Some Economic Aspects of Provincial Educational Systems

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prepared for the
Economic Council of Canada

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PREFACE

While it would be impossible to properly acknowledge everyone who has been of assistance in this Study, there are some to whom our debt is particularly great.

We would like to give special thanks to the officials of the Dominion Bureau of Statistics, particularly in the Education and Census Divisions, for providing previously unpublished data and useful advice in the interpretation of it.

The Study also benefited from the assistance of a number of people who read all or part of earlier drafts. They include Dr. J. E. Cheal, Head of the Department of Educational Administration, University of Calgary; Dr. J. W. Holland, Chairman, Department of Educational Planning, Ontario Institute for Studies in Education; Dr. F. E. Whitworth, then Director of the Canadian Council for Research in Education; Dr. M. Wisenthal, Director of the Education Division of the Dominion Bureau of Statistics; Dr. O. E. Thür, Vice-Chairman of the Economic Council of Canada; and Dr. M. von Zur-Muehlen, a colleague on the professional staff of the Economic Council. We found their suggestions most helpful, and naturally we accept full responsibility for any errors or inadequacies found in the Study.

We would also like to give specific thanks to all those on the staff of the Economic Council who were involved in the typing and photocopying of the many drafts of the report and its final preparation.

For the convenience of those who might wish to make further enquiries regarding the Study, we would add that, while the Study is in every sense a joint project, each author was identified with a particular area of concentration -- J. Cousin, with Chapters 4 and 8 and Appendixes B and F; J. Fortin, with Chapters 5 and 9 and Appendixes C, D, and E; and C. Wenaas, with Chapters 2, 3, 5, 6, and 7 and Appendix A.

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CHAPTER 1

INTRODUCTION

Purpose of Study

With education ranking today as a major industry
and the largest single item of government expenditure,
increasing attention is being given to research and
analysis of the functioning of educational systems and
the relationship between educational systems and the
rest of the economy.

The purpose of this Study is a relatively modest
one -- to examine some of the data on educational systems
in the various provinces of Canada and to indicate some
of the differences in the resources employed and in the
ways in which they are utilized. Attention has been
directed mainly to the elementary and secondary levels.
The approach has been largely a descriptive one.

This Study is intended as a macro examination of
the resources of provincial systems rather than as a
study of individual schools or classrooms. A reliance
upon provincial averages may, of course, obscure the
substantial variations within each provincial system.
In some cases, the range of intraprovincial variations
has been indicated.

Much of the material presented in this Study formed
the background for Chapter 8 of the *Sixth Annual Review*
of the Economic Council of Canada,[1] but other data that
have become available since then have been incorporated.
Primary attention has been given to the decade of the
1960's.

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[1] Economic Council of Canada, *Sixth Annual Review:
Perspective 1975* (Ottawa: Queen's Printer, 1969).

Framework of Study

In this Study, education is approached as an enterprise utilizing resources or "inputs" from the rest of the economy and producing services or "outputs" in exchange. Major attention has been given to the input side of what may be described as the input-output equation as well as to any regional and provincial differences that appear to exist. Output has been assessed only in terms of years of schooling of the labour force, with several alternative measurements being offered, incorporating different weights for different educational levels. It is recognized that the *quality* of output is one of the most relevant factors in assessing output, but currently no objective nation-wide criteria are available for doing this. Therefore, little is said *explicitly* in this Study about the effectiveness of the manner in which inputs are combined to produce an output.

Nevertheless, there is an implicit assumption that the quality of outputs is related to the quantity and quality of inputs. This is an underlying theme of several of the chapters of this Study.

Outline of Study

Chapter 2 sets forth the general framework within which the factors employed in educational systems are considered. This involves a brief description of the nature of the educational function and a classification of the inputs or resources employed in educational systems in terms of the ways in which they impinge on the educational function.

The next four chapters consider the magnitude of the resources employed and some of their characteristics. Chapter 3 begins with a general examination of the human resources -- teachers and non-teachers -- employed in each province in different educational systems. This examination is confined to numbers, occupational characteristics and levels of educational attainment. Chapter 4 then focuses on teachers at the elementary and secondary level and on various characteristics which are regarded as being indicative of teacher quality. Chapter 5 considers the capital resources used in elementary and secondary schools with major attention being given to buildings. Chapter 6 examines selected characteristics of students in educational systems.

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In Chapter 7, we report on some of the data indicating scale of operations of provincial elementary and secondary school systems. These include data at the school-district, school, and class levels.

Chapter 8 examines education expenditures primarily at the elementary and secondary levels. It examines the provincial differences in levels of education expenditures and some of the factors that account for these differences. Provincial expenditures on education are evaluated in terms of indexes of educational "need" and "effort" which incorporate the effects of demographic structure and income levels -- in other words, which provide some illustration of the relationship of external factors to the educational system.

Chapter 9 considers the relationship between educational systems and the outside economy in a different context -- the output of the educational system as reflected in years of schooling of the labour force. This may be described as educational stock. The changes in the educational stock in the various regions of Canada have been examined over the period since 1951.

A summary of the report and conclusions is included in Chapter 10.

CHAPTER 2

ECONOMIC FACTORS IN EDUCATIONAL SYSTEMS

Teachers, clerks, administrators, schools, black-boards, books, radios, television sets, typewriters, soap -- these are just some of the resources used in educational systems. Since it is impossible to consider meaningfully the hundreds and even thousands of individual items employed in educational institutions, some system of classifying and aggregating them into distinctive groups is necessary. Two such systems may be adopted: the first would use such standard economic definitions as land, labour and capital; the second would classify resources in terms of their relationship to the educational process. The first approach is most useful in comparing, in a broad and highly aggregated way, the nature and performance of the educational industry with those of other industries; the second provides a framework in which one may illustrate more precisely the manner in which changes in resources may be presumed to affect educational performance.

Both approaches are considered in this chapter. In the Study as a whole, it has been found necessary to shift from one approach to the other; for example, much more intensive consideration has been given to one subdivision of the labour factor -- the teacher -- than to labour as a whole. This is because it is generally accepted that the teacher plays a critical role in the educational process, and considerable data on teachers have been accumulated over the years. On the other hand, other specific factors, such as audio-visual aids, uniquely involved in the educational process have not been examined separately due to lack of data.

Regardless of the system of classification employed, one has the further alternative of examining economic factors either in terms of numbers and other physical characteristics or in terms of their prices. Here again, a two-pronged approach has been followed. Data on labour-resource and certain other factors have been indicated in terms of physical quantities, but the most comprehensive examination has been in terms of market prices, i.e., expenditures in current dollars.

Classification of Factors of Production

In standard economic terms, at least three factors of production may be described -- (1) land, (2) capital, and (3) labour -- or alternatively, natural resources, capital resources (i.e., certain durable resources that have been produced for use in further production processes), and human resources.[1] At any given point in time, it is also appropriate to speak of a fourth factor -- (4) resources that have only partially undergone a particular production process. For any given industry, a fifth category would be added to cover (5) resources purchased from other industries. Thus one may attempt to describe the resources employed in education in terms of these five categories.

Natural resources -- This factor is difficult to define within the economic framework[2] and, for various reasons, it has been almost entirely ignored in this Study. No data exist, for instance, that compare the value of land or other natural resources utilized by one industry with that of another. Moreover, although land is an important item among the capital assets listed in the financial statements of educational institutions, it is generally valued in such statements in terms of original cost. In an extended period of inflation, comparisons in terms of original cost would be significantly affected by the time at which the land was purchased. Rapidly expanding educational systems would almost automatically be shown with a larger land component than slow-growing systems. One could attempt to adjust for this and express the value of land in terms of current market value (ostensibly, the value of the land for its most attractive alternate use) but, apart from the practical difficulties of doing so, this would serve to introduce another bias -- the metropolitan

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[1] Frequently, another factor is identified -- the entrepreneur who serves to combine all these resources -- but as will be discussed later, entrepreneurship in the education industry seems to be a feature associated with a number of subclasses of the human resources employed, not just one.

[2] Natural resources are not priced in the National Accounts, for instance.

bias. The land in the central core of a metropolitan area naturally has a much greater market value than rural land. A metropolitan educational system is therefore likely to have a larger land component in terms of market value than a rural system. Since such a difference in value has no bearing on educational performance, it seemed unwise to try to account for this factor.

Capital resources -- This second factor -- the capital employed in educational systems -- mostly takes the form of buildings and typically has a relatively long life. Thus, as in the case of land, the problem of current valuation of these capital resources emerges. Yet since the major part of capital stock has been put in place within the last two decades (with much of the construction concentrated in the 1960's), this is not as critical a problem as might appear at first. The data on the original cost of buildings, with adjustments to account for increases in price levels, should be reasonably representative of the gross capital stock of the educational sector. Estimates of net capital stock incorporate assumptions with respect to depreciation rates, but because of the recent date of most construction, they are not markedly lower than those for gross capital stock.

In 1968, gross capital stock of the education industry was estimated at about $8.5 billion in constant 1961 dollars, with about $6.4 billion accruing to schools and $2.1 billion to universities. For the same year, net capital stock for the education sector was estimated at $6.5 billion in constant 1961 dollars (see Table 2-1). The gross capital stock estimates assumed a 50-year life for buildings and a 20-year life for machinery and equipment. For net capital stock, straight-line depreciation with the same life assumptions was adopted.

Capital stock may obviously be evaluated in terms of other base years. In 1968 dollars, for instance, the estimated capital stock naturally becomes higher -- at $10.4 billion in gross terms and $8.0 billion in net terms. The estimates of capital stock in original-cost dollars ($8.3 billion, gross; $6.8 billion, net) coincidentally are not much different from those made in terms of constant 1961 dollars. From the point of view of this Study, the absolute level of any estimate of capital stock is not particularly important. The principal interest is in the relative levels in the various provinces. These are examined in Chapter 5.

Table 2-1

ESTIMATES OF CAPITAL STOCK
EDUCATION INDUSTRY, CANADA, 1968

(Millions of dollars)

	Universities			Schools			Total		
	Construction	Machinery and Equipment	Total	Construction	Machinery and Equipment	Total	Construction	Machinery and Equipment	Total
Current 1968 dollars									
Gross	2,204	325	2,529	7,150	714	7,874	9,354	1,039	10,393
Net	1,834	249	2,083	5,452	486	5,938	7,286	735	8,021
Constant 1961 dollars									
Gross	1,779	296	2,075	5,770	648	6,418	7,549	944	8,493
Net	1,480	226	1,706	4,399	442	4,841	5,879	668	6,547
Original-cost dollars									
Gross	1,811	304	2,115	5,560	650	6,210	7,371	954	8,325
Net	1,578	237	1,815	4,539	456	4,995	6,117	693	6,810

Source: Dominion Bureau of Statistics, *Fixed Capital Flows and Stocks, Non-Manufacturing Industries, 1926-1968* (unpublished data).

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These capital stock estimates may be used for the purpose of comparing capital-labour ratios in education with similar estimates for other industries. These indicate that utilization of capital in the education industry is relatively high -- higher than manufacturing and only slightly below the average for the whole economy[1] (see Table 2-2). Gross capital stock in constant 1961 dollars was estimated at about $18,000 per employed person for education compared with about $17,000 for manufacturing, $20,000 for agriculture, and $21,000 for the economy as a whole (excluding housing). The utilities sector was far above average at about $200,000 per employed person, and even public administration was high at about $66,000 per employed person.

Table 2-2

GROSS CAPITAL STOCK PER PERSON EMPLOYED IN
MAJOR INDUSTRIES, CANADA, 1968

(Thousands of constant 1961 dollars)

Utilities	202
Mining, quarries, oil wells	83
Public administration	66
Transportation, storage, communication	44
Agriculture	20
Education	18
Fishing	18
Manufacturing	17
Finance, insurance, real estate[1]	14
Forestry	12
Community, business, personal services[2]	10
Trade	6
Construction	4
Total economy[1]	21

[1] Excluding housing.

[2] Including education.

Source: Based on data from Dominion Bureau of Statistics.

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[1] It is, of course, appropriate to express some reservations about such comparisons. The results depend on the extent to which the assumptions regarding asset life are valid and also on the appropriateness of the price indexes applied to convert the values expressed in original-cost terms into values expressed in constant-dollar terms.

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It is not easy to establish the significance of these data since much of the capital stock of educational systems provides the *environment* for the educational process as distinct from direct participation in the educational process itself. A similar explanation accounts for the high capital-intensity of public administration. Yet, in manufacturing, a major part of the capital stock in the form of buildings also provides an environment for the manufacturing process. Thus the distinction between the two basic roles of capital stock is useful to keep in mind, but in some respects it is an artificial one.

Human resources -- As already noted, the third factor -- labour, or human resources -- is accepted as a critical element in education, particularly the teachers, who make up a large proportion of the human resources.[1] The number of people directly employed in all educational institutions in October 1968 totalled about 500,000, or about 6.7 per cent of total employment at that time (see Table 2-3).

Table 2-3

PERSONS EMPLOYED IN EDUCATIONAL INSTITUTIONS
CANADA, OCTOBER 1968

	Teachers	Teachers as Percentage of Total	Total
	(Thousands)	(Per cent)	(Thousands)
Public elementary and secondary schools	276.4	76	362.1
Private elementary and secondary schools	9.2	64	14.4
Universities and colleges	41.3	42	97.5
Teachers' colleges	1.9	64	3.0
Public vocational and trade schools	3.6	85	4.2
Institutes of technology	6.5	62	10.6
Others	5.8	55	10.6
Total	344.7	69	502.4

Source: Based on data from Dominion Bureau of Statistics.

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[1] John Vaizey makes the point that "The scarcest resource used in the greatest quantity in education is ability." *The Economics of Education* (London: Faber and Faber, 1962), p. 108.

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In addition, of course, another human resource --
the student -- is intimately involved in the educational
system. The numbers here are naturally much larger than
the numbers shown as "employed". During the 1968-69
term, the number of full-time students amounted to
approximately 6,100,000 and many others were involved in
part-time educational activity.

As indicated in Chapter 3, labour employed in the
education industry includes various categories, although
"teachers" accounted for 69 per cent of the total. Teachers
comprised 76 per cent of all employed in elementary and
secondary schools. The category "teachers", as used
here, includes school principals and vice-principals as
well as classroom teachers and university professors.
Many, perhaps most, of these school principals and vice-
principals have no direct teaching responsibilities, and
the temptation would be to consider this labour force
category separately. They are, however, generally the
most experienced and most highly qualified of teachers,
and their selection as principals is assumed to have
been on the basis of their qualifications as teachers.
Accordingly, in Chapter 4 where the characteristics of
teachers are examined, little distinction has been made
between school teachers and school principals.

A distinguishing characteristic of the education
industry is the relatively high average level of formal
education qualifications of the human resources employed
in it. The proportion of professional and technical
occupations is a reliable indication of this, since these
occupations, by definition, have a high formal educa-
tional component. In 1961, 76 per cent of the total
labour force employed in education was in the professional
and technical category compared with 7 per cent in all
other industries combined. This was also higher than
in any individual industry.[1] Only the industrial
grouping of religious organizations, offices of
physicians, and engineering and scientific services
came close (see Table 2-4).

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[1] This is true for industries down to the S.I.C. 3-digit
level.

Table 2-4

PROFESSIONAL AND TECHNICAL OCCUPATIONS
IN SELECTED INDUSTRIES, CANADA, 1961

(Per cent)

Industries	As Percentage of Total Employed in Each Industry
Education and related services	76
Religious organizations	64
Health and welfare services	44
Hospitals	41
Offices of physicians	65
Offices of dentists	56
Other health services	63
Welfare organizations	28
Services to business management	42
Accountancy service	42
Advertising service	17
Engineering and scientific service	69
Legal service	43
Other services	22
Provincial public administration	19
Federal public administration (excluding defence services)	18
Miscellaneous services	14
Motion picture and recreational services	7
Local public administration	6
All others	3

Source: Dominion Bureau of Statistics, *Census of Canada,*
1961, Labour Force, Occupation Divisions by
Detailed Industries and Sex.

Teachers (including school principals and university professors) make up a large part of the professional category employed in education. In 1961, fully 50 per cent of the male teachers had university degrees and another 25 per cent had some university training. For female teachers, the proportions were 14 per cent and 26 per cent, respectively.

Since educational systems are now relatively large in terms of total resource commitments, this means that education absorbs a significant proportion of the output of its own higher education sector. For instance, in 1961, 38 per cent of the females and upwards of 14 per cent of the males in the labour force with university degrees were employed in the educational system. Of females in the labour force with some university training, 38 per cent were employed in education; of males, 8 per cent. In other words, a significant portion of educational output becomes educational input at a subsequent stage.

There is increasing recognition that the cost of education and training of human resources may be described as capital investment in human resources.[1] Thus educational systems may be described as relatively *human capital*-intensive.

There is a major conceptual problem involved in the consideration of the student resource. The student is obviously a major human resource in the education industry but the student is not "employed" in the usual economic sense. Typically, he does not receive remuneration and is not producing a good or a service. In fact, in principle, it is the student who is receiving the service produced by the education industry. But this must be regarded in large part as an intermediate product; i.e., part of the skills and knowledge acquired by the student in the educational system are later "sold" to other industries or to the final consumer. It would, therefore, be valid to regard the student as a factor engaged in the production of a service for later exchange in the market place.

The recognition of this does not take us very far in an empirical sense. There is little information by which one can assess those characteristics of students which are important in this productive process. Data on age and sex of students are now generally available, and these have been briefly examined in Chapter 6. But the most critical characteristics appear to be such factors as aptitudes, intelligence in its various forms,

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[1] G. S. Becker, in his *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (New York: National Bureau of Economic Research, 1964), pays considerable attention to this point of view.

motivations and attitudes, which are seen to be related in complex ways to inheritance and environment. An increasing volume of research has been devoted to characteristics of intelligence, but the other factors are proving to be very difficult to put into a research framework.

There is also a problem in determining the "cost" of the student resource. In economic terms, this may be expressed in terms of "income forgone" -- i.e., income that the student could be earning if he were not attending school or university. At the university level, it has been estimated in some studies that the income forgone by students is just as great as, if not greater than, the other operating costs of the educational system.[1] Even if employment is not feasible (as in the case of young children), there are alternative uses for a student's time. The concept of psychic income forgone might be introduced to account for this.[2] While this is not capable of being measured, it is nonetheless a real factor.

Resources in process of production -- An alternative conceptual approach would be to regard the student as equivalent to "resources or goods in process", the fourth factor referred to at the beginning of this section. This would imply that the value of the student is not enhanced by the educational process until a certain stage has been completed. The specialized institutional structure of the economy gives this point of view a certain validity,[3] but it is not one that can be accepted as an overriding consideration.

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[1] For one estimate, see W. L. Hansen and B. A. Weisbrod, *Benefits, Costs, and Finance of Public Higher Education* (Chicago: Markham Publishing Company, 1969), pp. 41-54.

[2] The use of "psychic income" as a term equivalent to "satisfactions" serves to emphasize that money income does not represent the sum total of satisfactions subsequently obtained or, in other words, psychic income is not coterminous with money income. The psychic income forgone would have to be counterbalanced by the psychic income derived from attendance at school, which may in fact be larger.

[3] A law student, for instance, not yet having obtained his degree and thus unable to practise law, will find, in general, that his studies have not enhanced his prospects for other employment opportunities.

