "were based on their sex, grade in school, SEC, cumulative GPA, the score their teachers obtained on the hybrid TUCE, and a dummy variable of whether or not their teachers had participated in the program" (Thornton & Vredevelde, 1977, p. 95). Similarly,

Teachers' tests scores on the hybrid TUCE were regressed on discrete variables representing the number of undergraduate hours in economics, sex, the type of undergraduate institution that they had attended, and a dummy variable for whether or not they had participated in the program (Thornton & Vredevelde, 1977, p. 96)

The authors reported a regression coefficient of 2.27 on the dummy variable of teachers' attendance at the in-service

program indicating that "the students of teachers who participated in the program performed better (about 5% higher) than the students of those who did not" (Thornton & Vredeveld, 1977, p. 96). Whether the regression coefficient was standardized or unstandardized cannot be determined from the table, although the authors reported that the squared multiple correlation for all the variables was .305 which means that 30.5% of the variance between control and experimental pupils was due to the variables of sex, grade, socioeconomic level, grade point average, teachers' test scores in economics, and teachers' participation in the in-service program. Pupils' performance was measured from gain scores on the Test of Economic Understanding. For the regression analysis on the teachers' scores, the authors reported that the regression coefficients for all the predictors had the expected sign, and similarly, that the variables were statistically significant (level of confidence unspecified) with the exception of sex and type of undergraduate school attended. Based on these analyses, the authors drew the following general conclusions:

That teacher in-service economic education programs have a positive effect on their students' understanding of economics...that a program that focused almost exclusively on materials and pedagogy was as effective as more traditional programs with a heavier emphasis on teaching economic content...that teachers can learn some economics simply by being exposed to economics curricular materials that they

can use in their own classrooms...(that) even when we controlled for the teachers' understanding of economics, the program had a positive effect on the students' performance (which) suggests that there is an "awareness effect" associated with the introduction of new curricular materials (Thornton & Vredevelde, 1977, p. 97-98)

The experimental design used was appropriate to the study. Because the experimental and control group subjects were matched on several background variables the authors minimized some of the effects of history. Overall, the in-service program appeared to have some potential for effectiveness. Replication of the study with better control over mortality would be productive.

Results and conclusions of the quasi-experimental studies. Proportionally more of the quasi-experimental studies reported no statistically significant differences as a result of in-service education than did the two previous sets of studies (see Table 5). This was particularly true for teachers' attitude (Robertson, 1969; Shettel, Hughes & Garee, 1975) and teachers' behavior (Carline, 1970; Robertson, 1969) as well as for pupils' attitude. Similarly, in the five pre-experimental studies (33%) in which percentile scores could be calculated, claims for practical significance were supported as compared to 25% (2 of 8) of the quasi-experimental studies. Reports of positive gains in teachers'

knowledge seemed to support similar trends in the pre-experimental studies. In only one of these studies, however, (Anderson & Gies, 1975) was it possible to calculate a percentile score in order to determine the practical significance of the change. The resulting percentile score of 71 was just barely over the 70 criterion on which acceptance of practical significance was based. The strategies for reporting effects on pupils were inadequate in this set of studies. In only two of the eight studies (Nadler, 1973; Thornton & Vredeveld, 1977) were sample size of pupils provided. Two of the studies (Carline, 1970; Flanders, 1962) indicated that effects on pupils were measured but no results from these measurements were reported.

Overall, some evidence does exist that gains in pupils' knowledge may result from teachers' participation in in-service education (Nadler, 1973; Robertson, 1969, Thornton & Vredeveld, 1977). In only one of these studies (Nadler, 1973) however, was it possible to calculate a percentile score in order to determine the practical significance of the change. The resulting percentile score of 72 was just barely over the 70 criterion level on which acceptance of practical significance was based. Reported gains in pupils' knowledge did not generalize to desired changes in pupils' attitude (Robertson, 1969; Shettel et al., 1975). Nadler's study (1973) was the only one that measured effects on

pupils' behavior. He reported some improvement in the drop-out rate of pupils whose teachers had participated in an English as a Second Language (ESL) in-service program. He cautioned, however, that collection of this data late in the school year resulted in only a small number of schools responding such that "the sample ... was too small to make any general conclusions" (p. 22).

Two of the studies in this category measured effectiveness of in-service education three months after the termination of the in-service program (Carline, 1970; Shettel et al., 1975) and one study measured effectiveness one year later (Robertson, 1969). No sustained statistically significant effects on teachers' attitude or teachers' behavior were found. Carline (1970), for example, reported that only five of the 14 trained behavior variables were still apparent three months after termination of the in-service program. These results suggested changes in teachers' behavior and attitude as a result of in-service may not be sustained over time.

Summary of the quasi-experimental studies. All the studies in this category employed a centralized approach to planning and implementing in-service education. Thus, active teacher participation was minimal. All the studies engaged in a formal evaluation involving at least two

distinct evaluation instruments. None of the studies reported that a formal needs assessment was conducted prior to in-service program.

The results from the quasi-experimental studies supported some of the trends noted in the pre-experimental studies. First, although increases in teachers' knowledge were reported when a centralized approach was used, positive changes in teachers' and pupils' attitude or classroom behavior were less likely to occur with this approach. Second, changes in teachers' attitude and classroom behavior may not be sustained over time. These two trends may relate to the fact that the centralized in-service approach focuses on school district's needs rather than teachers' needs and also minimizes active teacher participation. The conceptual literature suggested that without active teacher participation, teachers have no sense of ownership over their professional development and hence no vested interest in changing their in-class teaching procedures. Furthermore the centralized in-service programs described in these empirical studies did not provide feedback and follow-up. Without some reinforcement procedures, sustained change may be minimized.

These results appeared to support the hypothesis that the absence of needs assessment, active teacher participation, and feedback and follow-up as components of an in-service

program inhibits subsequent changes in teachers' and pupils' attitudes and behavior. The rival hypothesis-- that the presence of these components will produce the desired changes, however, also is not supported at this point.

True Experimental Designs

Characteristics of the pretest-posttest control group design. Three authors (10%) used a pretest-posttest control group design to test effectiveness of in-service education (see Table 6). In this design an experimental group receives the treatment and the control group receives no treatment. The assignment of subjects to experimental or control groups is done randomly. Use of randomly assigned groups eliminates many threats to internal validity that were apparent in the previous studies, including history, statistical regression, maturation, mortality, and selection bias. Tuckman (1972, p. 132) points out, however, that

There is no control for testing effects (that is, gain on the posttest due to experience on the pretest), which may reduce internal validity, nor is there any control for the possible sensitization to the treatment which a subject might gain by having the pretest experience, thus affecting external validity.

Table 6

Procedures and Results of the True Experimental Designs RO₁ X O₂

(Pretest-Posttest Control Group Design) RO₃ O₄

Csapo (1976)

Approach: centralized

Test time: immediate - at end of program and delayed - 6 weeks after termination of program

Grade level: elementary

Results: teachers (N = 20)

cognitive - positive results
behavior - unsubstantiated gain

pupils (N = 38)
cognitive - unsubstantiated gain

Comments: Data for teachers' acquisition of knowledge were based on analysis of teachers' assignments. Data for teachers' behavior and pupils' acquisition of knowledge appeared to be based on teachers' self-reports. Procedural and statistical reporting for teachers' behavior and pupils' knowledge was minimal, hence claims to positive results are not substantiated. Z scores could not be calculated since mean scores for teachers' acquisition of knowledge were graphically rather than numerically presented. No standard deviation scores were reported.

Heilman (1965)

Approach: centralized

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 30)

behavior - unsubstantiated gain
cognitive - no change: word meaning,
55th percentile; paragraph meaning,
56th percentile; spelling, 56th
percentile; word study, 60th per-
centile

Table 6 (continued)

Comments: Data for teachers' behavior were based on teachers' self-reports. The author indicated that scores "might well reflect agreement with verbal statements rather than internalized behavioral change" (p. 50). Data for pupils' acquisition of knowledge were based on results of standardized tests.

Prentice (1968)

Approach: centralized

Test time: delayed - 5 months after termination of program

Grade level - not reported

Results: teachers (N = 40) behavior - positive results - 77th percentile

pupils (N not reported) cognitive (author reported that achievement tests were given but no results were reported.)

Comments: Data for teachers' behavior were collected through observation (Instruction Observation Record). Results of pupils' achievement tests were not reported since the author indicated that confusion in administering the test to the control group necessitated dropping the data.

A representative pretest-posttest control group study.

Csapo's study (1976) is a typical study in this category. She examined the effects on teachers and pupils of a centralized approach to in-service education. Post in-service evaluation was conducted immediately after the in-service program for both teachers and pupils and again six weeks later for effects on teachers' classroom behavior.

The goal of the in-service training was to provide learning assistance teachers with the skills to functionally analyze behavior and implement teaching strategies...for altering academic and social behaviors of selected students with problems.
(p. 45)

Twenty elementary school learning assistance teachers were matched on three variables: age, similarity of teaching assignments, and years of teaching experience--and subsequently randomly assigned to the experimental group or control group. The experimental group received 30 hours of in-service work including "lectures, role-playing, group discussions, and microteaching" (p. 45). Data from teachers were collected from pre and post written assignments describing target pupils' classroom behavior and performance. A questionnaire of teachers' rating of the in-service program was collected from the experimental group of teachers. Data for teachers' classroom behavior was collected through teachers' self-reports of intervention pro-

cedures for target pupils.

The strategies for measuring effects on pupils were very ambiguous in this study. Csapo reported that 19 pupils were identified for academic acceleration, 16 for academic deceleration and 3 for social deceleration. She reported 100% successful projects for all three areas. No further information was given on pupil data. The claimed positive effects on pupils lacked empirical support, therefore, since no information was available on the methods of measurement, reliability and validity of instrumentation, and the conditions under which student measurement were conducted.

Analysis of teachers' pre and post assignments indicated positive and statistically significant differences for the experimental group over the control group. A percentile score could not be calculated since mean scores were graphically rather than numerically reported. A follow-up conducted six weeks after the termination of the program "indicated that all participants of the experimental group continued using the standard behavior chart for improving teacher and student performance" (p. 50).

Although Csapo reported positive effects of in-service education on learning assistance teachers, her conclusions were not conclusive, particularly for teachers' classroom behavior. Teachers' self-reports are a subjective source

of data with questionable validity (Hook & Rosenshine, 1972). Nor was it clear how these self-reports were analyzed and scored--whether one or more than one rater scored the teachers' self-reports, or whether a blind scoring procedure was used in scoring data from control or experimental groups, or in scoring pre and post in-service data. Without this information, decisions about degree of experimenter bias cannot be made. No reliable conclusions about effects on pupils could be drawn since procedural and statistical reporting were inadequate. Further, a sample size of 10 for the experimental group in this study was small. One of the consequences of a small sample size is the possibility of increasing potential for type 1 error, that is, rejecting a null hypothesis that is true. Consequently, generalizability of the results to other populations is questionable.

Results and conclusions of the pretest-posttest control group studies. Given that there was some delayed measurement of the effects of in-service programs in two of the three of these studies (Heilman, 1965; Prentice, 1967), and that both claimed statistically significant changes in teachers' classroom behavior, the evidence seems to support some long term effects of in-service education up to at least five months. Heilman's claims, however, were not

substantiated. Not only were the data based on teachers' self-reports, but Heilman also recognized (p. 50) that teachers' scores "might well reflect agreement with verbal statements rather than internalized behavioral change". A percentile score was calculated to determine effect size for change in teachers' behavior in Prentice's study (1968). The percentile score of 77 indicated that the degree of change in teachers' behavior was of practical significance based on the criterion level of 70 for practical significance. This result contradicted findings in the previous sets of studies.

All three studies in the true experimental design category used a centralized approach to in-service education. The results seemed to support the hypothesis that a centralized approach to in-service education may produce desired changes in teachers' knowledge and behavior. This support is weakened, however, since only one study (Prentice, 1968) demonstrated that the results were practically significant. Furthermore, there is little evidence of concomitant effects on pupils' academic performance. In Heilman's study (1965) for example, percentile scores for pupils' performance on a standardized test were well below the 70 criterion level for practical significance (see Table 6). Effects of in-service education on pupils' attitudes and behavior were not investigated in this group of studies.

Summary of the pretest-posttest control group design studies. As in the previous studies, the truly experimental studies incorporated evaluation as a built-in component of the in-service program. Needs assessment of teachers and active teacher participation in planning and implementation, however, were absent.

It is only in well controlled research such as true experimental design studies that educators and decision makers can place any confidence in the validity of the conclusions. The paucity of studies in this category forces educators to continue to speculate about effective in-service practices. Given the small number of studies in this category, therefore, further research using true experimental designs are needed, particularly to test the effects of in-service education on teachers' behavior and pupils' academic achievement, attitude and behavior.

Characteristics of the factorial experimental design studies. Four authors used a factorial experimental design to test in-service effectiveness (see Table 7).

Factorial designs are modifications of true experimental designs...with the further complication that additional independent variables (usually moderator variables) are included in addition to the treatment variable (Tuckman, 1972, p. 133).

Table 7

Procedures and Results of the Factorial Design Studies

Davidson & Kilgore
(1974)

Approach: centralized

Test time: immediate - at end of program

Grade level: elementary

Results: pupils (N = 504) cognitive - statistically significant results claimed but percentile score only 58.

Comments: Data for pupils' acquisition of knowledge were based on results of the Primary Test of Economic Understanding. The three groups were C₁ = control group (\bar{X} = 10.5, Sd = 4.8),

C₂ = experimental group using economics materials only (\bar{X} = 10.9),

C₃ = experimental group using economics materials plus receiving in-service training. (Z score between C₁ and C₃ was .25). The

Z score was calculated by averaging the \bar{X} scores of C₂ and C₃ and subtracting the \bar{X} score of the control group. The results were divided by the standard deviation for the control group's scores.

Kazdin (1974)

Approach: decentralized

Test time: immediate - at end of program

Grade level: elementary

Results: teachers (N = 6) behavior - positive results

Comments: The author indicated statistical significance but

Z scores could not be calculated since mean scores for 3 of

the 6 teachers were not reported (the author indicated they were

not statistically significant). Note the small N. Data for

teachers' behavior were based on observation.

Table 7 (continued)

Kosier & Severson (1971) Approach: collaboration

Test time: immediate - at end of program and delayed - 1 month after termination of program

Grade level: elementary

Results: teachers (N = 20)

- behavior - positive results
- teacher compliments to problem pupils - 88th percentile
- teacher compliments to whole class - 99th percentile
- teacher reprimands to problem pupils - 27th percentile
- teacher reprimands to whole class - 34th percentile

pupils (N = 64)

- behavior - positive results
- problem pupils' on task behavior - 99th percentile
- whole class' on task behavior - 70th percentile

Comments: Data on teachers' behavior were collected by observation of teachers' classroom management techniques (author developed observation instrument). Data on pupils' behavior were based on observation of on task behavior (5 observers). NOTE C group = control group, S1 group = self-implementation group receiving feedback within a group situation only, OD group = observational data group receiving group feedback plus individualized feedback, TV group - receiving group and individualized feedback plus self-video feedback. (The author found no significant differences between the 3 experimental groups). Z scores were calculated for the delayed measurement. Since the authors found no significant differences between the three experimental groups, the z score was calculated by averaging \bar{X} scores for all three experimental conditions, and then subtracting the \bar{X} score of the control group.

Table 7 (continued)

The result was divided by the standard deviation of the control group's scores.

Sperry & Carter (1974)

Approach: collaboration

Test time: immediate - at end of program

Grade level: K-12

Results: teachers (N = 60) behavior - positive results

Comments: Data for teachers' behavior were based on frequency of teachers' use of discipline cards, and number of psychological and counselling referrals. Z scores could not be calculated since statistical significance was reported only, i.e. no mean scores or standard deviation were reported. The experimental design is outlined in text.

These designs allow researchers to determine how one variable will interact with or moderate the treatment, for example, how video feedback affects the results of an in-service program versus in-service education without video feedback.

A representative factorial experimental design study.

Sperry and Carter's study (1974) as an example of this type of study tested the effects on teachers' behavior of a centralized approach to in-service education. In this study, 60 teachers from kindergarten to grade 12 were randomly assigned to one of three experimental conditions (elementary, junior, and senior secondary teachers receiving human relations in-service training) and one of three control groups (elementary, junior, and senior secondary teachers who did not receive training). The number of teachers per group was ten. The moderator variable in this study was grade level taught. The theoretical framework for the in-service program was based on Bruner's concept of defending and coping behaviors. The hypothesis for the study was directional, i.e. "teachers would learn new coping techniques for dealing with classroom problems and subsequently teachers could expect a decrease in the number of teacher-student confrontations" (Sperry & Carter, 1974, p. 6). Statistical analysis therefore, required the use of a one-tailed test. Evaluation instrumentation employed three

nonreactive measures: discipline cards, psychological referrals, and counselling referrals. The authors indicated that a blind procedure was used whereby "neither the teachers nor the administration were aware of the collection of data" (Sperry & Carter, 1974, p. 4). Baseline data were collected for a four week period prior to the in-service training and preliminary analysis of this data showed no significant differences between the control and experimental groups. After a six week training session for the experimental groups, data were again collected for a four week period from both experimental and control groups. Statistical analysis involved the application of the non-parametric Mann-Whitney U test on the three nonreactive measures, use of discipline cards and numbers of psychological and counselling referrals. The results showed "significantly fewer psychological and counselling referrals at the elementary and junior levels and fewer discipline cards at the elementary level for the experimental group as compared with the control group" (Sperry & Carter, 1974, abstract). The authors concluded that the in-service program had its greatest effect at the elementary level, and no effect at the senior secondary level since the latter experimental and control groups showed no significant differences. Although probability levels for statistical differences and tables showing the statistical data were lack-

ing, this is a well controlled study with respect to threats to internal validity. Because statistical data were not reported, percentile scores could not be calculated. This study is particularly interesting since it seems to support empirically the trend noted earlier, that the effects of in-service education at the secondary level indeed may be minimal.

