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SOURCES OF INFLUENCE FOR INSTRUCTIONAL

INNOVATIONS IN CANADIAN URBAN

SCHOOL SYSTEMS AS PERCEIVED

BY SUPERINTENDENTS

by

(C) JOHN ALFRED EARLE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

EDMONTON, ALBERTA

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THE UNIVERSITY OF ALBERTA

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The undersigned certify that they have read, and

recommend to the Faculty of Graduate Studies for acceptance,

a thesis entitled "An Analysis of the Sources cf Influence

for Instructional Innovations in Canadian Urban School

Systems," submitted by John Alfred Earle in partial fulfill-

ment of the requirements for the degree of Doctor of

Philosophy.

[signature]
Supervisor

[signature]

[signature]

[signature]

Date *Oct. 28, 1968*

[signature]
External Examiner

ABSTRACT

The main purpose of this study was the identification of
the major sources of influence for instructional innovation in
Canadian urban school systems during the period from 1954 to
1964 as perceived by superintendents. Data for the study were
obtained from fifty-nine superintendents of urban school systems
representing each province of Canada. Two questionnaires: an
Inventory of Instructional Innovations and a Program Development
Form were designed to identify the sources of influence for
innovation. The completed questionnaires also provided data on
the number of instructional innovations, as well as certain
characteristics of the superintendents and their school systems
during the decade under study.

The analyses of the perceptions of the superintendents
indicated that the significant sources of influence were located
within the school systems, rather than within the environment of
the school systems. The superintendents perceived themselves to
be the most significant single influence for the innovations
reported. Situational factors, such as the appointment of the
superintendent from within or from without a particular school
system, the length of tenure of the superintendents, and the
number of levels of hierarchical order within a school system
were not related significantly to the number of instructional
innovations developed. The superintendents did not perceive
any significant differences of influence for innovation among

provincial departments of education, local school boards, and school system faculty.

Among the potential sources of influence for innovation from the environment in which the school systems existed, the superintendents perceived the following order of influence: the general public, professional educational associations, teacher training institutions and universities, commercial organizations, and private foundations.

Analyses of the data suggested that Canadian urban education, as represented by the school systems participating in the study, was characterized by stability rather than by change for the period from 1954 to 1964. When change did occur, the significant agents of change were found to be within the group of educators at the system level according to the superintendents. Potential sources for innovation located outside the local school systems were not perceived by the superintendents to be as significant as the sources located inside the school systems.

ACKNOWLEDGEMENTS

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CHAPTER   I

THE PROBLEM

The strength of an idea to direct and to motivate change
does not lie in the idea alone but also lies in those influences
which cause the idea to be accepted or rejected. There is no
shortage of ideas in education today. However, there appears to
be a dearth of literature which identifies the agents who make
the ideas effective in Canada.

Research which attempts to identify the sources of influ-
ence for change has recently begun to focus attention on the
personnel who seem responsible for educational change. This
study proposed to determine the significance of these potential
agents of change and used a theory developed by Griffiths
(6, p. 425-536). This theory is based on the rationale of the
general systems theory of organizational behavior as outlined by
Hearn (7, 1958). The study attempted to modify some of Griffiths'
propositions by incorporating the research from two recent
studies of educational change in the United States. The first
was developed by the National Education Association (12); the
second was conducted in New York State by Brickell (2, 1961).
The research by the National Education Association and Brickell
indicates that American public school systems were not character-
ized by change. Their studies seemed to support the view that
educational organizations closely approximate the ideal type of
bureaucratic organization with their outstanding characteristic

being stability not change.

This study was concerned with innovations in instructional programs of urban school systems in Canada for the period from 1954 to 1964. The major problem was the identification of the main sources of influence for change in Canadian public school systems.

At present there are influences within society which are creating a new environment for education. In general, limited knowledge exists concerning the nature and effects of these influences. Few studies, in Canada, have determined the effect these influences have had on our educational systems. The studies demonstrating the process by which educational change is initiated and developed have been conducted mainly in the United States. Whether similar influences are evident to the same degree in Canada remains to be seen.

Systems in Education

The model used by Griffiths, in developing his theory of educational change was based on systems theory as outlined by Hearn (6, 1958). A system is defined as a complex of elements in mutual interaction (7,p. 39). Allport stated that a system is something that is concerned with some kind of activity and preserves a kind of integration and unity, and a particular system can be recognized as distinct from other systems to which it may be dynamically related (1, p. 469). Hearn added that each system consists of _objects_ which are the parts of the system,

attributes which are the properties of the objects, and relation-
ships which help tie the system together (7, p. 39). Every
order of system has sub-systems and each is a part of a supra-
system consisting of a system in its environment. Systems may
be open or closed. Most organic systems are open; they
exchange materials, energies, or information with their environ-
ments. Whether a given system is open or closed depends on the
amount of interaction with its environment. Open systems have
important inputs and outputs of both energy and information from
their environment. A system is closed if there are no inputs or
outputs of both energy and information.

Open systems have the following properties which distin-
guish them from closed systems.

1. Open systems have important inputs and outputs of both
   energy and information; whereas closed systems do not.

2. Open systems tend to maintain themselves in steady
   states. Given a constant flow of inputs, a constant
   ratio among the components of the system is maintained.

3. Open systems are self-regulating. After any disturb-
   ance, a system tends to re-establish a steady state.
   If external conditions change in any major way, the
   system can react to establish another steady state.

4. Open systems are characterized by having equifinality,
   which is the property which enables them to achieve
   identical results from different initial conditions.

5. The steady state of open systems is maintained in part
   by the dynamic interplay of its sub-systems operating
   as functional processes. Each sub-system has its
   function to perform. This condition is called functional
   unity, and is defined as a condition in which all the
   parts of the system work together with a sufficient de-
   gree of harmony without producing persistent conflicts
   which cannot be resolved or regulated.

6. Open systems maintain their steady state through <u>feed-back</u> processes, described as the property which enables certain systems to feed back a certain portion of their outputs, thus affecting succeeding outputs.

7. Open systems are characterized by <u>progressive segregation</u> which imposes limitations on the above regulatory processes. Progressive segregation involves the division of the system into a hierarchical order of subordinate systems which gain a certain independence of each other.

8. Progressive segregation is related to the production of negative entrophy wherein there is a progression to higher levels of order and differentiation. Accompanying this process is the property of <u>progressive mechanization</u>, wherein certain processes become set as fixed arrangements.

There are two consequences of the operation of these progressive processes. One is that the forces toward differentiation and homogeneity are held in check, that is, progressive segregation and mechanization are life-maintaining. The other is that they impose constraints upon the free interplay of the functional sub-systems of the system, that is they seem to impose a limit upon the degree to which the system may achieve its potentiality (7, p. 45).

For purposes of this study, the provincial system of education was defined as the system. The various urban school systems were designated as sub-systems and the environment was defined as the supra-system.

The Purpose of the Study

The major purpose of the study was to identify the sources of influence for instructional innovations in Canadian education. The significance of such a study was indicated by Rogers:

I would agree that in conjunction with research to develop educational innovations, we need to study how these new ideas spread and are adopted. Our past research in educational diffusion has been rather unimaginative, and has been the almost sole property of one university (Columbia). . . . and only one study of school superintendents in spite of their importance in school adoption decisions (14, p. 60).

This study attempts to offer insights into a current dilemma best expressed by Neal, who stated:

Certainly one must pause and wonder why Canadian and Australian educators are not noted for innovations and experimentation, and correspondingly why change and vitality appear more frequently in the United States schools (13, p. 34).

Assumptions

The study assumed that the local superintendent possessed the information needed to complete the questionnaire. In most cases it was assumed that he would have been in the school system for the period under study, or he would have possessed knowledge of the actions and interactions involved in the initiation and development of the innovations.

A second assumption was that the local superintendent was the best single source of information on instructional innovations within the school system and that his perception of the change process was indicative of the actual process.

Limitations of the Study

A major limitation was the absence of any research on this subject, on the national level, in Canada. The application of results from studies conducted in the United States may or may not be applicable to the Canadian situation.

Another limitation arose from the problem in attempting to determine the degrees of influence among the many potential agents of change from responses offered by only one of them, although that one, the superintendent, is considered by most researchers to be the most influential (9, p. 411). The study was directed to the superintendents because recent research seemed to support Carlson's conclusion that " . . . the school superintendent is at the focal point in the decision process regarding innovations" (4, p. 10).

Obtaining data by the questionnaire method presented another limitation. However, this method is similar to studies conducted in the United States. The National Education Association study used this method exclusively. Brickell's study used questionnaires to determine the extent, rate, and direction of instructional change.

Delimitations of the Study

The study was delimited to an analysis of the sources of instructional innovations in the elementary and secondary public school systems in Canada. A list of the urban school systems whose superintendents participated in the study is found in Appendix F.

The study was delimited to an analysis of the innovations in the instructional programs of the above school systems, and focussed on the initiators and developers of these programs. As such it was concerned with innovations developed at the level of

the system rather than with those initiated by individual teachers for use within their own classrooms.

Since the validity of the data for the study was dependent to a great extent on the knowledge and memory of the superintendents, it was decided that a ten year period was the maximum time to be examined. The period from 1954 to 1964, to which the research was delimited, was one of great activity in Canadian education. A number of provincial Royal Commission reports on education were tabled in this period. In addition, two Canadian Conferences on Education were held during this time.

Definitions

Supra-system. This is also referred to as the environment and is the set of all entities which surround the system whose action may affect the system, and may be affected by the system. Universities, teacher training institutions, teacher professional organizations, and other organizations indirectly connected to public school systems were included in the supra-system.

System. A system is defined as a complex of elements in mutual interaction (7, p. 39). Allport states that a system is something that is concerned with some kind of activity and preserves a kind of integration and unity (1, p. 469).

Provincial school system. This will be referred to as the system and includes all sub-systems in elementary and secondary education in each province, including public, separate, and denominational schools where they exist, and includes other sub-systems related to these, provincial departments of education, local school boards, school administrators, both local and provincial, teachers, and students.

Steady state. A state in which the system appears to be constant, although its constancy is maintained in

continuous change. This concept is similar to Lewin's quasi-stationary equilibrium.

Innovation. An innovation is any alteration in the structure of the system, in any of its processes, or in its goals, or purposes. Miles states that an innovation is "a deliberate, novel, specific change, which is thought to be more efficacious in accomplishing the goals of a system" (11, p. 14).

Instructional innovation. Any alteration in the institutional elements of the system or in their utilization. The institutional elements include the teachers, subjects, methods, students, times, and places of instruction.

Local superintendents. The chief executive officers of local school boards.

Design of the Study

Data were supplied by superintendents of urban school districts in Canada who participated in the study. Superintendents of school systems in the larger urban centres of population in Canada were initially selected, because previous studies in the United States (Brickell, N.E.A.) indicated that these centres are more likely to be "lighthouse" areas of educational change. Population centres of 10,000 and over were used as the standard because of the variation in terminology in use across Canada for these larger population areas. The list of school systems is given in Appendix F.

Superintendents of the school systems initially selected were contacted by mail and questionnaires were forwarded to those who indicated a willingness to participate in the study.

The data gathering instrument consisted of two parts: an Inventory of Instructional Innovations (Appendix D) and a Program Development Form (Appendix E).

<u>Inventory</u> <u>of</u> <u>innovations</u>. This part of the question-
naire contained a checklist on which the superintendent was
requested to enter all the instructional innovations developed
within his system between 1954 and 1964, and to check the
attributes of each change project presented on the questionnaire.

The inventory also requested information on the personal
and professional qualifications of the superintendent; on the
size of the school system and community; on the size, complex-
ity, and composition of the administrative organization of the
school system.

In addition to completing the Inventory of Instructional
Innovations, the superintendents selected three of the instruct-
ional innovations developed in their school system between 1954
and 1964, and completed a Program Development Form on each of the
three. They were requested to select the innovations which they
considered to have had the greatest effect in changing all, or
any of the institutional elements of their school systems. The
Program Development Form was designed to indicate the perceptions
of the superintendents related to the effect of these innovations
on the institutional elements of the school systems, and to
determine the relative influence of various potential change
agents in initiating and developing the innovations.

Hypotheses

1.0 The most significant sources of influence for instruct-
ional innovation in Canadian urban school systems
emanate from the supra-system.

1.1 Within the supra-system, the potential sources of influence for instructional innovation are in the rank order of:

    1) the general public,
    2) commercial organizations,
    3) professional educational associations,
    4) teacher training institutions and universities, and
    5) private foundations.

2.0 The most significant influence for instructional innovation, within the system or sub-system, is the superintendent.

2.1 The number of instructional innovations developed during the tenure of a superintendent is greater when the superintendent is appointed from without the system, than when he is appointed from within.

2.2 The number of instructional innovations developed within a school system is inversely proportional to the years of tenure of the superintendent.

2.3 The number of instructional innovations developed within a school system is inversely proportional to the levels of authority within the system.

3.0 Among the potential sources of influence for change in the system or sub-system, excluding the superintendent, the order of influence is:

    1) provincial departments of education,
    2) local school boards, and
    3) school system faculty.

The first major hypothesis proposed that when change in school systems did occur, the initiative for the change was from the supra-system, that is, from the environment in which the system existed, and with which it interacted. Brickell states that if, for some reason, the general public develops an interest in a new type of program (for example, foreign language instruction in elementary schools), that program is likely to be developed in the local classrooms (2, p. 20). Other external stimuli have

had similar influence on both the rate and direction of educational change. Brickell cites the influence of the Soviet Sputnik I on instructional change in New York State (2, p. 18). The rate of instructional innovation, in the public school systems of that state, more than doubled within fifteen months after the launching of the first space capsule.

MacKenzie claims that the influence of critics of education, from the 40's to the present, has served as a "softening up" process which has permitted the sweeping changes of this decade (9, p. 79). He cites the influence of Lucille Cardin Crain on textbook revision, Frank Gannett and his Committee for Constitutional Government, Marvin K. Hart and the National Economic Council, Allan Zoll and the National Council for American Education. Other individuals who have created the climate for change in the United States include Bestor, who attacked educational methods and emphases; Adler and Mayer, who attacked the purposes and under-lying rationale of the school systems in the United States.

Brickell found that professional organizations were the supreme communicators in the profession (2, p. 53). However, he states the communication provided was random, disjointed, and overlapping. As a group, professional organizations had little influence for educational change in instructional programs. Practising administrators, and teachers, believed that the full truth about innovations in other school systems was unavailable through use of the professional literature, formal

speeches at conventions, workshops, research reports, and information sources. Brickell found that the single greatest persuasive influence for change was visitation to new instructional programs in schools very much like the ones from which the superintendents had come (2, p. 43).

Teacher training institutions and universities were found to be ineffective in exerting direct influence on elementary and secondary programs, and these institutions did not consider this to be one of their basic responsibilities (3, p. 508). High schools were sensitive to college expectations but these concerned the qualifications of students, and not the instructional methods or programs of the high schools. Anxiety over college admission was a general anxiety in high economic status communities but the effect this had on the schools was quite diffuse. Brickell states that the evidence gathered in his study pointed unwaveringly toward the conclusion that innovations in college-related subjects had received little more additional attention; than innovations in other subjects (2, p. 45). He also found that teacher training institutions did not train teachers in new instructional processes until these were in general use in the public schools (3, p. 508).

The second major hypothesis proposed that the superintendent is the most significant influence for instructional innovation within the system or sub-system. Brickell states that this is so simply because he has the authority to precipitate a decision (3, p. 502). The literature seems to support the

conclusion that authority is a critical element in innovation. In discussing the role of various potential change agents, MacKenzie indicated that the superintendent appeared to be the most powerful single participant in change (10, p. 411).

Both Carlson's study on executive succession and the Descriptive Criteria of Success study in organizational change, support the proposition that the superintendent appointed from without the school system is the most frequent change agent (5, p. 54). Lewin's theory of social change and General Systems Theory offer an explanation for this conclusion. Whether the superintendents' actions result from their ignorance of the functional unity of their systems, or their lack of feedback, or through their design in the use of controlled conflict, remains to be researched.