Purchases of resources from other industries --
The fifth category of resources involved in a single
industry consists of those goods and services purchased
from other industries. In education, most of such
purchases are capital items and therefore have already
been considered in this chapter -- for example, buses
and various kinds of equipment, such as television sets,
radios, books, etc.[1] Buildings may also be regarded as
purchases from the construction industry. New construc-
tion in a given year, however, is only a small proportion
of total stock. Apart from capital items, purchases by
educational systems are minimal, involving such items
as paper, electrical power, fuel and water.

Expenditures of Educational Systems

In the final analysis, the total resources[2] used by
the educational system may be evaluated in terms of total
expenditures in money terms. The utilization of different
types of resources is thus expressed in a common term
which indicates something of the quantity and quality of
the resources utilized as well as the structural factors
that affect the price of each resource.

In 1967-68, total expenditures for formal education
and vocational training reached $5.2 billion, of which
about $1.1 billion was for capital expenditures -- i.e.,
expenditures on buildings, machinery and equipment, and
land. This amounted to about 7.8 per cent of Canada's
Gross National Product. Of the total, about $3.4 billion
was for elementary and secondary education and about
$1.1 billion for universities and colleges (see Table 2-5).

Since major attention is being directed to the long-
established provincial systems of publicly controlled
elementary and secondary schools, additional details of
this sector will be examined.

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[1]Generally, in the financial accounts of educational
authorities, some equipment is not capitalized, and
expenditures for such components may be regarded as
operating expenditures.

[2]Subject to earlier reservations about land and student
resources.

Table 2-5

EXPENDITURES ON FORMAL EDUCATION
AND VOCATIONAL TRAINING, CANADA, 1967-68[1]

(Millions of dollars)

	Operating	Capital	Total
Elementary and secondary			
Publicly controlled schools	2,299[2]	655	2,954[2]
Private schools	--	--	84
Indian and Eskimo education	--	--	67
Other	--	--	299
Subtotal	--	--	3,404
Teacher training outside universities	--	--	31
Postsecondary non-university	66	63	130
Universities (including research)	739	381	1,120
Other postsecondary[3]	--	--	114
Other formal education	--	--	25
Total formal education	--	--	4,824
Vocational training			338
Total formal education and vocational training			5,162

[1] Fiscal year ending closest to March 31, 1968.

[2] Excludes interest on debenture debt.

[3] Includes mostly scholarships and student aid.

Source: Based on data from Dominion Bureau of Statistics.

In 1967, the operating costs[1] of public school boards amounted to $2,299 million, of which teachers' salaries comprised $1,488 million. Expenditures on fixed capital assets were estimated at about $655 million.

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[1] Excluding interest on debt.

No further consideration is given to expenditures for land, or interest on school debt. The expenditures for capital assets (excluding land) are considered in Chapter 5. The operating expenditures of school boards are considered for each province in Chapter 8.

Relationship to the Educational Process

The resources thus far identified may now be considered in terms of their relationship to the educational process. This involves some consideration of the educational process itself,[1] a description of the ways in which resources interact in the educational system, and a discussion of some operational principles. The material in this section has not been fitted into a rigorous input-output framework, but some background material on this question has been considered in Appendix A, entitled "A Consideration of Output and Input-Output Relationships in Education".

The educational process -- It is difficult to express in exact terms what the educational process is. One of the problems is that conventional terms such as "education", "training" and "learning" do not have precise meanings and are sometimes used interchangeably. In general, the term "learning" seems to be used to encompass a wide universe -- much wider than that of either "education" or "training" -- and may be said to include both "education" and "training". "Learning", in this broad generic sense, may be said to comprise the whole of life's experiences -- the receipt of all information obtained through our sensory organs and its organization in meaningful ways, and the acquiring of ability to perform some or all of the actions of which the human body and mind are capable. "Training", on the other hand, may be thought of as a specialized form of learning -- learning in an organized way how to perform specific tasks, generally physical ones -- while "education", in a broad sense, is concerned with the

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[1] This is only one of the points at which studies in educational psychology and the economics of education converge.

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formal acquiring of knowledge as to the meaning of
things and events as distinct from the ability to perform
the events themselves.[1]

The principal distinction between "education" and
"training", on the one hand, and "learning" as a whole
would appear to be its systematic nature. The school
environment, for instance, has been described as
"systematic, one thing at a time, orderly and linear",[2]
while learning outside educational and training institu-
tions is largely unstructured. Perhaps more clearly
than in other forms of learning there is in education a
definite attempt to transmit something to the student,
whether it be information, principles, or attitudes.
Thus the educational system appears to have some of the
characteristics of a communications system.

It is clear, of course, that another characteristic
of educational systems has led to the adoption of non-
communication responsibilities. This is its "totalistic"[3]
character, particularly in the elementary and secondary
schools where a distinct portion of a student's day,
extending over a period of years, is committed to the
educational system. This means that inevitably the
educational system performs other functions, such as
the promotion of better health, or it merely acts as a
custodian. Even its communication role becomes a subtly
more complex one, taking on some of the characteristics
of the home learning situation.

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[1] Learning to perform mental tasks may be classed as
either "training" or "education", depending upon which
stage of the process one wants to emphasize. It is
apparent that "education" and "training" are closely
related.

[2] Dr. F. E. Whitworth, *Education and the New Technology*,
Canadian Council for Research in Education symposium,
Ottawa, November 22-24, 1967, p. 138.

[3] A useful term employed by Professor Wallin of the
Faculty of Education of the University of British
Columbia to describe institutions with total, or at
least very great, powers of control over all or a
given portion of a person's day.

Other roles of educational systems include research, which is undoubtedly a major function of universities; student selection, which enables employers to choose those applicants who have the qualities they desire; etc.

But in this Study almost total emphasis is placed on the communications framework of an educational system.

A simple communications model -- While a communications model provides only an overly narrow and limited description of an educational system, it has a certain explanatory utility. The wide range of resources in educational systems may be classified then in terms of their relationships to the structure of the simple communications model -- i.e., as they relate to (1) the sources of information, (2) the means of communication, (3) the environment in which the communication takes place, and (4) the destination of the information. This is being presented with elementary and secondary school systems primarily in mind.

The curriculum -- The nature of the information being presented for communication in elementary and secondary school systems will have a significant bearing on the means chosen for that communication and consequently on the relationships among resources within an educational system. The curriculum decided upon by provincial authorities largely determines what may, or may not, be presented in the school. In fact, the curriculum may be described as the program for the communication function -- the very symbol and essence of the educational approach -- determining the horizontal division of knowledge into subjects, the vertical division of subjects into levels associated generally with the previous educational exposure of a student, the systematic selection of items of each subject and their sequential presentation.

The curriculum may also be looked upon as a major device by which educational systems attempt to achieve the economies associated with specialization and mass production in other industries. It typically offers a limited array of subjects to be presented by means of prescribed texts, or otherwise, in a uniform manner so that in the original design the same information is presented to all students at a given level in the province at about the same time. School curricula

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today, however, are becoming less rigid. The range of subject options and the variety of forms of presentation have widened considerably. This naturally has modified the conditions under which mass production is achieved.

In spite of their importance, provincial curricula are difficult, if not impossible, to evaluate objectively, and no attempt will be made to describe any of the differences in this Study.

Origin of information and means of communication -- In a simple education communications model, a considerable variety of resources may be thought of as sources of information or as origins, ranging from teachers to books, records, radios, films, television sets, equipment for computer-assisted instruction, and others. It would not be correct, of course, to regard the teacher only as a source of information in the narrow sense that is true of books and records. The teacher also acts as a guide to other sources of information and, as well, probably plays the key role in the more difficult function of stimulating student creativity.

Each source of information has a particular mode of communication, such as sight or sound, associated with it. Each mode has certain technical characteristics, such as the velocity of communication and the nature of the information that may be communicated. The nature of the information source indicates the possibility of repetition and reinforcement, the likely quality of the information, and such factors as convenience and cost.

The teacher, of course, mostly communicates orally although there would appear to be an important visual component. In addition, he will refer to other sources for information and use it to supplement his presentation. Oral communication is rather slow but its effectiveness in terms of retention by the student is probably quite high. Moreover, there are other advantages to a teacher's communication, arising out of purely human factors, that seem to be important.

The book is basically the spoken word expressed in a visual code. As such, it may transmit the same content as that of a lecture although at greater speed. The characteristics of a book that render it in some ways superior to the teacher as a source of knowledge in the education process are its wide range, its permanence,

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its convenience, its low cost and generally its careful-
ness in preparation.[1]   But because the book must be
decoded again by the student, it requires the rather
specialized comprehension characteristics and abilities
associated with reading.   The recognition of the impor-
tance of the book in education is illustrated by the
fact that the acquiring of reading skills is given major
attention early in school.

Other information resources employed in educational
systems, such as the record and the film, have the
permanency characteristic of the book.   An important
difference is that the use of special equipment enables
the original message to be made available to students
without any special training on the part of the student --
i.e., by the same modes of hearing and seeing used to
obtain knowledge via a teacher or by actual experience.
The film enables dispensation with oral description as
a means of communicating information and would seem to
permit the partial duplication in a school setting of
the environment in which much information is obtained
in ordinary life.

The radio and the television are still further
removed from the book in that they have dispensed with
the permanency characteristic of the record and the
film.   This has very important consequences for the
immediacy and economy of the communication.   Of course,
radio and television programs are convertible to record
and film, and vice versa.

An important distinction between teachers and these
other material resources as sources of information is
that books, records, films, radio and television cannot
evaluate the extent to which the information has been
received by the student.   Further, they cannot respond,
except in a rather indirect way, to student questioning.

Approaching more closely the teacher in ability to
act as a receiver of a communication are certain types
of computer-assisted instruction.   They do not add a
new sensory dimension to the category of other sources
of information, but some installations, in their ability
to utilize a multimedia system and to redirect students

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[1]It has also been described as "patient" -- a particularly
evocative comment.

along a programmed sequence of material in accordance with student responses, incorporate certain limited features of teachers.

The student himself should not be ignored as a source of information in the educational process. It seems likely that in the best educational environment the student is also a teacher.

Also involved in the educational process are other material resources, such as laboratory equipment, which are not such direct sources of information as the other resources cited. They require manipulation by students and yield their information through a process similar to direct experience.

The environment for communication -- The major capital expenditures and a significant part of the operating expenditures go to provide and maintain the physical environment for communication -- a building. It is recognized that this is important, but it is admittedly difficult to assess the effects on the educational process of different levels of expenditure for this purpose. It is recognized that different types of facilities are required for different educational approaches; the traditional style of building may not be sufficiently adaptable and may need to be replaced. It has been noted that:

> "The current trend towards diversifying the types of education offered in the same school, for example, demands considerable innovation in the quantity balance and character of accommodation which is provided. The greatly extended range of subjects studied demands a wider variety of special spaces, the larger number of pupils in attendance may prompt new social or administrative arrangements in the school and these in turn will affect the kind of accommodation needed."[1]

The operation and maintenance of the school building require both human resources, such as electricians, cleaning staff and caretakers, and material resources for light, heat and water, and they also involve a large proportion of operating expenditures.

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[1] Organisation for Economic Co-operation and Development, *School Building Resources and Their Effective Use* (Paris: OECD, 1966), p. 139.

Factors related to scale of operation -- A remaining group of resources that are not directly involved in the educational process may be described as having the common characteristic of arising directly out of the increasing scale of operation designed to obtain more effective use of resources. Two main kinds of activities are involved here -- transportation and administration.

The relationship of transportation to scale of operation is the easier to establish. They are expenditures that are largely occasioned in rural areas[1] to assemble a number of students equivalent to that in urban areas. Increasing the scale of operations in such regions is directly reflected in increased transportation expenditures.[2] Transportation costs may also be significant in their utilization of student time.

The resources consisting of administrators, school principals, vice-principals, department heads, clerical staff, etc., may be said to play a role similar to that of the office staff of a large factory. They supervise, control, measure and record the operations in the "plant". While not directly involved in production, expenditures on this category are theoretically reflected in increased efficiency of production.

In this Study, no separate analysis of school principals as distinct from school teachers has been undertaken. Salaries of school principals, vice-principals and department heads have been aggregated with salaries of classroom teachers. It would be a major task to distinguish properly the administrative and teaching roles of school principals and vice-principals.

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[1] In the United States, transportation of students in cities by school buses is a growing phenomenon but this is related to social environmental factors which prevail only to a limited extent in Canada. Of course, many students in urban areas travel to school on the public transit systems but the cost of this does not show up in school accounts.

[2] In Alberta, for instance, outside the city school districts, transportation costs make up almost 20 per cent of operating expenditures for public schools. For those students who are transported, this item of expenditure makes up an even larger proportion of the school expenditures related to their school attendance.

Resources for noncommunication purposes -- Examples of resources not directly related to the educational process are nurses, dieticians and waitresses, as well as cafeteria equipment, etc. Some of these human resources have been identified in the census data of 1961 and comments are offered in Chapter 3. No attempt has been made to identify the different purposes of the material resources employed.

Operational principles -- It is an accepted operational principle of educational systems that an improvement in the quality of teachers, books, audio-visual aids, etc. -- in other words, sources of information -- will improve the educational performance or will, at least, increase the possibility of an improved educational performance. This point, expressed in terms of extremes, is so obvious as to be a truism; for instance, one would hardly expect someone who is illiterate to be able to teach reading. Similarly, an inaccurate or poorly prepared book would hardly generate a superior educational performance. But as the knowledge and training of a teacher, or the accuracy[1] of a book, is increased, it becomes more and more difficult to determine what aspects of quality most significantly affect educational performance. Nevertheless, in this Study the proposition is accepted that an improvement in quality, measured by certain physical and technical characteristics, probably improves educational performance.

A second operational principle is that an increase in the quantity of information sources will also improve educational performance. "Quantity" is here expressed in per-student terms. So an increase in the number of teachers and books, and in the amount of audio-visual equipment per student has been regarded, in general, as desirable. Again, this is obvious when expressed in terms of extremes, but it also seems that in principle, at least, a threshold level will be reached at some point above which any further increase in sources of information yields no improvement in educational performance. No studies have as yet determined empirically where such a threshold may be. Again, in this Study, an increase in resource quantities has been regarded as a favourable factor.

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[1]Recognizing that "accuracy" is largely relative and temporal.

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Any evaluation of the operating principle regarding quantity is complicated by the fact that it is almost always associated with the quality factor though not always directly so. In general, an increase in quantity of resources per student permits increased specialization -- i.e., increased quality so that it is difficult to separate the effect of one factor from another. On the other hand, in one-room multigrade schools, the teacher resource per student may be large,[1] but the quality in terms of degree of teacher specialization may be relatively low. Moreover, the opportunities for teacher-student communication may be limited.

A third operational principle appears to be that improvements in the quality and quantity of the environment for communication will improve educational performance. It is obvious that a certain amount of building space per student is required and that certain minimum standards of comfort must be met. But here it seems that a threshold in both quantity and quality terms may be more readily attained and be subjected to precise administrative standards.[2] No comment has been made in this Study on the possible significance of such changes in this factor as have been shown in Chapter 5.

A fourth operational principle applies to treatment of the student. The students may be regarded as passive factors -- i.e., raw material to be shaped and molded into finished products, or empty vessels to be filled with "knowledge". This may have been a reasonable description of the student's role at one stage and it implies a particular structure and interrelationship of resources. But if students are viewed as active agents playing a positive role in the production process of education, as appears increasingly to be the case, educational structures come to be evaluated more in terms of flexibility and opportunity for inspiration and innovation. Unfortunately, none of the data employed in this Study relate to such factors.

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[1] This is another way of saying that the student-teacher ratio is low.

[2] *School Building Resources and Their Effective Use, op. cit.*, deals at length with such administrative standards. They may be found also in the regulations of almost any provincial Department of Education regarding school-building construction.

A fifth operational principle is that educational performance is related to the quality of the student. Today, with attendance at elementary and secondary schools being nearly 100 per cent of a particular age group of the population, the educational institution accepts the quality of the student as given. In higher education, however, the performance of the educational system is related to the selection of students on the basis of certain quality factors. Again, however, as has been noted in Chapter 6, it has not been possible to deal explicitly with the student-quality factor.

In general, it is suggested that the result of the operation of an educational system will be the product of a complex interrelationship of factors that are, themselves, complex in nature and generally inadequately specified. This serves to heighten the challenge to those who would examine the operations of educational systems.

CHAPTER 3

HUMAN RESOURCES AND PROVINCIAL EDUCATIONAL SYSTEMS

In this chapter, human resources in provincial educational systems[1] are considered largely in terms of occupation. The question of occupation is important since each occupation will have associated with it an array of special characteristics, skill requirements, educational requirements, and wage and salary levels. Also the occupational description of the human resource employed in educational systems tells us much about the activities performed within them. Although it is true that occupation is not always identical to function,[2] it is assumed that the differences in occupational structure indicate functional variations in educational systems.

Comprehensive data on occupational structure are available from the Census of Canada for the year 1961. However, data are also available for the total employment of teachers and nonteachers (without any further occupational breakdown) for educational systems for each year since 1966. The data for 1968 for elementary and secondary schools are also examined in this chapter.

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[1]In this chapter, the data employed are for the "education and related services" industry (according to the 1960 DBS Standard Industrial Classification) with the exclusion of two small subsectors: "libraries, museums and other repositories" and "education and related services, n.e.s.".

[2]"Teachers", for instance, are not engaged exclusively in the function of "teaching". Classroom teachers are known to spend considerable time on nonteaching activities, such as checking records, filling out reports, etc. Apparent nonteaching activity such as the preparation of material for classroom presentation is, of course, properly regarded as directly related to the teaching activity. It has already been noted that school principals have been classified as teachers in the 1961 Census but the function of many of them is largely administrative. People in other occupations also may perform functions other than those associated with the specified occupation.

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Only one occupation, that of teachers, will be given more extended consideration. Such characteristics of teachers as experience, tenure, and formal educational qualifications will be examined in Chapter 4.

Labour Force, by Major Occupation Division

In 1961, the total labour force employed in education amounted to about 255,000, of which 196,000 or about 77 per cent were in professional and technical occupations (see Table 3-1). Teachers[1] alone comprised 71 per cent of the total.

Table 3-1

LABOUR FORCE EMPLOYED IN EDUCATIONAL SYSTEMS
BY OCCUPATION DIVISION, CANADA, 1961

Occupation Division	Elementary and Secondary Schools	Vocational Schools	Universities and Colleges	Total
Managerial occupations	126	37	900	1,063
Professional and technical occupations	174,229	3,895	18,041	196,165
Clerical occupations	7,266	799	4,146	12,211
Sales occupations	84	103	77	264
Service and recreation occupations	24,332	854	5,410	30,596
Transport and communication occupations	2,751	38	268	3,057
Farmers and farm workers	490	132	707	1,329
Other primary occupations	6	5	7	18
Craftsmen, production process and related workers	5,743	485	2,096	8,324
Labourers	799	75	400	1,274
Occupation not stated	865	67	244	1,176
Total	216,691	6,490	32,296	255,477

Source: Dominion Bureau of Statistics, *Census of Canada, 1961, Labour Force, Occupation Divisions by Detailed Industries and Sex.*

In 1961, service and recreation occupations came second with 12 per cent of the total. Clerical occupations stood third with about 5 per cent of the total; craftsmen, production process and related workers were fourth with about 3 per cent (see Table 3-2).

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[1]Including school teachers, professors and college principals, and teachers and instructors, n.e.s.