Results and conclusions of the factorial experimental design studies. One of the four studies in this category used a centralized approach to in-service education (Davidson & Kilgore, 1974). Gains in pupils' cognitive scores were not practically significant (58th percentile). The collaboration approach used in two of the studies seemed to produce some desired changes in teachers' classroom behavior at least at the elementary school level (Kosier & Severson, 1971; Sperry & Carter, 1974). Positive effects on pupils as a result of their teachers' participation in in-service education was not strongly supported since only one of the studies in this category examined the effects on pupils' behavior (Kosier & Severson, 1971) and only one study (Davidson & Kilgore, 1974) examined effects on pupils' academic performance. Kosier and Severson reported positive and statistically significant changes in target pupils' on-task behavior (99th percentile), but indicated no significant differences for total class behavior as a result of

in-service intervention for teachers. Change in whole class behavior, however, was accepted as practically significant (70th percentile) even though it was not statistically significant. The percentile score for whole class behavior, however, just barely met the criterion of 70 for practical significance. Although Davidson and Kilgore (1974) reported statistically significant effects on pupils' acquisition of knowledge their results were not accepted as practically significant. The percentile score of 58 was well below the 70 criterion level for practical significance.

Summary of the factorial experimental design studies.

All the factorial design studies included evaluation as a built-in component in the in-service design. Active teacher participation in planning and implementation was completely neglected. Only one study (Kazdin, 1974) reflected the "needs" of teachers, and it is to be noted that it is the only decentralized in-service approach in this set of studies. Kazdin reported that the behavior of only three of the six teachers in his study changed significantly in the desired direction as a result of the in-service training. Because mean scores and standard deviations were not reported for three of the six teachers, percentile scores could not be calculated. Kazdin further indicated that "all teachers whose behavior changed (during the reinforcement

phase) reverted to their baseline level of performance during the extinction period". He concluded that "it is likely that when the consequences of the teacher behavior were withdrawn, the behaviors that were trained extinguished" (Kazdin, 1974, p. 269). It appeared that even when a decentralized approach to in-service education was used and the needs of the teachers considered, long term effects of the in-service program may not result if reinforcement for the changed behavior, i.e. some form of follow-up and encouragement, is withdrawn.

Summary of Empirical Literature

It appeared that in-service programs using either a centralized or decentralized approach was effective when effectiveness was measured in terms of teachers' acquisition of new knowledge. Effectiveness when measured in terms of positive changes in teachers' attitude and behavior is generally but not consistently supported. The results of empirical studies that examined sustained positive effects on teachers' attitudes and behavior are conflicting, but generally do not support claims for the longitudinal effectiveness of in-service programs.

Most of the empirical studies that examined changes in pupils' academic performance claimed positive results. As indicated throughout this section, however, pupils'

academic results must be interpreted with caution given problems relating to experimental design and poor reporting. Many rival hypotheses cannot be discounted. Reports of the effects of in-service education on pupils' attitudes are conflicting but generally do not support claims for positive effects. Twenty percent of the studies claimed positive results and 80% indicated no statistically significant effects. In terms of effects on student behavior, conflicting data were again evident. A greater number of studies, however, supported positive changes in pupils' behavior than not. Fifty percent, for example, reported empirical data supporting claims of positive changes in pupils' behavior, 33% claimed positive changes but without empirical support, and one study (17%) reported no positive changes in pupil behavior.

The majority of studies (80%) examining effectiveness of in-service education measured effects only at the termination of the in-service program. For those studies examining longitudinal effects, the data were conflicting regarding residual effects on teachers' classroom behavior and pupils' academic performance. The few studies that did examine longitudinal effects of in-service education on teachers' attitudes and pupils' attitudes all reported no sustained changes over time (Trincherò, 1974; Robertson, 1969; Shettel et al, 1975).

Predicted Effectiveness of the Conceptual Model

The majority of studies (80%) examining effectiveness of in-service education used a centralized or a collaboration approach to the in-service program. These in-service programs were initiated, planned, and implemented outside the school unit without input from teachers. Because of heavy reliance on these approaches, very little consideration was given to the role of active teacher participation and assessment of teachers' needs as an essential component of in-service education. Similarly, very few studies provided feedback or follow-up. The type of in-service approach favored in the conceptual literature and upon which the conceptual model was primarily based is not the type used as a vehicle for testing in-service effectiveness in the empirical literature. This heavy reliance in the empirical literature on centralized and collaboration approaches may reflect actual practice.

The predicted effectiveness of the conceptual model in Chapter Two was not supported in the empirical literature since the majority of studies (80%) did not incorporate components of the conceptual model into their in-service programs. Assessment of teachers' needs and teacher participation were consistently overlooked. As a result, relevance to classroom practices is questionable given the relationship between this component and the previous two as

discussed earlier. The importance of a supportive climate as a component for in-service education was overlooked also. The absence of the above components does not appear to have had a detrimental effect on in-service education when effectiveness was measured in terms of teachers' or pupils' acquisition of new knowledge. When effectiveness was measured in terms of positive changes in teachers' attitudes and behavior, however, a similar conclusion was not consistently supported. The absence of the above components for example, did appear to have a detrimental effect when sustained changes in teachers' attitude and behavior were measured. The apparent lack of sustained effects of in-service education on teachers' attitudes and classroom behavior could be a reflection of teachers' feelings of alienation or lack of ownership over their own in-service programs when centralized or collaboration approaches were used. The conceptual literature supported this view. These results appeared to support the hypothesis that the absence of needs assessment, active teacher participation, feedback and follow-up, and so on, as components of in-service programs, inhibits subsequent changes in teachers' and pupils' attitude and behavior. The rival hypothesis, that the presence of these components will produce the desired changes, however, also was not supported conclusively since only four studies examined in-service effectiveness

using a decentralized approach to in-service education. These four studies reported positive effects on teachers' attitude and classroom behavior. Similarly all four of these studies with the exception of Martin (1973) reported similar positive changes in pupils' attitudes and behavior. Martin's study examined pupil effects at the secondary school level. Recall that Sperry and Carter's study (1974) reported positive changes in pupils' behavior at the elementary and junior secondary level, but not at the senior secondary level. Martin's study therefore supported Sperry and Carter's findings that behavior changes for secondary school pupils may be minimal as a result of their teachers' participation in in-service programs. The results of these four studies tend to support the view that the conceptual model described in Chapter Two will produce desired changes in teachers' and pupils' attitudes and behavior. The small number of studies supporting this view, however, should be considered as reason to accept the results with caution.

Several areas for further research are immediately apparent. Studies to determine the differential effects of centralized and collaboration approaches versus decentralized and centrally coordinated approaches are a priority. Research is also needed to determine whether pupils' age level (secondary versus elementary) is a moderator variable for in-service effectiveness. Long term effects of in-

service education on teachers and pupils also must be given closer scrutiny. More effort must be made by educational researchers to use factorial and true experimental designs in educational research so that rival hypotheses can be rejected confidently. Validation of methodology is recommended by Wehmeyer (1975, p. 108) who concluded

This search of the literature reveals that many methods have been used to evaluate in-service education, but little attention has been given to the validity of these methods. Several studies failed to demonstrate that in-service education is effective in changing teacher behavior or pupil learning. This lack of effect has often been true despite extensive in-service programing and pervasive change objectives.

There is need for specialists in evaluation of education to undertake a systematic study of assessment of in-service experiences. Procedures need validation, and problem areas must be more clearly delineated.

CHAPTER FOUR

Research Procedure and Results

Purposes of the Survey

The survey of current in-service practices in British Columbia was conducted for two purposes: to provide data for this thesis, and to provide input for five task force committees for the May 1979 Simon Fraser University Symposium, In-service: A Means of Progress in Tough Times. For the purpose of this thesis information was sought regarding organization and implementation practices in in-service education. Of particular interest were survey data on evaluation, needs assessment, degree of teacher participation, and planning and implementation strategies for in-service education since these components were discussed most frequently in an initial review of the literature conducted in November, 1978.

Development of the Questionnaire

Based on issues raised in the preliminary literature review and concerns expressed by task force committees at a pre-conference plenary session for the Simon Fraser University symposium, a draft questionnaire was prepared. The draft was mailed to all members of the symposium steering committee, task force chairpersons, and members of the research and evaluation task force committee (N=19).

Based on feedback, a final draft questionnaire was prepared (see Appendix F). The final draft was approved by the conference director and the chairman of the research and evaluation task force committee.

Time constraints for developing the instrument, collecting data, and collating were very restrictive--less than two months from the decision to conduct the survey to the start of the conference. Because of limited time, therefore, no field testing of the survey instrument was conducted. Face validity was accepted based on: feedback from knowledgeable personnel in research and evaluation, and on the assumption of a common understanding of in-service education terminology. Henderson (1978, p. 107) indicated that "in general terms...assumption of a common vocabulary..is less of a problem in evaluation of in-service training..since educators do to a substantial extent, share a common professional vocabulary".

Design of the Questionnaire

The nature of the questionnaire was "biographical" (Tuckman, 1978), soliciting information on what occurred in in-service education for the 1977-1978 school year. The questionnaire comprised two sections: the first (questions 1 - 5) consisted of a combination of open-ended questions; the second (questions 6 - 14) contained specific questions related to two high priority in-service topics. In this

second section, respondents were asked to identify the two topics (e.g. classroom management, reading instruction) that received major focus in in-service education in their school district in 1977-1978. Respondents were requested to complete an identical series of questions for each of the two identified topics of priority. This procedure was adopted for a number of reasons. It was believed that by asking respondents to focus on a specific in-service topic, accuracy of response would be increased. Invalidity due to "social desirability" factors (Tuckman, 1978) might be decreased since respondents were asked to recall specific events rather than indicate perceptions of general events. It was assumed also that responses based on high priority in-service topics would yield data on the "best" in-service practices in the school districts.

Because the survey was designed for two purposes, some of the questions were irrelevant to this thesis. Only relevant questions, therefore, are dealt with in the following discussion. In part one, only question five, an opinion-based, open-ended question on perceived strengths and weaknesses of in-service programs was retained to provide insight for recommendations. In part two, only five of the questions are examined here. These solicited factual information about planning and implementation strategies (questions 9, 10, 11), frequency of needs assessment (question 13) and

frequency of evaluation (question 14). Three aspects of planning and implementation strategies were considered. Question 9 asked who initiated or identified the need for the in-service program. Question 10 asked who organized the in-service program. Question 11 asked who the resource persons were who conducted the in-service program.

Response format. In question 5 on perceived strengths of in-service programs, the response format was unstructured or open-ended since the purpose of the question was to provide general perceptions rather than constrained responses. Questions 9, 10 and 11 used nominal categories exclusively through checklist responses since data were intended to be used quantitatively. These questions are replicated below for clarification.

Question 9: Please indicate who initiated the program (i.e. who identified the need for the in-service program).

- a) school staffs _____
- b) school principals _____
- c) local teacher groups _____
- d) district staff _____
- e) Department of Education _____
- f) other (specify) _____

Question 10: Please indicate who was responsible for the actual organization of the event.

- a) teacher elected or appointed by the local teachers' association _____
- b) committee elected or appointed by the local teachers' association _____
- c) a member of the district staff _____
- d) combined committees of elected or appointed teachers and district staff _____
- e) Other (specify) _____

Question 11: Please indicate the resource persons used for the in-service program

- a) own teachers _____
- b) own administrators _____
- c) own district staff _____
- d) other district teachers or administration _____
- e) University of British Columbia personnel _____
- f) University of Victoria personnel _____
- g) Simon Fraser University personnel _____
- h) Ministry of Education personnel _____
- i) other (specify) _____

Categories under each of the above questions were not discrete categories since more than one response could have been checked off if more than one response applied. In the question on initiators for the in-service program, for example, a respondent may have responded that both district staff and the Department of Education were initiators of the in-service program. The questions on whether a needs assessment was conducted prior to the in-service program and whether a post in-service evaluation was conducted, used categorical responses (yes or no) although space was provided for further detail or clarification. The two categories under evaluation, formal and informal evaluation, also were not discrete categories.

Distribution and Collection of Data

Data were collected on two separate occasions using two different sampling procedures. The survey was designed for two purposes, one of which was to provide input to task force committees for the in-service conference (see

Appendix E, covering letter). Because of limited time, a comprehensive survey prior to the conference was not feasible. The first survey, therefore, was intended to provide a "portrayal" of representative in-service activities and used a stratified sampling procedure. For this first sample representative school districts from each of the 12 regions of the province (with the exception of South Coast) and eight key educational institutions (such as the universities and the Ministry of Education) received questionnaires. Representativeness of school districts was determined arbitrarily based on previous experience by the chairman of the research and evaluation task force committee. A total of 26 questionnaires were mailed, 18 to school districts and eight to other educational organizations and institutions (see Appendix F). Data were collected by telephone interview. The mailing of the questionnaire prior to the telephone interview was intended to assist the respondent in compiling information that would be needed at hand during the interview. Collection of data via telephone interview was thought beneficial for the following reasons: it would allow for clarification by the respondent or interviewer if required, it would permit probing on open-ended questions, and it would ensure a better rate of return.

Telephone interviews for the first sample were conducted April 18-25, 1979 by the author with assistance from two

personnel connected with the conference and two research assistants. Instructions were given to interviewers on coding procedures. These instructions were minimal, however, and it appeared that some of the interviewers did not probe on questions that asked for clarification. Some of the interviewers, for example, neglected to collect descriptions of needs assessment and evaluation procedures. All data were returned to the author for collating and reporting. Fourteen of the 18 school districts polled (82%) and five of the eight other educational institutions (63%) provided data for the interviewers.

The second sample was a random selection of 29 school districts that had not been previously polled (see Appendix G). Questionnaires were mailed in advance and telephone interviews conducted between June 18-22, 1979. Interviews were conducted by the author and a volunteer graduate student. The volunteer interviewer received prior instructions on coding the survey. Twenty-two of the 29 school districts polled in the second sample (78%) provided data.

In summary, 46 of the 75 school districts in the Province (61%) were polled. Thirty-six school districts (78% return rate) submitted data, representing 48% of all the school districts in the Province (see Appendix H for regional map).

Survey Results

Since two different sampling procedures were used in collecting the data, it was necessary to determine if samples were equivalent before data could be combined. A chi-square analysis was run for part two of the questionnaire (questions 6 - 14) to determine if there were significant differences between the two sets of data. To increase the ability to detect differences between the samples, that is, to increase statistical power, the conservative levels of statistical significance traditionally set at $p = .01$ or $p = .05$ were relaxed to $p = .15$. Analysis of the 2×2 tables formed by comparing sample one (April 1979-stratified sample) with sample two (June 1979-random sample) on each item in question 6 - 14 yielded eight statistically significant chi-square values in tests over 50 variables. Given that one would expect 15% of these statistical tests to be significant by chance since p (statistical significance) was set at .15, the observation of 16% statistically significant tests of reasonable power does not allow rejection of the null hypothesis. Thus it was concluded that there were no systematic differences between data collected in sample one and sample two. Data for the two samples, therefore, were combined for the following discussion.

Frequency and percentage data on planning and implementation, needs assessment, and evaluation are reported based

on in-service topics for all school districts and other academic institutions. Since the total number of completed surveys was 41, and since each respondent completed two sets of questions, i.e. priority 1 and 2 in-service topics, the total number of in-service programs addressed by the data should be 82. The University of Victoria, however, did not submit data for part two of the questionnaire on in-service topics since they believed the questions did not apply to their procedures. Data on in-service topics, therefore reflected responses from 40 schools and other institutions, each commenting on their two most significant in-service programs.

Initiators for in-service programs. An initiator was defined as the person(s) or group(s) who identified the need for the in-service program. Since subcategories in this question were not discrete, each item was analyzed independently to meet the assumption for chi-square -- independence of items. Frequencies, therefore, add up to 80 and percentage add up to 100% for each item in the question rather than across the whole question (see Table 8).

It appears that district staff were involved in initiating topics for in-service programs most frequently--57.5% of the time. Teachers, as a school staff were involved in the initiating topics 30% of the time while teacher groups outside the school unit, such as a teachers' association,

Table 8

Initiators for In-service Education

Initiators	Response			
	yes		no	
	f	%	f	%
District staff	46	57.5%	34	42.5%
School staff	24	30.0%	56	70.0%
Local teachers' groups	21	26.3%	59	73.8%
Other (breakdown below)	20	25.0%	60	75.0%
School principals	16	20.0%	64	80.0%
(Other - breakdown)	9	11.3%	71	88.8%
-Professional committees (e.g. district staff & teachers)	9	11.3%	71	88.8%
-Organizations or people related to public schools (e.g. trustees)	6	7.5%	74	92.5%
-Universities	4	5.0%	76	95.0%
-Private organizations	1	1.3%	79	98.8%
Department of Education	9	11.3%	71	88.8%

Note. Based on a total row number of 80.

were involved in initiating topics 26.3% of the time. It appears that the Department of Education (11.3%) and the universities (5%) have minimal involvement in suggesting topics for in-service education. From this data it is not possible to determine whether the approach to initiating in-service programs was centralized or decentralized since the categories were not discrete. The fact that school district staff were involved in initiating in-service programs 57.5% of the time should not be interpreted as the school district staff were the exclusive initiators of the in-service program. Recall that sub-categories in the question on in-service initiators were not discrete categories. A figure of 57.5% simply indicates that school district staff were involved 57.5% of the time.