A study of the development of the steady state in open systems would suggest that the number of innovations will be inversely proportional to the length of service of the superintendent in the system (6, p. 434). The self-regulatory processes enable the system to react in such a way as to re-establish a steady state similar to the original after any minor disturbance. These processes also provide for the establishment of another steady state if a stimulus is prolonged, or if external conditions change in any major way. Griffiths' theory offers an explanation for this phenomenon (6, p. 434). The longer a superintendent remains in a position, the longer the self-regulatory processes will have had time to

operate. Feedback processes have become fully developed. Progressive segregation has enabled sub-systems to become structured and independent to a degree. When this stage is reached, change is more difficult because interaction decreases and the chances for effective communication are diminished. The sub-systems, in time, develop conflict-reducing behavior which is counter to change-inducing behavior.

One of Griffiths' propositions states that the more hierarchical the structure of an organization the less the possibility for change (6, p. 434). Hierarchical structure makes innovation from the bottom virtually impossible, and the independence of the sub-systems isolates them from innovative activity.

General Systems Theory describes open systems as having negative entrophy and functional unity. The theory hypothesizes that these properties are conflict-reduction processes, which enable all parts of the system to work together with a sufficient degree of harmony and internal consistency. The two limiting properties of open systems, progressive segregation and mechanization, may impose restraints on the system's achievement of its goals or its potential. This suggests that increased amounts of progressive segregation (hierarchical structure) will inhibit change.

The third major hypothesis attempted to rank the potential sources of influence for innovation. Brickell concluded that the Department of Education in New York State was an active stimulus

the professional staff had to explain why it was not adopted.

An extreme expression of the role of the classroom teacher in instructional change is offered by Wayland (15, p. 43). His central thesis is that the teacher is a functionary in an essentially bureaucratic system. As such, the teacher is a replaceable part in a rationally organized system and most of the significant aspects of his work are determined for him. Wayland offers nine factors which operate within most present school systems, and which set the limits of the decision-making of the teacher within the system. As a result of being a functionary in the system others determine whom he will teach; what he will teach; where, when, and for how long he will teach; how he will evaluate the work of students; and (in a measure) how he will teach. According to Wayland, the factors which have led to this development are the need for integration in school systems, the division of labor, rationalization of the teacher's work, differences in personality and technical competence of the staff, limitation of time, traditions of the school, public responsibility of the superintendents, turnover of staff, the size, and complexity of modern school systems (15, p. 44).

These speculations seem to be substantiated by the research of Brickell (2, p. 24). He concluded that, contrary to general opinion, teachers were not change agents for institutional innovations. Those changes calling for significant rearrangements of the structural elements of the institution depended almost exclusively upon administrative initiative. He found that even

in systems where administrative authority was characterized by a high level of consideration, teachers seldom suggested new types of working patterns for themselves. Brickell added that the language of modern school administration is not descriptive of the actual process. Phrases and concepts like democratic administration, staff involvement, and the team approach are used by administrators to hide the great strength of administrative behavior which is actually autocratic in practice.

General Systems Theory offers an explanation for this situation. The effects of progressive segregation and mechanization on open systems suggests the difficulty of change emanating from the bottom. The factors outlined by Wayland on the functionary role of the teacher in a bureaucratic organization offer further substantiation for the proposition.

This chapter outlined the problem to be researched and attempted to offer evidence from the review of the literature to support the hypotheses. Few studies were available in Canada to assist in the direction of this research. The major hypotheses were based on studies developed in the United States. The two succeeding chapters will outline the theoretical framework from which the study was developed.

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CHAPTER   II

GENERAL SYSTEMS THEORY

General Systems Theory describes a level of model-building
situated somewhere between the highly generalized constructions
of pure mathematics and the specific theories of the specialized
disciplines (8, p. 11). A. Lotka, in 1925, was probably the
first to advance the idea of general system laws, but it
remained to Ludwig von Bertalanffy to develop, in the late
thirties, the idea for a General Systems Theory (8, p. 3). Con-
cerned with the ever-increasing specialization of modern science,
the complexity of techniques, and the theoretical structures
within every field, he formulated a concept of general systems.

> Thus, there exist models, principles, and laws that
> apply to generalized systems or their subclasses,
> irrespective of their particular kind, the nature of
> their component elements, and the relations of "forces"
> between them. It seems legitimate to ask for a theory,
> not of systems of a more or less special kind, but of
> universal principles applying to systems in general.

> In this way we come to postulate a new discipline,
> called General Systems Theory. Its subject matter is the
> formulation and derivation of those principles which are
> valid for "systems" in general (8, p. 1).

Von Bertalanffy states two important consequences of
systems theory. The first permits the "appearance of struc-
tural similarities or isomorphies in different fields"
(8, p. 2). A theory of systems can be a useful tool by pro-
viding models that can be used in different fields, and which
can be safeguards from vague analogies which often have marred

the progress in these fields (8, p. 2).

Greenfield sees General Systems Theory providing the form and structure for the advancement of administration as a science (2, p. 19). Boulding offers similar expectations for the empirical world.

> At a low level of ambition, but with a high degree of confidence it aims to point out similarities in the theoretical constructions of different disciplines, where these exist, and to develop theoretical models having applicability to at least two different fields of study. At a higher level of ambition, but with perhaps a lower degree of confidence it hopes to develop something like a "spectrum" of theories--a system of systems which may perform the function of a "gestalt" in theoretical construction. Such "gestalts" in special fields have been of great value in directing research towards the gaps which they reveal. Thus the periodic table of elements in chemistry directed research for many decades towards the discovery of unknown elements to fill gaps in the table until the table was completely filled. Similarly a "system of systems" might be of value in directing the attention of theorists towards gaps in theoretical models, and might even be of value in pointing towards methods of filling them (1, p. 11).

A more important consequence of systems theory is that it can be concerned with a class of phenomena beyond the reach of classical physical science, that is, it can deal with phenomena other than those in closed systems, and with phenomena which are characterized not by disorganization but by organization. The importance of General Systems Theory for the social sciences, is that these sciences deal not with behavior which is appropriate to the second law of thermodynamics, but with behavior which exhibits wholeness, complexity, purposiveness, and regeneration (2, p. 20).

Today our main problem is that of organized complexity. Concepts like those of organization, wholeness, directiveness, theology, control, self-regulation, differentiation and the like are alien to conventional physics. However, they pop up everywhere in the biological, behavioral, and social sciences, and are, in fact, indispensable for dealing with living organisms or social groups. Thus a basic problem posed to modern science is a general theory of organization. General System Theory is in principle capable of giving exact definitions for such concepts and, in suitable cases, of putting them to quantitative analysis.(8, p. 3).

Characteristics of Systems

"A system is a set of objects together with relationships between the objects and between their attributes" (4, p. 18). To reduce the vagueness inherent in the above definition, an elaboration on the terms objects, relationships, and attributes is offered.

Objects. The objects in a system are its parts, elements, or components. Such objects are usually physical; in an educational system, objects are schools, books, teachers, and pupils (2, p. 21).

Attributes. Attributes are properties of objects. Attributes of schools would be their size, age, esprit, and facilities.

Relationships. The relationships referred to are those which tie the system together. They are the relationships which define the system and make it significant or important for some purpose. In school systems, relationships hold between the

economic resources of a district, the administration of schools, the competence of teachers, the attitudes of pupils, and the output of knowledge gained by pupils (2, p. 21).

Boundary. Systems are bounded in the sense that objects may be either in or out of the system. Boundaries, like relationships in systems, are determined by the nature of the purposes of the system (2, p. 22).

Boundaries may be operationally defined in terms of the intensity of interaction within groups of objects (5, p. 42), or in terms of energy concentration (7, p. 514). In both cases the definition may be somewhat arbitrary, though open to later empirical validation (2, p. 22). For purposes of this study, a system is bounded by the limits of the provincial system of education.

Environment. The environment of a system is everything beyond its boundaries which affects, or is affected by, the operation of the system.

> As in any scientific activity, one includes in the universe of system and environment all those objects which he feels are the most important, describes the inter-relationships as thoroughly as possible and pays closest attention to those attributes of most interest, neglecting those attributes which do not play essential roles (4, p. 20).

What the boundaries, objects, and environment of a system are, depends on the unit of activity to be analyzed. The supra-system, as defined in this study, corresponds to the environment of the system.

Sub-systems. From the definitions of environment and boundaries, it is evident that systems are hierarchical arrangements of smaller systems, with the definition of the system depending on the unit of analysis (2, p. 23). "Every order of system with the exception of the smallest has sub-systems, and all but the largest are part of a supra-system consisting of the system and its environment..." (5, p. 41). This study designated the urban school systems as sub-systems within their respective provincial system of education.

Open and Closed Systems

Systems may be open or closed. Most organic systems are open, meaning they exchange materials, energies, or information with their environments. Whether a given system is open or closed depends on the amount of interaction with its environment.

Closed system. A system is closed if there is no import or export of energies in any of its forms, such as information, heat, or physical materials (4, p. 23).

Open system. An open system has important inputs and outputs of energy from its environment (4, p. 23). General Systems Theory deals with open systems rather than closed.

> . . . we find systems which by their very nature and definition are not closed systems. Every living organism is essentially an open system. It maintains itself in a continuous inflow and outflow, building up and breaking down of components, never being, so long as it is alive, in a state of chemical and thermodynamic

Both open and closed systems are capable of attaining
stationary states, the nature of which, however, is dif-
ferent, in each case. A closed system must eventually
reach a state of equilibrium. An open system may attain
a stationary state in which the system appears also to
be constant although maintaining its constancy in a
continuous change, inflow, and outflow of materials
(5, p. 41).

A school system in a steady state would be character-
ized by the maintenance of a constant ratio among its insti-
tutional elements. Implication from the understanding of the
homeostatic steady state of social organizations led to the
first hypothesis of this study, that is, since there is a
tendency for open systems to maintain a steady state, the
major impetus for change comes from outside rather than from
inside an organization.

Equifinality. This is the property of open systems which
enables them to achieve identical results from different initial
conditions.

In any closed system, the final state is unequivocally
determined by the initial conditions; for example, the
motion in a planetary system where the positions of the
planets at a time are unequivocally determined by their
positions at a time to . . .

If either the initial conditions or the process is
altered the final state will also be changed. This is
not so in open systems. Here, the same final state may
be reached from different initial conditions and in
different ways (8, p. 4).

Equifinality has important implications for educational
systems, though not necessarily for purposes of this study.
This property explains why, with various different ratios of
institutional elements, the different systems and sub-systems

within Canadian education achieve to a greater or lesser degree
similar outputs. Greenfield explains the implications of this
property for education as follows:

> Given that schools, classes, and districts have char-
> acteristic steady states, these sub-systems will function
> to produce constant outputs. Thus, we can conceive, for
> example, of a classroom functioning to maintain output at
> a high level despite varying inputs such as pupils of
> different intelligence, social status, and attitude.
> Conversely, there could be schools whose steady state
> acted to depress output despite its new building,
> elaborate equipment, and ample economic resources. The
> equi-final process in systems would predict, too, that
> educational systems with similar inputs could achieve
> different outputs (2, p. 27).

Feedback. The property which enables systems to feed
back a certain portion of their outputs or behavior to their
inputs, thus affecting succeeding outputs, is defined as feed-
back. This occurs when portions of the output of a system are
re-directed back into the system as input (4, p. 23).

If control in the organization is inadequate, the causes
are most probably found in the feedback mechanisms. Boulding
suggests the following control mechanisms to ensure adequate
feedback. First, there must be a selection or sampling of
output. Second, the control mechanism must have receptors
capable of receiving the feedback. Third, the control
mechanism must be able to interpret feedback received, and be
able to make decisions in accordance with the information
received. Finally, the control mechanism must feed orders to
effectors which are capable of implementing the decisions of

the control mechanism. Any flaws in receptor, control, or effector mechanisms may destroy the flow of information or render it useless (1, p. 15).

Stating the implications of the feedback process for educational systems, Greenfield indicates the problems arising from inadequate feedback:

> In bureaucratic organizations such as educational systems, feedback may be inadequate for various reasons. Proliferation of functions and increase in size makes the flow of information more difficult and administrators become increasingly isolated from the information which they need to make decisions. In this case. . . channels of communication, which the administrator thinks of as windows become more like mirrors. Even if communication is clear, the personality of the administrator may render him incapable of making effective decisions. As is more often the case, the administrator simply does not know what effectors are appropriate to carry out certain decisions (2, p. 28).

Greenfield further states "feedback is information and information is the negative entrophy which maintains organization, it is feedback (or lack of it) which maintains educational systems in their characteristic steady states" (2, p. 29).

The feedback process apparently supports three hypotheses of this study: the hypothesized role of the superintendent in the change process; the relatively greater innovativeness of the superintendent appointed from without the system; and the characteristic steady state of educational systems (3, p. 433).

Progressive segregation. This property of systems involves the division of the system into a hierarchical order of

subordinate systems (4, p. 22). Operating within a system, progressive segregation imposes limitations on the regulatory processes of functional unity and feedback. In describing this property, Hall and Fagen state that "most non-abstract systems change with time. If these changes lead to a gradual transition from wholeness to summativity, the system is said to undergo progressive segregation" (4, p. 22). Two kinds of progressive segregation are proposed.

> The first, and simplest kind . . . corresponds to decay. It is as though, through much handling, the parts of a jigsaw puzzle become so rounded that a given piece no longer fits the other pieces better than another. Suppose an openwire carrier telephone system were suddenly deprived of maintenance, vacuum tubes would wear out, poles would rot, and so on, and eventually there would be a group of parts that no longer behaved as a system.

> The second kind of progressive segregation corresponds to growth. The system changes in the direction of increasing division into sub-systems and sub-subsystems or differentiation of functions. This kind of segregation seems to appear in systems involving some creative process or in evolutionary and developmental processes (4, p. 22).

The effects of progressive segregation suggest a decreasing rate of innovation for superintendents appointed from without the system. A sub-hypothesis of this study states that the number of innovations is inversely proportional to the tenure of the superintendent. Supporting this proposition Griffiths states:

> The longer an administrator stays in a position, the less likely he is to introduce change . . . All of the processes which bring about the steady state have been given time to operate. . . . Progressive segregation has set in; the subsystems have become structured and have gained relative

independence. Change is thus more difficult, because the frequency of interaction between sub-systems is decreased, and the chances for effective communication are diminished (3, p. 434).

Progressive systematization. This is simply the opposite of progressive segregation, and is a process in which there is change toward wholeness (4, p. 22). This property may consist of strengthening pre-existing relations among parts previously unrelated, the gradual addition of parts and relations to a system, or some combination of these changes.

As is the case with the other properties, it is possible for progressive segregation and systematization to occur in the same system.

These two processes can occur simultaneously, and go on indefinitely so that the system can exist in some kind of steady state as with the processes of anabolism and catabolism in the human body. These processes can also occur sequentially. (4, p. 22).

Centralization. Either progressive segregation or progressive systematization may be accompanied by progressive centralization. As the system evolves one part emerges as a central and controlling agency. A centralized system is one in which one element or sub-system plays a major or dominant role in the operation of the system. A small change in the dominant part may be reflected throughout the system causing considerable change. "An example from politics might be a totalitarian regime, decisions of an autocrat affecting behavior of the entire system" (4, p. 22).

The development of the theory of educational change by
Griffiths relies very substantially on the above three proper-
ties and the significance of their effects on systems is out-
lined in the following chapter.

Application of Systems Theory in Education

Applications of General Systems Theory are few. Recently,
however, its potential has become increasingly recognized.
Greenfield summarizes the efforts of three projects (2, p. 39).
Kershaw and McKean have indicated the general application of the
theory in education as follows:

> In a successful systems analysis, the analyst can vary
> the inputs, note the effect on both cost and output, and
> then decide that one system is better than another. He can
> tell you that . . . your money is best spent on a combina-
> tion of inputs he can specify because this combination will
> maximize output. Or, . . . if you tell him what output you
> want, he can tell you how to get it at minimum cost (6, p. 3).