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Table 3-2

PERCENTAGE OF LABOUR FORCE EMPLOYED IN EDUCATIONAL SYSTEMS
BY OCCUPATION DIVISION, CANADA, 1961

Occupation Division	Percentage of Total Employed in			
	Elementary and Secondary Schools	Vocational Schools	Universities and Colleges	Total
Managerial occupations	0.06	0.57	2.79	0.42
Professional and technical occupations	80.40	60.02	55.86	76.78
Clerical occupations	3.35	12.31	12.84	4.78
Sales occupations	0.04	1.59	0.24	0.10
Service and recreation occupations	11.25	13.16	16.75	11.98
Transport and communication occupations	1.27	0.59	0.83	1.20
Farmers and farm workers	0.23	2.03	2.19	0.52
Other primary occupations	0.00	0.08	0.02	0.01
Craftsmen, production process and related workers	2.65	7.47	6.49	3.26
Labourers	0.37	1.16	1.24	0.50
Occupation not stated	0.40	1.03	0.76	0.46
Total	100.0	100.0	100.0	100.0

Source: Based on Table 3-1.

There were significant differences in the occupational structure of the three principal educational divisions -- elementary and secondary schools, vocational schools, and universities (including colleges). Vocational schools and universities, in fact, emerged with remarkably similar occupational structures,[1] both with substantially lower proportions of professional and technical occupations, 60 per cent and 56 per cent respectively, compared with 80 per cent for elementary and secondary schools. The proportion of service and recreation occupations was higher, 13 per cent for vocational schools and 17 per cent for universities, compared with 11 per cent for elementary and secondary schools. But the most significant difference was in the clerical occupations with 12 per cent for vocational schools and 13 per cent for universities, compared with 3 per cent for elementary and secondary schools. The proportion of craftsmen, production process and related workers was also significantly higher at 7 per cent for

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[1]Of course, this is in terms of broad occupational divisions.

vocational schools, 6 per cent for universities, and
3 per cent for elementary and secondary schools.[1]

The distribution of principal occupations among
elementary and secondary schools, vocational schools,
and universities is given in Table 3-3.

Table 3-3

LABOUR FORCE EMPLOYED IN EDUCATIONAL SYSTEMS
BY 15 MAJOR OCCUPATIONS, CANADA, 1961

Occupation	Elementary and Secondary Schools	Vocational Schools	Universities and Colleges	Total	Percentage of Total Employed in *All* Industries
School teachers	163,569	290	2	163,861	97.5
Janitors and cleaners	17,242	403	2,096	19,741	19.5
Professors and college principals	--	--	11,145	11,145	100.0
Stenographers	4,753	356	2,188	7,297	4.4
Teachers and instructors, n.e.s.	4,188	3,028	35	7,251	72.5
Cooks	1,657	93	655	2,405	4.8
Bus drivers	2,381	1	3	2,385	12.8
Musicians and music teachers	2,078	35	221	2,334	20.7
Carpenters	1,234	78	332	1,644	1.3
Stationary engineers	1,187	55	298	1,540	5.2
Housekeepers,[(1)] matrons, stewards	972	37	440	1,449	8.9
Athletes and sports officials	975	12	122	1,109	29.7
Bookkeepers and cashiers	531	89	302	933	0.6
Librarians	261	22	631	914	26.6
Painters, paperhangers and glaziers	684	16	163	863	2.0
Others	14,979	1,975	13,663	30,617	--
Total	216,691	6,490	32,296	255,477	3.9

[(1)] Except private households.

Source: Based on special tabulation from Dominion Bureau of Statistics.

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[1]The large weight of elementary and secondary schools
in the total (85 per cent of the labour force in 1961)
thus largely decided the characteristics of the educa-
tional system as a whole. As the proportion of the
educational labour force in elementary and secondary
schools declines (it stood at about 76 per cent in
1968), the labour force characteristics of universities,
in particular, will play a larger part.

It is also worth noting the proportions of people in major occupations that are employed in educational systems. As one would expect, nearly all teachers are employed in formal education and it is not surprising to note that over a quarter of the librarians are employed in schools and universities. But apparently nearly one-fifth of all janitors and cleaners and about one-eighth of all bus drivers are employed in the educational system.

Provincial Differences in 1961

The differences among the provinces in human resource utilization in education will be considered in terms of the labour force distribution by occupational division in 1961. This has been undertaken for elementary and secondary schools and for universities. The labour force employed in vocational schools was too small in 1961 for any provincial differences to merit attention.

Elementary and secondary schools -- The differences from province to province in the occupational composition of the school labour force are notable.[1] The range of the proportion in professional and technical occupations (almost entirely teachers) was from 92 per cent in Newfoundland to 73 per cent in British Columbia. The differences might perhaps be better illustrated by indicating that the range of nonprofessional (or non-teacher) occupations was from 8 per cent of the total in Newfoundland to 27 per cent in British Columbia (see Table 3-4).

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[1] It is, of course, possible that these occupational differences do not indicate differences in functions performed. It is possible, for instance, that teachers in Newfoundland perform clerical and service functions that are performed by nonteachers in British Columbia, but even if this is true to a limited extent, it would not seem to destroy the validity of the comparisons. There may also be more "contracting out" of services in some provinces than in others.

Table 3-4

LABOUR FORCE EMPLOYED IN ELEMENTARY AND SECONDARY SCHOOLS
BY OCCUPATION DIVISION AND BY PROVINCE, 1961

Occupation Division	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
					(Percentage of total)					
Managerial occupations	(1)	--	--	--	0.1	0.1	(1)	(1)	0.1	0.1
Professional and technical occupations	92.0	87.9	81.8	84.1	84.3	77.9	80.5	80.0	79.8	73.3
Clerical occupations	0.8	1.2	1.9	1.5	2.6	4.4	2.8	1.9	3.6	5.3
Sales occupations	(1)	0.3	0.1	(1)	(1)	(1)	(1)	(1)	0.1	0.1
Service and recreation occupations	5.8	7.0	9.5	8.5	9.1	13.3	11.2	11.7	12.4	12.5
Transport and communication occupations	0.1	2.5	5.0	4.1	0.6	0.8	2.6	2.5	0.4	1.7
Farmers and farm workers	--	--	0.1	0.1	0.2	0.2	0.3	0.1	0.3	0.8
Other primary occupations	(1)	--	(1)	--	--	--	--	--	--	(1)
Craftsmen, production process and related workers	0.5	0.4	1.0	1.1	2.2	2.9	2.1	2.8	2.6	5.5
Labourers	0.2	0.2	0.2	0.2	0.5	0.2	0.3	0.6	0.4	0.5
Occupation not stated	0.5	0.3	0.5	0.4	0.5	0.3	0.3	0.4	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) Less than .05 per cent.

Source: Based on special tabulation from Dominion Bureau of Statistics.

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Typically, the same pattern of provincial differences was shown for each of the nonprofessional occupation divisions. For instance, the range for service and recreation occupations was from 6 per cent in Newfoundland to 13 per cent in Ontario and British Columbia. The range for clerical occupations was from 1 per cent in Newfoundland to 4 per cent in Alberta and Ontario and 5 per cent in British Columbia.

Another pattern of differences exists in the transport and communication occupations, which, heavily weighted as they are by bus drivers, seem to be related to the degree of rurality.

An attempt has been made to explain these provincial differences. A relatively strong rank-order correlation has been established between the percentage of nonprofessional staff in the schools and personal income per capita (see Table 3-5). The correlation is stronger if bus drivers are excluded. In general, as personal income per capita[1] became higher, the proportion of nonprofessional staff also became higher.[2] The four Atlantic Provinces and Quebec were the lowest. British Columbia, Ontario and Alberta were the highest in that order.

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[1] Presuming that any relationship between income levels and school occupational structure would be long-run in nature, the 10-year average (1951-60) personal income per capita was used. This also has the advantage of smoothing out the sharp fluctuations that are a feature of agricultural income in Saskatchewan and, to a lesser extent, in Alberta.

[2] Income levels are partly related to degree of urbanism so that the mechanism of the relationship may be partly the urbanization factor.

Table 3-5

INCOME LEVELS AND STAFF COMPOSITION OF
ELEMENTARY AND SECONDARY SCHOOLS, BY PROVINCE, 1961

	Personal Income Per Capita[1]	Percentage of Total Staff			
		Total Nonprofessional Staff		Service and Recreation Occupations	Clerical Occupations
		Including Bus Drivers	Excluding Bus Drivers		
British Columbia	1,646	26.7	25.0	12.5	5.3
Ontario	1,633	22.1	21.3	13.3	4.4
Alberta	1,432	21.2	20.8	12.4	3.6
Manitoba	1,344	19.5	16.9	11.2	2.8
Saskatchewan	1,261	20.0	17.5	11.7	1.9
Quebec	1,198	15.7	15.1	9.1	2.6
Nova Scotia	1,026	18.2	13.2	9.5	1.9
New Brunswick	918	15.9	11.8	8.5	1.9
Prince Edward Island	770	12.1	9.6	7.0	1.2
Newfoundland	725	8.0	7.9	5.8	0.8

[1] Average of period 1951-60, in current dollars.

Source: Table 3-4; and Dominion Bureau of Statistics, *National Accounts* (various years).

Universities -- There were also fairly substantial provincial differences in the occupational structure of the university labour force in 1961. The range for professional and technical occupations was from 45 per cent of the total in New Brunswick to 67 per cent in Saskatchewan (see Table 3-6). The differences in the proportion of the university labour force employed in service and recreation occupations ranged from 12 per cent in Saskatchewan and Alberta to 26 per cent in Nova Scotia and Prince Edward Island. Similar variations also showed up in clerical occupations, where the proportion varied from 5 per cent in Prince Edward Island to 17 per cent in Alberta. In the group including craftsmen and production process and related workers, there are rather wide variations on the extreme -- New Brunswick, 11 per cent and Prince Edward Island, 3 per cent -- but most provinces are reasonably close to the national average of 7 per cent. Differences in the proportion of farm workers reflect the degree of develop- ment of agricultural schools.

Table 3-6

LABOUR FORCE EMPLOYED IN UNIVERSITIES AND COLLEGES
BY OCCUPATION DIVISION AND BY PROVINCE, 1961

Occupation Division	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
					(Percentage of total)					
Managerial occupations	2.5	1.3	3.0	3.3	3.5	2.4	1.9	1.5	2.0	2.0
Professional and technical occupations	56.4	53.8	46.5	45.3	58.2	54.6	58.1	66.8	52.8	55.6
Clerical occupations	14.1	5.0	12.1	9.3	9.5	15.4	14.9	14.5	16.9	16.4
Sales occupations	--	1.3	0.3	0.3	0.1	0.3	0.3	0.4	0.6	0.5
Service and recreation occupations	17.8	26.3	26.0	23.0	17.9	15.8	14.5	11.7	15.7	12.0
Transport and communication occupations	--	--	0.8	0.8	0.8	0.9	0.4	0.8	0.9	0.9
Farmers and farm workers	--	6.3	2.4	2.8	1.8	2.2	3.4	2.5	2.2	3.1
Other primary occupations	--	--	--	0.4	--	--	--	--	--	0.1
Craftsmen, production process and related workers	6.1	2.5	7.5	11.4	6.0	6.8	4.8	4.7	6.7	7.5
Labourers	2.5	1.3	1.2	2.8	1.6	0.7	0.9	1.6	1.2	1.3
Occupation not stated	0.6	2.5	0.4	0.5	0.7	0.9	0.8	0.6	1.1	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Based on special tabulation from Dominion Bureau of Statistics.

Unlike the situation for elementary and secondary schools, the proportions of nonprofessional occupations in the provincial university labour forces do not seem to be closely related to the income position of the province. In fact, only three provinces deviate significantly from the average -- Saskatchewan, on the one hand, with an unusually low percentage of non-professional staff, and Nova Scotia and New Brunswick, on the other, significantly higher than the other provinces. When nonprofessional occupations are examined in more detail, however, some correlation with income levels seems to emerge. In general, excluding Newfoundland, there seems to be some correlation between the proportion of clerical occupations and provincial income levels, while an inverse correlation seems to prevail for the proportions engaged in service and recreation occupations (see Table 3-7). These two relationships, therefore, tend to cancel each other out when the totals are examined.

Table 3-7

INCOME LEVELS AND OCCUPATIONAL COMPOSITION
OF UNIVERSITIES, BY PROVINCE, 1961

| | | Nonprofessional as Percentage of Total Occupations | | |
	Personal Income Per Capita[1]	Total	Clerical Occupations Only	Service and Recreation Occupations Only
British Columbia	1,646	44.4	16.4	12.0
Ontario	1,633	45.4	15.4	15.8
Alberta	1,432	47.2	16.9	15.7
Manitoba	1,344	41.9	14.9	14.5
Saskatchewan	1,261	33.2	14.5	11.7
Quebec	1,198	41.8	9.5	17.9
Nova Scotia	1,026	53.5	12.1	26.0
New Brunswick	918	54.7	9.3	23.0
Prince Edward Island	770	46.2	5.0	26.3
Newfoundland	725	43.6	14.1	17.8

[1] Average of period 1951-60, in current dollars.

Source: Table 3-6; and Dominion Bureau of Statistics, *National Accounts* (various years).

Provincial Differences in 1968, Elementary and Secondary Schools

The proportion of teaching staff in elementary and secondary schools seemed generally to be lower in 1968 than in 1961. In 1961, for Canada as a whole, teachers made up about 78 per cent of the labour force in elementary and secondary schools. By 1968, the proportion for elementary and secondary schools (excluding private schools) had declined to 76 per cent.[1]

The pattern of provincial differences in 1961 seemed to have been maintained in 1968 with the exception of Prince Edward Island. In Prince Edward Island, a considerable drop in the proportion of teaching staff occurred, moving the province to the levels typical of the higher-income provinces (see Table 3-8). The proportion of teaching staff rose in British Columbia. The range of differences among the provinces narrowed considerably.

Table 3-8

TEACHING STAFF AS PERCENTAGE OF TOTAL STAFF
ELEMENTARY AND SECONDARY SCHOOLS[1]
BY PROVINCE, OCTOBER 1968

	Percentage of Total
Newfoundland	86.5
Prince Edward Island	73.0
Nova Scotia	80.4
New Brunswick	79.8
Quebec	80.0
Ontario	75.0
Manitoba	75.1
Saskatchewan	73.2
Alberta	70.7
British Columbia	73.5

[1] Excludes private schools.

Source: Based on special tabulation from Dominion Bureau of Statistics.

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[1]This would seem to be accounted for, in part, by the increased use of "teaching aides" who may be clerical or technical assistants performing functions previously performed by a teacher.

Conclusion

The significance of the apparent correlation between income and the occupational composition of the elementary and secondary school labour force will also be examined in Chapter 10 in connection with observations on other factors. Considered in isolation, however, it seems apparent that an increase in the proportion of nonteachers on the school staff has been regarded by school administrators as a quality factor. In other words, when income constraints have been less severe, there has been a tendency to employ additional staff to assist the teachers or to perform other activities. The average increase in the proportion of nonteaching staff over the sixties also seems to reflect this view, at least in part. There is an assumption that this has enabled more effective instruction to take place, although no definitive data are available.

Interpreting the results at the university level is a more complex matter. First of all, there were relatively few universities compared with the thousands of elementary and secondary schools. Sometimes there was only a single major university in one province so that the data describe the occupational structure of that single university. Secondly, because different university faculties require different types of personnel, the occupational structure may simply reflect the relative size of different faculties. Thirdly, the size of graduate schools or the magnitude of research activities will also be a factor, as will the presence or absence of student residences. It does not seem fruitful, therefore, to attempt to explore at greater length the nature of any relationship between income levels in the provinces and university occupational structures.

CHAPTER 4

SOME PROVINCIAL DIFFERENCES IN
TEACHERS AND TEACHER UTILIZATION

It has already been indicated that teachers comprise
over 75 per cent of the human resources employed in
elementary and secondary schools and that teachers'
salaries have consistently accounted for about 70 per
cent of total operating expenditures. By reason of its
magnitude alone, it is appropriate to give this factor
special attention. But more important, teachers are
regarded as performing a key role in the educational
process. It is appropriate to ask, therefore, whether
there are provincial differences in the characteristics
of teachers[1] that might have a bearing on the effective-
ness of their teaching.

This chapter will identify a limited number of
characteristics, such as the tenure, experience and
qualifications of teachers in the public elementary and
secondary school systems in each province in Canada,[2]

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[1] No distinction has been made between teachers and
principals in this Study. There are, of course,
fundamental differences in the role of classroom teachers
and principals in the teaching process although some
principals also perform classroom duties. Moreover,
principals, in general, have more experience, higher
educational qualifications, and higher salaries than
teachers. Nevertheless, it has been assumed that the
tenure, experience, and qualifications of principals
are as relevant to the teaching process as are those
of teachers.

[2] This covers what is described as the "publicly controlled"
elementary and secondary schools, financed largely out
of provincial and municipal revenues. Private elemen-
tary and secondary schools, and Indian schools operated
by the federal government, are thus not included but
these comprise only a very small part of the elementary
and secondary school system.

and will indicate some of the changes that took place during the decade of the 1960's.[1]

These changes took place against the background of a substantial increase in the number of teachers. From 1960-61 to 1967-68, the number of teachers rose from 152,000 to 230,000, an increase of 51 per cent. This increase was at least 25 per cent in all provinces although it was particularly large in Ontario, Quebec, and British Columbia, with increases of 61 per cent, 56 per cent and 54 per cent respectively (see Table 4-1). The rate of increase in the number of teachers naturally affects the rate of change in the characteristics of teachers since it indicates the rate of new entrants into the occupation.

The rate of increase in the number of secondary teachers was particularly large. For Canada as a whole, in the period 1960-61 to 1967-68, the number of secondary teachers rose by 136 per cent compared with 30 per cent for elementary teachers. The rate of increase for secondary teachers was particularly high in Quebec (237 per cent) but was also relatively high in Prince Edward Island (162 per cent) and Ontario (137 per cent).[2]

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[1] In general, the data cover the period from 1960-61 to 1967-68. Although data are available for most provinces for an additional year or two, it was felt desirable to cover only a period for which the provincial data were complete. Another complicating factor with data after 1967-68 is the fact that somewhat different definitions of elementary and secondary school teachers are employed, so that they are not strictly comparable with earlier years.

[2] It should be noted that for 1968-69 the Dominion Bureau of Statistics changed its methods of classifying elementary and secondary teachers. This had the effect of reducing the number of secondary teachers and increasing the number of elementary teachers in most provinces. But this does not appear to have significantly altered the relative positions of the provinces.

Table 4-1

PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 TO 1967-68

	1960-61			1967-68			Percentage Increase 1960-61 to 1967-68 (Total)		
	Elementary	Secondary	Total	Elementary	Secondary	Total	Elementary	Secondary	Total
Newfoundland	3,543	774	4,317	4,472	1,383	5,855	26.2	78.7	35.6
Prince Edward Island	812	157	969	986	411	1,397	21.4	161.8	44.2
Nova Scotia	5,013	1,651	6,664	5,654	2,833	8,487	12.8	71.6	27.4
New Brunswick	4,320	1,493	5,813	4,667	2,585	7,252	8.0	73.1	24.8
Quebec	32,978	9,115	45,694(1)	40,564	30,735	71,299	23.0	237.2	56.0
Ontario	36,641	11,197	49,292(2)	52,749	26,561	79,300	43.9	137.2	60.9
Manitoba	5,197	2,263	7,460	6,313	3,613	9,926	21.5	59.7	33.1
Saskatchewan	6,624	2,014	8,638	7,107	4,002	11,109	7.3	98.7	28.6
Alberta	7,849	3,913	11,762	9,853	7,649	17,492	25.5	95.2	48.7
British Columbia	7,367	4,501	11,868	10,523	7,749	18,272	42.8	72.2	54.0
Canada	110,344	37,078	152,477	142,878	87,511	230,389	29.5	136.0	51.1

(1) Total includes 3,601 teachers not classified by level.