Organizers for in-service programs. Since subcategories in the question about who was responsible for the actual organization of the in-service program were not discrete, each item was analyzed independently to meet the assumption for chi-square -- independence of items. Frequencies therefore, add up to 79 and percentage adds up to 100% for each item in the question rather than across the whole question (see Table 9). The frequencies sum to 79 rather than 80 since one school district did not identify a second priority topic for in-service education.

District staff organized in-service programs most fre-

Table 9
Organizers for In-service Education

Organizer(s)	Response			
	yes		no	
	f	%	f	%
Member of district staff	35	44.3%	44	55.7%
Combined committee of elected or appointed teachers and district staff	15	19.0%	64	81.0%
Teacher elected or appointed by teachers' association	14	17.7%	65	82.3%
Committee of teachers elected or appointed by teachers' association	11	13.9%	68	86.1%
Other	11	13.9%	68	86.1%
-School staff or administration	7	8.9%	72	91.1%
-Teachers with PSA's or district staff	2	2.5%	77	97.5%
-Universities	2	2.5%	77	97.5%

Note. Based on a total row number of 79.

quently (44.3% of the time). The second most frequent group cited for organizing in-service education was combined committees of teachers and district staff (19%). Again, the universities have minimal involvement in organizing in-service education (2.5%). The type of approach (centralized, decentralized) used for organizing the in-service programs cannot be determined from this data since items in question ten do not represent discrete categories.

Resource persons used for delivery of the in-service program. In question eleven information was solicited regarding people or groups used to conduct the in-service program. Since subcategories were not discrete each item was analyzed independently to meet the assumption for a chi-square test -- independence of items. Frequencies therefore, add up to 80 and percentages add up to 100% for each item in the question rather than across the whole question (see Table 10).

As in the questions concerning initiating and organizing in-service education, district staff again were the group most frequently involved (51.3%) as resource persons for in-service education. The universities appear to be much more involved as a resource for in-service education. The University of Victoria appears relatively more active in this respect than the other two universities. Approximately 43% top priority programs used local teachers as

Table 10
Resource Persons Used for Delivery
of the In-service Program

Resource Persons	Response			
	yes		no	
	f	%	f	%
Own district staff	41	51.3%	39	48.7%
Own teachers	35	43.8%	45	56.2%
Other (breakdown below)	28	35.0%	52	65.0%
Other districts' teachers or administrators	23	28.8%	57	71.2%
University of Victoria	19	23.8%	61	76.2%
University of British Columbia	14	17.5%	66	82.5%
Own administrators	13	17.5%	67	83.7%
Ministry of Education	10	12.5%	70	87.5%
Simon Fraser University	7	8.8%	73	91.2%
(Other - breakdown)				
- Private organizations	14	17.5%	66	82.5%
- Organizations related to the public schools as trustees	5	6.3%	75	93.7%
- American resource visitors	5	6.3%	75	93.7%
- Academic institutions outside the Province	4	5.0%	76	95.0%

Note. Based on a total row number of 80.

resource persons for in-service education. The type of approach used (centralized versus decentralized) in delivering the in-service program cannot be determined from this data since subcategories in the question were not discrete.

Needs assessment prior to the in-service program.

Question thirteen solicited information on whether needs assessments were conducted prior to the in-service program. A yes or no response was required and a brief description of the procedure was requested if respondents indicated that they did conduct a needs assessment. One school district did not answer this question for their second priority in-service topic. Consequently results were based on 79 in-service topics rather than 80. For 47 (58.5%) of the 79 in-service topics a needs assessment had been conducted. Some school districts that reported conducting a needs assessment did not describe their procedures or described them inadequately. For six of the 79 topics, therefore, data were missing or uninterpretable regarding the procedures that were used in conducting the needs assessment. Interviewers did not consistently collect this information or responses were ambiguous and subsequently uninterpretable. Ambiguity likely arose because no operational definition of needs assessment was provided for the interviewer or respondent. Two general types of procedures were described

for conducting needs assessment--questionnaire or survey sheets filled in by teachers, and verbal communication. Usually these comments were passed from teachers to district staff through the school principal or staff committee, or through the teachers' association. The questionnaire was the preferred method of needs assessment and was used for approximately 39% of the in-service topics. Verbal communication channeled through various people or groups applied to approximately 20% of the in-service topics.

Evaluation of in-service programs. Question 14a and 14b solicited information on whether a formal or informal evaluation was conducted at the termination of the in-service program. A yes or no response was requested followed by a brief description of the procedure, if respondents indicated that they did conduct an evaluation. Respondents could have checked off both formal and informal evaluation, hence the categories were not discrete. Each item therefore, was analyzed independently to meet the assumption for a chi-square test -- independence of items. Only three respondents indicated that both a formal and informal evaluation was conducted. One school district did not answer the question on evaluation for their second priority in-service topic. Consequently results are reported for 79 in-service topics. A formal evaluation was described as one that used test measurements while informal

evaluation used questionnaires. The author recognizes that formal and informal were poor distinctions for the type of information that was solicited. Providing operational definitions likely would have resulted in data that was more interpretable or more meaningful (see Table 11).

Table 11
Evaluation of In-service Programs

Type of Evaluation	Response			
	yes		no	
	f	%	f	%
Formal evaluation	7	8.9%	72	91.1%
Informal evaluation	61	77.2%	18	22.8%

Note. Based on a total raw number of 79.

Formal evaluations using test measurements occurred rarely for the 79 in-service topics (8.9% of the time). Only two respondents specified the test instrument used for formal evaluation. One respondent used Foster's Rating Scales while the other used the Canadian Test of Basic Skills to monitor pupils' performance. Respondents reported that informal evaluation of the in-service program using questionnaires and so on occurred in approximately 77% of the in-service topics. An attempt was made to determine the type of informal evaluation strategies that were used based on description of the procedures. Results can be interpreted

as approximations only since interviewers did not consistently collect descriptions of the procedures or alternatively the descriptions were ambiguous. This resulted in loss of data for six of the 79 in-service topics. Ambiguity most likely was a result of poor choice of terminology to describe the evaluation procedure. In approximately 50% of the in-service topics the informal evaluation procedure involved administering a questionnaire or response sheet on teachers' perceptions of the in-service program (N=33). On the rare occasion (N=4) evaluation was conducted through observation of teachers in their classrooms. The fact that observation of teachers' behavior appeared twice in the informal evaluation category and twice in the formal evaluation category is evidence regarding the ambiguity of the question. The two respondents that cited observation as formal evaluation specified that observation was conducted using a checklist for frequency of performance of the target behavior or for frequency of on task behavior. The two respondents that cited observation as informal evaluation, did not appear to use any observation instrument. For six of the in-service topics, informal evaluation consisted of verbal communication only, i.e. talking to teachers after the in-service program. No evaluation whatsoever was conducted for eight of the in-service topics.

Limitations of the Survey

Data from the survey should be interpreted as suggestive of trends rather than as conclusive because of methodological problems in collecting and interpreting the data. Methodological problems affecting the validity and reliability of the survey data are discussed as follows. The survey instrument was not field tested to determine reliability. This means that responses given in April and June of 1979 may not have been replicated if administered to the same participants at a later time. Because reliability is not ensured, validity of the data might be jeopardized. The construct validity of the questionnaire may be questioned since no field testing was done. Henderson's belief (1978) that a common vocabulary exists for describing in-service programs does not appear to generalize to descriptions of specific procedures. Some confusion appears to have occurred for example, because terminology was ambiguous regarding procedures for conducting needs assessment and evaluation. Interviewers received minimal instructions prior to collection of data by telephone. Reasonable congruence between respondents and interviewers could be expected in questions requiring a check off response only as in the questions on initiators, organizers, and resource persons for in-service education. Reasonable congruence is questionable, however, in descriptions of procedures for

needs assessment and evaluation since there was loss of data or data was uninterpretable in six of the 79 in-service topics. Subcategories for the questions on initiators, organizers, and resource persons for in-service education, and subcategories for evaluation were not discrete categories, that is, respondents were able to check off more than one item. Because items in these questions were not discrete, it was not possible to determine degree of centralized versus decentralized approaches to planning and implementing in-service programs. This is a regrettable loss since interpretation of the survey data in light of the recommendations in the conceptual literature is limited without this information. Bearing in mind the above limitations, survey data was not used to draw conclusions about in-service education in British Columbia. Rather the data were interpreted as approximations of current practices and used to suggest trends in in-service education in British Columbia.

CHAPTER FIVE

Theory and Practice

This chapter examines the extent to which in-service education in British Columbia reflects the model for effective in-service education developed in Chapter Two. The following discussion examines possible problems or difficulties in implementing individual components of the conceptual model as the authors' described these components in the conceptual literature. Each component will be stated as a theoretical proposition with its underlying assumption.

Discrepancies: In-service Education in British Columbia

Quantitative data for the provincial survey can be examined against only three of the components in the conceptual model--assessment of teachers' needs, teacher participation, and evaluation. These three components were identified in the conceptual literature as the essential components (category 1) for effective in-service education. Criteria for determining degree of correspondence between the conceptual model and actual practices in British Columbia were arbitrarily set based on the percentages of response for in-service topics in the provincial survey reported in Chapter Four. Hence, 0-49% indicates a low correspondence, 50%-85% a moderate correspondence, and over

85% a high correspondence between provincial practices and the conceptual model.

Needs assessment.

To be effective in-service education should be based on the felt needs of teachers and those needs should be determined through systematic assessment. This is based on the assumption that programs reflecting teachers' needs will be relevant to the teacher.

An assessment of teachers' needs was reported to have occurred in approximately 59% of the in-service topics in the province. On the surface, this reflects a moderate concordance with the conceptual model. Bearing in mind the limitations of the data in terms of its accuracy and interpretability, the 59% figure comprised questionnaires and surveys (approximately 39%) and verbal communication through various channels (approximately 20%). Based on survey respondents' descriptions of assessment procedures, the questionnaire method of needs assessment appeared fairly structured. Verbal communication, however, appeared to be quite unstructured, with the communication of needs being passed verbally through various channels as principal to supervisor to the person responsible for organizing the in-service program. This procedure leaves open the possibility

of the needs being distorted or modified because of bias from the person passing along the information. It could be speculated, therefore, that procedures using verbal communication were not very systematic and possibly subject to distortion or modification. If this speculation is correct, then in-service practices in British Columbia for needs' assessment reflect only a low correspondence with the conceptual model based on the 39% figure for use of questionnaires, since the model requires a systematic assessment of teachers' needs. Even if the 59% figure accurately portrays a systematic assessment of teachers' needs, this means that only slightly more than half of the most important in-service topics in school districts and other educational institutions (priority 1 and 2) were based on an assessment of teachers' needs.

Teacher participation.

To be effective in-service education should provide opportunities for active teacher participation and input into all aspects of in-service education, including decision making about content, initiating, planning, implementing, and evaluating. This is based on the assumption that teacher participation will maximize the commitment of teachers to the goals of the program.

Three types of teacher participation were examined in the survey data--teacher participation in initiating in-service programs, organizing programs, and acting as a resource person in the delivery of the program. Again, bearing in mind the limitations of the provincial data, it appears that active teacher participation in actual practice corresponds poorly to the conceptual model in all three areas. School staffs were involved in initiating the in-service program in approximately 30% of the in-service topics. It was also reported that 26% of the time local teachers' groups were involved in initiating in-service topics. The degree of overlap between these two categories cannot be determined from the data, since the two categories were not mutually exclusive. The level of teacher participation that would have been reported, had the category read--school staff and/or local teacher groups--cannot be determined.

Teachers' involvement in organizing in-service programs is subject to the same difficulty in interpretation since again categories are not discrete. Bearing in mind that percentages may overlap, individual teachers were involved in organizing approximately 17% of the in-service topics, committees of teachers were involved approximately 14% of the time, combined committees of teachers and district staff were involved approximately 19% of the time, while

school staffs as a unit were involved in organizing approximately 14% of the in-service topics. It appears that teachers are involved in the organizing of in-service education at various hierarchical levels--as individuals working through the teachers' association, as committees working with personnel from the central office, and as a school staff.

Teachers' participation as resource persons for conducting in-service programs appears to occur more frequently than their involvement in initiating and organizing programs. In approximately 44% of the in-service topics identified as top priority, teachers were involved as resource persons. This does not necessarily mean that teachers were the only resource persons used for the in-service program, since categories may overlap. Bearing in mind the limitations of the data, it appears that teacher participation as resource persons for in-service education reflects a low correspondence to the conceptual model. Furthermore, actual practices in British Columbia vis-à-vis resource persons for in-service education are not concordant with teachers' confidence ratings of resource personnel as reported by Reilly and Dembo (1975). Recall that in their survey of 100 elementary school teachers, other experienced teachers received the highest mean confidence ratings over 12 other in-service professionals, as instructors in both the affective ($\bar{X} = 3.45$) and cognitive

(\bar{X} = 3.45) domain. Experienced professors ranked third with a mean confidence rating of 2.94 for the affective domain and 3.06 for the cognitive domain. Experienced principals received mean confidence ratings of 2.62 and 2.73 for the affective and cognitive domain respectively.

Evaluation.

To be effective in-service education should have an objective evaluation to determine the effectiveness of the program and to permit informed decision making based on empirical data. This is based on the assumption that subjective evaluations and perceptions of effectiveness may not be accurate or valid.

Objective evaluation using pre and post measurements to determine the effectiveness of in-service programs was strongly advocated in the conceptual literature. Bearing in mind interpretation difficulties for the provincial data on evaluation because of ambiguity of terminology, it appears that provincial practices in evaluating in-service education have a low correspondence to the conceptual model. In approximately 9% of the top priority in-service topics a post in-service evaluation was conducted using test measurements. Given that the authors of the conceptual literature advocated formal evaluation, using test measurements reflect-

ing the objectives of the in-service program, the provincial data reflects a low correspondence to the conceptual model on this component. On the other hand, evaluation based on teachers' perceptions of the effectiveness of the in-service program is reported to have occurred in approximately 77% of the in-service topics. Based on respondents' descriptions of evaluation procedures, it appears that approximately 50% of the time, information on teachers' perceptions of the effectiveness of the program was solicited through a post in-service questionnaire or response sheet. In some cases (N = 6), school districts reported that effectiveness was determined through verbal communication only, by asking some of the teachers what they thought of the in-service program. Recall that the validity of such procedures was questioned in the conceptual literature.

In summary, in-service practices in British Columbia for high priority in-service topics seem to reflect a moderate to low correspondence to the critical components in the conceptual model regarding assessment of teachers' needs, active teacher participation, and evaluation.

Comments from school districts surveyed regarding perceived strengths and weaknesses of in-service programs are relevant here. Although provincial practices in in-service education do not appear to have a high correspondence to the conceptual model, it does seem that school districts are

aware of the possible advantages of including various components into the design of their in-service programs.

Twelve school districts (29%) for example, indicated that teacher participation in initiating and planning in-service education, and serving as resource persons, was important to the overall success of the program. Various respondents indicated that "the best in-service occurs when teachers are involved teaching other teachers", in-service programs "should use excellent teachers as resource persons", in-service education "must be teacher initiated--not laid on", in-service education should "involve staff and individual teachers in planning", in-service education "should be a teacher controlled activity" and so on.

A decentralized approach to in-service education or school based in-service programs was recommended by 17% (N = 7) of the respondents (N = 41). Typical comments included "in-service training in the form of staff development is a most important variable for enabling staff to meet changing needs", in-service program "initiation should be at the school level", there is a "priority for more school based in-service", a "decentralized system is very effective since it gives teachers a great deal of say" and "school level delivery is far more superior".

Seven of the 41 respondents (17%) also commented that in-service education should be based on the needs of teachers.

Typical comments included, "the district professional development day was effective when based on a needs assessment of the teachers", in-service education "must be responsive to individual needs for realization of potential", in-service programs "should start with the needs of the individual", and "the best in-service occurs when it is designed to meet the needs of the target group". One school district indicated that an "instrument needs to be devised to assess teachers' real needs".

Four of the respondents (10%) addressed the problem of relevance. They recommended "specific problem solving" and commented that the "relevance of the topic contributed to a worthwhile and useful experience for participants".

Insufficient released time for teachers was problematic in the view of 7 respondents (17%). They cited "pressures on teachers" indicating that it was "hard (for teachers) to turn out to in-service after school".

Only a few of the respondents (7%) addressed the issue of feedback or follow-up. Although some respondents recognized that in-service education "should have a follow-up component" they also indicated that "time for follow-up was problematic" and as a result perhaps "follow-up (was) minimal". Only one respondent indicated that school administrators should be more involved in in-service education.