Greenfield outlines the application of a cybernetic sys-
tems model to classroom instruction:

> In this study a computer was used to regulate the flow of
> information to pupils so that individual learning situat-
> ions could be presented to each pupil in the class. Control
> of rates of learning was maintained jointly by the computer
> and a teacher, with the teacher having general supervisory
> control and the computer greatly increasing the flow of
> information about rates of learning and providing each pupil
> with a lesson appropriate to his skill (2, p. 40).

In summarizing the implications of his own research,
Greenfield states:

> Perhaps the most important implication of the study is
> the tentative map which it offers as a guide to the oper-
> ation of educational systems. The nature of systems
> theory involves the analysis of complex wholes. Systems

theory thus provides a means of observing the action of
large educational units. Much research in education has
been in small units and the need to examine effects of
total operations is indicated if a theory of educational
organization is to be developed (2, p. 177).

Application of Systems Theory to Change Theory

In an attempt to develop a theory of administrative
change to account for some of the commonly made observations
concerning change in organizations, Griffiths proposes that
system theory serve as a model (3, p. 430). Using the model,
he proceeded to develop a set of propositions concerning change
in organizations. The research of Carlson and Brickell appar-
ently succeeded, to a degree, in validating the propositions
advanced by Griffiths.

The following chapter outlines a theory of educational
change based on the principles of General Systems Theory.

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CHAPTER III

THEORY OF EDUCATIONAL CHANGE

Educational Change Model

Characterization of a System. The theory of educational

change on which this study was based, uses General Systems

Theory as a model. First proposed by Griffiths, it is an

attempt to account for some of the commonly made observations

concerning change in educational organizations (8, pp. 425-436).

Griffiths' theory is an attempt to explain what is

rather than a proposal of what should be. The statement of the

problem as seen by Griffiths is as follows:

> The observer of social organizations is forced to the
> conclusion that organizations are not characterized by
> change. Indeed, when organizations are reviewed over a
> long period of time, their outstanding characteristic
> appears to be stability, rather than change. A social
> organization is the structural mechanism employed by a
> society to achieve some or more of its commonly accepted
> goals. Since the goals do not change noticeably and
> each organization's activities are rather clearly demar-
> cated, any particular organization comes into existence
> with a great deal of built-in stability. On the other
> hand, it is clear that organizations do change. In
> many the increments of change are small, but in others
> change is so radical as to cause the disappearance of
> the original organization and the appearance of a new
> one (8, p. 425).

Griffiths limited his consideration of change to formal

organizations which he defined as "an ensemble of individuals

who perform distinct but interrelated and coordinated functions,

in order that one or more tasks may be completed" (8, p. 426).

He further accepted Kaufman's description of organization as contributing to a definition of the concept.

> The term organization refers to all sets of human beings who exhibit the following five properties . . . :
>
> 1. Some criterion or set of criteria by which members may be distinguished from non-members (that is, demarcation of boundaries, though not necessarily territorial boundaries);
>
> 2. Some method of replenishment of materials used up by the members (also, for long-lived organizations, some method of replacing personnel lost by the organization through death, departure, disablement, or other factors);
>
> 3. Elicitation of effort of some kind by individual members of the organization;
>
> 4. Coordination of individual activities--that is to say some blending of the methods of eliciting effort and the methods of inhibiting activity such that the timing and character of each member's activities facilitate, or at least do not impede, the activities of other members;
>
> 5. Some pattern of distribution of materials and messages among the members, and perhaps the movement of people as well (10, p. 39).

Properties of a system. The definition of the properties of a system offered in explanation of General Systems Theory in the previous chapter apply to the properties in Griffiths' theory of change (8, p. 429). For purposes of this study, it was proposed that the ten provincial educational systems in Canada be considered as open systems, each having a supra-system (environment) and many sub-systems. Within each provincial system, each urban school system was considered a sub-system. Developing Griffiths' proposal for implementation in

this study, the provincial systems of education were considered
as open systems maintaining a definite boundary (8, p. 430).
Further, urban school systems were considered as sub-systems,
and the environment as a supra-system. The educational change
model is shown in Figure 1.

Significance of Theory and Model

The theory would suggest infrequency of change in the
educational system and sub-systems. Being open, they maintain
themselves in a steady state by keeping a constant ratio among
the components of the system. Change on the other hand will
require the establishment of new ratios among these same parts
or objects. Society, it may be argued, has enabled educational
systems to develop their characteristic steady state.

As is the case with other formal organizations, changes
do occur within educational systems, although Griffiths suggests
the increment of change may be small and infrequent. The
theory and model offer an explanation for these changes. The
major impetus for change was proposed to come from outside
rather than from inside the organization. Organizations tend
to maintain a steady state. Following minor changes the self-
regulating properties of open systems cause organizations to
revert to their original state. Carlson's study of executive
succession provided evidence to substantiate the self-
regulating properties of educational organizations (3, p. 17).

SUPRA-SYSTEM   SYSTEM   SUB-SYSTEM
Environment   Provincial   Urban School System
               School System
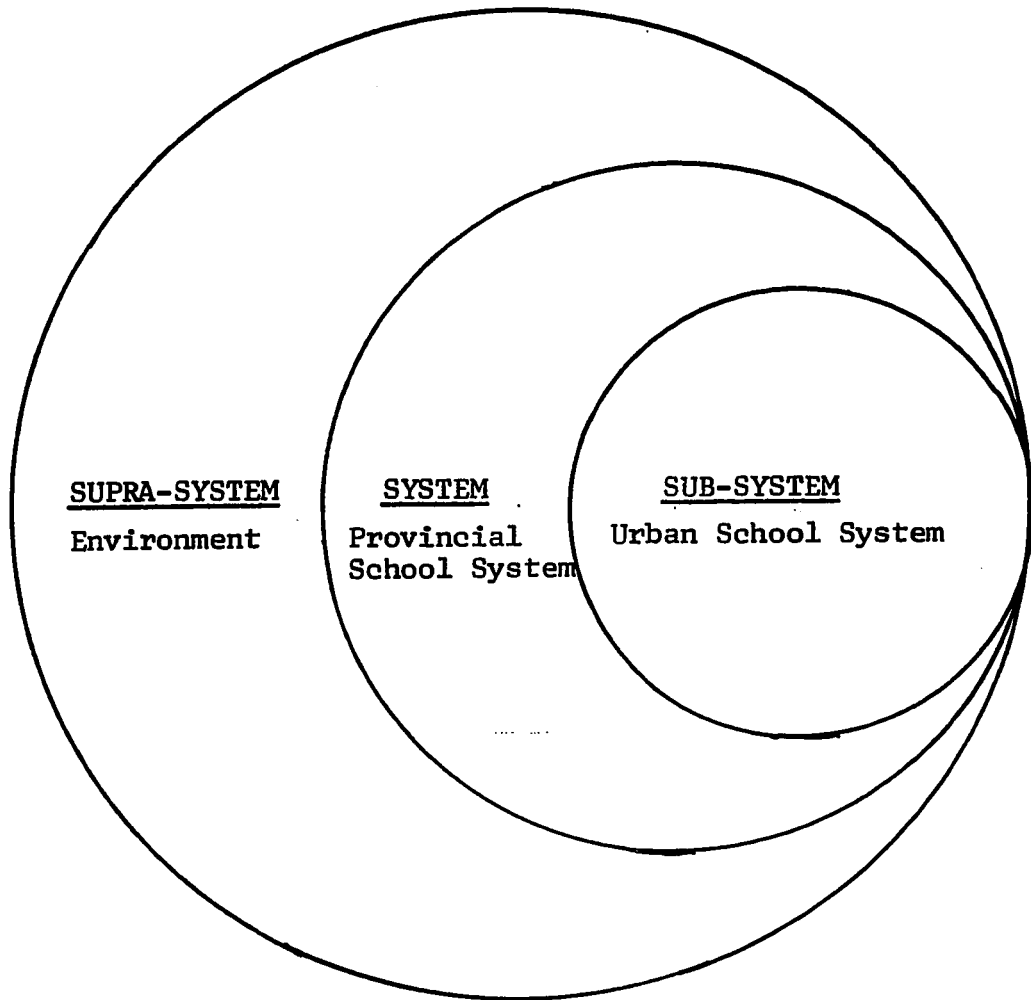
FIGURE 1

EDUCATIONAL CHANGE MODEL

Succession from outside the organization was viewed as an effective method of overcoming progressive segregation and hierarchical order. The same study further substantiated one of this theory's hypotheses that in open systems, hierarchical order makes it possible for change to occur from the top down, but practically impossible for significant change to occur from the bottom up.

Research studies in educational change offer conflicting conclusions whether our present educational organizations are characterized by stability or by change. Brickell concluded that public education as a structured institution has remained stable. He argues, with supporting evidence, that there had not been any significant shift in the institutional elements of school systems (2, p. 18). His conclusions were supported in Canada by Swift (15, p. 6). Alexander, on the other hand, reports that the National Education Association's Project on Instruction indicated that substantial change had taken place. Perhaps of greater significance was the finding that very little resistance to change was offered by personnel within the school systems (1, p. 12).

Disagreement is also evident as to whether the initiative for change comes from within or from without the school system. Carlson's study was cited by Griffiths to support the proposition that the supra-system was influential in initiating change. The Descriptive Criteria of Success study points out

that the elementary school principals who scored relatively high
on the Organizational Change Index were found to be non-
aggressive leaders, and had a tendency to make changes to please
outsiders and superiors. This finding seems to support
Griffiths' proposition (8, p. 432). The Project on Instruction
and Brickell's study reveal the great stimulus for change pro-
duced by the launching of Sputnik, especially in science and
mathematics programs (2, p. 27). In support of Griffiths'
position, Gallaher suggests that administrators can rarely be
forceful advocates of change because of their balancing role
between the school board and teachers (7, p. 50).

Holdaway, in supporting the role of principals in the
innovative process, questioned the external validity of the
Descriptive Criteria of Success study. He offers evidence
supporting the influence for change by personnel subordinate
to the superintendent (9, p. 17). Demeter, writing on the
role of principals in the change process, states:

> Building principals are key figures in the process.
> Where they are both aware of and sympathetic to an
> innovation, it tends to prosper. Where they are igno-
> rant of its existence, or apathetic, if not hostile,
> it tends to remain outside the blood stream of the
> school (5, p. 23).

Following a seminar at the University of Oregon in 1964, Miles
observed:

> . . . as if the superintendent were the key--as if he
> were the only person in the situation and as if his way of
> operating an innovative role was going to be the sole
> determinant of the consequences. The group began backing
> away and pointing out that there are figures called

building principals and various other figures in the system, and that working with them turns out to be very crucial (11, p. 87).

Ziolkowski comments that "as a change agent within the school the principal may induce a climate which will enable the staff to accept, and even to initiate change" (15, p. 1). Rogers suggests that principals are able to take steps to overcome the cause of teachers' rejection of innovation, once the principals are aware of the cause of rejection (12, p. 267).

Yakimishyn in an attempt to clarify the role of the classroom teacher in the adoption of educational change, states that decisions which affected the instructional program were made at three levels of remoteness from the student. He classifies these levels as:

> Close to the students, teachers make daily instructional decisions. At a more remote level, teachers and administrators make institutional decisions. At a still more remote level, school board members, state legislatures, and federal officials make societal educational decisions (14, p. 18).

Etzioni seems to lend support to the above position in his statement:

> In professional organizations administrators are in charge of secondary activities; they administer means to the major activity carried out by professionals . . . administrators offer advice about the economic and organizational implications of various activities planned by professionals. The final decision is, functionally speaking, in the hands of various professionals and their decision-making bodies (6, p. 8).

Rogers stresses the importance of the individual in adopting instructional innovations by maintaining that when the institution is used as the unit of analysis, much of the individual

An understanding of the development and the effects of a steady state in open systems suggests that the number of change projects will be inversely proportional to the tenure of the superintendent. Griffiths offers the suggestion that all of the processes which bring about the steady state have been given time to operate. Feedback channels have become established, and the self-regulatory processes of open systems have enabled the system to react in such a way as to re-establish a steady state. Change is thus more difficult, because the frequency of interaction between sub-systems is decreased, and the chances for effective communication are diminished. Subsystems develop conflict-reducing behavior which are counter to change-inducing behavior (8, p. 434).

This chapter and the preceding one have outlined the framework of General Systems Theory and its application to a theory of educational change. They have also indicated the relevance of the principles of Griffiths' theory of educational change to the present study.

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CHAPTER IV

RESEARCH PROCEDURES

The methodology and instrumentation of the study were determined by the nature of the problem as outlined in Chapter I. The examples offered by the studies conducted by Brickell and the National Education Association, mentioned previously, were used as guides. Before data pertaining to the study could be collected and analyzed, it was necessary to accomplish the following:

1. Determine the sources of data to be used.
2. Identify superintendents of Canadian urban school systems willing to co-operate with the study.
3. Construct instruments for collecting the data from the superintendents.

Sources of Data

The criteria for inclusion of the urban school systems in the sample were:

1. The city, in which the school system operated, was required to have a population in excess of 10,000.
2. The superintendent was required to have held office for a minimum of two years at the time of reporting.

Population centres. The initial selection of urban school systems was completed from information contained in the Directory of Administrative Personnel (2) and the Canada Year Book 1963 (3). One hundred and fourteen school systems in Canada were identified as meeting the population criterion.

Superintendents. The superintendent of each of the one

hundred and fourteen school systems was contacted by a letter

which requested his co-operation with the study (Appendix A).

Seventy-five of those contacted (65.8%) indicated a willing-

ness to co-operate.

Instruments. Two instruments were constructed to

collect the data from the superintendent: an Inventory of

Instructional Innovations and a Program Development Form.

The Inventory of Instructional Innovations was designed

to obtain the following information:

1) Professional and situational data about the
   superintendent.
2) General data on the system.
3) Data on the number and type of instructional
   innovations initiated and developed on a system
   level for the period from 1954 to 1964.

A copy of the Inventory of Instructional Innovations is

in Appendix D. The Inventory of Instructional Innovations is a

two-part questionnaire. Part A requested data on the superin-

tendent and the school system. Data requested included classi-

fication of the superintendent's total professional training,

total years of teacher training, graduate training, and admin-

istrative training. In Part A, the superintendent was requested

to state the number and type of university degrees awarded to

him. Data were requested of the superintendent on the classi-

fication of his total professional experience including

teaching experience, administrative experience, the number of

years in his present system prior to his appointment to the

superintendency, and the number of years of experience in his present position.

Part A also requested information on the school system in which the superintendent held an appointment. Data requested included the number and classification of central office supervisory staff, the approximate per pupil expenditure for elementary and secondary education, an indication whether the system had lay and/or faculty advisory curriculum committees.

Part B of the Inventory of Instructional Innovations obtained data on the innovations. Superintendents were requested to provide data on the innovations, and list all instructional innovations initiated and developed within their present system during the period from 1954 to 1964. In responding to the questions asked, the superintendents indicated sixteen main attributes of each innovation. These included the year in which the innovation was developed; the origin of the idea for the innovation; the grade in which the innovation was developed; the ability of pupils affected by the innovation; the subject area of the innovation; the changes in material presented and/or aspects emphasized; the changes which may have resulted in the responsibility of instructional staff, the type of personnel or the instructional procedures; the size of the instructional group; the basis for grouping; the changes in the use of equipment or materials; the changes in the time or place of instruction.

A Program Development Form was designed to collect data

on the sources of influence for the instructional innovations. The superintendent was requested to complete a Program Development Form on each of the three most important innovations developed in his system during the ten year period. A copy of the Program Development Form is shown in Appendix E. Completed questionnaires provided data on the sources of influence for the innovation and the role of the potential change agents in initiating and/or developing the innovation.