(2) Total includes 1,454 full-time itinerant teachers who cannot be distributed by level.

Source: Based on Table F-1 in Appendix F.

Distinctions between Elementary and Secondary Teachers

Most of the data in this chapter pertain to
elementary teachers and secondary teachers separately.
This is justified in part by the significantly higher
educational qualifications of secondary teachers. If
the data covered all teachers as a whole, the increasing
proportions of secondary teachers would produce somewhat
misleading results in any historical analysis. Never-
theless, it must be conceded that it is not always
possible to make a clear-cut distinction between elemen-
tary and secondary teachers.

First of all, the distinction between elementary
and secondary grades must be drawn somewhat arbitrarily.
In any study making interprovincial comparisons, it is
desirable to be as consistent as possible and to adopt
reasonably uniform classifications for all provinces.
In this Study, an elementary teacher, in most provinces,
has been defined as a teacher or principal who teaches
or supervises students up to, and including, Grade 8.
A secondary teacher or principal is one who teaches or
supervises students in Grade 9 and over. There are two
exceptions -- British Columbia and Quebec. In those two
provinces, the elementary teacher is defined as one
teaching or supervising grades up to, and including,
Grade 7; the secondary teacher, from Grade 8 on.

The second problem, from an analytical point of
view, is that some teachers teach at both the elementary
and secondary level, even as thus defined. In fact,
this is true of a growing proportion of teachers in a
majority of the provinces. By 1966-67, 20 per cent of
the teachers in Alberta and over 10 per cent of those in
Nova Scotia, New Brunswick and Newfoundland fell in that
category. The teacher who teaches at both levels now is
typically in a "junior high school" (comprised of students
in Grades 7, 8 and 9), although a number of other
combinations of elementary and secondary grades exist.

The question arises then of how to most effectively
allocate to the elementary and secondary levels those
teachers who teach grades at both levels. Any method
contains arbitrary features. In the past, the Dominion
Bureau of Statistics classified as "elementary" those
who taught both elementary and secondary grades in

rural schools of less than six classrooms; as "secondary", all others.[1] Beginning in 1968-69, the method for arriving at the teaching-level distinction was changed.[2]

As time passed, with the closing of small rural schools, the old method of classification produced the anomaly that, except for Newfoundland, almost all teachers of both elementary and secondary grades were classified in the secondary level. This means, therefore, that the number of secondary teachers has been over-stated in most provinces. For a recent year like 1966-67, 46 per cent of the "secondary" teachers in Alberta and 42 per cent in Nova Scotia were, in fact, teaching both elementary and secondary grades. The relevant proportions for other provinces were 32 per cent in New Brunswick, 31 per cent in Newfoundland, 24 per cent in Saskatchewan, 22 per cent in Manitoba, 9 per cent in Prince Edward Island, 5 per cent in British Columbia, and practically nil in Ontario.

Elementary school teachers have, by this practice, been almost entirely restricted to those teaching elementary grades only.

Therefore, in evaluating the data on tenure, experience and qualifications of teachers, and on student-teacher ratios, it should be remembered that in some provinces the secondary-teacher category includes many teachers who also teach elementary grades.

Teacher Quality and Effectiveness

Tenure,[3] experience and qualifications may be taken to be at least partial measurements of teacher quality and, therefore, of teacher effectiveness in the educa-tional system. It will be recognized, of course, that other factors, some unrelated to these, also influence teaching. These would include various aspects of personality that might either facilitate or hinder the

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[1]For instance, see Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, 1967-68*, p. 8.

[2]*Ibid., 1968-69*, p. 9.

[3]Tenure is defined as "experience with the present school board, which may or may not be continuous". *Ibid., 1967-68*, p. 10.

development of the most effective types of teacher-student relationships and thus promote or hinder effective education. No satisfactory measure of such qualities has been devised, however, nor is one likely to be in the immediate future.

Tenure and experience are included as aspects of teacher quality or effectiveness "on the basic assumption that up to a point at least, a teacher's effectiveness improves with experience and that some continuity with the same school district is necessary to make the maximum contribution to its educational programs".[1] It is difficult to assess the point at which additional years of experience or tenure begin to yield negative marginal returns. If in fact such a point is reached, it probably varies for different teachers. One may be fairly confident, however, that there *are* diminishing marginal returns to experience and tenure. Indeed, there are indications of an upper limit beyond which teaching effectiveness does not appear to improve with experience.[2]

The level of formal qualifications, as expressed in terms of levels of teachers' certificates granted (which are in most provinces related largely to years of professional training), is perhaps the most significant measure of the three selected. The proportion of teachers with university degrees also measures somewhat the same factor but is shown separately in this Study because the level of teachers' certificates does not always reflect the level of total academic qualifications.

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[1] J. E. Cheal and H. M. Kitchen, *Profiles of Education in the Atlantic Provinces* (revised edition), Atlantic Development Board, 1968, p. A-31. Tenure, of course, has become a less meaningful statistic as school districts have become larger. Since tenure is defined in terms of employment by the same school board, a teacher could be employed at 10 different schools in the same city in 10 years and be classed as having 10 years' tenure instead of one year if the schools were in different school districts.

[2] This was indicated by Dr. M. Wisenthal in *Sex Differences in Attitudes, Reinforcement and Attainment* (unpublished Ph.D. thesis, University of London, 1964), pp. 243-244.

An attempt has been made in this chapter to devise a composite index of comparative teacher quality on the basis of selected weights for these various factors.

Tenure

Tenure, the period of time with the same school board, was somewhat lower for secondary teachers than for elementary teachers in 1967-68.[1] This was a reversal of the situation at the beginning of the decade when the median tenure for secondary teachers was higher than for elementary teachers. For the nine provinces for which data were available throughout the period, tenure for elementary teachers had risen slightly from 1960-61 to 1967-68; for secondary teachers, it had dropped substantially (see Table 4-2). The decline in tenure at the secondary level undoubtedly reflects the particularly large increase in the number of secondary teachers in the 1960's.

Table 4-2

MEDIAN TENURE OF PUBLIC SCHOOL TEACHERS
AND PRINCIPALS, CANADA, BY PROVINCE
1960-61 AND 1967-68

	Elementary		Secondary	
	1960-61	1967-68	1960-61	1967-68
Newfoundland	1.2	1.6	2.2	1.9
Prince Edward Island	1.9	2.3	2.7	2.1
Nova Scotia	4.2	5.2	3.8	3.4
New Brunswick	2.5	4.2	3.1	3.4
Quebec	--	3.8[1]	--	2.6[1]
Ontario	2.8	2.8	3.2	2.6
Manitoba	2.1	2.0	2.6	2.7
Saskatchewan	2.2	2.9	3.2	2.9
Alberta	3.1	3.7	3.8	2.9
British Columbia	3.0	2.8	4.6	3.8
Canada[2]	2.7	2.9	3.5	2.8

[1] 1966-67 data.

[2] Excluding Quebec.

Source: Based on Table F-2 in Appendix F.

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[1] In Table 4-2, the Canadian average is given for nine provinces since the Quebec data were for 1966-67. However, it is reasonable to assume that the average tenure would not be very much different in 1967-68 than in 1966-67 and so this statement makes allowance for the tenure of teachers in Quebec.

There were substantial differences among the provinces. In 1960-61, at the elementary level, median tenure was highest in Nova Scotia at 4.2 years and lowest in Newfoundland at 1.2 years. At the secondary level, British Columbia had the highest median tenure at 4.6 years and, again, Newfoundland had the lowest at 2.2 years. In 1967-68, substantial differences remained, particularly at the elementary level with tenure of elementary teachers tending to be highest in Nova Scotia, New Brunswick, Quebec, and Alberta. At the secondary level, the differences were not so great. British Columbia had the highest tenure, followed by Nova Scotia and New Brunswick. Newfoundland still had the lowest tenure for both elementary and secondary teachers.

Changes in tenure over the period were reasonably consistent at the secondary level with declines in all provinces except New Brunswick and Manitoba. But the picture is not so clear at the elementary level, with median tenure increasing in the Atlantic Provinces, Saskatchewan, and Alberta; remaining nearly constant in Ontario and Manitoba; and declining in British Columbia.

One may well ask whether there is any consistent pattern in the 1967-68 provincial differences in tenure. No consistent relationships to income levels or degree of urbanization, to take two examples of factors with which tenure may be related, have emerged.

Experience

As one would expect, the level of experience is higher than that of tenure, with median experience in 1967-68 for elementary and secondary teachers being 7.3 years and 6.5 years respectively, compared with approximately three years for tenure. There was a slight increase in median elementary-teacher experience from 1960-61 to 1967-68, as was the case with elementary-teacher tenure in the same period. But there was a sharp decline in median experience at the secondary level, from 10.5 years in 1960-61 to 6.5 years in 1967-68 -- a sharper decline than that which occurred in median tenure (see Table 4-3).

Table 4-3

MEDIAN YEARS' EXPERIENCE OF
PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

	Elementary		Secondary	
	1960-61	1967-68	1960-61	1967-68
Newfoundland	2.9	4.0	9.8	6.9
Prince Edward Island	6.8	8.7	12.1	6.0
Nova Scotia	9.7	10.9	10.2	8.2
New Brunswick	7.3	8.4	8.5	6.9
Quebec	6.8	7.6	12.3	7.0
Ontario	6.9	6.2	8.2	5.1
Manitoba	6.9	6.4	9.4	6.6
Saskatchewan	7.9	7.3	12.2	9.0
Alberta	8.9	9.2	11.6	7.2
British Columbia	7.3	6.7	10.2	8.8
Canada	7.1	7.3	10.5	6.5

Source: Based on Table F-3 in Appendix F.

In 1967-68, the Atlantic Provinces (except Newfoundland) along with Alberta had the highest level of experience for elementary teachers; Newfoundland, Ontario, Manitoba, and British Columbia had the lowest level. The range was from a high of 10.9 years in Nova Scotia to a low of 4.0 in Newfoundland. At the secondary level, the differences between provinces were not as great. Saskatchewan and British Columbia were highest, with median years of experience for secondary teachers being about nine years; Ontario was lowest, with median experience of about five years.

The median years of experience for secondary teachers *decreased* between 1960-61 and 1967-68 in all provinces. On the other hand, the median years of experience for elementary teachers *increased* in the Atlantic Provinces, Quebec, and Alberta, while there was a decrease in Ontario and the three other Western Provinces. Of course, the trend at the secondary level is principally accounted for by the large increase in numbers.

Again, one must ask whether there is any symmetry in the interprovincial differences in median experience levels. In 1967-68, the five highest provinces, in terms of experience for elementary teachers, were Nova Scotia, Alberta, Prince Edward Island, New Brunswick,

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and Saskatchewan, in that order. The six highest
provinces, in terms of experience for secondary teachers,
were Saskatchewan, British Columbia, Nova Scotia, Alberta,
New Brunswick, and Newfoundland (the latter two being
tied for fifth place). There seems to be a moderate
tendency for the Atlantic Provinces to have teachers
with higher experience levels (and, it may be added,
a tendency for the two central provinces, Ontario and
Quebec, to have lower experience levels) but beyond
that, there seems to be no consistent pattern.

Educational Qualifications

The educational qualifications of teachers are
perhaps the most significant of the three measures
employed to determine teacher quality. It is particularly
noteworthy, therefore, that throughout the 1960's there
was a consistent increase in this measure both in terms
of certificate levels[1] (which take into account much,
but not all, of the academic and professional training
beyond junior matriculation at the secondary level) and
in terms of university degrees (both academic and
professional).

From 1960-61 to 1967-68, the percentage of elemen-
tary teachers with Level 2 certificates or higher
(adjusted to a common level) rose from 65 per cent to
around 82 per cent. For secondary teachers, the propor-
tion with Level 3 certificates or higher decreased
slightly during the same period from 71.2 per cent to
about 70.8 per cent (see Table 4-4). The percentage of
elementary teachers with university degrees rose from
10 per cent in 1960-61 to about 13 per cent in 1967-68.
For the same period, the proportion of university
graduates among secondary teachers rose from about
59 per cent to 63 per cent (see Table 4-5).

All provinces showed increases from 1960-61 to
1967-68 in the proportion of elementary teachers with
Level 2 certificates or higher. Similarly, increases in
the proportion of secondary teachers with Level 3
certificates or higher were recorded in all provinces
except Quebec.

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[1]See Appendix B for a definition of "certificate level"
and a discussion of certain reservations that are
necessary in their interpretation. Appendix B also
illustrates an attempt to indicate the average qualifi-
cations of teachers in two selected years.

Table 4-4

QUALIFICATIONS OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

	Elementary Percentage of Teachers with Level 2 Certificates or Higher		Secondary Percentage of Teachers with Level 3 Certificates or Higher	
	1960-61	1967-68	1960-61	1967-68
Newfoundland	14.2	26.0	52.6	67.1
Prince Edward Island	10.3	40.5	37.5	68.8
Nova Scotia	62.8	77.8	76.1	87.3
New Brunswick	26.9	63.2	51.7	63.4
Quebec	39.9[1]	70.3[1]	59.4[1]	45.3[1]
Ontario	83.7	91.0	76.4	86.6
Manitoba	77.4	90.9	54.0[2]	62.0[2]
Saskatchewan	95.7	96.6	87.1	91.5
Alberta	84.6	90.4	76.7	88.2
British Columbia	87.1	96.6	86.6	90.9
Canada	65.3	81.9	71.2	70.8

[1] Refer to Appendix B for an explanation of the method employed in classifying Quebec teachers.

[2] It should be noted that in Manitoba there was no provincial certificate level equivalent to the DBS Certificate Level 2.

Source: Based on Tables F-4 to F-13 in Appendix F.

Table 4-5

PERCENTAGE OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS WITH
UNIVERSITY DEGREES, CANADA, BY PROVINCE, 1960-61 AND 1967-68

	Elementary		Secondary	
	1960-61	1967-68	1960-61	1967-68
Newfoundland	4.4	8.1	39.7	50.8
Prince Edward Island	2.2	5.7	33.1	51.3
Nova Scotia	13.8	19.2	54.1	65.1
New Brunswick	5.6	8.8	38.5	50.4
Quebec	8.9	8.7	36.2	45.3
Ontario	8.8	13.0	88.0	78.9
Manitoba	12.3	11.2	56.4	72.2
Saskatchewan	4.4	11.6	57.4	63.5
Alberta	14.5	24.9	54.1	69.2
British Columbia	25.1	28.3	56.6	76.0
Canada	10.1	13.5	59.5	63.1

Source: Based on Table F-14 in Appendix F.

Almost without exception, the proportion of teachers with university degrees also increased during the period. A slight decrease occurred for elementary teachers in Manitoba, and a somewhat larger decrease was apparent for secondary teachers in Ontario.

An examination of the interprovincial differences must be preceded by a note of caution, in addition to that stated earlier regarding distinctions between elementary and secondary teachers. Even with adjustments to produce equivalent certificate levels for all provinces, it must be recognized that certain discrepancies still remain. Nevertheless, a fairly definite pattern may be established. With some exceptions, the certificate levels of teachers and the proportions of teachers with university degrees bear some relationship to average income levels.

In general, in 1967-68, the higher-income provinces had the highest formal qualifications for teachers. For instance, for elementary teachers, the four Western Provinces and Ontario all had more than 90 per cent with Level 2 certificates or higher. This factor was lower for Quebec and the Atlantic Provinces, with the two lowest provinces being Prince Edward Island and Newfoundland. For secondary teachers, the relationships were not quite as consistent. British Columbia, Saskatchewan, Alberta, Ontario, and Nova Scotia were uniformly high with over 85 per cent possessing Level 3 certificates or higher. The other three Atlantic Provinces, together with Manitoba,[1] formed another group with between 60 to 70 per cent of secondary teachers at this level. Quebec, reflecting the very rapid growth in the numbers of secondary teachers, had the lowest proportion -- around 45 per cent.

In terms of elementary teachers with university degrees, there were only three provinces that were markedly higher than the others in 1967-68 -- British Columbia, 28 per cent; Alberta, 25 per cent; and Nova Scotia, 19 per cent. The others varied between 6 per cent and 13 per cent. For secondary teachers, the highest proportions with university degrees were in Ontario, the four Western Provinces and Nova Scotia.

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[1]See, however, footnote (2) of Table 4-4.

In conclusion, it might be said that Nova Scotia is the principal exception to the pattern of relationships between the income position of a province and formal qualifications of teachers. That province tended to rank higher than might have been predicted on the basis of income alone.

Salaries

The salaries of teachers reflect formal qualification levels and experience,[1] and accordingly they may be regarded in some sense as a valuation of quality. They may also reflect average income levels in the provinces since it may be expected that teachers' salaries will be at such a level as to attract a sufficient number of competent candidates to the profession. Average income levels in a province will also likely be reflected in average teachers' salaries to the extent that the qualification levels of teachers employed in a province are related to the income position of the province.

Average salaries for elementary teachers and principals rose from $3,745 in 1960-61 to $5,860 in 1967-68 -- an increase of 56 per cent. For secondary teachers, average salaries in the same period rose from $6,059 to $8,290 -- an increase of 37 per cent.

There were substantial interprovincial differences in average teachers' salaries -- differences that were greater for elementary teachers than for secondary teachers. For elementary teachers, the range in 1967-68 was from $3,787 in Newfoundland to $6,849 in British Columbia -- a range of 80 per cent. For secondary teachers, the range was from $5,880 in Prince Edward Island to $9,583 in Ontario -- a range of 60 per cent (see Table 4-6). Teachers' salaries were lowest in the Atlantic Provinces and Quebec and highest in Ontario and the Western Provinces. The differences had, however, been generally greater in 1960-61.

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[1]Since teacher salary schedules recognize increased qualifications and contain annual increments for each year of experience up to a certain level, which may vary from school district to school district, they constitute built-in incentives to teachers to increase qualifications and experience.

Table 4-6

AVERAGE SALARIES OF
PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

	Elementary		Secondary	
	1960-61	1967-68	1960-61	1967-68
Newfoundland	2,236	3,787	3,685	6,310
Prince Edward Island	2,315	3,984	3,066	5,880
Nova Scotia	2,923	5,150	4,305	7,303
New Brunswick	2,585	4,414	4,169	6,476
Quebec	2,960	5,082[1]	4,882	7,563[1]
Ontario	4,346	6,578	7,230	9,583
Manitoba	3,863	5,641	5,674	8,063
Saskatchewan	3,888	5,876	5,887	8,077
Alberta	4,497	6,552	6,058	8,088
British Columbia	5,047	6,849	6,672	8,625
Canada	3,745	5,860	6,059	8,290

[1] Estimated.

Source: Based on data from Dominion Bureau of Statistics and
Quebec Department of Education.

It is useful to consider the relationship between average teachers' salaries and the wage and salary incomes for other occupations. Two fairly comprehensive measures of average wage and salary incomes that are available annually are for "industrial composite" employees and for "taxable" employees.[1] Data for both aggregates for the calendar years 1961 and 1967 were related to elementary and secondary teachers' salaries for the years 1960-61 and 1966-67 and expressed in terms of an index (see Table 4-7). Both indexes show about the same picture.

At the Canada level, elementary teachers' and principals' average salaries showed a tendency to increase somewhat faster than average wages during the period 1960-61 to 1966-67. On the other hand, average salaries for secondary teachers and principals increased somewhat more slowly than the wage index.