Although some of the respondents recognized the impor-

tance of some of the components of the conceptual model, it appears that these components nonetheless, are not consistently incorporated in the design of current in-service programs. It can be assumed that the discrepancy between perceptions of what should be occurring and actual practices stems from implementation difficulties. Speculations as to why implementation problems continue to be maintained are advanced in the following discussion.

Problems in Implementing Individual Components of the Conceptual Model

Needs assessment.

To be effective in-service education should be based on the felt needs of the teacher and those needs should be determined through systematic assessment. This is based on the assumption that programs reflecting teachers' needs will be relevant to the teacher.

The major problem that appears to exist according to the authors, is that direct input from teachers about their own needs for in-service education is often overlooked as a component of in-service programs. Given the perceived importance of assessing teachers' needs, it seemed reasonable that procedures or models for conducting needs assessments and that research supporting the validity of such

models would be available. This belief was not strongly supported, however. Of the 59 articles that discussed needs or needs assessment, only three (5%) described a procedure on how this could be done (Barlow & Timeraos, 1975; McCreary, 1960; Taylor, B., 1961). All three employed a questionnaire or survey format. The authors generally failed to go beyond identification of the problem which may explain in part, why the problem continues to be maintained. Given the perceived importance of needs assessment as a basis for designing effective in-service programs, and the contrasting paucity of literature on reliable and valid instruments and models, future work in this area seems desirable and necessary.

Basing in-service education on the stated needs of individual teachers, although conceptually ideal, may not be practically feasible. This would be the case for example, in school districts of 1,000 teachers or more. The cost of individualizing in-service education in such cases would likely be astronomical. In smaller school districts, of under 100 teachers, individualized in-service education may be more feasible. If, however, central office support staff are responsible for providing the in-service programs, even in small school districts individualized in-service education may not be viable since the number of support staff in the central office also would be proportionately small.

Basing in-service education on the needs of teachers within a school (unit perspective) has several clear advantages. Teachers would likely have peer and administrative support since the in-service program would be based on a school need. More opportunities would be available for feedback, reinforcement, and follow-up since other people working on the same problems would be on the school site. It is speculated also that long term benefits might accrue from such an approach, depending on the topic of the in-service program. If the whole school staff were involved, perhaps efforts would be cooperative, and implementation would be consistent throughout the school and continuous from year to year.

Goals and objectives.

To be effective in-service education should have clearly specified goals and objectives. This is based on the assumption that specified goals and objectives serve as the basis for appropriate selection of content, methods, and materials, and provide the criteria for subsequent evaluation.

The major problem with this component according to the authors, is neglect. Why this problem continues to be maintained is unclear since resources explaining how to write

instructional objectives are available (Mager, 1975). Perhaps those responsible for the organization of in-service education are not informed about the presumed advantages of writing instructional objectives. None of the respondents surveyed in the province mentioned prespecified goals and objectives as either a strength or weakness of their in-service programs. Alternatively, the problem may relate to accountability. People responsible for organizing in-service education in school districts, for example, may be judged as doing an adequate job based on the number of in-service programs they conduct. A shift in accountability from number of in-service programs to quality of in-service programs likely would produce the desired emphasis on criteria to judge effectiveness. This would encourage writing of instructional objectives since the objectives would serve as criteria for evaluation.

Planning and implementation.

To be effective in-service education should be thoroughly and carefully planned with consideration given to whether intended outcomes of the program could be achieved best through a centralized, decentralized or centrally coordinated approach. This is based on the assumption that different approaches to in-service education produced different degrees of teacher participation and relevance with subsequent differential impact on implementation.

The major problem in planning and implementing in-service education seems to be that in-service education is too centralized. This view was supported by some of the respondents in the provincial survey. It is speculated that the reason this problem continues to be maintained is that central office staffs perhaps mistakenly assume that centrally controlled in-service education is better planned and has greater impact in producing desired results than numerous decentralized attempts. One school district, for example, commented that "the most effective in-service is directive, systematic, and mandated by district staff and using central office staff". On the surface this may appear to be a logical assumption. When teachers' reactions are sought, however, the assumption becomes questionable. Brimm and Tollett (1974) reported that 44% of the teachers surveyed in Tennessee (N = 7646) believed that their in-service programs were not well planned. These results undermine the assumption of better planning. The assumption that centralized in-service education has more impact in producing desired results is also questionable, when issues of relevance and teacher participation are examined. As indicated earlier (Asher, 1967) a centralized approach tended to focus on problems significant to central office staff. Brimm and Tollett (1974, p. 523) reported that 73% of the teachers surveyed indicated that "too often in-service activities do not

appear relevant to any felt needs of the teacher". In terms of teacher participation, they similarly reported (p. 524) that 93% of the teachers believed that "teachers need to be involved in the development of purpose, activities and methods of evaluation of in-service programs". When in-service programs are conducted such that teacher participation and perceived relevance are minimal it is questionable whether these in-service programs have any significant impact on teachers' attitudes or classroom behavior. Daly (1977, p. 34) drew a similar conclusion as a result of her survey of 19 Teacher Education Council In-service programs (N = 169) conducted in Massachusetts. She indicated that "with no strong program involvement in their respective schools, potential for institutional change is greatly reduced".

The solution to the problem appears to lie in a shift from centralized and collaborative approaches to a decentralized approach. Initially, a centrally coordinated approach emphasizing teacher participation could be used so that teachers or school staffs could be trained in assessment, organization, and evaluation skills. Following training in these skills, school boards might place greater emphasis on the importance of in-service programs that are school based. With a shift in funding, for example, from district in-service programs to school based in-service programs,

decentralization would be encouraged.

Reference to the literature.

To be effective in-service education should be based on a thorough review of the conceptual and empirical literature. This is based on the assumption that duplication of effort and perpetuation of ineffective practices result when pertinent literature is ignored.

Although some authors criticized the absence of literature reviews in in-service education, other authors appeared to perpetuate the problem in their own studies and reports. It is speculated that the absence of literature reviews as part of in-service programs continues to be maintained because it involves a time commitment that may be prohibitive. To conduct a literature review prior to implementing in-service programs in a school district (depending on the topic of the in-service program) likely would require the full time services of at least one individual. The problem could be alleviated perhaps by establishing a provincial agency responsible for collecting and collating research reviews and conceptual works on in-service education. Information could then be disseminated to school districts throughout the province at their request. This procedure would eliminate

needless and costly duplication of effort and remove the time constraints on individual organizers for in-service education.

Teacher participation.

To be effective in-service education should provide opportunities for active teacher participation and input into all aspects of in-service education, including decision making about content, initiating, planning, implementing, and evaluating. This is based on the assumption that teacher participation will maximize the commitment of teachers to the goals of the program.

The major problem with active teacher participation as a component of in-service education is that teachers are all too often recipients of programs offered to them or imposed on them without their input. Although teachers endorsed the view that they must be active participants in in-service education, and particularly that they serve as resource persons for conducting the in-service program, it appears, however, that teachers themselves are the reason the problem continues to be maintained. Howey (1978b, p. 14) for example, reported that when teachers were asked whether they personally would avail themselves of opportunities to serve as an in-service education resource person, that "about half of the

teachers (had) no interest at all in such a function". Perhaps lack of teachers' interest in serving as resource persons for in-service education stems from lack of time to devote to such activity since classroom teaching already makes many demands on teachers' time. This speculation received some support in Howey's survey (1978b, p. 15) since he indicated that one of the big problems identified by teachers with in-service education was that "participants (were) too busy with other priorities to spend time on this activity". Perhaps the solution to the problem of active teacher participation in in-service education lies in the issue of providing released time for teachers.

Released time for teachers.

To be effective in-service education should provide released time for teachers participating in in-service programs. This is based on the assumption that tired teachers are not receptive to innovations that will make even more demands on their time and energy.

The problem with this component is that released time is not consistently provided for teachers to attend or participate in in-service education. The reason the problem continues to be maintained is likely a fiscal one. Providing substitutes for teachers attending in-service educa-

tion could be financially unfeasible. Perhaps a second reason that released time is not automatically provided for teachers attending in-service education is that parents generally are opposed to the recommendation. They tend to believe that the teachers' professional growth is the teachers' own responsibility and consequently that teachers should not have to be provided with time off to fulfill their professional responsibilities. The view that parental disapproval is a factor contributing to the continuation of the problem was supported in Howey's survey (1978b) in which a very small 5% of the parents surveyed (N = not reported) believed that released time for teachers participating in in-service education was a good idea. Perhaps a partial solution to the problem would be to provide released time for those teachers prepared to serve as resource teachers for in-service programs and to those actively involved in developing course content. This procedure might encourage teachers to whom time considerations are a barrier, to become more actively involved in in-service education.

Relevance to classroom practices.

To be effective in-service education should be relevant to the teachers' classroom situation. This is based on the assumption that teachers will not become committed to programs that do not contribute to their daily work in the classrooms.

The problem of relevance to classroom practices seems to be related to initiating in-service programs without input of teachers. The problem appears to be maintained because a systematic assessment of teachers' needs, as previously discussed, is often lacking. Active teacher participation in the selection of content for in-service programs also would help alleviate the problem since teachers could put forward their concerns. It is speculated that emphasizing a decentralized or school based approach would help to resolve the problem.

Supportive climate.

To be effective in-service education should occur in a climate that encourages free exchange of ideas, encourages self-direction, and experimentation, and is free of coercion. This is based on the assumption that change causes stress and that some of the stress can be alleviated if teachers feel their efforts are supported by colleagues, administrators, and parents.

The role of a supportive climate in in-service education appears to suffer from neglect. Not one of the respondents in the provincial survey for example, mentioned school climate as either contributing to or hindering the effectiveness of their in-service programs. Yet the authors in the con-

ceptual literature recommended that more attention be given this component. It is speculated that the role of a supportive climate is overlooked because school districts in the past have not assessed systematically the climate of their schools, particularly at the elementary school level. It is true that secondary schools have regularly undergone accreditations but perhaps these assessments focus mainly on the adequacy of the building and building site, library facilities, and adequacy of equipment. One predictor of school climate is teachers' level of job satisfaction (Gosine & Keith, 1970; Robinson, 1978). Some inference about school climate could be made from data on teachers' job satisfaction. It is suggested that information about school climate could be collected in conjunction with an assessment of teachers' needs. The data from these two sources could be used for subsequent decisions about the type of in-service program that is likely to produce the greatest impact.

Evaluation.

To be effective in-service education should have an objective evaluation to determine the effectiveness of the program and to permit informed decision making based on empirical data. This is based on the assumption that subjective evaluations and perceptions

of effectiveness may not be accurate or valid.

One of the more obvious problems related to evaluation of in-service education is the connection between specified goals and objectives and the determination of outcomes. As discussed previously, many in-service programs have only an ambiguous conceptualization of their goals and objectives. Often these are not written down, and as evidenced in Tarr's study (1969) of the school districts in Iowa; none of the in-service programs in his study had behaviorally stated objectives. This problem was addressed specifically as it concerned evaluation by Asher (1967) and Devore (1971). Devore (1971, p. 63) was adamant that "unless the philosophy of a given educational program, together with the assumptions of the program, is precisely stated, it is impossible to engage the question of change or evaluation".

A second major concern for evaluating in-service education deals with measurement and instrumentation. Since many authors maintained that the major purpose of in-service education was to enhance teachers' competence with a subsequent improvement in pupils' performance, the two major "subject" groups for evaluation would be pupils and teachers. Here lies the problem, however, as perceived by knowledgeable evaluators. Scriven (1974, p. 109) stated that

The crucial feature of this...evaluation problem is the failure of research to establish useable connections between (classroom) process variables and the (pupil) outcome variables that, for the most part, make up the performance that we identify as good teaching.

Henderson (1978, p. 152) discussed measurement specifically in terms of in-service education. He indicated that:

Measurement of the skills of teaching has always been a contentious matter. Though the literature in relation to in-service training is scanty, studies demonstrating the unsatisfactory nature of the techniques used to assess the skills...abound.

Perhaps the solution to the evaluation problem lies in the development of a "new theory of measurement especially developed for the complex criterion problems of education" (Asher, 1967, p. 69).

In-service programmer or program accountability was another problem alluded to in in-service evaluation (Burton, 1974; Waynant, 1971). Waynant blamed lack of programmer accountability for the "perpetuation of the failure of in-service programs" (p. 171). Cost-benefit analysis, in terms of longitudinal effects was rarely considered (Burton, 1974). Other problems plagued in-service evaluation, including primitive instrumentation (Devore, 1971), lack of trained evaluators or expertise in evaluation, and cost and time factors (Alford, 1974; Devore, 1971). Thus, it seems important that high quality research and testing of evalua-

tion models and instruments occur in the near future so that evaluation of in-service education can be conducted confidently by school districts.

Feedback and follow-up.

To be effective in-service education should provide feedback and follow-up for teachers attempting to implement new programs, ideas, and teaching strategies. This is based on the assumption that long term effects of in-service education cannot be realized in the absence of suitable feedback and reinforcement of the teachers' efforts.

Although the authors identified lack of feedback and follow-up as a problem in in-service education, they did not specify procedures whereby the problem might be alleviated. It is speculated therefore, that the difficulty in implementing this component stems from the weakness of objectives as reference points in providing formative and evaluative feedback, as well as the time factor involved. To be most effective feedback would have to be individualized. This view is supported in learning theory (Tarpy, 1975) on contingency reinforcement in which reinforcement is administered subsequent to the performance of the behavior. Such a strict application of principles of learning would be un-

feasible for in-service programs with high attendance since the personnel involved in conducting the program could not possibly administer individualized feedback for each participant. Perhaps the solution to the problem lies in adoption of a decentralized approach to in-service education discussed previously. In a decentralized or school based approach other teachers could provide the necessary feedback and follow-up. This delegation of responsibility to many teachers rather than a few in-service program directors could make implementation of the component feasible. This procedure also actively involves teachers in implementing the component. Such a strategy likely would receive positive support from teachers since Reilly and Dembo (1975, p. 126) reported that "the experienced teacher was selected as the source of educational information inspiring the most confidence for both the cognitive and affective areas of teaching".

The focus of the thesis to this point has been on reporting opinions and facts about in-service education and speculating on some problems in implementing various components of in-service education. The next chapter attempts to synthesize fact, opinion, and speculation in the form of several conceptual hypotheses for in-service education and to discuss implications for future research in in-service education.

CHAPTER SIX

Hypotheses and Implications

In-service education appears to be very complex. Training programs for practicing teachers take many different forms including conferences, university courses, one-day workshops, teachers' conventions, and mini-courses, i.e. workshops over an extended period of time. All of these differ in duration, yet all are called in-service education. For each type of activity a variety of approaches to planning and implementation are possible, including centralized, decentralized, centrally coordinated, and collaborative approaches. These different approaches presumably have different effects on teachers or pupils. Complexity is evident further in the variety of objectives for in-service programs. Although the overall objective of in-service education is change, the intended change may be directed to any, all of, or a combination of teachers' knowledge, pupils' attitudes, teachers' behavior, pupils' knowledge, pupils' attitudes, or pupils' behavior. How these outcomes interact with each other and are influenced by either or the type of in-service program and the approach that is taken in planning and implementing the in-service program is not yet established. Further complications arise if the grade level or subject area that teachers teach is added into this scheme. Added

to all these factors are unanswered questions about the longitudinal effects of in-service education. For future research in in-service education to be meaningful, a framework needs to be established whereby the type of in-service activity, the objectives of the program, the approach to planning and implementation, and teachers' background and attitudes are synthesized into testable hypotheses.

Conceptual Hypotheses for In-service Education

Definitions. Proposing a set of conceptual hypotheses for in-service education in the above context would not be very meaningful unless definitions are established. Three parameters are delineated in the following definitions of in-service activities: duration of the activity, initiator of the activity, and provision of released time for teachers.

A partial day workshop is a one-shot workshop lasting one to five hours, held after school, or during part of the school day with released time. It may be initiated at the district or at the school level.

A professional development day (district level) is mandated, one-day in-service education for the whole school district, provided on a released time basis. Selection of specific topics from among several offered usually is left to the individual.

A one-day workshop spans one day and includes in-service programs initiated at the district, regional, or provincial level, or in-service programs that are school based such as a school professional development day or professional development for an individual teacher released to observe another teacher in the classroom.

A conference spans a period of two to four consecutive days and focuses on one theme. It is typically initiated at the regional, provincial, or national level with partial released time.

A series of workshops focuses on one theme and is massed over a one to two week period or distributed over a two to four week period. These are usually initiated at the district level with or without released time.

Self-study is reading or study in a self-selected subject area or self-initiated observation of two or more days in another teacher's classroom with released time.

A university course or institute usually spans one to four months, including credit and non-credit courses voluntarily selected by teachers in the belief that the topic is relevant to their teaching. Typically, released time is not provided.

An educational leave of absence spans four months to two years in which a teacher is released from classroom duties with or without partial pay.

An internship is an on-going process whereby a certified teacher undergoes supervised training under a master teacher or expert in a particular area (e.g. Education 406 at Simon Fraser University, sponsored by the Joint Board of Teacher Education).

An associateship (master teacher) lasting approximately one to three years involves teaching other teachers, such as experienced teachers serving as resource teachers or consultants to a school district and working directly with teachers and pupils in the classroom.

In the following discussion and hypotheses, behavior change is taken to mean a pervasive and sustained change in actions or conduct based on a thorough consideration of alternatives

and usually associated with attitudinal change. This definition excludes changes in behavior associated with mandated curriculum change. Attitude change is taken to mean an internalized change in belief or values that has the potential for systematic impact on behavior. Knowledge refers to familiarity with a topic.