Following receipt of the letters of acceptance, questionnaires were forwarded to each cooperating superintendent. Seventy-two superintendents returned completed questionnaires, that is ninety-six per cent of those who initially agreed to participate. The list of urban school systems on which this study was based is found in Appendix F. The summary of the returns from the superintendents is presented in Table I and indicates that the study was based on a total of fifty-nine urban school systems in Canada.

Overview of the Analyses

Statistical tests. The statistical tests used in the analyses of the data included the median test, point biserial correlation, and Pearson product-moment correlations.

The writer investigated the possibility of applying an analysis of variance and subsequent comparisons of means as devised by Scheffé to test the significance of hypotheses 1.0

TABLE I

SUMMARY OF RETURNS FROM SCHOOL SYSTEMS
IN THE SAMPLE BY PROVINCES

	NfId	PEI	NS	NB	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL
Requested to participate	6	2	8	5	23	35	6	10	10	9	114
Agreed to participate	3	2	4	3	7	25	5	9	10	7	75
Questionnaires not returned	0	0	0	0	0	0	1	1	0	1	3
Questionnaires not usable	1	0	0	1	1	6	0	0	1	3	13
School Systems in the Study	2	2	4	2	6	19	4	8	9	3	59

and 3.0. Results obtained by this method were significant, but the writer believed the data did not meet the assumptions necessary for this type of parametric test (4, p. 294).

Hypothesis 1.0

The median test was applied to the data to test the significance of hypothesis 1.0. The null hypothesis is that no difference exists in the influence for innovation between the supra-system and the system. The median test is based on the principle that in two samples drawn from the same population the expectation is that as many observations in each sample will fall above as below the joint median (4, p. 355).

In an attempt to assure greater validity, the raw scores of influence, for the three levels of professional associations reported by the superintendents on the Program Description questionnaires, were first combined and then divided by three. This action seemed justified because the superintendent was requested to indicate a degree of influence from 0 to 3 for each source and three levels of professional associations were listed. The data used for analysis are contained in Table XXIX.

Hypothesis 1.1

The median test was applied to the data to test the significance of hypothesis 1.1. The order of rank of the sources of influence as listed in the Program Description questionnaires

were structured in accordance with the propositions of Griffiths
(5, pp. 431-435) and Brickell (1). The data used for the analy-
sis are found in Table XXIX.

Hypothesis 2.0

The median test was applied to the data to test the
significance of hypothesis 2.0. The classification of sources
of influence within the supra-system, system, and sub-system
as listed in the Program Description questionnaires was deter-
mined by definitions consistent with the theory. The data for
the analysis are contained in Table XXVI.

Hypothesis 2.1

The significance of the data for hypothesis 2.1 was
tested by point biserial correlation. Point biserial correl-
ation provides a relationship between a continuous variable and
a dichotomous variable. The total number of instructional
innovations for each school system for the ten year period
reported in the Inventories of Instructional Innovations was
corrected to account for those innovations initiated and
developed within the tenure of the reporting superintendent.

Hypothesis 2.2

Hypothesis 2.2 was tested by using Pearson product-
moment correlations. To assure greater statistical validity,
the total number of instructional innovations for each school

system, for the ten year period, was corrected to account for those initiated and developed within the tenure of the present superintendent. The period of tenure of the superintendent was indicated on the Inventory of Instructional Innovations questionnaire.

Hypothesis 2.3

Hypothesis 2.3 was tested by using Pearson product-moment correlations. The level of authority, which existed with each of the school systems, was determined from information provided from the organization charts of central office administrative personnel for each system. The analysis of the organization charts indicated that the fifty-nine school systems could be classified as having one of three levels of authority.

Hypothesis 3.0

The median test was applied to the data to test the significance of hypothesis 3.0. The order of rank of the potential sources of influence listed in the Program Description questionnaires was structured in accordance with the propositions of Griffiths (5, pp. 431-435) and Brickell (1). The data for the analysis are shown in Table XXVII.

Level of Significance

An alpha error level of .05 was accepted as the critical level of significance for the data analyses.

The preceding chapters outlined the nature of the prob-
lem and the principles of the two theories which were applied
to the problem.   Research related to the sources of influence
for innovation in education was presented.   Urban school systems
included in the sample are not totally representative of
Canadian education.   As Appendix F indicates, however, informa-
tion on innovations in school systems from each of the ten
provinces was collected and analysed.

A major limitation of the study was the attempt to deter-
mine the relative influence of a number of potential agents of
change by using data based on the perceptions of only one of
them, the superintendent.   However, supporting statements from
other research were offered to defend the use of the superin-
tendent as the sole reporting agent.   Conclusive evidence was
not available at the time to determine whether the superin-
tendent is at the focal point in the change process or whether
he is the man in the middle.   The following chapters present
the analyses of the data and discuss the conclusions suggested
by the study.

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        ation in Education. New York: Bureau of Publications,
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CHAPTER   V

ANALYSIS OF DATA PART I

This chapter will describe the professional character-
istics of the superintendents, the situational factors of the
fifty-nine urban school systems, and the innovations reported
in the study. The data were collected from information offered
by the superintendents in Part A of the Inventory of Instruc-
tional Innovations questionnaires.

The Superintendents

Professional training. The superintendents were
requested to indicate their total years of teacher training,
graduate training, and administrative training and to list the
number and type of university degrees granted to them.

The fifty-nine superintendents were classified into four
geographical regions of Canada, namely: Western Canada,
Ontario, Quebec, and the Atlantic Provinces. Table II indicates
the data pertaining to the professional training of the super-
intendents. The mean number of years of teacher training
ranged from a low of 1.0 in Ontario to a high of 3.7 in Quebec
with the mean number of years for the group of 2.3. The wide
range may be due in part to the differences in definition of
what is included in teacher training within the different
provinces of Canada.

TABLE II

PROFESSIONAL TRAINING OF SUPERINTENDENTS IN URBAN SYSTEMS BY GEOGRAPHIC REGION

Region	Mean Years of Teacher Training	Mean Years of Graduate Training	Mean Years of Administrative Training	Degrees Undergraduate	Graduate
Western Canada	N=24 3.3	N=18 2.8	N=8 1.4	N=24 12	12
Ontario	N=19 1.0	N=15 2.0	N=5 2.8	N=19 11	8
Quebec	N=6 3.7	N=6 2.8	N=3 3.3	N=6 2	4
Atlantic Provinces	N=10 2.3	N=8 2.3	N=6 1.5	N=10 2	8
	N=59 2.3	N=47 2.5	N=22 2.3	N=59 27	32

The mean number of years of graduate training ranged from a low of 2.0 in Ontario to a high of 2.8 in both Western Canada and Quebec. The mean number of years of administrative training ranged from a low of 1.4 in Western Canada to a high of 3.3 in Quebec. The national mean was 2.3 years. Thirty-two superintendents or 54.2 per cent were holders of graduate degrees.

Experience. The superintendents were requested to indicate their experience in teaching and administration both within and without their present systems. Table III provides the data pertaining to this experience. The mean number of years of teaching experience with the superintendent's present system ranged from a low of 14.6 in the Atlantic Provinces to a high of 19.7 in Ontario. The national mean was 17.4 years. The mean number of years of teaching experience outside their present system ranged from a low of 9.0 in Quebec to a high of 12.2 in the Atlantic Provinces, with the national mean being 11.0 years.

The mean number of years of administrative experience within their present system ranged from a low of 9.8 in Quebec to a high of 14.4 in Ontario. The national mean was 12.3 years. The mean number of years of administrative experience outside their present system ranged from a low of 5.0 in Quebec to a high of 12.1 in Western Canada. The national mean was 9.4 years.

TABLE III

TEACHING AND ADMINISTRATIVE EXPERIENCE OF SUPERINTENDENTS IN URBAN SYSTEMS BY GEOGRAPHIC REGION

Region	Mean Teaching Experience Within System	Mean Teaching Experience Without System	Mean Administrative Experience Within System	Mean Administrative Experience Without System	Mean Years in System Prior to Appointment
Western Canada N=24	16.6	11.1	10.9	12.1	16.4
Ontario N=9	19.7	11.7	14.4	9.1	18.9
Quebec N=6	18.5	9.0	9.8	5.0	12.0
Atlantic Provinces N=10	14.6	12.2	14.1	11.2	21.2
N=59	17.4	11.0	12.3	9.4	17.1

The mean number of years of experience within the system prior to appointment as superintendent, or equivalent, ranged from a low of 12.0 in Quebec to a high of 21.2 years in the Atlantic Provinces. The national mean for the sample was 17.1 years.

The School Systems

Central office staff. The superintendents were requested to indicate the number and type of central office personnel in their respective systems. This information, together with the organization charts provided by the superintendents, was used to determine the number of hierarchical levels existing within the school system. Table IV indicates the mean number of central office personnel ranged from a low of 4.7 in Quebec to a high of 9.8 in Ontario. The national mean was 6.8 persons.

Per pupil expenditure. The superintendents reported the approximate per pupil cost for elementary and secondary education in their systems for the school year 1963-64. Table V indicates the approximate national mean expenditure for elementary pupils was $300. The mean expenditure ranged from a high of $350 in Western Canada and Ontario to a low of $200 in the Atlantic Provinces.

Expenditures for secondary pupils ranged from a high of $550 in Ontario to a low of $300 in the Atlantic Provinces.

TABLE IV

MEAN NUMBER OF CENTRAL OFFICE PERSONNEL IN URBAN
SYSTEMS BY GEOGRAPHIC REGION

Region	Mean
Western Canada N=25	5.5
Ontario N=19	9.8
Quebec N=6	4.7
Atlantic Provinces N=10	7.1
N=59	6.8

TABLE V

APPROXIMATE PER PUPIL EXPENDITURES IN URBAN
SYSTEMS BY GEOGRAPHIC REGION*

Region	Cost Per Elementary Pupil	Cost Per Secondary Pupil
Western Canada N=24	$350.	$450.
Ontario N=19	$350.	$550.
Quebec N=6	$300.	$500.
Atlantic Provinces N=10	$200.	$300.
Mean N=59	$300.	$450.

*Source - Estimates of superintendents

The approximate mean expenditure for school systems in the sample per secondary pupil was $450.

Advisory committees. Table VI indicates the number of school systems that had lay and/or faculty advisory committees. Eight school systems had lay advisory committees. Twenty systems reported they had faculty advisory committees. Western Canada and Ontario each reported nine advisory committees.

The Innovations

Number of innovations. The fifty-nine superintendents reported three hundred and thirty-nine innovations initiated and developed during the period from 1954 to 1964. Table VII indicates the number of innovations per year by geographic region. Except for three school years, there was an annual increase in the number of innovations from a low of six in 1954-55 to a high of seventy-two in 1963-64.

In all regions, except Quebec, the later years indicated a greater number of innovations. The total number of innovations was greatest in Western Canada, but this region also included the greatest number of school systems in the study. The mean number of innovations per year by region was: The Atlantic Provinces 5.8, Quebec 2.4, Ontario 10.4, and Western Canada 15.3.

The number of innovations indicates a general increase during the period similar to that reported by Brickell (1, p. 495).

TABLE VI

URBAN SCHOOL SYSTEMS WITH ADVISORY COMMITTEES
BY GEOGRAPHIC REGION

Region	Number of Systems with Lay Advisory Committees	Number of Systems with Faculty Advisory Committees	Total
Western Canada N=24	4	5	9
Ontario N=19	1	8	9
Quebec N=6	3	4	7
Atlantic Provinces N=10	0	3	3
Total N=59	8	20	28

TABLE VII

NUMBER OF INNOVATIONS BY YEAR AND BY REGION

School Year	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
1954 - 55	3	0	2	1	6
1955 - 56	5	4	6	3	18
1956 - 57	1	0	8	8	17
1957 - 58	5	1	6	10	22
1958 - 59	1	3	11	9	24
1959 - 60	6	4	8	19	37
1960 - 61	6	4	9	14	33
1961 - 62	6	6	19	26	57
1962 - 63	13	2	9	29	53
1963 - 64	12	0	26	34	72
Total	58	24	104	153	339

Figure 2 presents a comparison between the number of innovations per year in the Canadian sample and the number reported for New York State by Brickell. The dramatic increase in the number of innovations in New York State immediately following the launching of Sputnik I, seems to be reflected by an increasing number of innovations in Canada, but at a somewhat later date.

Origin of the innovations. The superintendents were requested to indicate the origin of the idea for each innovation and Table VIII shows that the local school faculty was the source of the idea for the greatest number. Personnel within the sub-system were designated as the origin for 42.2 per cent of the innovations, those within the system for 28.6 per cent, and those within the supra-system for 29.2 per cent.

The comparison between regions indicates that the local school faculty was the greatest single source in Western Canada, Ontario, and Quebec. In the Atlantic Provinces, the greatest single source for the origin of the idea was the departments of education which were designated as the origin of the idea for 44.8 per cent of the innovations. The departments of education were the origin of the idea for 45.8 per cent in Quebec, 14.4 per cent in Ontario, and 29.4 per cent in Western Canada. Private foundations, universities, and teacher training institutions were not perceived by the superintendents to be significant sources for innovations.
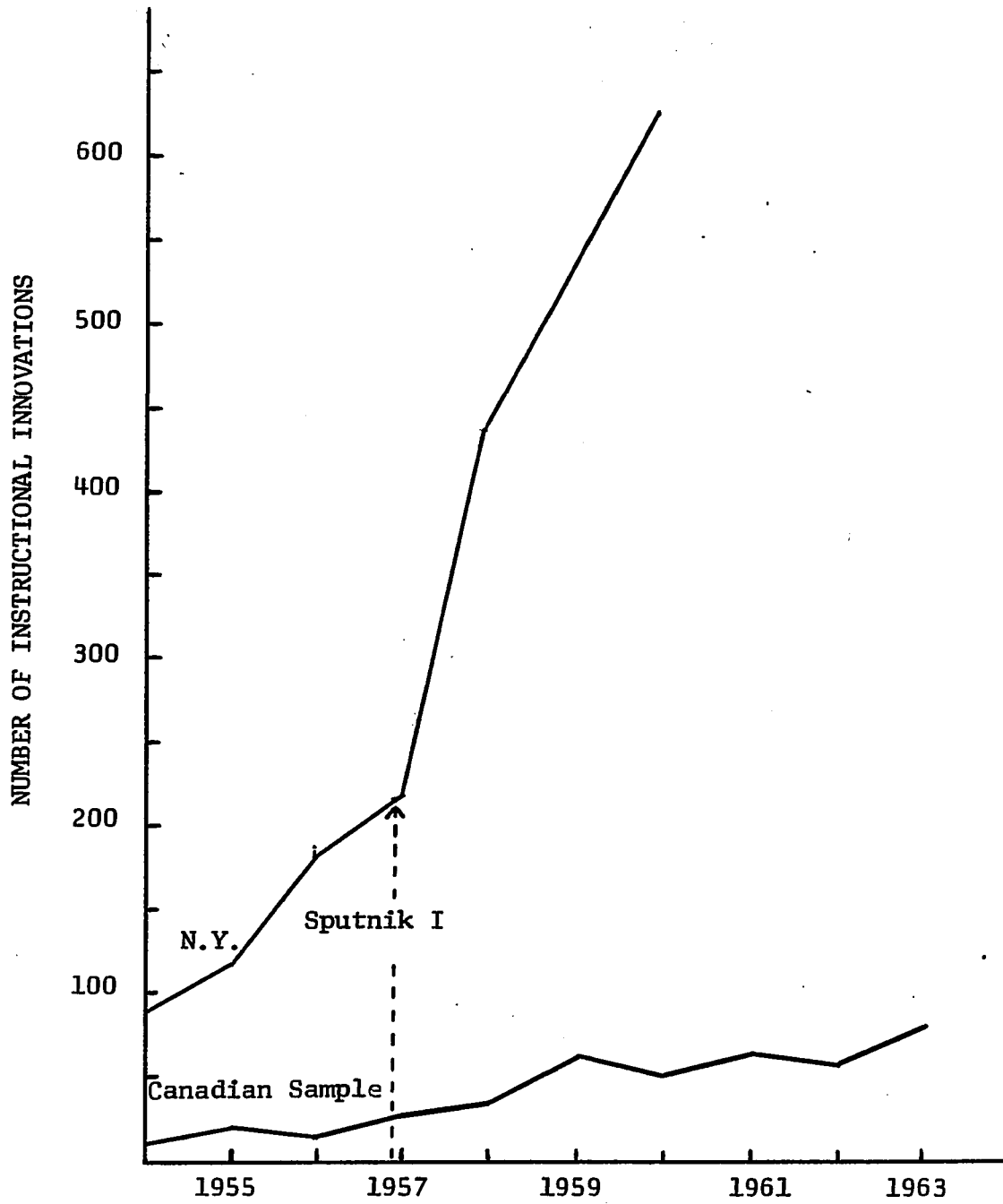
FIGURE 2