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[1] See Appendix B for a description of these data and an identification of the sources. While wages and salaries comprise by far the major part of earned personal income in most provinces, it is recognized that net income from farm operations is important in a few provinces, most notably Saskatchewan.

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Table 4-7

AVERAGE SALARIES OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS
IN RELATION TO PROVINCIAL MEASURES OF AVERAGE WAGES
AND SALARIES, CANADA, BY PROVINCE, 1960-61 AND 1966-67

	Elementary				Secondary			
	1960-61		1966-67		1960-61		1966-67	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Newfoundland	61	57	65	68	100	94	109	113
Prince Edward Island	81	70	96	88	107	92	139	127
Nova Scotia	88	80	100	94	130	118	143	134
New Brunswick	78	72	82	81	126	117	128	127
Quebec	75	74	89	91	124	123	128	131
Ontario	103	101	105	104	171	169	158	157
Manitoba	101	98	98	90	148	143	146	140
Saskatchewan	101	101	105	107	152	153	149	153
Alberta	108	110	112	112	145	147	141	141
British Columbia	114	116	106	111	151	153	135	142
Canada	92	91	97	98	149	147	140	141

Note: Column (1) is based on average annual wages and salaries of "industrial composite" employees = 100; Column (2) is based on average annual wages and salaries of "taxable" employees = 100.

Source: Based on Appendix B.

The provincial pattern was reasonably clear in 1960-61. At that time the index of average teachers' salaries in terms of "industrial composite" wages and salaries was consistently lower in the Atlantic Provinces and Quebec than in the other provinces. Elementary teachers' salaries ranged from an index of between 75 to 80 for New Brunswick and Prince Edward Island; Quebec and Nova Scotia stood at 88, while Newfoundland was lowest at 61. On the other hand, for Ontario and the Prairie Provinces, the index ranged from 101 to 108; the highest was British Columbia at 114. At the secondary level, the index for teachers' salaries ranged between 124 and 130 for Quebec, Nova Scotia, and New Brunswick; Prince Edward Island and Newfoundland were lower at 107 and 100, respectively. The four Western Provinces had indexes within a narrow range between 145 and 152, while Ontario stood at 171.

By 1966-67, the pattern had changed somewhat. In general, the provinces with low indexes for elementary teachers' salaries in 1960-61 had moved up considerably and those with high indexes had stayed about the same (in other words, elementary teachers' salaries had increased faster in the first case than average wages and at about the same rate in the second case). There

was thus a moving together of the indexes in the various provinces. Indeed, both Prince Edward Island and Nova Scotia were at about the same level in terms of "industrial composite" wages as Ontario and some of the Western Provinces.

A similar but more marked trend was manifested at the level of secondary school teachers. The indexes for Ontario and the Western Provinces moved down in all cases, while those of the other provinces moved up. Thus there was an even greater narrowing of interprovincial differences in terms of these indexes than occurred at the elementary level. All provinces except Newfoundland and Ontario moved to within the range of 125 and 150 (in terms of "industrial composite" wages). Newfoundland stood at 110; Ontario still had the highest index at 158, but lower than in 1960-61. Nova Scotia joined the three Prairie Provinces with an index in the 140's, but British Columbia dropped to 135 -- slightly below Prince Edward Island and slightly above Quebec and New Brunswick.

It should be repeated that the general level of teachers' salaries is affected by qualification levels but, even allowing for these differences, there is a pronounced tendency for salary levels to be determined by general wage and salary levels. This, of course, is not surprising, but it does indicate the nature of part of the relationship between the elementary and secondary school system and the economy in general.

Student-Teacher Ratios

Another aspect that could influence the effectiveness of education is the teaching load of the teacher. The teacher's productivity is probably related to, among other things, the number of hours of teaching, the variety of subjects to be taught, and the time required for preparation of teaching material. But it is difficult to obtain significant data concerning this aspect of education. A crude measure of this is the student-teacher ratio, which is the total number of students divided by the total number of teachers. A lower student-teacher ratio in one province than in another may mean a number of things. It may indicate smaller classes or, on the other hand, the classes may be the same size but the teachers may have more free periods for preparation or individual instruction. It may also mean a higher proportion of principals,

vice-principals, or department heads with no teaching responsibilities. In general, it seems to be accepted by educationalists that student-teacher ratios should be neither very low nor very high but, like little Goldilocks' porridge, should be "just right".

At the overall level, i.e., for the whole public elementary and secondary school system, the student-teacher ratio declined over the 1960's from about 26 in 1960-61 to 23 in 1967-68. This decline was registered in all provinces. In 1960-61 the highest student-teacher ratios were registered in Newfoundland, Ontario, British Columbia, and Nova Scotia; the lowest, in Quebec and Saskatchewan. By 1967-68, there was somewhat of a convergence of these ratios, but Newfoundland and British Columbia were still relatively high, and Prince Edward Island and Alberta had joined Saskatchewan in a relatively low position. It is apparent that there was no correlation with the relative income positions of the provinces (see Table 4-8).

Table 4-8

STUDENT-TEACHER RATIOS OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

	Elementary		Secondary		Total	
	1960-61	1967-68	1960-61	1967-68	1960-61	1967-68
Newfoundland	33	28	20	19	30	26
Prince Edward Island	26	23	22	17	25	21
Nova Scotia	30	29	17	15	27	24
New Brunswick	29	28	17	15	26	24
Quebec(1) (3)	27	25	24	15	24	21
Ontario(2)	30	26	25	18	28	24
Manitoba	29	27	17	16	25	23
Saskatchewan	25	25	21	16	24	22
Alberta	29	29	16	13	25	22
British Columbia(3)	30	29	23	21	27	25
Canada	29	27	21	16	26	23

(1) In 1960-61, this ratio excluded 3,601 teachers listed as specialists and not distributed between elementary and secondary levels.

(2) In 1960-61, 1,454 full-time itinerant teachers who could not be distributed by level were excluded.

(3) Elementary is defined as Grades 1 to 7; secondary, Grade 8 and over.

Source: Based on data from Dominion Bureau of Statistics and Quebec Department of Education.

When elementary and secondary levels are considered separately, it is established that student-teacher ratios were substantially higher at the elementary level than at the secondary level. This is true for all provinces although the degree of difference seems to vary.[1] The decline in student-teacher ratios was also apparent at both levels in all provinces. One should note particularly the decrease in the ratio for Newfoundland at the elementary level (33 to 28) and for Ontario at the secondary level (25 to 18).

Conclusion -- A Composite Index of Teacher Characteristics

Six characteristics of teachers have been examined in this chapter with somewhat varying interprovincial differences shown for each. Perhaps an overall summary in the form of a composite index of teacher characteristics would provide some useful insights. To this end, two indexes based on different weights have been developed.[2] In the first index, equal weight has been given to tenure, experience, average certificate levels, proportion of university degrees, average salaries, and student-teacher ratios.[3] An increase in each of the

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[1] The wide difference in Alberta between the student-teacher ratios at the elementary and secondary levels (29 and 13, respectively, in 1967-68) reflects the high proportion of teachers who teach both elementary and secondary grades and the fact that nearly all such teachers had been classified as secondary. If it were possible to adjust for this factor, it would probably be found that student-teacher ratios at the elementary and secondary levels would be about the same in Alberta as in the other two Prairie Provinces.

[2] The critical fact in an index is the weight given to each characteristic. In the absence of any definitive studies indicating the relative contribution to educational effectiveness of these characteristics, these indexes must be regarded as illustrative rather than evaluative.

[3] It is recognized that some of the factors are interrelated. For instance, proportion of teachers with university degrees, the average certificate levels, and average salaries are related.

first five factors has been regarded as favourable; a decrease in the student-teacher ratio has been regarded as favourable. In the second index, only the first four factors have been included, and differential weights have been introduced.

Both indexes give similar results, placing the four Western Provinces, Ontario, and Nova Scotia relatively high; placing the remaining Atlantic Provinces and Quebec relatively low (see Tables 4-9 and 4-10). Yet the differentials among the provinces in these factors deemed to have a bearing on teacher effectiveness have been reduced since 1960-61.

Table 4-9

COMPOSITE INDEX OF SELECTED TEACHER* CHARACTERISTICS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

	1960-61			1967-68		
	Elementary	Secondary	Total	Elementary	Secondary	Total
Newfoundland	24	66	30	41	77	45
Prince Edward Island	44	62	44	68	78	72
Nova Scotia	125	98	111	137	117	124
New Brunswick	65	74	68	94	95	94
Quebec	77	76	74	83	80	85
Ontario	107	106	113	101	105	103
Manitoba	105	87	100	87	99	94
Saskatchewan	100	106	106	103	117	108
Alberta	133	110	127	138	116	125
British Columbia	157	111	138	131	123	123
Canada	100	100	100	100	100	100

* Includes principals.

Note: This index includes the following characteristics: tenure, experience, qualifications, university degrees, salaries and student-teacher ratios. For Quebec, tenure is not included. Average teachers' salaries for Quebec were estimated for 1967-68.

Source: Various tables in Appendix F.

One could attach different weights than those employed here to the different characteristics, and somewhat different results might emerge. The indexes merely illustrate the effect of adopting certain assumptions. In general, as long as average certificate levels and university graduation of teachers are given considerable weight, the results of alternative indexes should not be markedly different.

Table 4-10

ALTERNATE INDEX OF SELECTED TEACHER* CHARACTERISTICS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

| | 1960-61 | | | 1967-68 | | |
	Elementary	Secondary	Total	Elementary	Secondary	Total
Newfoundland	33	75	40	46	91	54
Prince Edward Island	41	70	46	67	90	75
Nova Scotia	121	101	111	127	119	120
New Brunswick	64	75	68	91	95	93
Quebec	76	86	76	85	77	83
Ontario	109	108	116	100	110	105
Manitoba	110	83	102	95	98	98
Saskatchewan	109	112	113	105	122	111
Alberta	130	105	123	132	116	121
British Columbia	150	111	132	130	129	123
Canada	100	100	100	100	100	100

* Includes principals.

Note: Based on levels of tenure, experience, qualifications and proportion with university degrees, with a weight of one given to tenure, two to experience, four to qualifications and two to proportion with university degrees. For Quebec, tenure is not included.

Source: Various tables in Appendix F.

CHAPTER 5

CAPITAL RESOURCES -- ELEMENTARY AND SECONDARY SCHOOLS[1]

It has already been indicated in Chapter 2 that elementary and secondary school systems are significant users of durable capital goods. Buildings make up the bulk of capital resources employed in school systems. Buses and furniture are also significant items in school capital stock. Other capital resources more intimately involved in the educational process are also important factors in school effectiveness although expenditures for them in aggregate are relatively small. Such items include books, audio-visual aids of various kinds, and laboratory equipment.

In this chapter, principal attention is given to aggregate estimates of school capital stock divided into two categories -- construction, and machinery and equipment. Construction mainly consists of buildings, but fixed equipment, such as a heating system, is regarded as part of the buildings. The machinery and equipment component consists mostly of buses, furniture and movable equipment, such as audio-visual aids. Indications are that the latter item is somewhat understated in the financial accounts since school authorities treat some purchases of movable capital items as ordinary operating expenditures. This is probably particularly true of books.

Available data will not permit a discussion of these capital items in physical terms except for number of classrooms and number of books in centralized school libraries.

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[1]All data in this chapter exclude private elementary and secondary schools.

Estimates of Capital Stock[1]

The school building makes up nearly the whole of capital stock employed in elementary and secondary schools. Regardless of whether evaluated in terms of current or constant dollars, or in gross or net terms, the "construction" component of school capital stock in Canada reached over 90 per cent of the total in 1968, with "machinery and equipment" comprising about 9 per cent. Nevertheless, the machinery and equipment component seems to have risen somewhat as a percentage of the total during the 1960's. In 1960-61, it was estimated at about 7 per cent of the total.

Gross capital stock of publicly controlled elementary and secondary schools in Canada was estimated at $5.9 billion in 1968[2] in terms of constant 1961 dollars. This was a substantial increase over the estimated level of $3.1 billion in 1960 (see Table 5-1). The most rapid increases occurred in Ontario, Quebec, and Alberta.

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[1]These estimates of school capital stock by province have been prepared on the basis of DBS estimates of school capital stock at the national level in 1951 and unpublished data on capital flows by province since that time. They employ the same basic assumptions as used in the preparation of the national estimates, i.e., a 50-year life for buildings and a 20-year life for machinery and equipment. The 1951 national capital stock estimate was distributed provincially on the basis of school enrolment at that time. The old capital retired from the national stock was distributed provincially according to the school enrolment at the time it was initially obtained, e.g., building stock retired in 1968 was distributed provincially according to the school enrolment in 1918.

[2]This is lower than the $6.4 billion estimated for "schools" in Chapter 2. The difference is accounted for by the fact that private elementary and secondary schools, provincial vocational schools, institutes of technology and community colleges are included in the Chapter 2 data.

Table 5-1

ESTIMATED GROSS CAPITAL STOCK, ELEMENTARY AND SECONDARY SCHOOLS
CANADA, BY PROVINCE, 1960 AND 1968

(Millions of constant 1961 dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1960											
Construction	67	15	121	91	720	969	149	169	313	308	2,922
Machinery and Equipment	4	1	6	5	52	66	12	18	23	17	204
Total	71	16	127	96	772	1,035	161	186	336	325	3,126
1968											
Construction	99	26	167	125	1,317	2,038	241	261	596	508	5,378
Machinery and Equipment	8	2	11	11	108	214	27	38	60	57	537
Total	107	28	178	136	1,426	2,251	268	299	656	564	5,915

Note: See footnote 1/ on page 59 for a brief description of the methodology employed in making these estimates.

Source: Based on data from Dominion Bureau of Statistics.

Gross capital stock in constant 1961 dollars was estimated at about $25,000 per teacher and $1,090 per student in 1968. There has been an increase in the gross capital stock per teacher and per student since 1960. The comparable estimates for 1960 were $21,300 per teacher and $780 per student (see Table 5-2). The change in gross capital stock per student, an increase of about 40 per cent, is probably significant. It will be shown later in this chapter that the number of students per classroom has fallen, and this is reflected in part in the capital stock per student estimates. The increase in estimated gross capital stock per teacher from 1960 to 1968 was estimated at about 17 per cent, and this change could conceivably be accounted for by the types of assumptions employed in making the estimates.

Estimates of gross stock represent a maximum valuation of capital since they do not take account of depreciation of old buildings until they are retired completely from the accounts (at the end of 50 years in these estimates). Estimates of net stock are dependent on the depreciation rate employed but provide a more specific allowance for the quality factor, at least as it is affected by the age of buildings. However, in periods when there was a high rate of construction, such as in the 1950's and the 1960's, net capital stock estimates show a relatively greater increase than those expressed in terms of gross capital stock. Thus, if net capital stock data had been used, they would have shown an even greater increase in per-student or per-teacher terms than are shown here for gross capital stock.

There was a fairly wide dispersion among provinces in the estimates of gross capital stock per student in 1968. Indeed, the range from lowest to highest was around 235 per cent in terms of constant 1961 dollars.[1] The range was from $1,630 in Alberta to $690 in Newfoundland. The range in per-teacher terms was not as great, but again Alberta had the highest figure at $34,970 and Newfoundland had the lowest at $17,300.

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[1] And only four of the provinces were within 10 per cent of the national average.

Table 5-2

ESTIMATED GROSS CAPITAL STOCK PER TEACHER AND PER STUDENT
ELEMENTARY AND SECONDARY SCHOOLS, CANADA, BY PROVINCE, 1960-61 AND 1968-69

(Constant 1961 dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1960-61											
Per Teacher											
Construction	15,471	15,709	18,089	15,554	15,767	20,257	20,024	19,394	26,580	25,984	19,912
Machinery and Equipment	899	1,401	957	929	1,292	1,371	1,595	2,033	1,996	1,418	1,390
Total	16,370	17,110	19,046	16,483	17,059	21,628	21,619	21,427	28,576	27,402	21,302
Per Student											
Construction	518	620	672	599	656	698	788	808	1,062	960	733
Machinery and Equipment	30	55	36	36	47	47	63	84	80	52	51
Total	548	675	708	635	703	745	851	892	1,142	1,012	784
1968-69											
Per Teacher											
Construction	16,009	18,521	18,721	16,546	19,664	24,036	22,230	22,727	31,750	26,045	22,744
Machinery and Equipment	1,292	1,272	1,290	1,467	1,615	2,519	2,513	3,310	3,216	2,922	2,270
Total	17,301	19,793	20,011	18,013	21,279	26,555	24,743	26,037	34,966	28,967	25,014
Per Student											
Construction	636	900	799	723	839	1,055	1,002	1,046	1,484	1,054	987
Machinery and Equipment	51	62	55	64	69	111	113	152	150	118	99
Total	687	962	854	787	909	1,166	1,115	1,198	1,634	1,172	1,087

Source: Based on Table 5-1, and data from Dominion Bureau of Statistics.

There is obviously some correlation between average income levels and the provincial position on gross school capital stock in per-student or per-teacher terms. Ontario and the four Western Provinces were at, or above, the national average; the others were below. Apart from Alberta, Ontario and the Western Provinces were nearly the same. Alberta, on the other hand, had a gross capital stock per student nearly 40 per cent higher than the next highest province.

The factors accounting for these differences are likely to be several in number. Part of the difference may be accounted for by differences in amount of class-room space allowed per student;[1] differences in amount of supplementary space, such as libraries, gymnasiums, and auditoriums; differences in office and study space available for teachers; differences in space required for other personnel; differences in standards of construction; differences in construction costs in different provinces; and finally differences in the proportion of new buildings.

A more direct comparison of capital stock in real terms would relate the number of students to the number of classrooms.[2] In 1968-69, British Columbia had the highest number of students per classroom, 27.0; Alberta had the lowest, 21.3 (see Table 5-3). The pattern is not particularly consistent except that the three provinces with the largest agricultural component (Prince Edward Island, Saskatchewan, and Alberta) also had the lowest number of students per classroom. Since 1960-61, there has been a reduction in the number of students per classroom in all provinces except British Columbia.

The interprovincial differences in students per classroom are not as great as the differences in gross capital stock per student. In general, there is no correlation between the rank of a province on the students-per-classroom scale and the rank of a province on the gross-capital-stock-per-student scale.

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[1]Which may reflect differences in the number of students per classroom assuming classrooms are uniform in size, or differences in the size of classrooms assuming class sizes are uniform, or both factors.

[2]Classrooms may, of course, vary considerably in size, in nature of construction, and in terms of facilities provided.

Table 5-3

NUMBER OF STUDENTS PER CLASSROOM IN PUBLIC
ELEMENTARY AND SECONDARY SCHOOLS, CANADA, BY PROVINCE
1960-61, 1966-67 AND 1968-69

	1960-61	1966-67	1968-69
Newfoundland	29.9	26.4	25.2
Prince Edward Island	25.3	23.7	22.3
Nova Scotia	26.9	26.1	24.5
New Brunswick	26.2	25.3	24.4
Quebec	28.1	24.1	26.6
Ontario	28.8	27.7	26.1
Manitoba	29.7	25.1	23.8
Saskatchewan	24.2	22.4	21.9
Alberta	25.0	22.5	21.3
British Columbia	27.1	28.5	27.0
Canada	27.8	25.6	25.4

Source: Based on data from Dominion Bureau of Statistics.

Central School Libraries, Books, and Other Materials

In Chapter 2, reference was made to the apparently
important role of books in the educational process as
indicated by the early emphasis on learning to read, the
wide use of textbooks, and the encouragement of students
to read books from other sources.   The growth of centra-
lized school libraries[1] is more evidence of this
attitude.   Centralized school libraries also make
available other resource material such as projectors,
films, maps, tapes, and records.