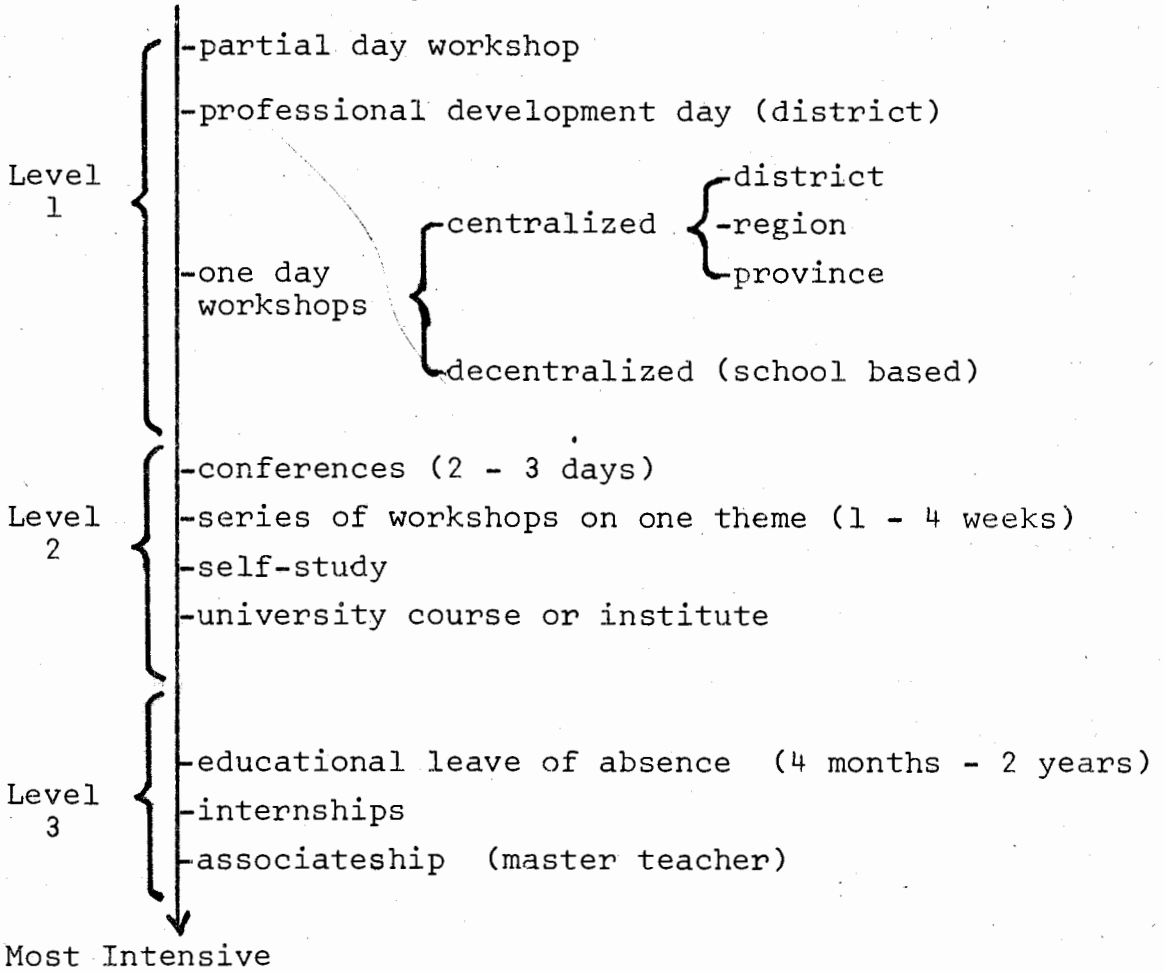
Assumption underlying the conceptual hypotheses. Based on input from practicing teachers (such as a coordinator for teacher training programs, and classroom teachers), and the author's experience, the following assumption is proposed. In-service education activities can be organized along a continuum of intensity or duration from least intensive to most intensive (see Figure 3). The continuum can be divided arbitrarily into three levels of intensity based on duration. These are operationally defined as: level 1 - duration of one day, level 2 - duration of two days to four months, level 3 - duration of over four months. The placement of self-study on the continuum is arbitrary but based on the perceptions of practicing teachers that it should be placed in the level 2 intensity category.

The conceptual hypotheses. The following conceptual hypotheses are based on the assumption above as well as the assumptions underlying each component of the conceptual model (see Chapter Five).

Figure 3

Level of Intensity of In-service Activities

Least Intensive



Hypothesis 1: In-service activities of low intensity (level 1 in Figure 3) will be effective in increasing teachers' knowledge.

Hypothesis 2: In-service activities of low intensity will attract mostly inexperienced teachers or teachers needing job retraining due to a changed teaching assignment or a change in curriculum.

Hypothesis 3: In-service activities of low intensity will be most effective in meeting objectives when the following components are included in the program design:

- a) an assessment of need at any level, i.e. the individual level (teachers), or the unit level (school building), or the corporate level (school district, Ministry of Education, universities),
- b) clearly specified goals and objectives,
- c) careful planning and implementation (with the approach, centralized or decentralized, being determined by the topic) and
- d) relevance to classroom practices based directly on the assessed needs of teachers.

In hypothesis 3, the components identified are those discussed by the authors in the conceptual literature review. Recall that clearly specified goals and objectives for example, referred to stating objectives in behavioral terms. Although the authors did not state precise and specific operational definitions for all the components of in-service programs, it is recommended that persons responsible for organizing and delivering in-service programs do so. It is likely that program components vary appropriately from one in-service program to another. In each situation therefore, it is left to the program organizer to operationally define the components of the program.

The rationale behind these hypotheses is that changes in attitude and behavior take time (Asher, 1967; Devore, 1971; Westby-Gibson, 1967). An in-service program of one day's duration therefore is not likely to have a sustained impact on teachers' classroom-relevant attitudes or behavior. Similarly, some of the components believed to be important to produce changes in attitude and behavior are not likely to occur in low intensity in-service programs. Specifically, involving teachers at the decision-making and planning level (Asher, 1967; Peters & Schnare, 1976) and feedback and follow-up (Bessent, 1971; Santelli, 1978) would not be cost effective for short duration efforts. In-service programs of low intensity seem most likely to attract inexperienced teachers since information about curricula, policies, and procedures is likely to be the most pressing need and the most relevant to new teachers (Daniels, S., 1975; Flanders, T., 1980). Hence, questions about the content of teaching assume a significant role as opposed to questions about the process of teaching and learning. Similarly, in-service programs of low intensity are likely to attract teachers needing job retraining since again, information about curricula will be the most pressing need for these teachers.

The following three hypotheses deal with moderate intensity in-service activities identified in Figure 3.

As in-service activities move up the continuum from least intensive to most intensive there are many more variables that impact on or moderate the effects of the in-service activity. Dispositional variables such as attitudes and perceptions of the teachers attending the in-service program are examples of variables that moderate the effects on teachers. Although specific dispositional and situational variables are addressed later in Hypothesis 10, they are introduced here because of their effects on moderate and high intensity in-service programs.

Hypothesis 4: In-service activities of moderate intensity (level 2 Figure 3) will be effective in changing teachers' attitudes given positive conditions of moderator variables.

Hypothesis 5: In-service activities of moderate intensity will attract mostly teachers of three or more years of teaching experience.

Hypothesis 6: In-service activities of moderate intensity will be most effective in meeting objectives when the following components are included in the program design:

- a) assessment of the needs of teachers,
- b) clearly specified goals and objectives,
- c) careful planning and implementation with the approach (centralized, decentralized) dependent on the topic,
- d) relevance to classroom practices based directly on the assessed needs of teachers,
- e) active teacher participation,
- f) a supportive climate, and
- g) evaluation.

In Hypothesis 6, components of moderate intensity in-service programs are derived from the conceptual literature review. Again, only general descriptions of each component were provided in Chapter Two since operational definitions of each component may vary from one in-service program to another.

The rationale behind these hypotheses is that change in teachers' attitudes requires moderately intensive exposure to the new ideas plus time for the ideas to be evaluated and subsequently accepted as having value (Fantino & Reynolds, 1975; Schultz, 1976). Hence a change in attitude is more likely to result when internalization occurs, i.e. when the consequence of the attitude change is accepted to be of value. Furthermore, changes in attitude are not likely to translate into sustained changes in behavior if follow-up and feedback are not provided (Bessent, 1971; Santelli, 1978). Given the moderate intensity of programs in the level 2 category, it is unlikely that feedback and follow-up would be consistently provided for each participant since this would be costly. The cost of providing individual feedback and follow-up in each teachers' classroom may not be justified or defensible within the context of the duration of the program.

Teachers' in-service needs change throughout their teaching careers (Flanders, T., 1972; Hewett, 1973; Westby-

Gibson, 1967). Although there is not likely to be a strong concordance between teachers' in-service needs and number of years of teaching experience, in-service programs of moderate duration seem more likely to attract teachers with approximately three or more years of teaching experience. After three years of teaching experience, the need for information about curricula, policies, and procedures is less likely to be uppermost while the need to understand why events occur the way they do likely will become more meaningful to the teacher. Hence, questions about the content of teaching assume a less significant role and are replaced in priority by questions about the process of teaching and learning. This relates to the concept of readiness. Flanders indicated that "teachers reported a growing, intensifying interest in theory in education and philosophies of knowledge at a certain stage in their career" (Flanders, T., 1980, p. A-12). He indicated further that

(Teachers) point out that genuine theory is usually presented before (teachers) have a meaningful context in which to place it.... theory and philosophy (should) be presented at a natural state of readiness, when the person has the framework and the interest in deepening his or her understanding" (p. A-12).

Hence, after approximately three years of teaching experience, teachers are more likely to be receptive to change since they can look beyond the immediate "survival" concerns of

teaching and the curricula and have acquired some experience against which theory can be examined.

The following three hypotheses deal with high intensity in-service activities identified in Figure 3. Again, moderator variables such as teachers' attitudes and perceptions are mentioned in Hypothesis 7 although they are not discussed in detail until Hypothesis 10. The components of high intensity in-service programs in Hypothesis 9 are derived from the conceptual literature review. Every component (excluding reference to the literature) of the conceptual model for in-service program components (see Figure 2 in Chapter 2) is perceived to be necessary for effective high intensity in-service programs. Only general descriptions of each component were provided in Chapter Two since operational definitions of each component will likely and appropriately vary from one in-service program to another.

Hypothesis 7: In-service activities of high intensity (level 3 in Figure 3) will be effective in producing sustained changes in teachers' behavior given positive conditions of moderator variables.

Hypothesis 8: In-service activities of high intensity (with the exception of internship) will attract mostly teachers with five or more years of teaching experience.

Hypothesis 9: In-service activities of high intensity will be most effective in meeting objectives when the following components are included in the program design:

- a) assessment of the needs of teachers,
- b) clearly specified goals and objectives,
- c) careful planning and implementation using a decentralized approach,
- d) relevance to classroom practices based directly on the assessed needs of teachers,
- e) teacher participation,
- f) supportive climate,
- g) evaluation,
- h) released time, and
- i) feedback and follow-up.

The rationale behind these hypotheses is that sustained change in behavior is difficult to achieve since change evokes emotional reactions (Devore, 1971) and involves "unlearning much that has become second nature" (Burton, 1974, p. 6). Many variables must be operating at an optimum level for pervasive and sustained change in teachers' classroom behavior to occur. The teacher must see the change as desirable and relevant (Cane, 1973; Ritz, et al., 1970). Time must be provided for ideas to be internalized and for attitudes to change (Asher, 1967; Devore, 1971; Westby-Gibson, 1967). The desired behavior must be practiced in the teachers' classroom under a condition where feedback is available (Bessent, 1971). Finally, the new behavior must be positively reinforced if it is to be sustained (Hunter, 1967; Tarpy, 1975). These conditions necessitate a high intensity in-service program. High intensity in-service programs (with

the exception of internship) seem likely to attract teachers of five years' teaching experience or more. School districts' policy specifies that teachers do not qualify, generally, for in-service activities in this category unless they have had a minimum of five years of teaching experience.

Hypothesis 10: People variables (dispositional) and environmental variables (situational) act as moderators influencing the degree to which in-service education affects teachers. Positive conditions of five moderator variables are necessary but not sufficient to produce desired effects on teachers:

- a) the actual competence and supportive attitude of the in-service instructor(s),
- b) the perceived competence and supportive attitude of the in-service instructor(s),
- c) the participating teacher's openness to change and innovation,
- d) the perceived reality of the message,
- e) the participating teacher's perception of the degree of support in his/her environment.

Based on factors that influence change (Fantino & Reynolds, 1975) these five variables were hypothesized to have a significant interaction effect on change. As a result of in-service education, new ideas have a greater impact, for example, if the in-service instructor(s), i.e. the communicator(s) of the message, are perceived to be "credible, prestigious, and expert in the area under study" (Fantino & Reynolds, 1975, p. 436). The personal characteristics of the participating teacher also influence the degree of change. Fantino and Reynolds (1975, p. 436) suggested that a major factor affecting change is "the nature

and strength of the person's original attitude." Hence, the participating teacher's openness or receptivity to change and innovation would be important. Change is influenced also by social and interpersonal factors (Fantino & Reynolds, 1975) such as open and positive communication with colleagues and the principal. Hence, the participating teacher's perception of support in his or her environment would be conducive to change. It is hypothesized that the above variables are necessary but not sufficient for change in teachers' attitudes and behavior to occur. Other demographic variables of the teacher such as academic background or grade level taught also may have a moderating influence on the effects of in-service education. Similarly, a discrepancy in the disposition of where the trainee's entering level of knowledge or skills and where the program starts in terms of these entry characteristics may moderate the influence of in-service programs. An upper level university course (moderate intensity) on conflict resolution for example, would likely advance the pros and cons of several theories of conflict resolution. Certainly a single answer on how to resolve conflict would not be provided. The inexperienced teacher expecting a definitive answer might experience frustration in this case since where the teacher starts and where the program starts may be discrepant.

Conceptual Models Based on the Hypotheses

From these hypotheses a conceptual model can be proposed to predict the kind and level of effects on teachers as a result of participating in in-service programs (see Figure 4). Four types of variables are depicted in Figure 4: independent variables regarding level of intensity of the in-service program, independent variables regarding necessary and sufficient program components, moderator variables (dispositional and situational variables) and dependent variables (effect of the in-service program on teachers). Figure 5 proposes a conceptual model for the specific interaction effects involving the moderator variables proposed in Hypothesis 10. In this model, positive but not necessarily optimum conditions are assumed to characterize the moderator variables. The model proposes that different moderator variables have different impact or importance depending on the intended level of outcome, e.g., gains in knowledge, or changes in attitude or behavior. Hence, the actual and perceived competence and supportive attitude of the in-service instructor are most important and necessary for in-service programs of low intensity and have diminishing importance as in-service programs approach high intensity. Conversely, perceived supportive climate, and the receptive attitude of the participating teacher are most important and necessary for in-service programs of