NUMBER OF INSTRUCTIONAL INNOVATIONS PER YEAR
IN NEW YORK STATE AND CANADA

TABLE VIII

ORIGIN OF THE INNOVATIONS BY GEOGRAPHIC REGION

Source	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Department of Education	26 (44.8%)	11 (45.8%)	15 (14.4%)	45 (29.4%)	97 (28.6%)
University Tch. Trg. Institutes	1 (1.7%)	0 (0.0%)	1 (1.0%)	2 (1.4%)	4 (1.2%)
Professional Organizations	2 (3.4%)	1 (4.2%)	12 (11.5%)	3 (1.9%)	18 (5.3%)
Citizens' Groups	3 (5.2%)	0 (0.0%)	8 (7.8%)	7 (4.6%)	18 (5.3%)
Curriculum Study Groups	7 (12.1%)	0 (0.0%)	4 (3.8%)	14 (9.2%)	25 (7.4%)
Local School Faculty	12 (20.7%)	12 (50.0%)	44 (42.3%)	50 (32.6%)	118 (34.8%)
Private Foundations	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Informal Professional Contacts	7 (12.1%)	0 (0.0%)	20 (19.2%)	32 (20.9%)	59 (17.4%)
Total	58 (100%)	24 (100%)	104 (100%)	153 (100%)	339 (100%)

Grade level. Each level of education within the system
was affected by almost the same number of innovations during
the period. Table IX presents data related to the grade levels
affected. Many of the innovations reported were initiated in a
number of grade levels within the systems. Innovations in the
secondary grade levels were slightly higher than those in
elementary grades in all regions, except Western Canada.

Ability level. With the exception of the mentally
retarded, each ability group of pupils in the school systems
was affected by almost equal numbers of innovations. Table X
indicates that the gifted and average groups were the classes
of pupils affected by the greater number of innovations, and
that the above and below average groups were comparable.
Pupils classified in the study as mentally-retarded were in-
volved in the least number of innovations. The average group
was involved in the greatest number of innovations in each of
the four regions.

Subject content. The superintendents were requested to
indicate the subjects affected by the innovations. Many of the
innovations involved changes in more than one subject. Table
XI shows the subjects having the greatest number of innovations
among the thirteen subject areas listed were English, mathemat-
ics, science and social studies. English and mathematics were
the two subject areas which were affected by the greatest number

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TABLE IX

GRADE LEVEL OF THE INNOVATIONS

Grade Level	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Primary (K - 3)	19	11	49	96	175
Intermediate (4 - 6)	24	11	58	85	178
Junior High (7 - 9)	29	16	78	72	195
Senior High (10 - 12)	24	10	31	49	114

TABLE X

ABILITY LEVEL OF PUPILS AFFECTED BY THE INNOVATIONS

Ability Level	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Gifted	17	6	79	108	240
Above Average	18	7	84	111	220
Average	44	17	90	117	268
Below Average	10	5	78	107	200
Mentally Retarded	8	4	12	29	53

TABLE XI

SUBJECT CONTENT OF THE INNOVATIONS CLASSIFIED
BY GEOGRAPHIC REGION

Subject Content	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Art	2	6	19	33	60
Business Education	1	4	10	17	32
English	19	9	61	81	170
Foreign Languages	16	5	34	36	91
Health	3	7	31	37	78
Home Economics	6	4	18	24	52
Industrial Arts	5	1	20	32	58
Mathematics	18	15	53	80	166
Music	4	10	32	42	88
Physical Education	10	10	32	46	98
Science	12	6	48	66	132
Social Studies	7	4	45	63	119
Technical Education	1	5	10	17	33
Other	8	5	10	24	47

in all regions, except Quebec, where the order of rank was mathematics, music, physical education, and English.

Changes in content. The superintendents were requested to indicate, where applicable, any changes in content with respect to the material presented or aspects emphasized. Table XII indicates that the use of different material was involved in the greatest number of innovations and innovations involving more material had the second greatest number.

Table XIII indicates that the innovations involved knowledge and skills to a greater degree than the other two aspects, attitudes and concepts. Knowledge of content material was the most significant aspect emphasized in the greatest number of innovations in each region, except the Atlantic Provinces and Ontario where skills were designated the most significant aspect.

Teaching activities. The data related to changes in teacher responsibility caused by the innovations indicates that regular teaching duties were combined in new ways for most of the innovations which affected teaching activities. Table XIV presents this data. New combinations of teaching activities were affected by most innovations in Ontario and Western Canada. In the Atlantic Provinces, the most significant change involved new leadership positions being created within the faculty.

TABLE XII

CHANGES IN CONTENT OF THE INNOVATIONS
(1) MATERIAL PRESENTED

Material Presented	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
More Material	10	14	37	37	98
Less Material	3	2	4	23	32
Different Material	24	16	57	95	192
Material Presented Earlier	9	2	21	20	52
Material Presented Later	3	0	7	11	21
Other	9	0	15	9	33

TABLE XIII

CHANGES IN CONTENT OF THE INNOVATIONS
(2) ASPECTS EMPHASIZED

Aspects Emphasized	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Attitudes	16	12	69	94	191
Concepts	14	9	57	83	163
Knowledge	34	18	77	108	237
Skills	51	16	86	105	258
Other	2	0	9	4	15

TABLE XIV

CHANGES IN TEACHING ACTIVITIES CAUSED BY THE INNOVATIONS
(1) TEACHER RESPONSIBILITY

Teacher Responsibility	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Regular Duties Divided Differently	4	7	24	29	64
Regular Duties Combined In New Ways	9	5	40	41	95
Leadership Positions Created in Faculty	14	7	26	35	82

With respect to changes in the type of personnel caused by the innovations, Table XV reveals that the most significant change in all regions involved the use of resource persons to assist with instruction.

No single significant change in teaching procedures was indicated by the data. Table XVI discloses that the innovations, where applicable to teaching method, involved demonstration, recitation, and discussion to a similar degree. These three methods were the most significant in all regions, except the Atlantic Provinces where the innovations affected changes in teaching procedures in the following order: demonstration, testing and review, and recitation.

Size of group. The most significant change in the size of the instructional group caused by the innovations was that the groups became flexible. Smaller class size resulted from most of the innovations which affected changes in grouping. Table XVII presents data related to changes in the size of the class groups.

Basis for grouping. Pupil achievement and mental ability were the most significant bases for grouping in the innovations which were developed. These two factors were the most significant in Ontario and Western Canada. In the Atlantic Provinces and Quebec, the age and mental ability of the pupil were the most significant of the six factors. Table XVIII presents data

TABLE XV

CHANGES IN TEACHING ACTIVITIES CAUSED BY THE INNOVATIONS
(2) PERSONNEL

Personnel	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Non-professionals Used in Non-professional Roles	1	2	9	5	17
Resource Persons Assist with Instruction	24	15	37	51	127
Semi-professionals in Instruction	7	6	6	4	23
Outside Personnel Teach Students Independently	0	2	5	3	10

TABLE XVI

CHANGES IN TEACHING ACTIVITIES CAUSED BY INNOVATIONS
(3) PROCEDURES

Procedure	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Lecture	13	7	23	40	83
Demonstration	23	12	46	54	135
Recitation	17	11	44	58	130
Discussion	8	6	62	52	128
Testing and Review	18	7	32	45	102
Student Projects	15	5	41	44	105
Other	15	3	18	26	62

TABLE XVII

CHANGES IN GROUPING CAUSED BY THE INNOVATIONS
(1) SIZE OF GROUP

Size of Group	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Individual Tutoring	3	4	7	10	24
Smaller than Before	9	4	32	55	100
Larger than Before	1	6	0	1	8
Variable	35	8	32	67	142

TABLE XVIII

CHANGES IN GROUPING CAUSED BY THE INNOVATIONS
(2) BASIS FOR GROUPING

Basis For Grouping	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Age	23	9	31	31	94
Mental Ability	22	18	37	60	137
Physical Ability	2	4	2	6	14
Emotional Stability	6	5	10	14	35
Achievement	18	7	51	76	152
Interest	16	5	17	39	77
Other	1	0	7	13	21

related to changes in grouping caused by the innovations.

Types of equipment. Table XIX indicates that the most significant changes in equipment affected by the innovations were the increased use of visual projectors and sound recorders. Television, either closed circuit or broadcast, was involved in the second greatest number of innovations that affected changes in equipment. The use of visual projectors and sound recorders was the most significant change in equipment in the four regions.

Type of materials. The most common materials used in the development of the innovations were textbooks. All regions reported that textbooks were the materials most extensively used in the innovation. Table XX indicates that the order of significance in relation to type of instructional materials used as a result of the innovations were: textbooks, workbooks, films and records, and packaged kits of materials.

Time of instruction. Table XXI indicates no significant change in the time of instruction. Only a minimum number of innovations involved changes from the regular, accepted times of instruction. Ontario and Western Canada indicated a greater number of changes in times of instruction in proportion to those reported from the Atlantic Provinces and Quebec.

TABLE XIX

EQUIPMENT CHANGES CAUSED BY THE INNOVATIONS
(1) TYPE OF EQUIPMENT

Type of Equipment	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Visual Projectors	10	2	37	39	88
Sound Recorders	13	8	35	25	81
Closed Circuit Television	1	1	1	1	4
Broadcast Television	6	1	24	16	47
Programmed Instruction - Machines	0	1	3	1	5
Programmed Instruction - Textbooks	5	8	6	9	28
Individual Listening Recording Booths	1	1	2	3	7
Other	18	8	15	20	61

TABLE XX

EQUIPMENT CHANGES CAUSED BY THE INNOVATIONS
(2) TYPE OF MATERIALS

Type of Materials	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Textbooks	31	17	52	81	181
Workbooks	8	11	29	58	106
Packaged Kits	4	4	3	22	33
Films and Recordings	14	4	42	35	95
Other	23	6	32	30	91

TABLE XXI

NUMBER OF CHANGES IN INSTRUCTIONAL TIME FOLLOWING THE ADOPTION
OF THE INNOVATIONS BY GEOGRAPHIC AREAS

Time of Instruction	Atlantic Provinces N=10	Quebec N=7	Ontario N=18	Western Canada N=22	Total N=57
Before School	0	0	2	1	3
After School	1	1	3	4	9
Evening	1	1	2	4	8
Weekend	0	1	4	5	10
Summer	2	0	4	3	9
Other	6	4	3	5	18

Place of instruction. Table XXII indicates that where
innovations resulted in changes in the place of instruction,
the greatest number affected changes within the existing school
plants. Changes resulting in regional schools were indicated
in Ontario and Western Canada.

The analysis of the innovations indicates that there was
an annual increase in the number of instructional innovations
during the period from 1954 to 1964. Most of the innovations
involved alterations in subject content, in the grouping of
pupils, and the extended use of traditional equipment and
materials. Innovations were minimal in the use of different
personnel, the time, and the place of instruction.

TABLE XXII

NUMBER OF CHANGES IN THE PLACE OF INSTRUCTION
CAUSED BY THE INNOVATIONS

Place of Instruction	Atlantic Provinces N=10	Quebec N=6	Ontario N=19	Western Canada N=24	Total N=59
Different Room(s)	17	4	19	16	56
Altered Room Space	3	4	6	14	27
Regional School	2	3	22	15	42
Other Public Facility	1	0	2	6	9
Commercial Facility	0	1	3	1	5
College Building	0	3	1	1	5
Outdoors	1	0	0	3	4

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CHAPTER VI

ANALYSIS OF DATA PART II

The purpose of the study was to identify the major

sources of influence for instructional innovation in Canadian

urban school systems. The hypotheses of the study were stated

in Chapter I. They were based on propositions contained in the

literature on educational change. To the best knowledge of the

writer, the hypotheses have not been subjected to research in

Canada. In this chapter the seven hypotheses are re-stated,

the method of testing each is described, and the results of the

tests are presented and discussed.

Hypotheses 1.0

The most significant sources of influence for instruct-
ional innovation in Canadian urban school systems emanate
from the supra-system.

Findings. The median test when applied to the data to

test the significance of this hypothesis indicates whether or

not samples have been drawn from populations with the same

median influence score. The null hypothesis is that no differ-

ence exists between the supra-system and the system in the

influence score. The corresponding parametric test is a test

for comparing the means of independent samples. As mentioned

previously, the writer was unwilling to use the latter test

since he could not prove that the data met the assumptions required for this type of test (2, p. 294). The median test is based on the concept that in two samples drawn from the same population, the expectation is that as many observations in each sample will fall above, as below, the joint median.

The null hypothesis that no difference exists between the influence scores of the supra-system and those of the system and sub-system was rejected. As Table XXIII indicates the median of the sources of influence from the supra-system is significantly lower than that from the system and sub-system.

Discussion. The significant difference of medians in the reverse direction to that hypothesized led to a rejection of a major proposition of the change theory. The analysis indicated that the sources of influence for educational change in Canadian urban school systems were from the system and the sub-system.

This study proposed that influences for change would emanate from the supra-system because the educational system, being open, tended to maintain a steady state. Further, the regulating properties of negative entrophy and functional unity would assure a quasi-stationary state. The data suggests that Canadian urban school systems had developed a degree of equilibrium which inhibited change to a greater degree than that proposed. The data suggest that the degree

TABLE XXIII

BASIC DATA FOR THE MEDIAN TEST OF DIFFERENCES
BETWEEN SCORES OF INFLUENCE FOR THE
SUPRA-SYSTEM AND OTHER INFLUENCES

	N	Median	Joint Median	X^2 Value	df.	Significance
Supra-System	59	11.05				
			17.42	70.0	1	.05
System and Sub-system	59	27.62				

of negative entrophy, functional unity, progressive segregation, and centralization was greater than was proposed.

The inclusion of the provincial departments of education within this study's definition of a system might have over-emphasized the significance of the findings. However, a visual analysis of the sources of influence within the system and sub-system indicates that the sub-system scores are of greater significance. The analysis indicates that change in Canadian urban school systems emanated from the sub-system, that is, from the school itself. Canadian urban school systems, it appears, possessed a higher degree of professional self-determination and autonomy than the literature supported.

Hypothesis 1.1

Within the supra-system, the potential sources of influence for instructional innovation are in the rank order of:

1) the general public,
2) commercial organizations,
3) professional educational associations,
4) teacher training institutions and universities, and
5) private foundations.

Findings. A sign test for k independent samples, which is the non-parametric analogue of a one-way analysis of variance with k independent samples, was not used by the writer. The analysis was concerned with inter-median comparisons rather than discerning whether any differences existed among

the k medians. Visual inspection of the data indicated that the latter situation did not exist. The data for the sequential medians tests are presented in Table XXIV and Table XXV.

The data partially support the hypothesized order for the sources of influence for educational change in the supra-system. The general public and private foundations were in their predicted order of significance.

Discussion. The order of rank, as noted in Chapter IV, for the sources of influence within the supra-system was based on the suppositions of Brickell (1, pp. 493-532). Source I and Source V were found to be in their predicted order, that is, the general public was the most influential and private foundations the least influential. Table XXIV indicates that the order of rank of the sources of influence within the supra-system is:

1) the general public,
2) professional educational associations,
3) teacher training institutions and universities,
4) commercial organizations, and
5) private foundations.