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[1] A centralized school library is defined in Dominion
Bureau of Statistics, *Survey of Libraries, Part II:
Academic Libraries, 1967-68* as "a library which is
administered as a unit, located in one place, at least
as large as a classroom, and provides books and other
library materials for the use of all the pupils and
teachers of the school; and is used as a library at
least 90 per cent of the time".   This does not include
"classroom collections, teachers' collections, nor book
collections administered by the public library authority
and located in the school".

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In 1967-68, student enrolment in schools with centralized school libraries amounted to 71 per cent of the enrolment in reporting schools. The enrolment of reporting schools, however, accounted for only two-thirds of total enrolment in public schools for Canada as a whole. While coverage in terms of enrolment was well over 80 per cent for each of the four Western Provinces, it was around 60 per cent for Nova Scotia, Quebec, and Ontario; somewhat under 50 per cent for New Brunswick; and 20 per cent or less for Newfoundland and Prince Edward Island. The results of the survey of centralized school libraries are not, therefore, equally representative for all provinces.

It appears that the highest degree of public school student access to centralized school libraries in 1967-68 was to be found in the four Western Provinces and Quebec.[1] These were also the provinces with a relatively large number of books per student in the schools that had centralized libraries (see Table 5-4). The number of books per student in schools with centralized libraries ranged from a high of 8.6 in Saskatchewan to a low of 2.7 in New Brunswick (the data for Newfoundland and Prince Edward Island should not be regarded as representative and have not been included in these comparisons).

In general, the number of books per student in centralized school libraries has been increasing in Canada. For example, in 1960-61 there were 4.2 books per student; in 1964-65, 5.1; in 1967-68, 6.5. At the secondary level only, the increase is also noticeable, with the proportion rising from 4.7 in 1960-61 to 5.3 and 6.9 in 1964-65 and 1966-67, respectively.

The range and quality of books available are of considerable importance but, in the absence of such an assessment, reliance has been placed on the quantities available. It may be noted that the American Library Association has suggested a standard of 10 books per student in centralized school libraries -- a standard that is higher than the level achieved in any of the provinces.

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[1]This is in terms of the index of the role of centralized school libraries, which is shown in Table 5-4.

Table 5-4

SURVEY OF CENTRALIZED PUBLIC SCHOOL LIBRARIES
CANADA, BY PROVINCE, 1967-68

	Coverage of Survey (1) (Per cent)	Percentage of Enrolment of Surveyed Schools with Access to Centralized School Libraries	Books per Pupil in Schools with Centralized Libraries		Index of Apparent Importance of Centralized School Libraries (2) (Canada = 100)
			Elementary and Secondary	Secondary	
Newfoundland	22.3	52.2	3.1	3.2	n.a.
Prince Edward Island	15.8	100.0	5.2	4.5	n.a.
Nova Scotia	56.1	50.3	3.2	4.1	35
New Brunswick	46.2	64.2	2.7	3.7	38
Quebec	58.7	71.7	7.1	8.4	110
Ontario(3)	63.7	62.6	4.7	5.2	64
Manitoba	88.3	63.5	7.1	7.6	98
Saskatchewan	96.1	80.4	8.6	9.0	149
Alberta	82.9	88.4	8.2	8.2	157
British Columbia	92.5	86.2	7.8	7.8	134
Canada	66.6	71.0	6.5	6.9	100

(1) Enrolment of reporting schools as percentage of total enrolment.

(2) This index is based on the number of books in centralized school libraries as related to the enrolment in schools covered by the survey. It assumes that the schools not covered by the survey had similar characteristics as far as centralized libraries are concerned. Because this assumption may not be valid in all cases, the indexes for Nova Scotia, New Brunswick, Quebec, and Ontario may be overstated.

(3) 1966-67 data.

Source: Dominion Bureau of Statistics, *Survey of Libraries, Part II: Academic Libraries, 1967-68*.

An index of the apparent role of centralized school libraries has been prepared for all provinces except Newfoundland and Prince Edward Island. This indicates the relatively greater development of school libraries in the Western Provinces and in Quebec (see Table 5-4).

Another possible index concerns expenditures for centralized school libraries and for books, periodicals, pamphlets, pictures, clippings, etc. In Canada as a whole, these reached $5.45 per student in 1967-68.[1] Expenditures were substantially below the national average in the Atlantic Provinces and in Quebec. The highest level of $13.33 per student was recorded in Manitoba, but this could have been a temporary fluctuation since in the previous year the province was close to the national average (see Table 5-5).

Table 5-5

EXPENDITURES ON BOOKS AND MATERIALS PER PUPIL
IN PUBLIC SCHOOLS WITH CENTRALIZED LIBRARIES
CANADA, BY PROVINCE, 1967-68

	Dollars Per Pupil
Newfoundland	1.25
Prince Edward Island	1.99
Nova Scotia	1.01
New Brunswick	1.00
Quebec	4.03
Ontario[1]	5.39
Manitoba	13.33
Saskatchewan	6.27
Alberta	5.45
British Columbia	5.62
Canada	5.45

[1] 1966-67 data.

Source: Dominion Bureau of Statistics, *Survey of Libraries, Part II: Academic Libraries, 1967-68.*

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[1]Expressed in terms of students enrolled in schools with centralized libraries.

    Such expenditures on books and materials for
centralized school libraries have been increasing,
rising to the current level from $2.36 per student in
1960-61 and $3.46 per student in 1965-66. Some of the
provincial data, however, fluctuated considerably from
year to year. The example of Manitoba has already been
cited. Nova Scotia and Prince Edward Island were
relatively higher in 1966-67 than in 1967-68.

CHAPTER 6

PROVINCIAL DIFFERENCES IN THE STUDENT FACTOR

In Chapter 2, there was a brief discussion of conceptual approaches to the role of the student in educational systems. This emphasized the importance of the quality of the student resource as expressed by mental capacity, attitudes, and motivations.[1] Unfortunately, comprehensive data on such factors are not available. This chapter is limited therefore to a consideration of the degree of participation by students in formal education, with emphasis on elementary and secondary education.

The percentage participation of students of a particular age does have some consequences for the operations of educational systems and vice versa. It also has consequences for any analysis of the student factor, for it indicates the extent to which some mechanism of selection may be at work in determining student population. When school attendance of an age group is nearly 100 per cent, the characteristics of the student population and the total population are obviously nearly identical.

The elementary and secondary school educational system is now largely nonselective of the population (except as regards age). Within given age groups, generally from 6 years to 15 or 16 years, universal attendance is required by provincial legislation, and increasingly this nearly universal attendance has been extended, without any legal coercion, to older age

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[1]It has been indicated that the education-related knowledge acquired by students before entering an educational system and acquired from the home during school attendance is likely to be related to the educational attainment of the parents and perhaps also of the community in general. Therefore, while it is not a measurement of innate quality, the regional differences of average levels of educational attainment indicated in Chapter 9 will have some bearing on the student factor. Student attitudes and motivations are also related to family environmental factors, of which income is one element.

groups attending at the secondary level. There has also been a tendency for students to enter school earlier -- ages 5, 4, and even 3 -- at the kindergarten or pre-kindergarten levels.

On the other hand, postsecondary educational systems are still selective. The proportion of young people attending such institutions has increased, but post-secondary students are still a minority in their age groups.[1] At some time in the future a majority of students of postsecondary school age are likely to continue attending at the postsecondary level but it is unlikely that there will be anything close to complete attendance.

Three indications of the degree of participation in each province will be examined. The first will be unpublished data from the 1961 Census of Canada, giving educational enrolment by single years of age. The second will be student retention rates at elementary and secondary school levels. The third will be aggregate enrolment ratios in which attendance at given educational levels is related to broad age groups.

Enrolment by Single Years of Age

As might be expected, for each age from 7 years to 14 years, the proportion of enrolment was close to universality at June 1, 1961, and any provincial diver-gence from this pattern was minimal (see Table 6-1). This reflects the compulsory school attendance require-ments. For children 6 years of age,[2] the proportionate attendance was over 50 per cent in all provinces and

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[1] Postsecondary enrolment is generally related to the 18-24 age group or the 18-21 age group on the assumption that the large majority of postsecondary students have proceeded directly from, or without a lapse of more than a year after, the secondary school level. This assump-tion is justified, but an apparently increasing number of older students are entering postsecondary institutions.

[2] It should be noted that the age of students is given as of June 1, 1961, which is near the end of the school term, so that many of these students would be 5 years of age at the beginning of the school term.

approached complete coverage in Nova Scotia, while
Ontario was not far behind. For children 5 years of
age, only in two provinces, Ontario and Nova Scotia,
were more than 30 per cent enrolled in school at June 1,
1961. For some of the provinces, enrolment of 5-year-
olds was less than 10 per cent.

Table 6-1

PROPORTIONAL ENROLMENT IN EDUCATIONAL INSTITUTIONS
BY SINGLE YEAR OF AGE FROM 5 TO 14, CANADA, BY PROVINCE, 1961

	Age as of June 1, 1961									
	5	6	7	8	9	10	11	12	13	14
	(Percentage of population enrolled)									
Newfoundland	17	70	95	96	97	97	97	96	97	96
Prince Edward Island	7	63	96	98	98	98	97	97	98	96
Nova Scotia	33	93	97	98	97	97	98	97	97	96
New Brunswick	3	55	96	97	97	98	98	97	97	95
Quebec	7	55	96	97	97	97	97	97	97	94
Ontario	38	84	97	98	98	98	98	97	98	97
Manitoba	22	69	97	98	98	98	98	98	98	97
Saskatchewan	12	61	95	97	97	97	97	97	97	97
Alberta	15	60	97	98	98	98	98	98	98	98
British Columbia	20	65	97	98	98	98	98	97	98	97
Canada	21	69	96	97	98	98	98	97	97	96

Source: Based on special tabulation of census data for 1961. For
additional details, see Table F-15 in Appendix F.

At the age of 15 in 1961, withdrawal from educa-
tional institutions began and increased with each
succeeding year of age. For instance, the enrolment
ratio at age 15 was 89 per cent; at age 16, 76 per cent;
at age 17, 59 per cent, and at age 18, 40 per cent
(see Table 6-2).

Interprovincial differences in enrolment ratios in
1961 began to emerge at age 15 although they were not
very great. The differences became more significant at
ages 16, 17, and 18. Two major provincial groupings
were indicated in terms of the enrolment in the 15- to
18-year-old population -- Ontario and the four Western
Provinces, on the one hand, tending to have a relatively
high enrolment ratio; Quebec and the four Atlantic
Provinces, on the other, tending to have a somewhat
lower enrolment ratio.

Table 6-2

PROPORTIONAL ENROLMENT IN EDUCATIONAL INSTITUTIONS
BY SINGLE YEAR OF AGE FROM 15 TO 24, CANADA, BY PROVINCE, 1961

	Age as of June 1, 1961									
	15	16	17	18	19	20	21	22	23	24
	(Percentage of population enrolled)									
Newfoundland	89	69	46	25	11	7	5	3	3	2
Prince Edward Island	88	69	53	36	20	11	8	5	4	4
Nova Scotia	91	76	58	36	19	11	6	5	4	3
New Brunswick	87	71	55	39	22	12	8	6	4	3
Quebec	83	66	47	30	19	13	9	6	5	4
Ontario	93	82	64	44	27	17	11	8	5	4
Manitoba	91	81	65	43	23	14	10	7	5	4
Saskatchewan	92	82	69	50	28	16	10	7	5	4
Alberta	94	84	70	48	27	15	9	6	5	4
British Columbia	94	86	74	52	28	17	12	8	6	5
Canada	89	76	59	40	23	14	10	7	5	4

Source: Based on special tabulation of census data for 1961. For
additional details, see Table F-15 in Appendix F.

Quebec had the lowest enrolment rates of any
province for 15- and 16-year-olds, but Newfoundland had
the lowest for 17- and 18-year-olds. British Columbia
had the highest enrolment ratio for each age. Enrolment
ratios in Alberta and Saskatchewan tended to be higher
than those in Manitoba and Ontario. Within the Atlantic
Region, Nova Scotia tended to have relatively high enrol-
ment ratios.

For the population aged 19 to 24 years, the dis-
parities described in the previous paragraph begin to
disappear. Apart from Newfoundland, which was consistently
low throughout, the remaining differences for ages 22 and
over did not follow any particular regional pattern.
Although enrolment ratios continued to be the highest for
all ages in British Columbia, the relative position of
Ontario strengthened at age 19 and continued relatively
high. Enrolment ratios in Quebec also became relatively
high for each of the ages under consideration.

Sex differences in educational enrolments also began
to emerge in some provinces at age 15, although the
national average did not show any significant evidence
of this until age 18, at which point the enrolment ratio
for males was 45 per cent and for females, 35 per cent.
By age 20, the male enrolment ratio was nearly twice

that of females (see Table 6-3). (This difference continued to be shown for the older age groups, which may be verified by reference to Table F-15 in Appendix F.)

Different provinces exhibited substantially different patterns. The female enrolment ratio dropped below the male enrolment ratio in Quebec at age 15, while tending to be above the male ratio in other provinces. At age 16, the female enrolment ratio was below the male enrolment ratio in both Quebec and Newfoundland but either at or above the male ratio in all other provinces (and substantially above in Prince Edward Island and Saskatchewan). At age 17, the picture became truly mixed, with female enrolment ratios lower than male in Newfoundland, Quebec, Ontario, and Manitoba; higher in the three Maritime Provinces and Saskatchewan; and about the same in Alberta and British Columbia. It was not until age 18 that a fairly uniform lower female enrolment ratio was apparent. But even then, a considerably higher rate was shown in Prince Edward Island and the difference was not too great in Nova Scotia and New Brunswick.

It is particularly noteworthy that the female enrolment ratios in the Maritime Provinces[1] tend to be above the national average for the 16-, 17-, 18- and 19-year-olds while the male ratios are below the national average.

Student Retention Rates

The student retention rate, as the name implies, indicates the extent to which students continue, or are "retained", at higher grade levels or in more advanced programs in a given educational system. Typically, these are applied to elementary and secondary school systems because of the fairly rigid grade structure, which enables retention rates to be calculated as the ratio of enrolment in one grade to that in a lower grade at an appropriate earlier time.

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[1] As distinguished from the Atlantic Provinces which include Newfoundland.

Table 6-3

PROPORTIONAL ENROLMENT IN EDUCATIONAL INSTITUTIONS, BY SEX AND BY SINGLE YEAR
OF AGE FROM 15 TO 20, CANADA, BY PROVINCE, 1961

	15		16		17		18		19		20	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	(Percentage of population enrolled)											
Newfoundland	89	89	70	67	50	42	30	20	14	8	9	5
Prince Edward Island	85	90	63	75	46	61	31	42	20	20	13	9
Nova Scotia	90	91	76	77	57	60	37	35	22	16	12	9
New Brunswick	87	87	69	72	53	57	39	38	26	19	15	9
Quebec	85	81	82	63	51	43	35	25	24	13	17	8
Ontario	93	94	80	81	66	62	50	39	34	20	22	11
Manitoba	91	92	79	82	67	63	49	37	30	17	19	9
Saskatchewan	91	92	84	84	66	72	52	47	32	24	19	13
Alberta	93	95	86	85	70	70	54	43	33	21	19	11
British Columbia	93	94	86	86	74	73	57	46	35	22	22	12
Canada	89	89	76	75	60	57	45	35	29	18	19	10

Source: Based on special tabulation of census data for 1961. For additional details, see Table F-15 in Appendix F.

In this chapter, retention rates are regarded as an input measure -- a measurement, in terms of time, of the commitment of students to educational systems. They may also be regarded as an output measure.[1]

A particular retention rate will give some indication of the proportion of the population of a given age enrolled in school because most children start elementary and secondary school at about the same time. For instance, it might be expected that the Grade 11 retention rates would indicate the proportion of 17-year-olds enrolled in school. As a matter of fact, the Grade 11 retention rates to 1960-61, shown in Table 6-4, are somewhat lower than the enrolment ratios of 17-year-olds in 1961 and more closely match the average of the enrolment ratios for 17- and 18-year-olds.

The retention rate to Grade 11[2] in 1960-61 showed wide variations, from 33 per cent in Quebec to 68 per cent in British Columbia, with an average for Canada as a whole of about 50 per cent. This implies that in Quebec about two-thirds of the students enrolled in Grade 2 in 1951-52 had left the school system by 1960-61, with a comparable proportion of about one-third in British

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[1]Dr. J. E. Cheal, in his book *Investment in Canadian Youth*, in order to sustain his choice of the retention rate as a measure of output makes the following assumptions: that grade level on leaving school is related to an individual's immediate productivity in the labour force; that grade level on leaving school is related to ability and opportunity to benefit from further training, either formal or informal; and that there is a significant relationship between further training and increased productivity in the labour force.

[2]For purposes of interprovincial comparisons, the retention rate to Grade 11 seems to be the most appropriate, since there are differences among the provinces in the terminal years of the secondary level. In most provinces, the final secondary year is Grade 12, but it is Grade 11 in Newfoundland and Quebec, and Grade 13 in Ontario. There has also been some Grade 13 enrolment in British Columbia and New Brunswick, although currently this is insignificant. Therefore, a comparison of Grade 12 or Grade 13 retention ratios would not be appropriate.

Columbia and one-half for Canada as a whole.[1]   The
retention rates in the four Western Provinces and
Ontario were the highest -- all between 68 and 56 per
cent.   Ontario tied for fourth place with Saskatchewan,
followed by Nova Scotia and New Brunswick at about
45 per cent and the three remaining provinces at under
40 per cent (see Table 6-4).

Table 6-4

STUDENT RETENTION RATES[1]
BY PROVINCE, 1960-61 AND 1968-69

	1960-61	1968-69
Newfoundland	38.1	54.3
Prince Edward Island	36.0	67.0[2]
Nova Scotia	47.3	69.0
New Brunswick	44.2	62.0
Quebec	32.7	73.0[2]
Ontario	55.7	75.4
Manitoba	60.8	81.5
Saskatchewan	55.8	75.2
Alberta	64.4	82.8
British Columbia	67.8	85.2

[1] The ratio of enrolment in Grade 11 to enrolment in
     Grade 2 nine years earlier. These ratios have been
     adjusted to remove the effects of student migration.

[2] Estimated.

Source: Based on data from Dominion Bureau of Statistics.

By 1968-69, the retention rates of all provinces
had increased considerably, with the increases in both
Quebec and Prince Edward Island being particularly large.
The leading provinces also increased significantly, with
British Columbia, Manitoba, and Alberta still in the top
three positions, exceeding the 80 per cent level in
1968-69.   Saskatchewan and the two central provinces of
Ontario and Quebec rose to about the 75 per cent range;
the Maritime Provinces were in the 60 per cent range or

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[1]This is only approximately true, since some students
would have repeated a particular grade and so would
have been enrolled in Grade 10 rather than Grade 11 in
1960-61. A few others might have accelerated and been
enrolled in Grade 12. If both "repeaters" and
"accelerators" were to be found, the error due to this
factor would be insignificant.

higher; and only Newfoundland was left at about 54 per cent. The changes, in fact, brought about a considerable reduction in interprovincial differences.

The retention rates described in Table 6-4, however, may not be particularly precise instruments for comparing educational performance since it is possible for two provinces to have the same retention rate to Grade 11, even if in one province all the withdrawals are in Grade 8 and in the other they are in Grade 10. Obviously, with the same Grade 11 retention ratios, the average educational attainment levels would be lower in the first case than in the second.