Figure 4
Conceptual Model for Teacher Effects as a Result of In-service Programs

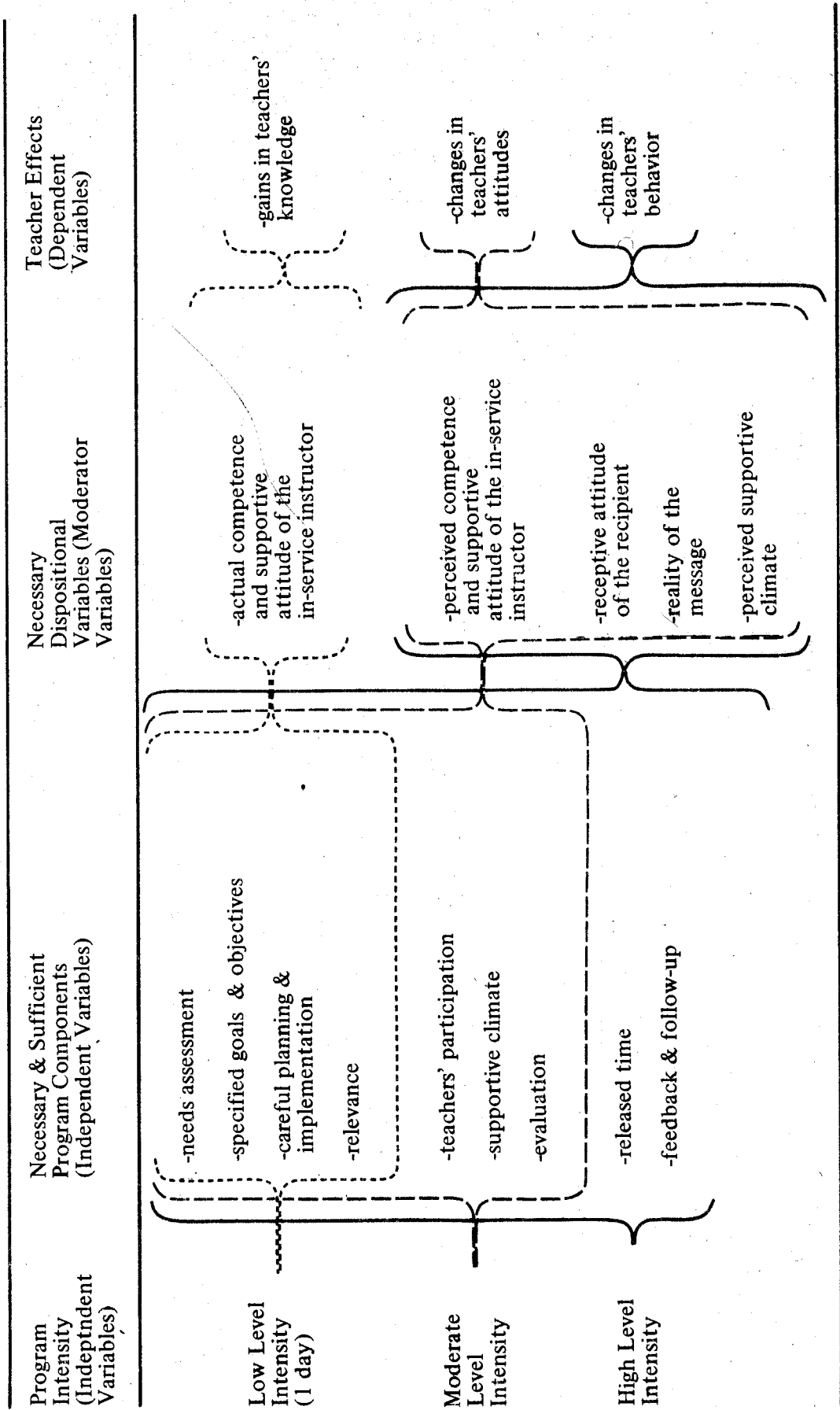
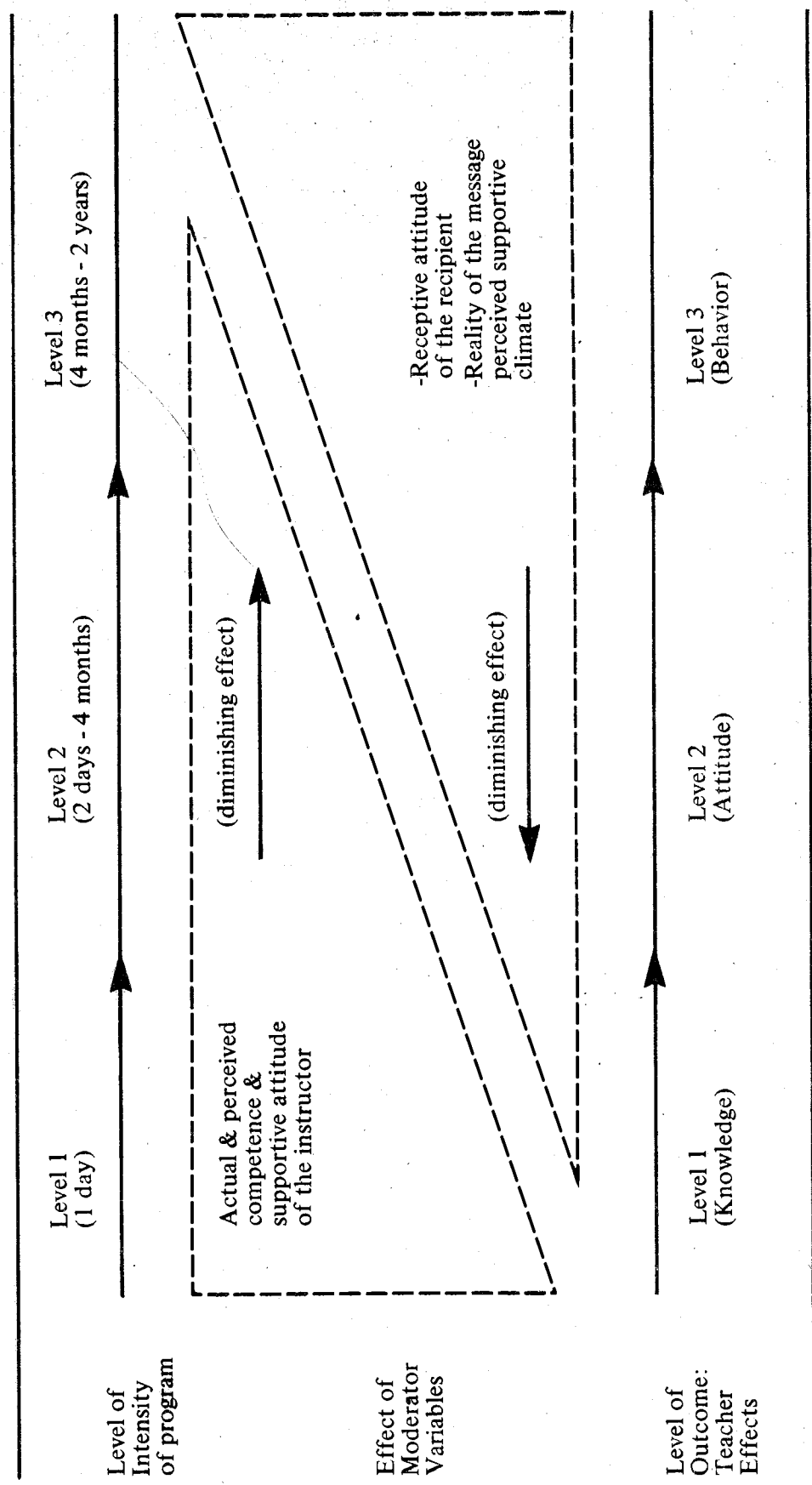


Figure 5
Conceptual Model for Interaction Effects of Moderator Variables



high intensity and have diminishing importance as in-service programs approach low intensity. One might wonder, however what the level of outcome of in-service programs would be if all the moderator variables were operating at optimum level, or conversely, far below optimum level.

It is proposed that in-service activities of increasing intensity on the continuum may produce a higher order effect on teachers if moderator variables are operating at optimum level. A one-day workshop held with a school staff, for example (level 1 intensity in Figure 3) might produce changes in teachers' attitudes (level 2 effect in Figure 3) if the moderator variables were operating at optimum level. The converse of this proposal also is plausible, that is, when moderator variables are operating far below optimum level, in-service activities closest to a lower level of intensity on the continuum may produce a lower order effect on teachers.

Implications for Research

The review of the empirical literature in Chapter Three revealed a number of methodological concerns that carry clear implications for future research. Recall that the research designs used in the empirical studies fell into three broad categories: pre-experimental designs, quasi-experimental designs, and true experimental designs. The majority of the research studies (77%) used pre-experimental designs or quasi-experimental designs. The critical methodo-

logical concern in the pre-experimental designs was that these studies violated most of the requirements for internal validity, failing to control such sources of invalidity as maturation, history, statistical regression, or testing effects. Hence there was no justification for concluding that the treatment caused whatever was observed to follow it since a host of rival hypotheses could not be ruled out. The central methodological concern in the quasi-experimental studies was that selection bias and testing effects may not have been controlled. Hence the possibility of rival hypotheses being true was still apparent.

One of the more obvious problems for in-service education is the amount and nature of the research already published. Recall that only 19% of the literature reviewed comprised research studies on the effectiveness of in-service education. An even smaller 4% of the research studies used experimental designs (true experimental designs) that were capable of adequately controlling most of the possible sources of invalidity. Only in these studies could the reported positive effects be attributed with any degree of confidence to the in-service program itself as opposed to some other uncontrolled variable. Even in these studies, however, conflicting data were evident regarding interpretation of interaction effects of some of the variables mentioned in the introduction to this

chapter.

A major implication for research in the future is that research studies on the effectiveness of in-service education should assume a narrower focus. Only inferences can be made at this point about the interaction effects of dispositional and situational variables. The relationship between these variables and the subsequent effect on teachers should be determined before further research is conducted on the overall effectiveness of in-service education in meeting its objectives. The conceptual model for teacher effects, and the model for interaction effects may provide a practical starting point. A second major implication for research is that more effort must be made to use research designs that control some of the many sources of internal validity. Only when this is done can experimenters confidently negate rival hypotheses. Following is an example of the type of research study that could be conducted in the future. Looking at the three variables--low intensity in-service programs, elementary school teachers, and teachers' knowledge it would be reasonable and appropriate to conduct research using a control group design for effectiveness of a low intensity in-service program as measured by gains in teachers' knowledge.

Based on the hypotheses and conceptual model, the following questions might be asked for future research.

Does level of intensity of in-service programs correspond to level of outcome regarding teachers' gains in knowledge or change in teachers' attitude and behavior? What components of in-service program design are necessary and sufficient to produce the intended outcomes of the program? What are the participation patterns vis-à-vis years of teaching experience, of teachers attending in-service education? What are the characteristics regarding years of teaching experience and job description of teachers attending in-service programs of low intensity, moderate intensity, high intensity? How do teachers' attitudes and perceptions affect the intended outcomes of in-service education?

It is recommended further that research results be reported in sufficient detail that effect sizes in terms of z scores could be calculated. This would require that educational researchers report mean scores and standard deviations. Consistent application of this practice would permit comparison of results across studies and would allow educators to make reasonable decisions about the practical importance of the results by changing the z score results to percentile ranks.

A third implication for research on in-service education is that teachers' self-reports on teaching behavior and pupils' attitudes and pupils' behavior not be used as the only method of measuring change on these variables.

Although more time consuming and costly, collecting data on these variables should be done through observation (using more than one observer), or through audio or video tapes. Analysis of data should be done using a blind procedure. This recommendation is advanced so that invalidity due to experimenter bias, and unreliability due to teachers' self-assessments can be avoided. A fourth implication for research on in-service education is that teachers must be sensitized to the importance of educational research and become involved in the research process. Without teachers' cooperation, the type of research recommended above cannot be implemented. A major task in acquiring teachers' cooperation would be to reassure them and convince them that evaluation efforts are intended to focus on the effectiveness of the in-service program, not on the effectiveness of their teaching as individuals. Given the pressures of accountability that teachers already feel, this is perceived to be a major undertaking.

As indicated throughout Chapters Four and Five, many problems were encountered in the analysis and interpretation of the provincial survey data. These problems developed because of an inadequate conceptualization of the complexity of in-service education in conjunction with poor design of the survey instrument. Based on lessons learned in the collection of data on the provincial survey the following

recommendations are made for future analysis of provincial practices. Just as research into the effectiveness of in-service education must become more focused, future surveys of provincial practices should be more focused than they were in this study. In-service education is complex-- many different types of approaches to in-service education are apparent. They are designed for different purposes, from disseminating information only to changing teachers' or pupils' attitudes and behavior. Because in-service education is complex, a single survey of reasonable length on in-service practices in British Columbia, is not likely to reveal useful information or interpretable data. One possibility for narrowing the focus of a survey instrument would be to design the survey based on the level of intensity of the in-service program, or alternatively, based on the intended teacher effects of the in-service program such as gains in teachers' knowledge, or changes in teachers' attitudes or behavior. Basing the survey on the perceived priority or importance of the in-service program as in this thesis, did not prove to be very productive. School districts might be requested for example, to identify initiation and organization strategies and so on for an in-service program designed specifically to disseminate information, or to encourage change in teachers' behavior, and so on. The instructions should include operational definitions and

examples to ensure reasonable correspondence between the interviewers' and the respondents' understanding of the task.

The design and validity of the survey instrument is of critical importance to subsequent data analysis and interpretation. Inadequate attention to the design and validity of the survey instrument in this study resulted in a regrettable loss of information. Questions on the survey should be designed so that categories are discrete. Although this procedure may lengthen the survey, it is necessary if statistical analysis is to be conducted, since a chi-square test of significance for example, assumes independence of categories. Furthermore the survey instrument should be field tested so that reliability and validity can be determined.

If data is collected in the above fashion results could be run against demographic and other background variables to determine their effects on in-service practices in the province. Researchers for example, might wish to conduct a comparative analysis of school districts to determine if specific characteristics of a school district result in different in-service practices. Some variables to be considered in this type of study would be: number of teachers in a school district, average years of teaching experience, level of teacher qualification, wealth of a school district, urban, rural or suburban characteristics of the school

district, or region in the province in which the school district is located, such as Peace River North versus Lower Mainland. A final recommendation for collecting data on in-service practices would be to interview practicing teachers as well as persons responsible for organizing the in-service programs. A high degree of correspondence between the perceptions of the recipients of the program and the organizers of the program would indicate that the data were valid. A low degree of correspondence in perceptions of actual practices could mean that the perceptions are not reliable or that what is intended to occur, is not occurring.

Much work remains to be done before educators can claim with any degree of confidence that in-service teacher education improves the quality of teaching instruction with subsequent improvement in the academic performance of pupils. A review of the conceptual literature yielded a model or template for conducting in-service education. The predicted effectiveness of this model could not be determined from the review of the empirical literature, since the in-service programs reviewed in the empirical literature did not correspond to the components of the conceptual model. Actual practices in in-service education based on a survey of in-service programs in British Columbia similarly did not correspond to components in the conceptual model, although respondents' opinions seemed to support the importance of various compo-

nents in the model. Given the discrepancy in the findings of the conceptual literature, the empirical literature, and actual practices, the author concludes that in-service teacher education is much more complex than it at first appeared. Implications for future research, both empirical and descriptive were based on this conclusion. Ten hypotheses were proposed to help focus future research on in-service education. Future efforts in research must attempt to determine the interaction and effects of specific variables in in-service education. Without such information, results from general studies of effectiveness of in-service education do not contribute meaningful information.

APPENDICES

APPENDIX A

In-service Literature: Topical Analysis/Type

Author(s)	Year	Area	Model	components	empirical	referenced	pupils tested	effectiveness of	Literature review
Alford, H.	1974	evaluation	X	X					
Alvir, H. P. (a)	1975	evaluation strat.	X	X	X		X		
Alvir, H. P. (a)	1975	evaluation strat.	X	X	X				
Alvir, H. P.	1976	evaluation	X	X	X				
Anderson & Gies	1975	cognitive growth		X	X			X	
Andrews, L. O.	1975	pre and in-service	X	X		X			
Arena, J.	1974	individualized IS	X	X	X				
Asher, J. J.	1967	literature review		X		X			
Austin, M. C.	1966	components		X		X			
Axlerod, J.	1975	staff. dev.-reading	X	X					
Barlow & Timiraos	1975	needs assessment	X	X	X				
Beegle & Edelfelt	1977	multiple authors	X	X		X			
Berrie, P. J.	1975	general	X	X					
Billeh & Hasan	1975	science			X	X		X	
Boeck & Foster	1975	learning disabil.			X	X		X	
Bolam, R.	1979	peer tutoring	X	X		X		X	
Bolam, R.	1980	internal. summary		X		X			
Borg & Stone	1974	protocol materials	X	X		X			
Brainard, E.	1973	individualized IS	X						
Brimm & Tollett	1974	teachers' percept.		X					
Brown, C. R.	1975	on-site programs	X	X					

APPENDIX A (continued)

Author(s)	Year	Area	model	components	empirical	referenced	pupils tested	effective-ness of	literature review
Bruce, W. et al.	1976	field based prof.	X						
Burgy, D. R.	1974	video in-service	X						
Burton, K.	1974	components		X					
Carline, J. L.	1970	mathematics			X	X	X	X	
Carmichael & Kallenback	1971	individualized IS	X						
Carpenter, J. O.	1972	IOTA assessment			X				
Cheney, W.	1971	video in-service	X			X			
Cobun, T. C.	1975	media production	X	X					
Cochran, L. H.	1975	components		X					
Coleman, P.	1979	teachers centers		X		X			
Comras & Masterman	1972	components		X					
Csapo, M.	1976	learning assist.			X				
Cunningham, R. C.	1972	components		X		X	X	X	
Dailly, E.	1975	expansion of IS							
Daly, K.	1977	teachers percept.							
Daniels, P. & O'Connell	1976	floating faculty	X						
Daniels, S.	1975	physical education				X			
Davidson, D. & Kilgore	1974	economics		X		X	X	X	

APPENDIX A (continued)

Author(s)	Year	Area	Model	components	empirical	referenced	pupils tested	effectiveness of	literature review
Davidson, R. G.	1972	administration	X	X					
Davis, S. & Gross-Davis	1974				X		X		
Degroote, D. A.	1973	science		X	X	X	X	X	
Devore, P. W.	1971	literature review		X	X	X			X
Draba, R. E.	1975	reading		X		X			
Edelfelt, R. A.	1974	components		X		X			
Edelfelt, R. A.	1977	multiple authors		X		X			
Edelfelt, R. A.	1978	multiple authors		X		X			
Ernst, W.	1974	components		X		X			
Fast, E. T.	1974	performance eval.	X	X		X			
Felker, et al.	1971	teacher flexibility	X			X			
Fiedler, et al.	1979	differential staff.	X			X			
Fifer & Rush	1974	evaluation	X			X			
Finnegan, H.	1972	staff development	X			X			
Fiske, D.	1974	components		X		X			
Fitzgerald & Clark	1976	process evaluation	X	X		X	X		
Flanders, N. A.	1962	interaction anal.	X		X		X		
Flatter & Koopman	1976	self-study	X						
Foshay, A. W.	1956	components		X					
Fowler, H. S.	1960	science			X				
Fox & Griffin	1974	inter-institution.	X						

APPENDIX A (continued)