The order indicated differs to a degree from that proposed by Brickell (1, pp. 506-11) and MacKenzie (3, pp. 413-17). Professional educational associations in Canada, as perceived by superintendents, had a significant role in the change process beyond being merely communicators of change. The role of the universities appears to be more significant than that stated

TABLE XXIV

MEDIANS OF SOURCES OF INFLUENCE
IN THE SUPRA-SYSTEM*

	Source I	Source II	Source III	Source IV	Source V
Median	2.36	0.33	1.81	0.84	0.12

*Source I   - general public
Source II   - commercial organizations
Source III - professional educational associations
Source IV   - teacher training institutions and
              universities
Source V   - private foundations

TABLE XXV

SIGNIFICANCE OF INTER-MEDIAN COMPARISONS BETWEEN
SOURCES OF INFLUENCE IN THE SUPRA-SYSTEM*

	Source I	Source II	Source III	Source IV	Source V
Source I	-				
Source II	.05	-			
Source III	NS	.05	-		
Source IV	.05	NS	.05	-	
Source V	.05	NS	.05	.05	-

*Source I   - general public
 Source II   - commercial organizations
 Source III - professional educational associations
 Source IV   - teacher training institutions and
               universities
 Source V   - private foundations

by Brickell (1, pp.507-508). However, their degree of influence within the supra-system would appear to support his proposition that they had little <u>direct</u> influence.

The importance of commercial organizations, for example, textbook publishers, as sources of influence did not appear to be as great in Canadian urban school systems as that proposed by Brickell for the American situation (1, pp. 510-511). This may be due in large part to the different role of the Canadian provincial departments of education in textbook authorization. American urban school systems may have a greater degree of autonomy in textbook authorization which would account for the change in the order of rank of influence.

The minor sources of influence classified within the supra-system were not included in the statistical analysis. A visual analysis of the basic data indicates a degree of influence greater than one might expect from the literature. The superintendents indicated a greater degree of influence from lay critics and influential parents in the community than from commercial organizations and private foundations. The insignificant influence of private foundations in educational change in Canada should be expected. No explanation is offered for the greater significance of individuals in the community compared to that of commercial organizations whose chief interests lie in promoting change in curriculum development.

Hypothesis 2.0

The most significant influence for instructional innovation, within the system or sub-system, is the superintendent.

Findings. The median test was applied to the data to test the significance of this hypothesis. The basic data for the sequential medians test are presented in Table XXVI and Table XXVII. The median tests indicate significance at the .05 level between the superintendent and the other sources of influence within the system and sub-system.

Discussion. The research indicates that the influence of the superintendent in developing change was paramount. The statistical analysis indicates that the superintendents perceived themselves as being the most significant single influence for change within the system and sub-system. A visual analysis of the data (Table XXVIII) led to a conclusion that the superintendent was the most influential source for change among all the potential sources.

Hypothesis 2.1

The number of instructional innovations developed during the tenure of a superintendent is greater if the superintendent is appointed from without the system than when he is appointed from within.

Findings. This hypothesis was tested by determining the significance of the point biserial correlation between the

TABLE XXVI

MEDIANS OF SOURCES OF INFLUENCE WITHIN
THE SYSTEM AND SUB-SYSTEM*

	Source I	Source II	Source III	Source IV
Median	6.36	4.44	3.81	5.33

*Source I   - superintendent
 Source II   - provincial departments of education
 Source III - local school boards
 Source IV   - school system faculty

TABLE XXVII

SIGNIFICANCE OF INTER-MEDIAN COMPARISONS
BETWEEN SOURCES OF INFLUENCE WITHIN
THE SYSTEM AND SUB-SYSTEM*

	Source I	Source II	Source III	Source IV
Source I				
Source II	.05			
Source III	.05	NS		
Source IV	.05	NS	NS**	

* Source I   - superintendent
  Source II - provincial departments of education
  Source III - local school boards
  Source IV - school system faculty

**Significant at the .10 level

TABLE XXVIII

BASIC DATA ON SOURCES OF INFLUENCE WITHIN THE SUPRA-SYSTEM AND OTHER SOURCES

School System	SUPRA-SYSTEM*									SYSTEM AND SUB-SYSTEM**								
	1	2	3	4	5	6	7	8	TOTAL	1	2	3	4	5	6	7	8	TOTAL
1	6	0	0	1	3	0	0	5	15	9	7	9	4	0	3	5	0	37
2	0	2	0	0	2	0	1	0	5	6	9	9	4	1	7	7	0	43
3	0	0	0	0	1	0	0	0	1	2	5	4	1	1	0	7	0	20
4	1	3	0	0	4	0	3	0	11	5	5	0	3	0	0	3	1	17
5	1	5	0	1	2	2	4	2	17	6	4	5	0	4	6	9	0	34
6	5	3	0	0	6	0	3	2	19	6	7	6	7	0	5	3	1	35
7	2	2	5	0	8	2	0	0	19	2	2	3	1	1	0	7	0	16
8	1	2	0	1	3	0	0	6	13	4	2	4	0	2	0	4	2	18
9	0	2	0	0	4	0	0	0	6	6	7	2	2	0	0	9	0	26
10	0	2	2	6	0	0	0	0	10	4	2	4	0	4	0	9	0	23
11	4	3	2	0	3	3	5	0	20	1	6	7	7	5	1	8	0	35
12	2	0	0	0	1	0	0	0	3	4	4	8	6	0	2	6	0	30
13	1	1	0	1	1	3	3	0	10	6	4	0	4	4	4	8	0	30
14	0	2	0	3	6	0	0	0	11	8	0	9	6	0	3	5	0	31
15	2	3	0	1	4	1	0	4	15	5	0	5	0	4	2	9	3	28
16	0	4	0	0	2	2	2	0	10	5	4	9	0	9	0	8	0	35
17	1	2	1	4	3	1	1	0	13	9	1	6	4	6	3	8	0	37

TABLE XXVIII (continued)

School System	SUPRA-SYSTEM*									SYSTEM AND SUB-SYSTEMS**									TOTAL
	1	2	3	4	5	6	7	8	TOTAL	1	2	3	4	5	6	7	8	TOTAL	
18	1	6	0	2	1	2	1	1	14	5	4	7	3	4	2	7	0	32	32
19	5	3	1	3	4	4	2	1	23	5	5	6	2	1	0	6	1	26	26
20	4	0	0	0	1	2	0	5	12	4	3	3	6	1	0	6	1	24	24
21	1	2	0	1	4	1	0	0	9	3	4	5	0	3	8	8	0	31	31
22	5	5	1	2	7	4	2	0	26	5	5	1	1	5	6	9	0	32	32
23	2	0	3	1	2	2	1	2	13	5	3	0	8	0	0	9	0	27	27
24	2	0	3	1	1	0	0	6	13	0	0	2	4	0	0	7	0	13	13
25	1	4	0	1	4	3	3	0	16	6	5	8	8	0	4	8	0	39	39
26	0	2	0	0	5	3	3	0	13	0	6	2	3	2	0	5	0	18	18
27	0	0	0	0	3	3	4	3	13	1	9	6	3	2	0	0	4	25	25
28	0	2	6	0	8	8	5	3	32	0	7	7	5	4	2	9	0	34	34
29	0	0	0	0	6	0	0	0	6	9	0	0	0	0	0	6	0	15	15
30	0	0	0	0	2	0	1	6	9	0	1	8	3	0	2	8	4	26	26
31	0	1	0	0	2	0	1	2	6	4	1	7	7	2	1	8	0	30	30
32	0	0	0	0	1	1	0	4	6	3	2	4	3	2	2	7	0	23	23
33	6	3	0	1	3	1	1	1	16	4	4	7	4	3	0	7	1	30	30
34	4	3	0	6	0	0	0	0	13	8	0	5	6	3	2	8	0	32	32
35	0	3	0	0	4	0	0	5	12	6	8	8	4	3	2	6	0	37	37
36	0	2	0	0	4	0	0	2	8	4	1	6	7	1	1	2	2	24	24

TABLE XXVIII (continued)

School System	SUPRA-SYSTEM*									SYSTEM AND SUB-SYSTEM**								
	1	2	3	4	5	6	7	8	TOTAL	1	2	3	4	5	6	7	8	TOTAL
37	1	3	2	2	7	2	1	0	18	9	2	7	1	1	2	9	3	34
38	1	3	0	0	5	3	1	2	15	8	6	7	7	3	4	6	2	43
39	0	3	0	0	0	0	0	2	5	0	6	3	0	0	0	8	0	17
40	0	3	0	0	3	4	1	0	11	0	7	2	5	1	0	7	0	22
41	0	2	0	0	0	0	0	0	2	4	1	4	5	0	0	7	0	21
42	0	1	0	2	0	0	0	5	8	0	7	5	7	0	2	6	2	29
43	0	2	0	1	0	0	0	0	3	9	6	9	0	2	5	0	0	31
44	0	2	0	2	0	0	0	0	4	3	0	0	0	0	0	0	0	3
45	1	0	0	0	2	1	1	1	6	3	3	0	0	1	1	2	0	10
46	4	1	1	3	2	0	1	1	13	7	0	1	9	2	1	2	0	22
47	0	2	0	0	3	0	1	0	6	8	8	4	0	2	3	0	0	25
48	2	1	0	0	2	1	1	0	7	3	3	1	0	2	1	2	0	12
49	0	3	0	0	2	0	0	1	6	7	5	7	5	2	5	6	0	37
50	0	0	0	0	1	0	0	0	1	9	3	2	8	0	0	6	0	28
51	4	4	0	2	3	3	2	3	21	8	4	6	5	5	6	9	0	43

TABLE XXVIII (continued)

School System	SUPRA-SYSTEM*									SYSTEM AND SUB-SYSTEM**								
	1	2	3	4	5	6	7	8	TOTAL	1	2	3	4	5	6	7	8	TOTAL
52	0	1	0	0	1	1	0	4	7	3	0	3	0	2	2	2	2	14
53	0	1	0	0	0	1	0	0	2	6	9	0	0	5	0	6	0	26
54	1	0	0	0	5	3	1	0	10	3	3	8	4	4	0	6	0	28
55	2	1	0	0	1	0	0	0	4	3	2	1	2	0	2	2	0	12
56	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	5
57	0	1	0	0	0	3	0	0	4	0	0	0	0	3	0	3	0	6
58	3	2	0	1	2	1	1	1	11	3	3	5	2	2	4	4	2	25
59	6	1	2	0	4	3	3	4	23	7	9	4	9	3	9	5	2	48
TOTAL	82	109	29	49	158	74	60	84	645	265	227	261	195	117	115	342	33	1545

*SUPRA-SYSTEM
1 - teacher training institutions and universities
2 - professional educational associations
3 - private foundations
4 - commercial organizations
5 - general public
6 - lay critics
7 - influential parents
8 - other

**SYSTEM AND SUB-SYSTEM
1 - provincial departments of education
2 - local school boards
3 - system faculty
4 - central administration personnel
5 - teacher critics
6 - examination results
7 - superintendent
8 - other

number of instructional innovations expressed as a continuous
variable and the origin of the appointment of the superintendent
as a dichotomous variable. An analysis of the data indicates
that of the fifty-nine superintendents, thirty-six had been
appointed from within the system (61.0 per cent) and twenty-
three had been appointed from without the system (39.0 per
cent).

In Chapter IV, it was noted that the number of instruc-
tional innovations was corrected to indicate those initiated
and developed during the tenure of the superintendent. The
point biserial correlation was determined to be .015, a value
which is not statistically significant. Data related to the
number of instructional innovations and the origin of the
appointment of the superintendent are reported in Table XXIX.

Discussion. The similarity between the degree of
innovativeness between superintendents appointed from within
and without the system is noteworthy. The theory of change
would support the view that the "outsiders" appointed to the
superintendency were aware of the feed-back properties of
their new systems or that there were no significant differ-
ences between their former systems and their new systems.
School boards in appointing a new superintendent may tend to
appoint an individual similar to the previous one. The study
indicates that the "outsiders" functioned to maintain the
steady state previously in operation within the school system.

TABLE XXIX

BASIC DATA RELATED TO NUMBER OF INNOVATIONS AND ORIGIN OF APPOINTMENT OF THE SUPERINTENDENT

System	Number of Innovations	Origin of Appointment	
		Within	Without
1	9		x
2	5		x
3	10	x	
4	4	x	
5	11		x
6	12		x
7	5	x	
8	7		x
9	4	x	
10	8		x
11	10		x
12	9	x	
13	4		x
14	4	x	
15	5		x
16	2		x
17	3	x	
18	10	x	
19	14	x	
20	3	x	
21	3	x	
22	7	x	
23	7	x	
24	12	x	

TABLE XXIX (continued)

System	Number of Innovations	Origin of Appointment Within	Without
25	11	x	
26	11		x
27	0		x
28	2		x
29	6		x
30	4	x	
31	3	x	
32	3	x	
33	4	x	
34	8	x	
35	6		x
36	8	x	
37	5	x	
38	6	x	
39	4		x
40	2		x
41	7		x
42	0	x	
43	3	x	
44	1	x	
45	5	x	
46	10	x	
47	1	x	
48	1	x	
49	4	x	
50	3	x	
51	16	x	

TABLE XXIX (continued)

System	Number of Innovations	Origin of Appointment Within	Without
52	1		x
53	6	x	
54	6	x	
55	5	x	
56	3		x
57	5		x
58	4	x	
59	7		x
TOTAL	339	36	23

Hypothesis 2.2

The number of instructional innovations is inversely
proportional to the years of tenure of the superintendent.

Findings. This hypothesis was tested by assessing the
significance of the Pearson product-moment correlation existing
between the number of instructional innovations and the years
of tenure of the superintendent. The prediction was that the
relationship would be linear and negative. Chapter IV noted
that the total number of instructional innovations reported for
each system during the ten year period was corrected to indi-
cate those developed during the tenure of the superintendent.
The obtained value of the correlation was .224. On the basis
of the decision rules, the hypothesis was rejected. Data
related to the number of innovations developed during the
tenure of each superintendent are presented in Table XXX.

Discussion. The research does not support the pro-
position that there is a relationship between the number of
innovations and the years of tenure of the superintendents.
Canadian urban school systems had a greater degree of equilib-
rium than that hypothesized. The research suggests that the
self-regulating processes within the school systems reported
in the study were operating at a high level.

TABLE XXX

BASIC DATA RELATED TO NUMBER OF INNOVATIONS
AND TENURE OF THE SUPERINTENDENT

System	Number of Innovations	Years of Tenure
1	9	7
2	5	3
3	10	12
4	4	11
5	11	8
6	12	7
7	5	2
8	7	6
9	4	4
10	8	6
11	10	14
12	9	11
13	4	8
14	4	5
15	5	5
16	2	6
17	3	9
18	10	4
19	14	8
20	3	20
21	3	4
22	7	8
23	7	8
24	12	14
25	11	14

TABLE XXX (continued)

System	Number of Innovations	Years of Tenure
26	11	10
27	0	3
28	2	4
29	6	13
30	4	4
31	3	3
32	3	5
33	4	4
34	8	6
35	6	8
36	8	6
37	5	14
38	6	8
39	4	13
40	2	6
41	7	8
42	0	5
43	3	6
44	1	3
45	5	7
46	10	10
47	1	3
48	1	5
49	4	14
50	3	36
51	16	17

TABLE XXX (continued)

System	Number of Innovations	Years of Tenure
52	1	3
53	6	19
54	6	5
55	5	14
56	3	12
57	5	18
58	4	10
59	7	25
Total	339	

Hypothesis 2.3

The number of instructional innovations developed within a
school system is inversely proportional to the levels of
authority within the system.