An examination of the apparent withdrawal rates for individual grades from Grade 7 onwards indicates that low Grade 11 retention rates are, in fact, associated with relatively higher withdrawal rates at all lower grade levels. This is particularly true after Grades 7 and 8. In 1960-61, for those two grade levels, apparent withdrawal rates generally were significantly higher in the Atlantic Provinces and Quebec than in Ontario and the Western Provinces. For the higher grade levels, apparent withdrawal rates did not exhibit a particularly consistent pattern (see Table 6-5).

It will be noted that the level of the apparent withdrawal rates for 1960 and 1967 in Table 6-5 cannot be directly related to the Grade 11 retention rates for the same years in Table 6-4. This is because the Grade 11 retention rate for 1960-61 is the product of a series of withdrawal rates spread out over the period from 1951-52 to 1960-61, including the withdrawal rate after Grade 7 in 1956, after Grade 8 in 1957, etc. A hypothetical Grade 11 retention rate may be constructed, as in Table 6-5, to indicate the situation that would result from 1960 withdrawal rates. For Prince Edward Island, there is a substantial difference between this hypothetical Grade 11 retention rate and that shown for the same date in Table 6-4. Moreover, little change in this hypothetical retention rate took place in Prince Edward Island from 1960 to 1967 while, in terms of the actual retention rate, a marked increase occurred. This indicates that the decline in withdrawal rates in that province associated with higher retention took place not in the 1960's but in the latter part of the 1950's. A similar situation, though not as marked, may be observed for Newfoundland, Manitoba, and Saskatchewan.

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Table 6-5

APPARENT WITHDRAWAL RATE(1)

ELEMENTARY AND SECONDARY SCHOOL STUDENTS, BY PROVINCE, 1960 AND 1967

(Per cent)

	After Grade 7		After Grade 8		After Grade 9		After Grade 10		Hypothetical Grade 11 Student Retention Rate(2)	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Newfoundland	10.7	8.0	0.9	4.0	31.0	26.5	24.0	21.0	46.4	51.3
Prince Edward Island	3.4	-0.3	18.2	16.1	4.3	14.7	15.4	12.6	64.0	62.7
Nova Scotia	12.2	10.7	12.5	6.1	18.7	17.9	21.9	11.2	48.8	61.1
New Brunswick	11.8	11.2	14.6	4.7	18.2	8.6	21.5	10.3	48.4	69.4
Quebec	11.9	-5.0	11.1	9.8	25.8	7.3	18.1	7.8	47.6	81.0
Ontario	4.7	3.0	-4.1	-4.5	16.0	9.0	24.4	13.7	60.8	79.6
Manitoba	5.1	5.8	1.7	-0.1	13.6	11.1	5.0	5.1	76.6	79.6
Saskatchewan	6.4	4.2	1.4	-0.4	14.8	9.2	15.7	16.5	66.3	72.9
Alberta	4.2	2.1	2.1	1.7	15.1	6.4	9.0	7.2	72.5	83.6
British Columbia	2.5	-1.0	3.2	1.1	8.9	4.1	12.0	5.5	75.7	90.5

(1) As an example, the apparent withdrawal rate for 1960 after Grade 7 is calculated as the percentage decline from the level of enrolment in Grade 7 in the 1959-60 school year to the level of enrolment in Grade 8 in the 1960-61 school year.

(2) This indicates the proportion of Grade 2 students who would have been retained to Grade 11 at the withdrawal rates shown for each grade level.

Note: A negative apparent withdrawal rate indicates that enrolment was greater in the succeeding grade. It indicates that a number of students were repeating the succeeding grade.

Source: Based on data from Dominion Bureau of Statistics.

In other provinces, the increase in the actual Grade 11 retention rates in the 1960's was largely associated with a decline in the withdrawal rates that occurred in the 1960's.

By 1967-68, apparent withdrawal rates had generally declined at all grade levels, although the largest declines appeared most consistently after Grades 9 and 10. Again, however, the pattern is far from a consistent one.

Another aspect of student enrolment patterns is associated with the number of students repeating Grade 1. This is measured approximately by the relationship of Grade 2 enrolment to Grade 1 enrolment the preceding year (assuming there are no repeaters in Grade 2). A high percentage of repeaters may be regarded as an unfavourable factor indicating student difficulties in adapting to the school environment and the need for a student to invest an additional year to attain a given academic standing. In Table 6-6, the record for 1955-56, 1960-61 and 1968-69 has been examined. In general, a reduction in the number of Grade 1 repeaters is indicated, particularly in Newfoundland which, in 1955-56, had an exceptionally high rate. By 1968-69, the interprovincial differences in the number of Grade 1 repeaters had largely disappeared.

Table 6-6

GRADE 2 ENROLMENT AS PERCENTAGE OF GRADE 1 ENROLMENT
BY PROVINCE, SELECTED YEARS

	1955-56	1960-61	1968-69
Newfoundland	67.5	90.4	99.2
Prince Edward Island	92.2	96.0	94.6[1]
Nova Scotia	93.9	94.3	99.6
New Brunswick	90.7	93.8	95.3
Quebec	97.7	99.7	98.8[1]
Ontario	94.6	95.6	95.0
Manitoba	90.0	95.3	94.8
Saskatchewan	94.3	95.4	92.9
Alberta	96.2	97.1	97.6
British Columbia	97.7	96.7	96.2

[1] 1967-68 data.

Source: Based on data from Dominion Bureau of Statistics.

Enrolment Ratios

The ratio of enrolment at an entire educational level to an appropriate age group provides a convenient summary of the changes in retention rates or in enrolment for individual years of age (see Table 6-7). As previously suggested, few provincial differences were to be found in the enrolment ratios at the elementary level in 1960-61. All of them showed elementary enrolment ratios of more than 100 per cent because of repeaters in certain grades. But there were three distinct groups of provinces as far as secondary enrolment ratios were concerned -- British Columbia, Alberta, and Ontario, over 80 per cent; Saskatchewan and Manitoba in the 75 per cent range;[1] and the Atlantic Provinces plus Quebec varying between 57 and 67 per cent.

By 1968-69, the picture had changed substantially. Secondary enrolment ratios had increased considerably in all provinces but most notably in Quebec. Quebec, which had ranked seventh in 1960-61, was a close second in 1968-69. The two central provinces had the highest ratios,[2] followed by the four Western Provinces at the 90 to 95 per cent level and the four Atlantic Provinces at slightly under 80 per cent.

Postsecondary enrolment ratios have also increased sharply in all provinces but because of substantial structural differences it is not easy to make appropriate interprovincial comparisons.

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[1] The actual secondary enrolment ratio in Manitoba in 1960-61 was 70 per cent, but in addition there were Grade 11 graduates who were enrolled at university.

[2] It should be noted that the high secondary school enrolment ratio in Ontario partially reflects the significant Grade 13 enrolment in the province.

Table 6-7

FULL-TIME ENROLMENT RATIOS, BY EDUCATIONAL LEVEL
AND BY PROVINCE, 1960-61 AND 1968-69

	Kindergarten(1)		Elementary		Secondary		Total Postsecondary	
	1960-61	1968-69	1960-61	1968-69	1960-61	1968-69	1960-61	1968-69
Newfoundland	38.6	82.2	108.9	109.7	66.8	78.5	3.9	9.7
Prince Edward Island	7.5	2.3	106.5	110.6	59.2	79.8	8.5	14.3
Nova Scotia	104.0	104.8	106.1	106.6	57.2	76.2	10.3	16.0
New Brunswick	0.6	1.1	109.3	109.1	59.7	77.1	9.7	15.4
Quebec	9.4	77.3	111.1	100.3	65.4	101.8	11.4	19.3
Ontario	68.8	94.1	104.7	104.4	83.0	102.6	9.0	16.9
Manitoba	30.4	62.6	105.4	104.6	70.1	90.0	9.5	15.8
Saskatchewan	14.9	21.0	106.2	105.8	76.8	90.5	9.8	15.1
Alberta	1.9	2.4	106.7	104.3	84.9	96.0	7.9	19.5
British Columbia	12.7	47.4	101.5	108.6	85.1	95.2	10.9	16.9

(1) Excludes private kindergartens.

Note: These enrolment ratios are generally the ratio of enrolment in September of the school year to the population as of June in the same calendar year. Kindergarten enrolment was calculated as a proportion of the population 5 years of age. Elementary enrolment ratios were calculated in all but two provinces as the ratio of enrolment in Grades 1 to 8 to the 6-to13-year-old population. The two exceptions were Quebec and British Columbia where enrolment in Grades 1 to 7 was related to the 6- to12-year-old population. For most provinces, the secondary enrolment ratios were calculated as the ratio of enrolment in Grades 9 to 12 or 13 to the population aged 14-17 years. The exceptions were: Newfoundland, where enrolment for Grades 9 to 11 was related to the population aged 14-16 years; Quebec, where enrolment for Grades 8 to 11 was related to the population aged 13-16 years; and British Columbia, where enrolment for Grades 8 to 13 was related to the population aged 13-17 years. Postsecondary enrolment was related to the population aged 18-24 years.

Source: Based on data from Dominion Bureau of Statistics.

Concluding Observations

The degree of participation by students in formal education obviously increased substantially over the 1960's. But more significant, for the purposes of this Study, was the indication that provincial differences in student participation rates were reduced. Nevertheless, moderate differences still remained at the secondary school level and substantial differences were to be found at the kindergarten level and in some of the provinces at the postsecondary level.

The significance of these remaining differences is not easy to assess. First, it must be borne in mind that there are structural differences in the educational systems in the provinces that affect the enrolment ratios shown in Table 6-7. Thus, when the secondary school level terminates at Grade 11, as it does in Newfoundland and Quebec, one may expect a somewhat higher secondary school enrolment ratio (since the average age of students when they reach the terminal level is likely to be lower). The inclusion of an additional level of secondary school, such as Grade 13 in Ontario, has somewhat distorted the secondary school enrolment ratios in that province since the enrolment at five grade levels has been related to the population of a four-year age group. The structural differences are particularly significant at the postsecondary level.

Second, there are substantial differences in the proportion of non-residents enrolled in individual provinces at the postsecondary level, especially at universities, and also in the proportion of residents of a particular province enrolled at universities outside that province.[1]

Third, there are the more fundamental points of determining the significance of time spent by students in a particular educational system and of comparing the graduates of one provincial system with another. Obviously, the period of student participation is not in itself an adequate assessment of an educational system. Until other objective criteria of student

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[1] For a more complete discussion of this point, refer to Z. E. Zsigmond and C. J. Wenaas, *Enrolment in Educational Institutions by Province, 1951-52 to 1980-81*, Economic Council of Canada, Staff Study No. 25 (Ottawa: Queen's Printer, 1970), pp. 73-79.

performance are developed, however, it will be necessary to continue to accept an increase in the length of time a student is engaged in the educational system as an improvement in that final output. This point is explored further in Chapter 9 and in Appendix A.

CHAPTER 7

DIFFERENCES IN SCALE OF OPERATIONS IN
ELEMENTARY AND SECONDARY SCHOOLS

In this chapter, the scale of operations of public
elementary and secondary school systems is considered,
since it is apparent that it has been the objective of
provincial governments for some time to consolidate many
of the small schools and school districts into larger
schools and larger school districts.

Although scale of operations is associated with
size, it may be considered in a number of different
respects in any industry or even within any enterprise,
firm, or establishment.[1] Scale of operations may be
expressed in terms of the value or other measurement of
the aggregate output of industries, enterprises, firms,
or establishments. But it may also be considered in

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[1]In the Dominion Bureau of Statistics *Standard Industrial
Classification Manual* (Ottawa: Queen's Printer, 1960),
the three-digit groupings in the industrial classifica-
tion are defined as industries. An industry theoretically
is a group of establishments producing the same identical
product. Within this system of classification, elementary
and secondary schools in total are classified as one
industry, regardless of whether operated by the federal
government (Indian schools), provincial government
(schools for the handicapped), school boards, or private
institutions. An enterprise is defined as "a firm or
an aggregation of firms under common ownership and
financial control" (*ibid.*, p. 7); a firm is described
as resulting from "a legal arrangement and may be a
sole proprietorship, partnership, corporation or other
form of organization such as a co-operative" (*ibid.*,
p. 8); an establishment is a firm or sub-unit of a firm
which is "the smallest unit which is a separate operating
entity capable of reporting all elements of basic indus-
trial statistics" (*ibid.*, p. 8).

terms of the number of repetitions of a single operation or task.[1] The scale of operations may appear to be large in terms of the total output of an enterprise but it may be small at the task level.

An attempt has been made initially to describe elementary and secondary school systems in terms of this framework. In certain respects, an entire provincial publicly controlled elementary and secondary school system may be regarded as an enterprise. The school curriculum, which sets some of the conditions of operations, is prescribed at the provincial level, and there is an increasing measure of financial control over local authorities by provincial Departments of Education. But, as will presently be indicated, the scale of operations at the provincial level does not indicate very much, except that it describes the upper limit of operations at the school-district and school level. The school district or division may be described as a firm because of its substantial measure of administrative autonomy and the centralized control over operations. The school, however, is the most basic unit of operation and may be described as an establishment. Within a school district, the operations of a school are largely self-contained in that students typically attend only one school at a time and teachers typically teach in only one school.[2] Moreover, the school typically has a separate administrative head.

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[1] The concept of a "task" is difficult to define with precision but it could be regarded as an operation that *may* be performed by an individual or machine distinct from the individual or machine performing the immediately preceding operation. It is taken to represent the ultimate divisibility of a production process. One may also consider scale of operations at a somewhat more aggregated level -- the "production run" which is "the number of items of a specific commodity that are produced on a given machine or assembly line without change-overs". D. J. Daly, B. A. Keys and E. J. Spence, *Scale and Specialization in Canadian Manufacturing*, Economic Council of Canada Staff Study No. 21 (Ottawa: Queen's Printer, 1968), p. 20.

[2] The principal exception would be the teachers who are called upon to replace regular teachers who may be absent because of illness, etc.

Within the school itself, another distinct level of operations is associated with the manner in which the teacher resource is employed. The average school today contains a number of teachers, each of whom meets a portion of the student body in a separate classroom. A class is not as self-contained a unit of operation as is the school, since there is considerable inter-changeability of teachers and students. Nevertheless, in the lower and middle elementary grades, there is usually only one teacher for a given class of students. It is in the upper elementary and secondary grades that one teacher teaches several classes of students, and a student may be part of several classes.

The scale of operations appears to be most relevant at the school and class levels;[1] the significance of the size of the school district arises primarily because of its impact on the organizational possibilities for schools and classes. The enrolment of a school district obviously determines at least the upper limit of the school or schools within it but is also likely to affect the extent to which specialized schools may be developed. At one time, particularly in rural areas, many school districts were responsible for only one school and that school, in turn, may have contained only one classroom. Under such conditions, the scale of operations of the school district, school, and class could be said to be the same. Today, the situation is mostly one of large school districts, each of which has many schools, with each school consisting of many classes. Thus the scale of operations at each level differs significantly.

In this chapter, consideration is given to the four administrative levels of elementary and secondary school systems, beginning at the provincial level and moving progressively to lower levels of aggregation at the school-district, school, and class levels.

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[1]However, studies on the scale of operations as it affects costs have tended to be concentrated at the school-district level. As an example, see N. W. Hansen, "Economy of Scale as a Cost Factor in Financing Public Schools", *National Tax Journal*, vol. 17, no. 1, March 1964.

Scale at the Provincial Level

The range in scale of operations at the provincial level[1] is obviously very great, extending from Prince Edward Island with 29,000 public school students and 1,430 teachers to Ontario with 1,931,000 students and 84,790 teachers.[2] The size of all provincial elementary and secondary school systems increased considerably over the 1950's and 1960's due to increases in the number of children of elementary and secondary school age and increases in enrolment ratios.[3]

As indicated earlier, the size of a provincial school system is relevant primarily because of the implications for the scale of operations at the school-district level. Several individual school districts have a substantially larger enrolment than the whole of the province of Prince Edward Island, and the largest school district in Canada accounted for an enrolment of about eight times that of Prince Edward Island. But there are indirect implications also. In the larger provincial school systems, with greater possibilities for large school districts, there seems to be a greater measure of supervision and inspection performed by staff of the school districts and a reduced role for the staff of the provincial Department of Education.[4] Thus it is found that provincial government expenditures for services

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[1]It is possible to find an example such as Quebec where two distinct school systems operate. Also in a province like Ontario, with provision for the establishment of so-called "separate schools", the separate schools, while part of the provincial system of publicly supported schools, may also come to possess a certain province-wide distinctiveness. No attempt has been made to adjust for these factors.

[2]These 1968-69 data were obtained from Dominion Bureau of Statistics, *Preliminary Statistics of Education, 1968-69.*

[3]For further details, see Z. E. Zsigmond and C. J. Wenaas, *Enrolment in Educational Institutions by Province, 1951-52 to 1980-81,* Economic Council of Canada Staff Study No. 25 (Ottawa: Queen's Printer, 1970).

[4]There appears to be a growing trend in this direction, which is not entirely accounted for by the increasing size of school district.

and supervision of public schools[1] in 1966 amounted to
about 4.5 per cent of public school operating expendi-
tures in Prince Edward Island and 3.7 per cent in
Newfoundland compared with 3.0 per cent in Quebec and
2.3 per cent in Ontario (see Table 7-1). There is no
close inverse correlation with size, however, since the
three most westerly provinces have lower proportions
than the large central provinces.

Table 7-1

PROVINCIAL GOVERNMENT EXPENDITURES ON
SERVICES AND SUPERVISION OF PUBLIC SCHOOLS
AS PERCENTAGE OF PUBLIC SCHOOL OPERATING EXPENDITURES
CANADA, BY PROVINCE, 1966

Newfoundland	3.7
Prince Edward Island	4.5
Nova Scotia	3.1
New Brunswick	2.5
Quebec	3.0
Ontario	2.3
Manitoba	3.1
Saskatchewan	2.2
Alberta	1.8
British Columbia	1.0
Canada	2.4

Source: Based on data from Dominion Bureau of Statistics,
Survey of Education Finance, 1966.

Scale at the School Board Level

There was a sharp increase in the average size of
operative school districts in Canada during the 1960's.
The average number of students enrolled per school
district more than quadrupled from 454 in 1960-61 to
2,036 in 1968-69 (see Table 7-2). Part of this was
related to increased enrolment, but most of the change
was due to a reduction in the number of school districts,
from about 8,800[2] in 1960-61 to about 2,900 in 1968-69.

[1]Provincial government expenditures on such items as
audio-visual programs, guidance, curricula, examinations,
departmental administration costs, and supervision and
inspection. Expenditures on textbooks and school
supplies, and on contributions to teachers' pension
funds, have been excluded because of the widely different
financial treatment of these items in different provinces.

[2]In addition, there were 6,800 local boards within larger
administrative units.

The reduction in the number of school districts was particularly large in Ontario, bringing it from one of the lowest in terms of students per school district in 1960-61 to the highest in 1968-69. Fairly considerable reductions in the number of school districts also took place in New Brunswick, Manitoba, and Saskatchewan. Moderate reductions in school-district numbers took place in Newfoundland, Prince Edward Island, Quebec, and Alberta. In Nova Scotia and British Columbia, the growth in the number of students per school district was entirely due to the growth in total enrolment as the number of districts remained relatively constant.