Author(s)	Year	Area	Model	components	empirical	referenced	pupils tested	effectiveness of	Literature Review
Gaddis, W. G.	1973	televised IS	X		X			X	
Gillie, B. C.	1975	general	X	X					
Goodlad, J. I.	1972	league model	X	X		X			
Granum, R.	1975	class management			X	X	X	X	
Hammons, J. O.	1975	community college			X	X			
Harris, et al.	1969	laboratory apprao.	X	X		X			
Hart, H. A.	1974	self-renewal	X			X			
Harty, H.	1975	science eval.		X		X			
Haycocks, N.	1974	role of university			X	X			
Hazard, W.	1968	sabbaticals				X			
Heilman, A. W.	1965	effectiveness of	X		X	X	X	X	
Henderson, E. S.	1978	evaluation	X	X		X			
Henry, N. B.	1957	multiple authors	X	X		X			
Hodges & Hodges	1975	role of universit.	X	X		X			
Hopkin & Aquino	1975	components	X	X		X			
Houmes, B.	1974	components		X					
Howey, K. R. (b)	1978	teachers percept.							
Hull, W. L.	1975	innovation	X	X					
James, S. M.	1976	components		X					
Jaramillo, M.	1975	bilingual educ.	X	X					
Johns & Tyrrell	1975	competency based	X	X					
Johnson, T.	1976	staff development	X	X					

APPENDIX A (continued)

Author(s)	Year	Area	Model	components	empirical	referenced	pupils tested	effectiveness of	Literature review
Jones, A. H.	1975	univer. collabor.	X	X					
Katz, et al.	1974	advisory approach	X	X		X			
Kauffman & Dwyer	1974	cartoon/realistic	X		X	X	X	X	
Kazdin, A. E.	1974	effectiveness of			X	X			
Kitching, J.	1974	length of IS	X						
Koble & Gray	1975	task force approa.	X	X		X			
Koch, R. R.	1973	math			X	X		X	
Kosier & Severson	1971	feedback	X		X	X	X	X	
Landrith, H. F.	1977	systems approach	X	X		X			
Larson, V. M.	1974	staff development	X	X					
Liddle, W.	1974	feedback		X					
Longmore, A. J.	1974	components	X	X					
Luke, R. A.	1972	collaboration	X	X					
Lutz, J. E.	1976	components		X		X			
McCreary, A. P.	1960	needs assessment		X		X			
McGrady, S.	1973	video in-service	X		X				
McKeegan, H. F.	1977	teachers centers			X				
McLeod, P. H.	1974	student teaching	X			X			
McPherson, B.	1979	state wide systems	X	X		X			

APPENDIX A (continued)

Author(s)	Year	Area	model	components	empirical	referenced	pupils tested	effective-ness of	literature review
Mackie & Gervais	1977	IS effectiveness	X	X		X			
Martin, F.	1973	contingency manag.	X		X	X	X	X	
Mayer et al.	1975	earth sciences			X	X	X	X	
Messick, R.	1975	competency educ.	X	X		X			
Minnis, D. L.	1975	demand curriculum	X	X		X			
Mohan & Hull	1975	components	X	X		X			
Monahan & Miller	1970	planning & implem.	X	X		X			
Mullen, T.	1975	decentralized IS	X	X		X			
Nadler, H.	1973	E.S.L. evaluation		X	X		X	X	
National Education Association	1966	literature review		X	X	X			X
Nelms, B. F.	1975	IS retreats	X			X			
Olsen, T.	1975	reading		X		X			
Olson, J.	1975	reading	X	X		X			
Otto & Erickson	1973	reading	X	X		X			
Pederson, G.	1975	evaluation-teach.				X			
Pelton, C. B.	1975	who receives IS		X					
Peters & Schnare	1976	components		X					
Phillips, E. T.	1975	microteaching	X		X			X	
Pillai, J. K.	1976	teacher affective		X		X			
Piper & Butts	1976	televised science	X		X	X			
Plant, W. T.	1974	teacher effective.	X		X	X			

APPENDIX A (continued)

Author(s)	Year	Area	model	components	empirical	referenced	pupils tested	effectiveness of	Literature review
Polos, N. C.	1975	IS improvements	X			X			
Popham, J. W.	1975	teaching perf. t.			X	X	X	X	
Prentice, J. A.	1968	instructional stra.			X	X	X	X	
Reilly & Dembo	1975	teachers percept.		X		X			
Reynard, H. E.	1963	pre & in-service	X	X		X			
Ritz et al.	1970	how to conduct	X			X			
Roberts & Tretten	1975	staff in-service	X		X	X	X	X	
Robertson, W. E.	1969	t. self-appraisal	X	X		X			
Rubin, L.	1971	multiple authors	X	X		X			
Russell, E. B.	1975	vocational	X			X			
Rutherford & Weaver	1974	teach. preferences	X			X			
Sakamoto, P. S.	1975	individualized IS	X			X			
Schankerman, M.	1968	participat. pattern	X		X	X			
Schmid & Scranton	1972	longitudinal IS	X		X	X		X	
Schwartz et al.	1977	research methodol.	X	X	X	X	X		
Scott-Blair	1974	administrator IS	X	X					
Scriven, M.	1974	evaluation	X	X					
Shettel, et al.	1975	teach. humanism		X	X			X	
Smith, M.	1975	components	X	X		X			
Somers & Southern	1974	stud. eval. of t.	X	X		X			
Sperry & Carter	1974	human relations			X			X	

APPENDIX A (continued)

Author(s)	Year	Area	model	components	empirical	referenced	pupils tested	effective-ness of	literature review
Taylor, B. L.	1959	occurrence of IS			X	X			
Taylor, B. L.	1961	needs assessment		X	X				
Taylor, W.	1978	components		X		X			
Technical Advisory Committee	1976	recommendations		X					
Thornton & Vredevelde	1977	economics	X		X	X	X	X	
Tillis & Laltant	1974	peer tutoring	X			X			
Trincherro, R. L.	1974	longitudinal effec.			X	X	X	X	
Trump, J. L.	1962	future setting				X			
Twiford, D. D.	1965	counseling		X		X			
Vanderpool, J. A.	1975	certification		X		X			
Verner, Z.	1975	components		X					
Watkins, R.	1973	multiple authors		X		X			
Waynant, L. F.	1971	components		X		X			
Wehmeyer, L. M.	1975	eval. & effective.		X		X			X
Westby-Gibson, D.	1967	literature review		X		X			X
Wilson & Winstanley	1976	eval-critique	X	X	X		X		

Note. N = 159

APPENDIX B

Essential Components of In-service Programs

Author(s)	Year	-needs assessment	based on needs	specified goals	objectives	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
Alford, H. J.	1974												
Allen, D. W.	1971												X
Alvir, H. P.	1976												
Alvir, H. P. (a)	1975												
Alvir, H. P. (b)	1975												
Andrews, L. O.	1975	X				X X				X X			
Arena, J.	1974	X		X		X X				X X			
Asher, J. J.	1967	X		X				X	X X	X X			
Austin, M. C.	1966	X		X			X					X X	
Axlerod, J.	1975	X		X									
Barlow & Timiraos	1975	X		X									
Berge et al.	1957	X					X	X					
Bolan, R.	1979	X											
Bolan, R.	1980			X		X X	X			X X	X X		
Brimm & Tollett	1974	X											
Brinkerhoff, R.	1977									X			

APPENDIX B (continued)

Author(s)	Year	-needs assessment	based on needs	specified goals	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
Britton, E.	1973	X				X	X	X	X		X	X
Brown, C. R.	1975					X	X	X	X		X	X
Burton, K.	1974						X	X	X		X	X
Bush, R. N.	1971	X				X	X	X	X		X	X
Cane, B.	1973						X	X	X		X	X
Cobun, T. C.	1975	X			X	X	X	X	X		X	X
Cochran, L. H.	1975	X			X	X	X	X	X		X	X
Coleman, P.	1979	X		X	X	X	X	X	X		X	X
Comras, J. & Masterman	1972	X		X	X	X	X	X	X		X	X
Cunningham, R. C.	1972					X	X	X	X		X	X
Davidson, R. G.	1972					X	X	X	X		X	X
Devore, P. W.	1971	X		X		X	X	X	X		X	X
Draba, R. E.	1975	X		X		X	X	X	X		X	X
Edelfelt, R. A.	1974	X			X	X	X	X	X		X	X
Edelfelt, R. A. (Ed.)	1977	X				X	X	X	X		X	X
Edelfelt, R. A. (Ed.)	1978	X				X	X	X	X		X	X
Ernst, W.	1974	X		X			X	X	X		X	X
Fantini, M.	1971						X	X	X		X	X
Fast, E. T.	1974			X		X	X	X	X		X	X
Fifer & Rush	1974	X		X		X	X	X	X		X	X

APPENDIX B (continued)

Author(s)	Year	-needs assessment	specified goals	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
Finnegan, H.	1972	X	X	X	X	X	X	X		X	X
Fischler, A. S.	1971			X	X	X	X	X		X	X
Fiske, D.	1974	X			X	X	X	X		X	X
Fitzgerald & Clark	1976										
Fleming, R.	1977										
Foshay, A. W.	1956										
Gilchrist et al.	1957	X			X	X	X	X		X	X
Gillie, B. C.	1975			X	X					X	X
Goddu, R.	1978	X									
Goodlad, J. I.	1972	X		X		X	X	X		X	
Harris et al.	1969	X	X	X							
Harty, H.	1975										
Henderson, E. S.	1978		X		X					X	
Herrick, V. E.	1957		X								
Hewett, S.	1973	X									
Hodges, L. & Hodges, R.	1975	X							X		
Hopkin & Aquino	1975	X		X	X				X		
Houmes, G.	1974	X	X								
Howey, K. R. (a)	1978	X	X								
Hoyle	1973										
Hull, W. L.	1978	X	X								
Jackson, P. W.	1971						X	X			

APPENDIX B (continued)

Author(s)	Year	-needs assessment	-based on needs	specified goals	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
James, Lord	1973	X							X			
James, S.	1976	X	X			X		X	X	X		
Jones & Tyrrell	1975	X				X		X	X			
Katz et al.	1974	X				X		X	X			
Kinnick et al.	1957	X	X			X		X	X			
Koble & Gray	1975	X			X	X		X	X			
Landrith, W. F.	1977	X				X		X	X			
Larson, V. M.	1974	X				X		X	X			
Lewis et al.	1957	X				X		X	X			
Liddle, W.	1974	X				X		X	X			
Lippitt & Fox	1971	X				X		X	X			
Long, D.	1977	X				X		X	X			
Longmore, A. J.	1974	X				X		X	X			
Lutz, J. E.	1976	X			X	X		X	X			
McCreary, A. P.	1960	X				X		X	X			
McPherson, B.	1979	X	X			X		X	X			
Mackie & Gervais	1977	X	X		X	X		X	X			
Massanari, K.	1978	X				X		X	X			
Meade, E. J. Jr.	1971	X				X		X	X			
Messick, R.	1975	X				X		X	X			
Minnis, D. L.	1975	X	X			X		X	X			

APPENDIX B (continued)

Author(s)	Year	-needs assessment	-based on needs	specified goals & objectives	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
Monahan & Miller	1970	X		X	X	X	X		X	X	X	X
Mullen, T.	1975	X				X	X	X	X	X	X	
National Education Assoc.	1966								X	X		
Olsen, T.	1975	X			X	X			X	X		
Otto, W. & Erickson, L.	1973	X			X	X			X	X		
Parker, J. C.	1957	X		X	X	X	X		X	X		
Peters & Schnare	1976	X		X	X	X			X	X		
Pillai, K. J.	1976				X	X			X	X		
Pinkney, H. B.	1977				X	X			X	X		
Reilly & Dembo	1975					X	X		X	X		
Ritz et al.	1970	X		X	X	X	X		X	X	X	
Rubin, L. (Ed.)	1971				X	X			X	X		
Russell, E. B.	1975	X		X		X	X		X	X		
Schwartz et al.	1977	X		X	X	X			X	X		
Scott-Blair, M. D.	1974	X		X	X	X			X	X		
Scriven, M.	1974	X			X	X			X	X		
Smith, M.	1975	X			X	X			X	X		
Somers & Southern	1974	X			X	X			X	X		
Tarr, J. E.	1969	X										
Taylor, B. L.	1961	X										
Taylor, W.	1978	X				X	X		X	X		

APPENDIX B (continued)

Author(s)	Year	-needs assessment -based on needs & objectives	planning & implementation	teacher participation	relevance	supportive climate	evaluation	feedback & follow-up	released time	reference to the literature
Technical Advisory Comm.	1976		X	X	X		X	X	X	
Thelan, H. A.	1971	X		X	X	X			X	
Trump, J. L.	1962			X					X	
Twiford, D. D.	1965	X	X	X	X	X	X		X	
Tyler, R. W.	1971			X	X					
Verner, Z.	1975			X						
Watkins, R. (Ed.)	1973			X	X	X	X			
Waynant, L. F.	1971	X	X	X	X			X		
West, S.	1977			X	X					X
Westby-Gibson, D.	1976	X	X	X	X	X	X	X	X	
Wilson & Winstanley	1976			X	X		X			

Note. N = 110

APPENDIX C

Approaches for In-service Programs

Centralized Approach

Borg & Stone (1974)	Olson, J. (1975)
Johns & Tyrrell (1975)	Schmid & Scranton (1972)
Mohan & Hull (1975)	Scott-Blair (1974)
Monahan & Miller (1970)	Thornton & Vredevelde (1977)

Centrally Coordinated Approach

Brown, C. R. (1975)	Kitching, K. (1974)
Fox & Griffin (1974)	Longmore, A. J. (1974)
Gillie, B. C. (1975)	Luke, R. A. (1972)
Hodges & Hodges (1975)	McLeod, P. H. (1974)
Hopkin & Aquino (1975)	Minnis, D. L. (1975)
Jones, A. H. (1975)	Reynard, H. E. (1963)

Decentralized ApproachStaff development models.

Axlerod, J. (1975)	Johnson, T. (1976)
Beegle & Edelfelt (Eds.) 1977	Larson, V. M. (1974)
Daniels, P. R. & O'Connell (1976)	McPherson, B. (1979)
Fast, E. (1974)	Martin, F. (1973)
Fiedler et al. (1979)	Mullen, T. (1975)
Finnegan, H. (1972)	Roberts & Tretten (1975)
Goodlad, J. (1972)	

Peer tutoring models.

Bolam, R. (1979)	Tillis & Laltart (1974)
Bush (1971)	

Individualized models.

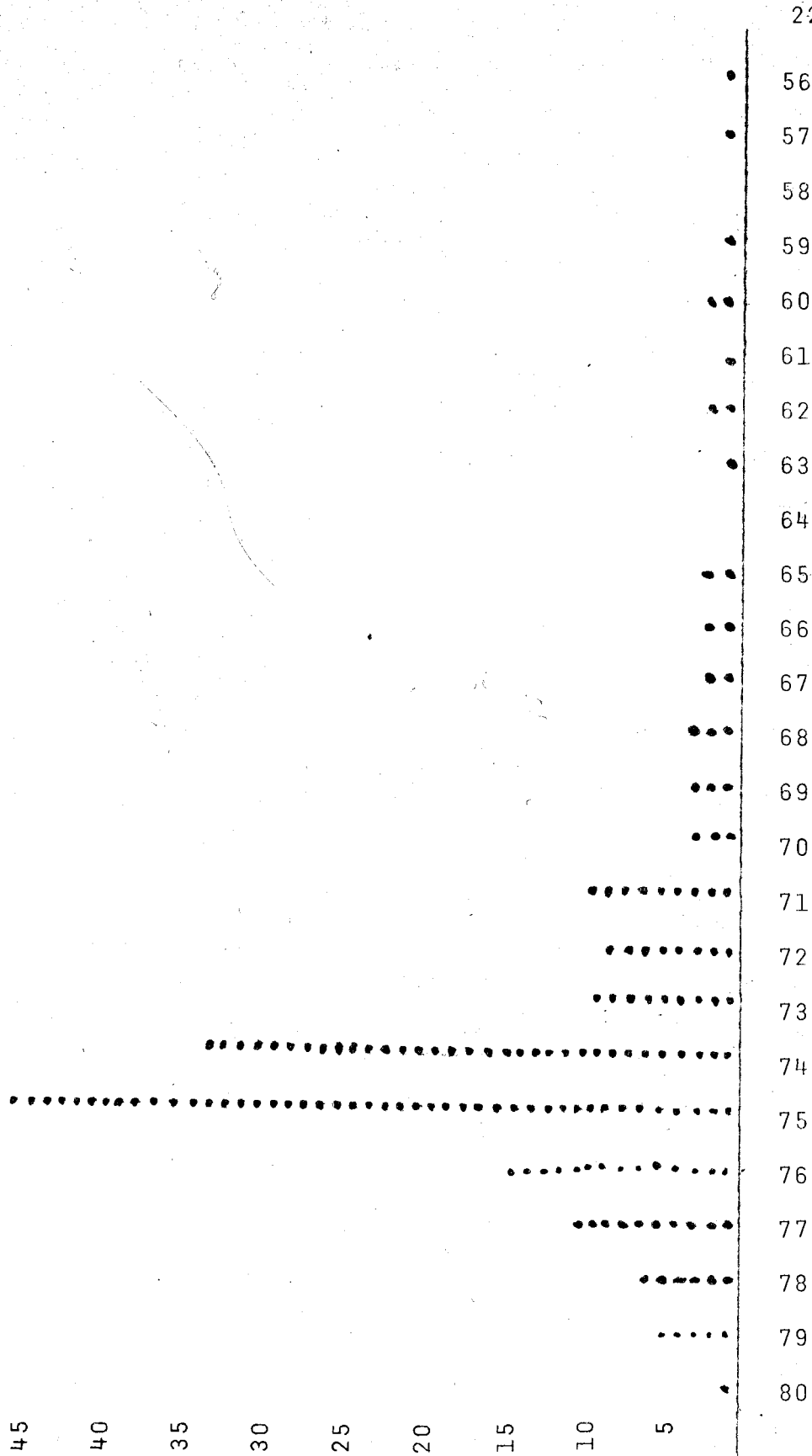
Arena, J. (1974)	Katz et al. (1974)
Brainard, E. (1973)	Rubin, L. (1971)
Carmichael & Kallenback (1971)	Sakamoto, P. S. (1975)
Flatter & Koopman (1976)	
Hart, H. A. (1974)	

Microteaching models.