Findings. The Pearson product-moment correlation was
applied to the number of instructional innovations and the
levels of authority. In Chapter IV it was noted that the
levels of authority that existed within each system were clas-
sified from information provided on the central administration
organization chart for each system. The obtained value of the
correlation was .012. On the basis of the decision rules, the
hypothesis was rejected. Data related to the number of inno-
vations and the levels of authority are presented in Table
XXXI.

In addition to the above correlation, the writer decid-
ed to make an a posteriori visual analysis of the relationship
which exists between the mean number of instructional innova-
tions and the three levels of authority. The mean number of
innovations for each level of authority was calculated and
plotted in a two dimensional diagram (Figure 3). The plot
suggests that a curvilinear relationship exists between the
variables.

Discussion. Although there was an indication of a
trend between level one and level two which would support the

TABLE XXXI

BASIC DATA RELATED TO THE NUMBER OF INNOVATIONS
AND LEVELS OF AUTHORITY

System	Number of Innovations	Level of Authority
1	12	2
2	6	1
3	10	2
4	4	2
5	11	1
6	12	3
7	15	2
8	10	2
9	8	2
10	8	2
11	10	3
12	9	3
13	5	2
14	6	3
15	5	1
16	2	2
17	3	2
18	12	2
19	14	1
20	3	3
21	4	3
22	7	1
23	9	2
24	13	3
25	11	3
26	11	3
27	2	2
28	2	3
29	6	2
30	4	2
31	9	3
32	7	3
33	8	3
34	9	2
35	6	2

TABLE XXXI (continued)

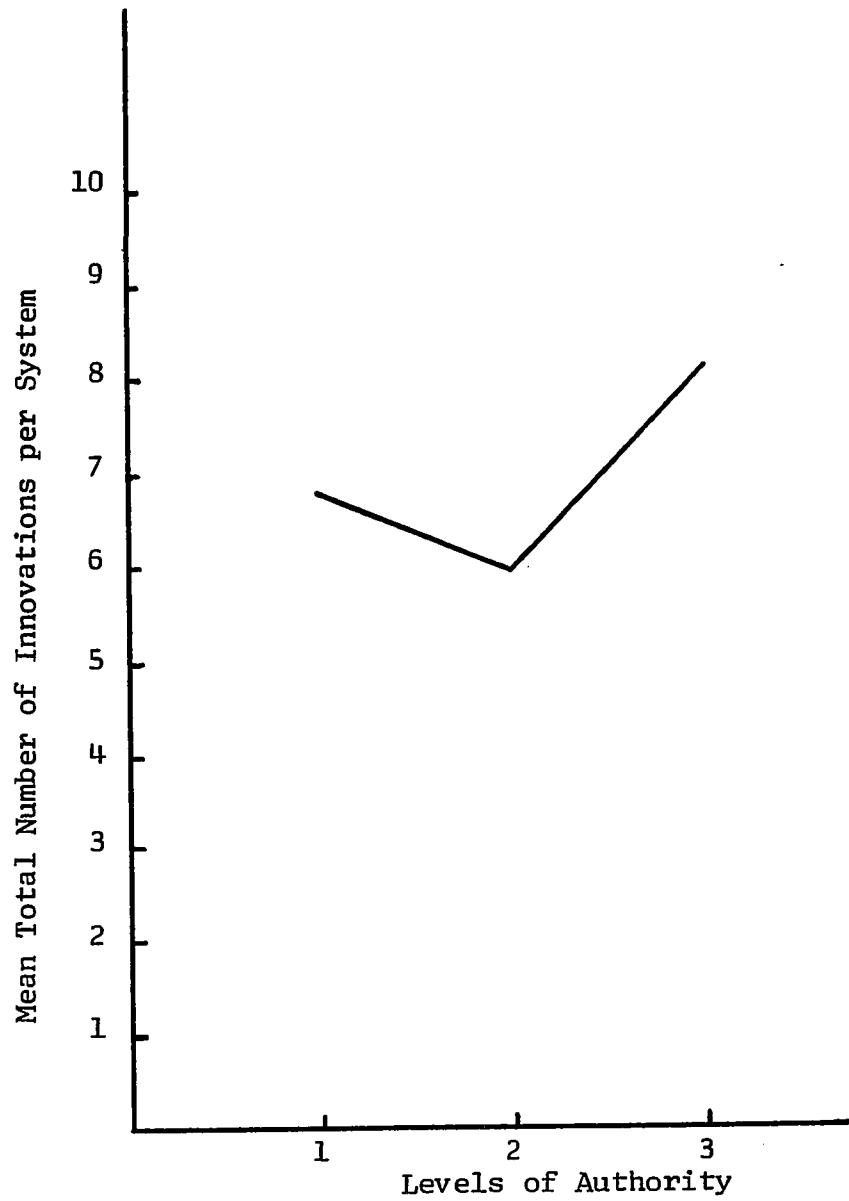| System	Number of Innovations	Level of Authority
36	10	2
37	5	2
38	6	3
39	4	2
40	3	2
41	8	3
42	3	2
43	4	2
44	1	2
45	6	2
46	10	3
47	3	2
48	2	2
49	4	2
50	3	2
51	16	1
52	2	1
53	6	1
54	7	2
55	5	1
56	3	1
57	5	1
58	4	1
59	7	1
Total	399	Level 1 - 13 Level 2 - 30 Level 3 - 16

FIGURE 3

RELATIONSHIP BETWEEN NUMBER OF INNOVATIONS PER
SYSTEM AND LEVELS OF AUTHORITY
WITHIN THE SYSTEM

hypothesis, the analysis indicated no significant difference in innovativeness dependent on the three levels of authority.

A visual analysis of the data indicated that systems classified as medium size systems were in the process of adapting to abnormal increases in enrolments and inadequate financial and human resources. This general situation may have inhibited their ability to develop changes beyond those required to maintain their status. The third level of systems is located in large urban centres of the country. These systems may be classified as having relatively high degree of innovativeness or as being highly stabilized systems.

Hypothesis 3.0

Among the potential sources of influence for change in the system or sub-system, excluding the superintendent, the order of influence is:

1) provincial departments of education,
2) local school boards, and
3) school system faculty.

Findings. The median test was applied to the data to test the significance of this hypothesis. The data for the sequential medians tests are given in Table XXVII, page 100. The tests indicated no significance in the order of influence among provincial departments of education, local school boards, and school system faculty.

Discussion. Previously it was noted that the order of influence among the potential sources within the system and sub-system was determined by the propositions discussed in the literature. The research indicates no significant differences existed in the relative influence of the three main sources in the system and sub-system. An examination of the data indicated that if the potential sources of influence were ranked, departments of education, the system faculty, and local school boards would follow the superintendent and professional associations. The relative significance of the provincial departments of education may be understood when one considers that, in Canada, they often are able to mandate certain kinds of curricular changes. They also influence subject content and methods of instruction through external examinations. They are able to stimulate or inhibit change through control of financial support. The superintendents perceived the departments of education exerting both direct and indirect influence.

Summary of analyses. While the major hypothesis developed from systems theory is not supported by the research, the focal point of the role of the superintendent in the change process is very evident.

Reasons why the research did not support the hypothesis that influential sources for change emanate from the supra-

system may be developed from systems theory. The urban school systems reported on in the study may be characterized as having a high degree of equilibrium as the extent of influence from the supra-system was found to be minimal. The characteristics previously noted to describe the steady state may be attributed to the school systems during the early and middle periods of the term of the study.

The possibility that the tenets of systems theory would be more significant if applied to substantive changes should be considered. A review of the data indicates that the great majority of innovations reported by the superintendents involved minor changes within the existing institutional elements. Innovations in the order of socio-philosophic changes may well be those that emanate from the supra-system. This conclusion may be substantiated by consideration of the fact that education and its institutions are generally considered to be ultra-conservative. Maintenance of the social order has long been an objective and an expectation of our educational system.

The similarity of school systems across Canada is evident from the research related to the degree of innovativeness of superintendents appointed from within or from without the system. The research shows that there exists a "general

type" superintendent who was or could be equally effective in the majority of Canadian urban systems. The low number of innovations reported may be attributable to the characteristics of the steady state of the school systems, and/or the long tenure of the superintendents within the systems, both prior to appointment and in the appointment. Evidence that the self-regulating processes were developed to a high degree in the urban school systems in the study is suggested.

Situational factors, especially financial resources, performed a significant role in the number of innovations developed. Although the research did not relate the number of innovations to the expenditure per pupil, it is apparent that the latter part of the research period gave evidence of an increase in innovativeness. This period was also the time for substantial increases in educational expenditures throughout Canada.

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CHAPTER VII

SUMMARY, CONCLUSIONS AND IMPLICATIONS

A review of the study will be presented in this chapter. A statement of the problem investigated, the methodology and instrumentation used in the study, and a description of the sample will be included. Also contained in this chapter are the major conclusions and implications of the study.

Summary of the Study

The problem. The main problem of this study was the identification of the chief sources of influence for innovation in Canadian urban school systems. Griffiths' theory of educational change, which was based on General Systems Theory, was employed to establish the theoretical concepts of the study. Using the principles of this theory and the propositions enunciated in the review of literature on educational innovation, seven research hypotheses were developed.

The first major hypothesis postulated that the most significant influences for innovation would emanate from the supra-system, or the environment. These sources of potential influence included organizations, associations, and individuals indirectly involved in the operation of school systems.

The second major hypothesis attempted to define the relative significance of the superintendent as a source of

influence for innovation. Situational factors relative to the
appointment of the superintendents, their years of tenure,
their degree of innovativeness, and the hierarchical order of
the systems were tested as subsidiary hypotheses.

The third major hypothesis attempted to identify the
relative significance of potential sources of influence within
the system and sub-system.

Methodology. Two questionnaires were developed to
gather the data: an Inventory of Instructional Innovations and
a Program Development Form.

The Inventory of Instructional Innovations is a question-
naire containing a sixteen item checklist which was completed
by the superintendent on each innovation developed within his
school system during the period from 1954 to 1964. Infor-
mation on the superintendent and the school system was also
provided. The Program Development Form is a questionnaire which
the superintendent completed on each of the three most signifi-
cant innovations developed in his school system during the ten
year period.

The sample. The study was developed from data supplied
by the superintendents of fifty-nine urban school systems in
Canada. Reports from superintendents in urban school systems
from each province of Canada were included in the sample.

Seventy-five superintendents indicated a willingness to co-operate with the study, seventy-two completed reports were returned of which fifty-nine were usable. These fifty-nine completed questionnaires constituted the data used in testing the hypotheses.

Results. Tests of significance applied to the data revealed the following results:

Hypothesis 1.0, that the major sources of influence for instructional innovation emanate from the supra-system, was supported but in the reverse direction, that is, the major influences emanated from the system and sub-system.

Hypothesis 1.1, which predicted the order of influence among potential change agents within the supra-system was partially supported, as it was found that professional educational associations, teacher training institutions and universities ranked higher than commercial organizations. The study indicated that the order of influence for innovation among potential change agents within the supra-system was:

1) the general public,
2) professional educational associations,
3) teacher training institutions and universities,
4) commercial organizations, and
5) private foundations.

Hypothesis 2.0, that the most significant influence for instructional innovation, within the system or sub-system, is the superintendent was supported. The analysis of data indicated

that the superintendents perceived themselves as being the most
significant influence among all potential sources, whether the
source was classified as being within the supra-system, system,
or sub-system.

Hypothesis 2.1, that the number of instructional innova-
tions developed during the tenure of the superintendent is
greater if the superintendent was appointed from without the
system, was not supported. The analysis indicated that the
origin of the superintendent's appointment had a correlation
of .015 with the degree of his innovativeness.

Hypothesis 2.2, that the number of innovations is
inversely proportional to the years of tenure of the super-
intendent, was not supported. The analysis indicated a corre-
lation of .224 between years of tenure and number of innova-
tions.

Hypothesis 2.3, that the number of instructional innova-
tions, developed within a school system, is inversely propor-
tional to the levels of authority within the system, was not
supported. The analysis indicated a correlation of .012
between the number of innovations and levels of hierarchical
order.

Hypothesis 3.0, which predicted the order of influence
among potential sources within the system and sub-system, was
supported. However, there was no statistical significance
among the last three sources. The analysis indicated the order
of influence was:

1) the superintendent,
2) provincial departments of education,
3) local school boards, and
4) system faculty.

In summary, the study indicated that two hypotheses were supported, one hypothesis was partially supported, and four hypotheses were not supported. Of the three major hypotheses, two were supported by analysis. The study indicated significant differences in the degree of influence among eighteen potential change agents in Canadian education. Of greatest significance, the study indicated the importance of agents within the system and sub-system in initiating and developing innovations, at least for the type of innovations reported by the superintendents.

Conclusions

The conclusions presented are based on evidence presented in the study. A number of them must be treated with a degree of caution due mainly to a lack of comparative research on educational innovation in Canada. Comparisons with research conducted in "lighthouse areas" in the United States may not be necessarily conclusive. Conclusions based on the perceptions of local superintendents, albeit the best single source of information related to innovations in urban school systems, may at best be an indication of the actual process of initiation and development of these changes.

Evidence was not presented to indicate the complete role of the superintendent in initiating and developing the innovations. Research in the power structure of communities in decision-making projects indicates that in the early stages of policy formulation, there will be a few individuals making the basic decisions for change. However, as the change project is shaped into manageable proportions there may be a recognition that the group of decision-makers should be enlarged. Conclusive research does not exist to determine the role of the superintendent in the community power structure in Canadian cities. The findings of this study indicate that the superintendent had a significant role to play in the innovations, but whether his position was at the focal point of decision, or merely in the middle position among antagonistically cooperative forces within the community, was not determined.

The research provided evidence that Canadian urban education, as represented by the school systems included in this study, was not characterized by change during the early and middle periods of the study. The fifty-nine superintendents indicated a total of three hundred and ninety-nine innovations over the ten year period, that is .68 innovations per school system per year. Evidence supporting the high degree of stability existing in the school systems was indicated by the tests of significance to related variables which the literature stated lead to a significant degree of innovativeness. However,

no significant effects resulted from the appointment of super-
intendents from without the system; no significant change in
the number of innovations per year occurred during the tenure
of the superintendents; and no significant effects were indi-
cated by growth of the school systems.

The study offered evidence contrary to a main tenet of
systems theory namely that influence for change emanates from
the environment. The analysis of the data offered support for
a conclusion that innovation in Canadian education was initi-
ated and developed by educators, at least for the type of
innovations reported. The degree of professional self-
determination and autonomy indicated in the study is greater
than the literature suggests. Evidence was offered supporting
the conclusion that the system faculty, that is the teachers,
enjoyed as great a degree of influence for innovation as
provincial departments of education and local school boards.
The faculty members were not merely determiners of innovations
within their respective classrooms but rather were reported to
be influential participants in innovation at the system level.

The role of lay critics and influential parents in
innovation was one in which the literature is most indefinite,
but this study indicated a degree of significance greater than
one would propose. The fact that these individuals ranked
higher than private foundations, commercial organizations and

approximated the rank held by teacher training institutions and universities, could have important implications for education in a democracy. The relatively low degree of innovativeness reported for the smaller systems in the sample, supports a conclusion that adequacy and control of human and economic resources are significant factors in promoting and developing educational change.

Implications

The findings of this study suggest several implications for superintendents, school boards, and professional associations. Additional research in the general area of educational change in Canada is implied.

Implications for Superintendents.

The study indicates that the superintendents perceived themselves to be the most significant single source of influence among the potential sources. If superintendents are concerned with the implications of this finding, it is suggested that they should evaluate the decision-making process operating within their school systems; make provision for adequate feedback from all elements of the school systems; give consideration to the development of lay and/or faculty advisory groups; develop and maintain open channels of communication with other sources of influence for change; undertake the development of continual evaluation of the achievements of the expectations and objectives of the school systems.

The other potential sources of influence might not have allocated the same degree of influence to the superintendents' role in the change process. Studies related to the perceived roles of teachers, principals, school boards, and universities in the change process should be reviewed by the superintendents to make them more aware of other possible influences impinging on the change process.