Phillips, E. T. (1975)

APPENDIX D

Frequency Distribution for Dates of Articles in the Literature Review



Note. Works by multiple authors are listed once only under the date of publication of the collected work.

APPENDIX E
Copy of the Questionnaire

222,



SIMON FRASER UNIVERSITY, BURNABY, B.C., CANADA V5A 1S6
FACULTY OF EDUCATION, 291 3395

April 7, 1979

Dear

A study is currently being conducted in British Columbia by a task force to determine the current status of teacher in-service education. This letter is to outline the nature and the purpose of the study and to request your participation.

A major symposium, hosted by Simon Fraser University, is to be held on in-service teacher education in May, 1979. A brochure is enclosed. Five task forces have begun work to prepare for the conference. Each task force is representative of major groups in the province. In addition to the task force on research and evaluation, which is conducting the study, four other areas of in-service will receive consideration; the development of large scale systems for in-service, the teacher and the school as a focus for in-service, purpose and functions of in-service, and delivery systems.

In the pre-conference deliberations several task force committees expressed the need to obtain information on the current status of in-service education in British Columbia: the task force on research and evaluation is attempting to do this. The type of information required is solicited on the pages that follow. We ask your cooperation in providing as much of this information as possible and where applicable, for the school year September 1977 to September 1978.

In order to obtain the information prior to the symposium, telephone interviews will be conducted between April 18 and April 25. The questionnaire is intended to assist you in compiling the information necessary for this study prior to the telephone interview. After the data has been compiled and collated, copies will be available. Your cooperation in this endeavour is greatly appreciated.

If you have any immediate questions or concerns, please contact me at Simon Fraser University (291-3643) or Ms. Shirley Bens at 461-0616.

You will be contacted by telephone by members of the research and evaluation committee between April 18 and April 25. Please do not mail the questionnaire to Simon Fraser University.

Sincerely,

Dr. Marvin Wideen



5. Any additional information that you may have on the strengths or weaknesses of delivery systems, in-service models, or modes of presentation, etc. would be greatly appreciated by a number of the task force groups. We would also invite any suggestions that you may have for the task group committees, and would be interested in any particular concerns you may have about in-service education in British Columbia

NOTE: The following nine questions apply to a specific in-service topic. We would greatly appreciate receiving this intensive breakdown for each of your two top priority in-service topics for the school year, September 1977 to September 1978. Two separate forms are provided for each of the two topics.

TOPIC

PRIORITY NUMBER

6. Please specify the approximate number of sessions for this topic using the following in-service modes

- a) one day workshops _____
- b) 2 day (10 - 20 hour) workshops _____
- c) summer school programmes
 - i. number of participants (credit courses) _____
 - ii. number of participants (non-credit courses) _____
 - iii. number of courses offered (credit courses) _____
 - iv. number of courses offered (non-credit courses) _____
- d) educational leave of absence (number of participants) _____
- e) "in" school in-service (demonstration, visitations) _____
- f) other (specify) _____

7. Which type of in-service model was most frequently employed for this topic?

- a) lecture presentation _____
- b) participation workshop _____
- c) discussion groups _____
- d) films or video presentation _____
- e) demonstration presentation _____
- f) other (specify) _____
- g) combination of ... (please list, e.g. a & b) _____

8. Was this topic geared to

- a) beginning teachers (1 - 3 years of experience) _____
- b) teachers with 3 to 10 years' experience _____
- c) teachers with 11 or more years of experience _____
- d) other (specify) _____
- e) combination of the above (please list) _____

9. Please indicate who initiated the program (i.e. who identified the need for the in-service program)

- a) school staffs _____
 - b) school principals _____
 - c) local teacher groups _____
 - d) district staff
 - i. coordinator/consultant _____
 - ii. supervisor _____
 - iii. director _____
 - iv. superintendent _____
 - e) Department of Education _____
 - f) other (specify) _____
-

10. Please indicate who was responsible for the actual organization of the event
- a) teacher elected or appointed by the local teachers' association
 - i. no release time _____
 - ii. 5 - 25% release time _____
 - iii. 26 - 50% release time _____
 - iv. over 50% release time _____
 - b) a committee elected or appointed by the local teachers' association _____
 - c) a member of the district staff
 - i. in-service coordinator _____
 - ii. other coordinators or consultants _____
 - iii. supervisor _____
 - iv. director _____
 - v. superintendent _____
 - d) combined committees of elected or appointed teachers and district staff _____
11. Please indicate the resource persons used for the in-service program
- a) own teachers _____
 - b) own administrators (vice principal and/or principal) _____
 - c) own district staff _____
 - d) other district teachers or administrators _____
 - e) University of British Columbia personnel _____
 - f) University of Victoria personnel _____

- g) Simon Fraser University personnel _____
- h) Ministry of Education personnel _____
- i) other (specify) _____

12. How was the resource person located:

- a) by district staff _____
- b) by teacher or committee elected by the local teachers' association _____
- c) through the B. C. T. F. _____
- d) through the University of British Columbia field development offices _____
- e) through the University of Victoria field development offices _____
- f) through Simon Fraser University field development offices _____
- g) through the Department of Education _____
- h) other (specify) _____

13. Was a needs assessment conducted prior to this in-service program?

___ Yes

___ No

If "yes" briefly describe the needs assessment procedure.

14. Was a post in-service evaluation conducted?

a) a formal evaluation using test measurements

Yes

No

If "yes" briefly describe the formal evaluation procedure.

b) informal evaluation as questionnaires, etc.

Yes

No

If "yes" briefly describe the formal evaluation procedure.

APPENDIX F

Organizations Surveyed in Sample One

Mr. T. S. Sankey
Director of Instruction
Courtenay

Mr. J. Ross White
Director of Instruction
Nanaimo

Mr. Bert Morgan
Director of Instruction
Duncan

Mr. Roy Lister
Director of Instruction,
Curriculum
Victoria

Mr. Jack Allen
Supervisor of Instruction
Cranbrook

Mr. A. S. Tindill
Director of Instruction
Nelson

Mr. A. W. Webb
Director of Instruction
Kelowna

Ms. E. Kathy McNally
Teacher Consultant &
Professional Development
Coordinator
Vernon

District Superintendent
of Schools
Kamloops

Mr. Floyd G. Harry
Director of Instruction
Prince Rupert, B. C.

Ms. Dorothy Fast
Manager (Curriculum -
Programmes)
Dawson Creek

Mr. Owen Corcoran
Co-ordinator of
Professional Development
Prince George

Dr. Len Sampson
Superintendent of
Instruction
Langley

Mr. Jack Cresswell
In-service Coordinator
Delta

Mr. John Burdikin
Assistant Superintendent
Coquitlam

Dr. E. Froese
District Superintendent
Burnaby

Dr. Alf Clinton
Assistant Superintendent
Vancouver

Mr. Robin Brayne
Supervisor of Instruction
North Vancouver

Dr. J. Trivett
Simon Fraser University

Division Director and
Co-ordinator
Nutritional Education in
the Schools
Ministry of Health,
Victoria

Dr. Bruce Fraser,
Executive Director,
Programme Services
Department of Education

Dr. Russ Leskiw
Superintendent of
Field Personnel
Ministry of Education

Ms. Sharon Alexander
Academic Assistant,
Professional Programmes
University of Victoria

Dr. Dennis Milburn
Director, Field Development
Office
University of British Columbia

Mr. Gary Cleave
B. C. School Trustees Association

Mr. Mike Zlotnik
B. C. Teachers Federation

APPENDIX G

Organizations Surveyed in Sample Two

Mr. R. S. Sankey
 Director of Instruction
 School District #71
 892 Harmston Avenue
 Courtenay, B. C.
 V9N 2X8

Ms. Dorothy Fast
 Manager (Curriculum-
 Programmes)
 School District #59
 929-106th Avenue
 Dawson Creek, B. C.
 V1G 2N9

Mr. Floyd G. Harry
 Director of Instruction
 School District #52
 Box 517
 Prince Rupert, B. C.
 V8J 3R6

Mr. Bert Morgan
 Director of Instruction
 School District #65
 2557 Beverly Street
 Duncan, B. C.
 V9L 2X3

Mr. J. Ross White
 Director of Instruction
 School District #68
 395 Wakesiah Avenue
 Nanaimo, B. C.
 V9R 3K6

Mr. Roy Lister
 Director of Instruction,
 Curriculum
 Department of Education
 Parliament Buildings
 Victoria, B. C.

Mr. Jack Allen
 Supervisor of Instruction
 School District #2
 703 Cranbrook Street
 Cranbrook, B. C.
 V1C 3S1

Mr. A. S. Tindill
 Director of Instruction
 School District #7
 308 Anderson Street
 Nelson, B. C.
 V1L 3Y2

Mr. A. W. Webb
 Director of Instruction
 School District #23
 599 Harvey Avenue
 Kelowna, B. C.
 V1Y 6C8

Ms. E. Kathy McNally
 Teacher Consultant &
 Professional Development
 Drawer 1028
 Vernon, B. C.
 V1T 6N2

District Superintendent of
 Schools
 School District #24
 1383-9th Avenue
 Kamloops, B. C.
 V2C 3X7

Mr. Owen Corcoran
 Coordinator of
 Professional Development
 School District #57
 1894-9th Avenue
 Prince George, B. C.
 V2M 6G6

Dr. Len Sampson
 Director of Instruction
 School District #35
 22259-48th Avenue
 Langley, B. C.
 V3A 3Z7

Mr. Jack Cresswell
 In-Service Coordinator
 School District #37
 4629-51st Street
 Delta, B. C.
 V4K 2V9

Mr. John Burdikin
 Assistant Superintendent
 School District #43
 550 Poirier Street
 Coquitlam, B. C.
 V3J 6A7

Dr. E. Froese
 District Superintendent
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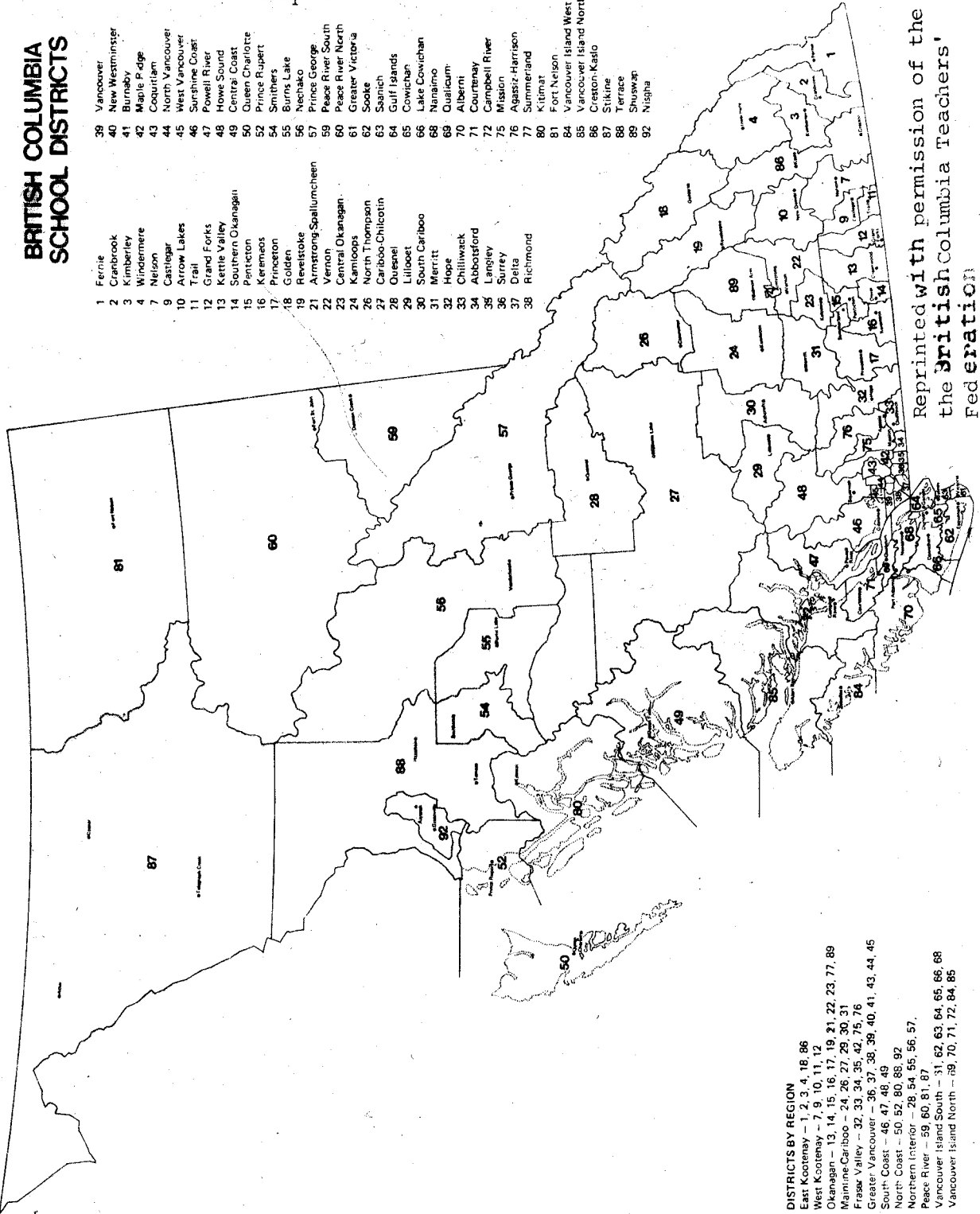
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APPENDIX H

Map of School Districts

**BRITISH COLUMBIA
SCHOOL DISTRICTS**

- 1 Fernie
- 2 Cranbrook
- 3 Kimberley
- 4 Windermere
- 7 Nelson
- 9 Castlegar
- 10 Arrow Lakes
- 11 Trail
- 12 Grand Forks
- 13 Kettle Valley
- 14 Southern Okanagan
- 15 Penticton
- 16 Keremeos
- 17 Princeton
- 18 Golden
- 19 Revelstoke
- 21 Armstrong-Spallumcheen
- 22 Vernon
- 23 Central Okanagan
- 24 Kamloops
- 26 North Thompson
- 27 Cariboo-Chilcotin
- 28 Ouesnel
- 29 Lillooet
- 30 South Cariboo
- 31 Merritt
- 32 Hope
- 33 Chilliwack
- 34 Abbotsford
- 35 Langley
- 36 Surrey
- 37 Delta
- 38 Richmond
- 39 Vancouver
- 40 New Westminster
- 41 Burnaby
- 42 Maple Ridge
- 43 Coquitlam
- 44 North Vancouver
- 45 West Vancouver
- 46 Sunshine Coast
- 47 Powell River
- 48 Howe Sound
- 49 Central Coast
- 50 Queen Charlotte
- 52 Prince Rupert
- 54 Smithers
- 55 Burns Lake
- 56 Nechako
- 57 Prince George
- 59 Peace River South
- 60 Peace River North
- 61 Greater Victoria
- 62 Sooke
- 63 Saanich
- 64 Gulf Islands
- 65 Cowichan
- 66 Lake Cowichan
- 68 Nanaimo
- 69 Qualicum
- 70 Alberni
- 71 Courtenay
- 72 Campbell River
- 75 Mission
- 76 Agassiz-Harrison
- 77 Summerland
- 80 Kitimat
- 81 Fort Nelson
- 84 Vancouver Island West
- 85 Vancouver Island North
- 86 Creston-Kaslo
- 87 Stikine
- 88 Terrace
- 89 Shuswap
- 92 Nisga'a



DISTRICTS BY REGION
 East Kootenay - 1, 2, 3, 4, 18, 86
 West Kootenay - 7, 9, 10, 11, 12
 Okanagan - 13, 14, 15, 16, 17, 19, 21, 22, 23, 77, 89
 Mainline Cariboo - 24, 26, 27, 29, 30, 31
 Fraser Valley - 32, 33, 34, 35, 42, 75, 76
 Greater Vancouver - 36, 37, 38, 39, 40, 41, 43, 44, 45
 South Coast - 46, 47, 48, 49
 North Coast - 50, 52, 80, 88, 92
 Northern Interior - 28, 54, 55, 56, 57
 Peace River - 59, 60, 81, 87
 Vancouver Island South - 31, 62, 63, 64, 65, 66, 68
 Vancouver Island North - 89, 70, 71, 72, 84, 85

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