However, if the perceived role of the superintendents in the change process is a reality, it is apparent that superintendents may promote as well as inhibit innovation. Their authority would be a critical element in innovation and the responsibility for the achievements of the school system, the low degree of innovativeness, and the influences of the indicated steady state existing in the school systems becomes more appropriately that of the superintendent rather than other elements in the school system. The perception of the superintendents of their crucial role in innovation should stimulate them to a re-examination of their role as perceived by others.

Implications for school boards. An understanding of the relative importance of potential agents of change in initiating and developing educational innovation in Canada should be apparent from this study. The selection of a superintendent for a particular school system is one of the most important decisions the board can make. The far-reaching effects of this decision is evident from the study. No other single influence

or situational factor existed which was greater than that of the superintendent for maintaining the stability of the system or for changing it.

Implications for professional associations. As a most powerful agent for change outside the school system, the responsibility of professional educational associations is evident. Existing as communicators and promoters of change, these associations had a direct influence on the decisions of the superintendents. Local, provincial, and national issues in education need to be debated and reported. Opportunities for intervisitation of superintendents should be promoted on a national and international scale. Certification and training programs for educational administrators in senior positions need to be advanced. Diffusion of information on innovations should be improved.

Implications for further research. This study of innovations in Canadian education has led to a concern for additional research on this subject. The need for a study to determine the reasons for the high degree of stability in Canadian education during this period of great social and technological change may be apparent. Factors leading to the degree of commonality among superintendents in Canada, if researched, would offer insights valuable to a greater understanding of Canadian education.

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APPENDIX A

INTRODUCTORY LETTER TO SUPERINTENDENTS

Department of Educational Administration
University of Alberta
Edmonton, Alberta

January 9, 1964.

Dear Sir:

Please allow me to introduce myself and my research
project. I am a Nova Scotian presently enrolled in a Doctor
of Philosophy program in the Department of Educational
Administration at the University of Alberta, Edmonton.

The research study I am undertaking attempts to
determine the main influences of educational change in
Canadian urban school systems. Recent evidence from studies
conducted in the United States indicates that the past dec-
ade has witnessed an acceleration in instructional innov-
ation. Few studies have been completed to offer information
on the sources of influence for these innovations and the
processes by which they are developed. My study may pro-
vide educational administrators with greater understanding
of the change process in educational institutions and offer
insights into the classification of innovators and resistors
of change.

The focus of my study will be the urban school systems
in Canada during the period from 1954 to 1964, that is, the
past ten school years. Information will be required on each
of the system instructional innovations during this period.
Data collection will be by questionnaire. The question-
naires will be answered by the superintendent and although
the system will be identified on the questionnaire, you may
be assured that anonymity will be maintained in any reports
on the study.

Considerable effort has been exerted to ensure that completion time of the questionnaires has been minimized. The information requested concerns such superintendent character- istics as experience and training and system instructional innovation in your system during the past ten years. The reports on the instructional innovations will be by a check- list.

An early reply stating your co-operation with this study is requested and will be greatly appreciated.

Yours truly,

J. A. Earle

APPENDIX B

LETTER OF INSTRUCTIONS TO SUPERINTENDENTS

Department of Educational Administration
University of Alberta
Edmonton, Alberta

January 31, 1964

Dear Sir:

Please accept my thanks for deciding to co-operate with my study on instructional innovation in Canadian urban school systems. Enclosed are copies of the questionnaires required to complete the study.

The Inventory of Instructional Innovations. I have enclosed three copies of this questionnaire. Directions for its completion are printed on the questionnaire. Please list all instructional innovations for the period from 1954 to 1964 as per instructions and ensure that PART A of the questionnaire is completed.

Program Development Form. You are required to select three instructional innovations from those listed, which in your opinion were the most important for the system in the ten year period. Complete one Program Development Form for each of these selected innovations.

I would also appreciate having a copy of your administration organization chart. This is required as one of the areas to be researched and relates to system organization structure.

A copy of the abstract of the study will be sent to each co-operating superintendent on completion. I will appreciate an early return of the completed questionnaires.

Yours truly,

J. A. Earle

APPENDIX C

FOLLOW-UP LETTER TO SUPERINTENDENTS

Department of Educational Administration
University of Alberta
Edmonton, Alberta

May 15, 1964.

Dear Sir:

I am asking that the questionnaires related to my
study on Instruction Innovation in Canadian School Systems
sent to you earlier be completed and returned by May 31st.
This is the deadline date for collection of material for
my study. I would appreciate having the completed question-
naires returned by this date or a reply stating that you are
no longer willing to co-operate in this project.

I thank you once again for your co-operation with
this project.

Yours truly,

John A. Earle

APPENDIX D

INVENTORY OF INSTRUCTIONAL INNOVATIONS

PART A

A. SUPERINTENDENT

1. PROFESSIONAL TRAINING:

a. Total Years — Teacher Training ....

b. Total Years — Graduate Training ....

c. Total Years — Administrative Training ....

d. Degrees: 1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

2. EXPERIENCE

	Within Present System	Outside Present System
a. Total Teaching Experience		
b. Total Administrative Experience		
c. Years in present system prior to present appointment		
d. Years in present appointment		

B. SYSTEM

3. Number and classification or Central Office staff—

   (Please check the number of each)

   ...... Assistant Superintendent   ...... Director of Instruction

   ...... Director of Secondary Education   ...... Director of Research

   ...... Director of Elementary Education   ...... Director of Personnel

   ...... Director of Primary Education   ...... Director of Guidance

   ...... Director of Special Services   ...... Director of Vocational Education

   ...... Administrative Assistant

   ...... Other (please specify) 1. .... 2. ....

4. Please check the approximate per pupil cost for elementary and secondary education in your system—

Elementary	Per Pupil Cost	Secondary
_____	less than $100	_____
_____	$100 - $200	_____
_____	$200 - $300	_____
_____	$300 - $400	_____
_____	$400 - $500	_____
_____	$500 - $600	_____
_____	over $600	_____

5. Does your system have a Lay Advisory Curriculum Committee? Yes ...... No ......

6. Does your system have a Faculty Advisory Curriculum Committee? Yes ...... No ......

7. Are the members of your school board — elected ......, appointed ......?

QUESTIONS AND ANSWERS

Q. What type of change projects should I include?

A.   Any project which you consider to be part of the instructional program of your system. Changes in subject content areas, pupil classification, are examples. Don't include any changes made in improving public relations, hiring better qualified teachers or similar changes in policy. **IF IN DOUBT include the change.**

Q. How many change projects should one include?

A.   List all the projects which were started since-1954-55 and **are still in operation.**

Q. Should projects which are in operation in some of our schools but not in all be included?

A.   No — we are interested in changes at the system level only.

Q. What if the project was new for our system but another system has had it for years?

A.   List it — we are interested in your system.

Q. What about a project which we are planning to adopt?

A.   List it **if it will be in operation this school year.**

INVENTORY OF INSTRUCTIONAL INNOVATION

DIRECTIONS: — Please name all new instructional programs started in your school system since the school year 1954 - 55. Include only those changes in the instructional program adopted on a system level we are not interested in those changes adopted at the individual classroom or school level. Write the name of the change project in the column on the left and check the characteristics of each project in the columns to the right.

An example is given on the first line. Don't write in any comments, the I.B.M. machine will simply count your checkmarks.

The reverse of this questionnaire provides answers to questions which other superintendents have asked about the use of this form. This information may be of use to you.

PLEASE COMPLETE PART "A" OF THE QUESTIONNAIRE.

PART B

FOR WHAT GROUP IS THE PROGRAM PROVIDED?

HOW DID THE IDEA COME TO YOUR ATTENTION ORIGINALLY?

GRADE LEVEL

ABILITY LEVEL

PLEASE NAME ALL THE INSTRUCTIONAL PROGRAMS STARTED SINCE 1955

CHECK OFF THE FACTS ON EACH

	Year Program Began	Prov. Dept. of Education	Univ. - Tch. Trg. Instit.	Professional Organ.	Citizen's Group	Prov. Curr. Study Group	Local School Faculty	Private Educ. Foundation	Informal Professional Contact	K-3 (Primary)	4-6 (Intermediate)	7-9 (Junior High)	10-12 (Senior High)	Gifted	Above Average	Average	Below	Mental Retard.	Art	Business Ed.	English - Language Arts	Foreign Languages	Health - Person
ORAL FRENCH	1960				√		√	√			√	√									√		
01																							
02																							
03																							
04																							
05																							
06																							
07																							
08																							
09																							
10																							
11																							
12																							
13																							
14																							
15																							

PROVINCE

FOR WHAT GROUP IS THE PROGRAM PROVIDED?			WHAT CONTENT DOES THE PROGRAM INVOLVE?			CHECK ANY CHANGES IN CONTENT				CHECK ANY CHANG ACTIVI
GRADE LEVEL	ABILITY LEVEL					MATERIAL PRESENTED	ASPECTS EMPHASIZED	RESPONSIBILITY		PERSONN

Column labels (diagonal):
...ifted | ...enior High) | Above Average | Average | Below | Mental Retard. | Art | Business Ed. | English - Language Arts | Foreign Languages | Health - Personal Dev. | Home Economics | Industrial Arts | Mathematics | Music | Physical Education | Science | Social Studies | Technical Education | Other | More Material | Less Material | Different Material | Presented Earlier | Presented Later | Other | Attitudes | Concepts | Knowledge | Skills | Other | Regular Duties Divided Differently | Regular Duties Combined In New Ways | Leadership Positions Created in Faculty | Non Professionals used in non-teaching roles. | Resource Persons assist with Instruction | Semi-Professionals in Instruction | Outside Personnel Teach students independently | Lecture | Demonstra | Re...

Row 1 checkmarks:
√ (ifted) | ... | ... | ... | √ (English - Language Arts) | ... | √ (More Material) | ... | √ (Attitudes) | √ (Concepts) | ... | √ (Resource Persons assist with Instruction) | ... | √ (Lecture)

r CHANGES
NTENT

CHECK ANY CHANGES IN TEACHING
ACTIVITIES

CHECK ANY CHANGES
IN GROUPING

CHECK
USE OF E(

ASPECTS EMPHASIZED	RESPONSIBILITY	PERSONNEL	PROCEDURE	SIZE OF GROUP	BASIS FOR GROUPING	EQUIP

Column labels:
- Regular Duties Divided Differently
- Regular Duties Combined in New Ways
- Leadership Positions Created in Faculty
- Non Professionals used in non-teaching roles.
- Resource Persons assist with Instruction
- Semi-Professionals in Instruction
- Outside Personnel teach students independently
- Lecture
- Demonstration
- Recitation
- Discussion
- Testing and Review
- Student Projects
- Other
- Individual Tutoring
- Smaller than before
- Larger than before
- Variable
- Age
- Mental Ability
- Physical Ability
- Emotional Stability
- Achievement
- Interest
- Other
- Visual Projectors
- Sound Recorders and Players
- Closed Circuit T.V.
- Broadcast T.V.
- Programmed Instruction Machines
- Programmed Instruction
- Textbooks
- Individual Listening
- Recording Bo...
- Other

CHECK ANY CHANGES IN GROUPING		CHECK ANY CHANGES IN THE USE OF EQUIPMENT AND MATERIALS		CHECK ANY CHANGES IN THE TIME	CHECK ANY CHANGES IN THE PLACE
SIZE OF GROUP	BASIS FOR GROUPING	EQUIPMENT	MATERIALS		

APPENDIX E

PROGRAM DEVELOPMENT FORM

INSTRUCTIONAL INNOVATION STUDY

PROGRAM DEVELOPMENT FORM

Name of Project: _____

1. Local educational change is sometimes influenced by a
   number of outside groups, agencies, or sources. In your
   opinion which of the following outside groups had an
   effective influence on the initiation of this innova-
   tion in the instructional program of your system?

   Enter a "3" to indicate a source of considerable influ-
   ence, a "2" one of some influence, a "1" to indicate one
   of minor influence, and a "0" for one of no influence.

   a. Provincial Department of Education . . . . .____

   b. Universities and/or Teacher Training Institutions ____

   c. Professional Associations - Local . . . . .____

   d. Professional Associations - Provincial. . . . . . ____

   e. Professional Associations - National . . . . . . .____

   f. Education Foundations (Ford, Carnegie, etc.) . . ____

   g. Commercial Organizations (textbooks publishers) . ____

   h. Other sources . . . . .____

2. Local educational change is sometimes developed from a
   local climate of change. In your opinion which of the
   following local sources had an effective influence on
   the initiation of this innovation in your system?

   Enter a "3" to indicate a source of considerable influence,
   a "2" one of some influence, a "1" to indicate one of
   minor influence, and a "0" for one of no influence.

   a. General public demand . . . . ____

   b. Local school board . . . . ____

   c. Local system faculty . . . . ____

   d. Central office personnel (other than yourself). . ____

   e. Critics within your teaching staff . . . . ____

   f. Lay critics in your community . . . . ____

g. Demand from few influential parents . . . . .____

h. Examination and/or achievement tests . . . . . . .____

i. Your own initiative . . . . .____

3. If you were in favor of the innovation, which of the following helped you in recommending this project?

   Enter a "3" to indicate a source of considerable influence, a "2" one of some influence, a "1" to indicate one of minor influence, and a "0" for one of no influence.

   a. Research reports . . . . .____

   b. Speeches by prominent educators . . . . .____

   c. Professional literature . . . . .____

   d. University and/or teachering training courses . .____

   e. Curriculum workshops . . . . .____

   f. Actual observation of similar project in
      another system . . . . ____

   g. Your own experience in another system . . . . . ____

   h. Other . . . . ____

4. In assessing **your** **own** **role** in the initiation and development of this particular instructional innovation, which **ONE** of the following best describes that role:

   a. You made the decision and announced it . . . . . ____

   b. You "sold" the decision to your staff . . . . . ____

   c. You presented the idea to the staff and/or
      school board and invited participation in the
      decision. ____

   d. You presented a tentative decision which was
      subject to change . . . . ____

   e. You presented the problem to stimulate sug-
      gestions, then made the decision . . . . ____

   f. You defined the limits of the solution and per-
      mitted the staff and/or board to make the
      decision . . . . ____

   g. You made your recommendation on the decision
      made by your staff . . . . ____

   h. Other . . . . ____

APPENDIX F

LIST OF SCHOOL SYSTEMS

LIST OF SCHOOL SYSTEMS

NEWFOUNDLAND

St. Johns' Board of Education (Salvation Army)
St. Johns' Board of Education (Anglican)

PRINCE EDWARD ISLAND

Charlottetown
Summerside

NOVA SCOTIA

Glace Bay
Halifax
Sydney Mines
Yarmouth

NEW BRUNSWICK

Edmundston
Moncton

QUEBEC

Chambly County (Protestant Central)
Drummondville
Hull
Montreal (English Catholic)
Sherbrooke
Verdun (Catholic)

ONTARIO

Brantford (Public)
Belleville (Public)
Etobicoke
Fort William
Guelph
Lakeshore
Leaside
London
Niagra Falls
Oshawa
Ottawa (Collegiate)
Ottawa (Public)

ONTARIO (continued)

St. Catharines
Sault Ste. Marie
Sudbury
Toronto
Welland
Willowdale
Windsor

MANITOBA

Winnipeg
Brandon School District #129
Brandon School District #40
Seven Oaks

SASKATCHEWAN

Prince Albert (Separate)
Regina (Collegiate)
Regina (Public)
Regina (Separate)
Saskatoon (Collegiate)
Saskatoon (Separate)
Swift Current (Public)
Yorkton (Public)

ALBERTA

Calgary (Public)
Calgary (Separate)
Edmonton (Public)
Edmonton (Separate)
Lethbridge (Separate)
Medicine Hat (Public)
Red Deer (Public)
West Jasper Place (Public)
West Jasper Place (Separate)

BRITISH COLUMBIA

Kelowna
Nanaimo
Trail