Table 7-2

PUBLIC SCHOOL DISTRICTS AND AVERAGE NUMBER
OF STUDENTS PER DISTRICT, CANADA, BY PROVINCE
1960-61 AND 1968-69

	Number of Districts[1]		Students per District	
	1960-61	1968-69	1960-61	1968-69
Newfoundland	313	197	412	793
Prince Edward Island	480	337	51	87
Nova Scotia	77	76	2,330	2,748
New Brunswick	89	33	1,711	5,224
Quebec	1,587	1,415	692	1,109
Ontario	4,065	235[2]	342	8,219
Manitoba	1,462	157	130	1,530
Saskatchewan	375	128	556	1,950
Alberta	241	201	1,222	1,998
British Columbia	87	83	3,693	5,800
Canada	8,779	2,862	454	2,036

[1] Excluding areas within larger units that had appointed or elected school boards but were not independent of the board governing the larger unit.

[2] As of January 1, 1969, when a major reorganization became effective.

Source: Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education, 1960-61* and Dominion Bureau of Statistics, *Preliminary Statistics of Education, 1968-69.*

The reduction in the number of school districts in most provinces is due mostly to consolidation of school districts with low enrolment. In general, the boundaries of the school districts with the largest enrolment in each province have remained relatively unchanged or have merely been adjusted to keep step with expansion of the major urban areas for which they may be responsible.

The range in average size of a school district[1] was very great in 1968-69, extending from 87 students per district in Prince Edward Island to 8,219 in Ontario. The range of variation is, however, somewhat narrower than at the beginning of the 1960's.

The provincial averages obscure the wide range of differences within each province in the scale of operations of school districts. With the exception of Prince Edward Island, the largest school district in each province had an enrolment of at least 20,000 students and, in most cases, well over 20,000. (For instance, in 1968-69 the largest school district in Quebec had an enrolment of 230,000;[2] the largest in Ontario had an enrolment of about 110,000; and at least one school district in three other provinces had an enrolment of over 50,000 students.) On the other hand, most provinces still had some school districts with an enrolment of less than 100 students, and occasionally school districts were found with an enrolment of under 25 students.

Data on the scale of operations of public school districts, by size of school district, are outlined in Table 7-3. While size of district is indicated in terms of the number of teachers, this is reasonably representative of the distribution of districts in terms of the number of students. In 1968-69, the proportion of teachers for school boards employing 500 or more teachers (with enrolment, accordingly, of about 13,000 or more) ranged from 13 to 14 per cent in Newfoundland and

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[1] In addition to the factors indicated in the previous paragraphs, some of the differences in average size of school district are accounted for by differences in administrative structure. For instance, in most provinces, some of the school boards administered elementary schools only, others administered secondary schools only and still other boards administered both elementary and secondary schools. In other provinces, all school boards administered both elementary and secondary schools.

[2] This is almost exactly the same as the total enrolment of the 1,053 school boards in Quebec with an enrolment of less than 600 students. These school boards comprised about 75 per cent of the total number of school boards in the province. See *Guide to School Boards, 1969*, Quebec Bureau of Statistics, pp. 154-155.

Saskatchewan to about 25 per cent in New Brunswick and
Quebec, just over 30 per cent in Manitoba and Nova
Scotia, almost 50 per cent in Alberta and British
Columbia, and over 80 per cent in Ontario.

Table 7-3

SCALE OF OPERATIONS OF PUBLIC SCHOOL DISTRICTS
AND PERCENTAGE DISTRIBUTION OF TEACHERS
BY SIZE OF SCHOOL DISTRICT AND BY PROVINCE, 1968-69

	Less than 100 Teachers	100 to 499 Teachers	500 to 999 Teachers	1,000 to 1,999 Teachers	2,000 or more Teachers	Total
Newfoundland	50.2	37.1	12.7	--	--	100.0
Prince Edward Island	74.8	25.2	--	--	--	100.0
Nova Scotia	22.5	45.6	17.6	14.3	--	100.0
New Brunswick	6.8	68.2	11.1	13.9	--	100.0
Quebec	-----75.0-----		5.8	4.2	15.0	100.0
Ontario	-----16.9-----		20.7	24.9	37.5	100.0
Manitoba	14.9	55.0	9.3	--	20.8	100.0
Saskatchewan	27.6	58.1	5.7	8.6	--	100.0
Alberta	16.6	36.6	4.3	7.0	35.6	100.0
British Columbia	9.4	41.1	17.4	17.0	15.1	100.0

Source: Based on data from Dominion Bureau of Statistics, except for Quebec
and Ontario. The latter two provinces are estimated on the basis of
data from the annual reports of the respective Departments of Education.
The Ontario data are based on the number of teachers as of September
1969, in order to allow for consolidation of school districts, which
became effective January 1, 1969.

The degree of concentration in some provinces is
even greater than indicated by these data. For instance,
in 1968-69, two school districts in Alberta had more
than 36 per cent of the students in the province; one
school district in Manitoba had more than 21 per cent
of the enrolment in that province, while in each of
British Columbia and Quebec one school district had
about 15 per cent of the total enrolment. This means
that in some provinces the characteristics of one or
two districts may have a significant effect on the
provincial average.

Scale at the School Level

An increase in the average scale of operation at
the school-district level may be made by a simple change
in a statute, regulation, or order-in-council. A
similar change at the school level will require construc-
tion of new schools to replace the old -- a process

which is not only more expensive but takes longer.   As
noted in Chapter 5, the bulk of elementary and secondary
schools in existence at the end of 1968 had been
constructed after 1950, about one-half[1] having been
constructed after 1960.

For Canada as a whole, the number of elementary
and secondary schools was reduced by about one-third,
from about 25,500 in 1960-61 to 16,500 in 1968-69.   Most
of this decline in the number of schools was accounted
for by a sharp reduction in the number of one-room
elementary schools in rural areas.   While the overall
number of schools was being reduced, there was
considerable construction of new schools.   At the same
time, total elementary and secondary enrolment was
increasing at such a rate that the number of students
per school more than doubled from 156 in 1960-61 to
326 in 1968-69.

A reduction in the number of schools took place
during the period in all provinces except Alberta and
British Columbia, the two provinces which, in 1960-61,
already had a relatively low number of schools.   In
1968-69, the average ranged from a low of 105 students
per school in Prince Edward Island to a high of 383 in
Quebec compared with a range, in 1960-61, from 55 in
Prince Edward Island to 255 in British Columbia (see
Table 7-4).

The differences among the provinces in number of
students per school have been reduced somewhat over the
period.

Again, the range within each province is greater
than the differences in averages among the provinces.[2]

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[1] In terms of gross capital stock in 1961 (constant) dollars.

[2] It should be recognized that the data in this section
provide only an overview of the scale of operations of
elementary and secondary schools.   A distinction should
be drawn, for instance, between elementary schools and
secondary schools.   In general, the average enrolment
of secondary schools is significantly higher than that
of elementary schools.   It would also be appropriate to
distinguish between urban and rural schools.   At both
levels, the urban schools tend to be larger, on average,
than their rural counterparts.

All provinces have at least some one-room schools and also large schools of 800 or more students. In a few rather exceptional cases, schools with over 2,500 elementary and secondary students can be found.

Table 7-4

SCALE OF OPERATIONS OF PUBLIC SCHOOLS
CANADA, BY PROVINCE, 1960-61 AND 1968-69

	Number of Schools in Operation		Number of Students per School	
	1960-61	1968-69	1960-61	1968-69
Newfoundland	1,253	981	103	159
Prince Edward Island	449	280	55	105
Nova Scotia	1,344	769	133	272
New Brunswick	1,372	736	111	234
Quebec	7,284	4,100	151	383
Ontario	7,482	5,055	186	382
Manitoba	1,548	816	122	294
Saskatchewan	2,352	1,090	89	229
Alberta	1,205	1,246	244	322
British Columbia	1,258	1,434	255	336
Canada	25,547	16,507	156	326

Source: Based on data from Dominion Bureau of Statistics.

Scale at the Class Level

The class, as an aggregation of students meeting a teacher, may be described as the fundamental unit of the educational system, although new educational methods, most notably the "open area" school, make it a rather less meaningful unit of measurement in some cases than was once the case. Nevertheless, the scale of operation at this level is regarded as relevant to educational performance. In general, a reduction in the number of students in a class has been regarded favourably by educators and students, although it is also accepted that classes may be "too small".[1] The question of class

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[1] The *Encyclopedia of Educational Research*, Fourth Edition (New York: Macmillan, 1969) stated (p. 141) that "the question of class size remains in that limbo of educational concern where definitive and categorical answers are elusive". One may refer to this volume (pp. 141-145) for an excellent review of studies in the United States on the question of class size and its relevance to educational performance.

size seems to be becoming increasingly a matter for administrative procedure and for collective bargaining between school boards and teachers.

The data in this section cover the period 1960-61 to 1967-68 and are based on class data collected by *registering* teachers. It does not necessarily follow that the class remains the same size for the total educational process particularly if the class meets several teachers. Moreover, there are some classroom teachers who are not in charge of a class register. However, at the elementary level, most teachers teach only one class and would also be the registering teacher. In such cases, the student numbers indicated by the class register would be synonymous with class size. At the secondary level, where only a small proportion of teachers teach only one class, it is necessary to assume that if the class size varies from that indicated in the register, the variations will cancel each other out.[1]

The data were not available for all provinces for all years between 1960-61 and 1967-68. For instance, Quebec data were not available throughout the period. In addition, Ontario data were not available for 1967-68, and coverage was incomplete in two other provinces. Class-size data are available for 1968-69 but only for seven provinces, representing about one-third of the elementary and secondary public school enrolment in Canada. The 1968-69 data are not strictly comparable to those of earlier years since they were collected on a somewhat different basis. Therefore, they have not been incorporated into this Study.

Changes in median class size -- Median class size for combined elementary and secondary classes declined slightly in the 1960's. The median class size for nine provinces (excluding Quebec) was 30 in 1960-61 and 29 in 1967-68. Newfoundland recorded the biggest reduction in median class size from 32 to 30. Prince Edward Island, Nova Scotia, Manitoba, and Saskatchewan also recorded modest reductions. The others remained about the same (see Table 7-5).

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[1] The same assumption is made in a study by Dr. D. B. Black, Faculty of Education, University of Alberta, entitled *Trends in Class Size in Alberta Schools, 1960-62* (Edmonton: Alberta Teachers' Association, Research Monograph No. 6, April 1963).

Table 7-5

MEDIAN CLASS SIZE IN PUBLIC SCHOOLS
BY PROVINCE, 1960-61 AND 1967-68

	1960-61	1967-68
Newfoundland	32	30
Prince Edward Island	26	25
Nova Scotia	30	29
New Brunswick	28	28
Ontario	31	31[1]
Manitoba	28	27
Saskatchewan	27	26
Alberta	27	27
British Columbia	32	32

[1] 1966-67 data.

Source: For 1960-61, Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education, 1960-61*; for 1967-68, Dominion Bureau of Statistics (special tabulation).

The interprovincial differences in median class size were not very substantial in 1960-61 and were slightly reduced by 1967-68. British Columbia, Ontario and Newfoundland had the highest median class sizes in 1967-68; Prince Edward Island and the three Prairie Provinces had relatively low median class sizes.

Changes in median class size by level[1] -- The data on median class size show opposite trends for the two broad levels -- elementary and secondary.[2] In general,

[1] It should be borne in mind that the data on median class size at the secondary level are not as reliable as those for the elementary level. In 1967-68, for the nine provinces in the Study, about 33 per cent of the secondary teachers did not have a registered class while the comparable proportion for elementary teachers was about 10 per cent. Obviously, some of these would be principals and vice-principals with no direct teaching responsibilities, but at the secondary level at least, most of them would be classroom teachers. There are indications that the data used here may overstate the median class size at the secondary level in some or all provinces.

[2] For definitions of elementary and secondary teachers, see Chapter 4.

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the changes from 1960-61 to 1967-68 included: (1) reduc-
tions in the median size of elementary classes;
(2) increases in the median size of secondary classes,
except for Ontario and Manitoba; and accordingly
(3) development of a close correspondence in 1967-68
between the median sizes of elementary and secondary
classes in each province, except Ontario (see Table 7-6).

Table 7-6

MEDIAN CLASS SIZE IN PUBLIC SCHOOLS, BY LEVEL
AND BY PROVINCE, 1960-61 AND 1967-68

| | 1960-61 | | | 1967-68 | |
	Elementary Teachers only	Elementary & Secondary Teachers	Secondary Teachers only	Elementary Teachers	Secondary Teachers
Newfoundland	33	27	29	30	31
Prince Edward Island	26	23	27	25	26
Nova Scotia	33	30	30	29	29
New Brunswick	29	24	23	28	27
Ontario	32	--	31	32 (1)	28 (1)
Manitoba	28	32	30	27	27
Saskatchewan	26	23	24	26	26
Alberta	28	27	25	27	27
British Columbia	32	30	31	32	31

(1) 1966-67 data.

Source: For 1960-61, Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education, 1960-61*; for 1967-68, Dominion Bureau of Statistics (special tabulation).

Median class sizes were shown in 1960-61 to have
been somewhat larger at the elementary level than at
the secondary level except in Prince Edward Island and
Manitoba. In 1967-68, the elementary median class size
was lower than that at the secondary level in Prince
Edward Island and Newfoundland.

Changes in Distribution of Classes by Size

Differences in the median class size may not always
be meaningful since provinces with the same median could
have widely varying distributions of classes by size.
Therefore, it seemed appropriate to examine the size
distribution of classes in public schools. In general,
well over 75 per cent of classes seemed to lie within
the 20-to-39-student range, so this was selected as an
average category, leaving classes with 1 to 19 students
to make up the "small" classes and those with 40
students or more, the "large" classes.

The degree of concentration of classes in the 20-to-39-student range varied somewhat in 1960-61 from a high of 87 per cent in Alberta to a low of 68 per cent in Newfoundland. British Columbia had the second highest concentration with 86 per cent of classes in the 20-to-39-student range; Ontario was third with 85 per cent. Saskatchewan, Prince Edward Island, and New Brunswick had a relatively low degree of concentration with 75 per cent, 77 per cent, and 77 per cent respectively (see Table 7-7).

Table 7-7

PERCENTAGE DISTRIBUTION OF CLASSES IN PUBLIC SCHOOLS
BY SIZE AND BY PROVINCE, 1960-61 AND 1967-68

	Small Classes (1 - 19 Students)		Average Classes (20 - 39 Students)		Large Classes (40 Students and over)	
	1960-61	1967-68	1960-61	1967-68	1960-61	1967-68
Newfoundland	9.5	13.8	68.2	75.8	22.2	10.5
Prince Edward Island	19.4	23.3	76.7	76.3	4.3	0.4
Nova Scotia	10.8	10.2	80.4	85.2	8.8	4.6
New Brunswick	17.3	13.4	77.3	84.9	5.4	1.7
Ontario	6.9	9.8[1]	84.9	86.1[1]	8.3	4.1[1]
Manitoba	18.7	16.4	79.4	83.1	1.9	0.5
Saskatchewan	23.5	19.2	74.6	80.2	1.9	0.6
Alberta	11.9	13.0	86.9	86.6	1.2	0.4
British Columbia	7.0	8.6	86.0	90.5	7.0	0.8

[1] 1966-67 data.

Source: For 1960-61, Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education, 1960-61*; for 1967-68, Dominion Bureau of Statistics (special tabulation).

In 1960-61, nearly a quarter of the classes in Saskatchewan were in the "small" category, followed by 19 per cent in Prince Edward Island and Manitoba and 17 per cent in New Brunswick. Ontario and British Columbia had the lowest proportion of "small" classes -- 7 per cent.

In 1960-61, nearly a quarter of the classes in Newfoundland were in the "large" category -- a proportion well above that in any other province. The three Prairie Provinces had the lowest proportion of "large" classes with less than 2 per cent.

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The changes from 1960-61 to 1967-68 were threefold with: an increase in concentration of classes in the 20-to-39-student group; a considerable drop in the proportion of "large" classes; and a relatively constant proportion of "small" classes, with the proportion increasing, however, in some provinces and declining in others. In general, all provinces moved towards a norm, although some differences remained.

By 1967-68, all but two provinces -- Prince Edward Island and Newfoundland -- had more than 80 per cent of their classes in the 20-to-39-student range. This meant that around 90 per cent of the students were attending classes within the average or medium-size range.

"Large" classes comprised more than 5 per cent of the total in only one province -- Newfoundland (with about 10 per cent, which was a substantial decline from the proportion in 1960-61). With the exception of Prince Edward Island, the proportion of "small" classes had decreased in the provinces with high levels in 1960-61 -- e.g., Saskatchewan, Manitoba, and New Brunswick. Provinces with relatively low proportions of "small" classes in 1960-61 had larger proportions in 1967-68.

Implications of Scale of Operations

In the elementary and secondary educational systems, two apparently contradictory trends in scale of opera-tions in the 1960's were noted. The first was the *increasing* scale of operations at several levels -- provincial, school-district, and school. The second trend was the *apparent decrease* in scale of operations at the class level in terms of the student-teacher ratio (referred to in Chapter 4) and in terms of the median size of class.

It would be interesting to ascertain whether there is any evidence of a positive correlation between the size of enrolment of school districts and the median size of class, and similarly whether there is a positive

correlation between the size of school and size of class.[1] The most extensive data correlating size of school district and median size of class are for 1968-69 for seven provinces, but they cover only about one-third of elementary and secondary enrolment in Canada, since Ontario, Quebec, and Nova Scotia are not included. Nevertheless, it is useful to examine these data. These indicate a rather mixed picture. First of all, in nearly all cases, the smallest school districts (those with less than 100 teachers, and enrolment of less than about 3,000) had the lowest median size of class (see Table 7-8). In addition, in three provinces, the group of largest school districts in each province had the largest median size of class. However, in the other four provinces, the group of the largest school districts did not hold this position. Thus it is appropriate to suggest that while the relationship between size of school district and size of class is positive, it is not very pronounced.

While the relationship between size of school and size of class has been examined in detail in only one province (Ontario), the conclusion seem to be of general validity. Examined in terms of the student-teacher ratio, [2]

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[1] There is the parallel question of whether there is a positive correlation between the size of school district and the size of school. It is clear, of course, that a small school district cannot have anything but a small school. Examined a little more profoundly, however, it appears that much of the past correlation between size of school district and size of school was due to the underlying correlation between the degree of urbanization and enrolment size of school district. Although very large rural school districts are now being organized, there is little reason to expect that they will have the same average size of school as a metropolitan school district with the same enrolment. The rural school district will still be obliged to take account of the fact that the students are relatively more scattered than in large urban centres.

[2] The student-teacher ratio is not always a measurement of class size, but it does indicate something of the scale of operations at the class level. However, class-size data are not available by size of school.

it is indicated that once a minimum size of school is attained, further increases in school size seem to have relatively little effect on the student-teacher ratio.

Table 7-8

MEDIAN CLASS SIZE OF TEACHERS, BY TEACHER CATEGORY AND
SIZE OF SCHOOL DISTRICT, AND BY PROVINCE, 1968-69

Teacher Category	Number of Teachers				
	Less than 100	100 to 499	500 to 999	1,000 to 1,999	2,000 or more
Newfoundland					
One class	27	31	35	--	--
More than one class	29	32	36	--	--
Prince Edward Island					
One class	23	28	--	--	--
More than one class	26	29	--	--	--
New Brunswick					
One class	28	27	28	31	--
More than one class	24	27	31	30	--
Manitoba					
One class	26	27	27	--	28
More than one class	23	26	27	--	29
Saskatchewan					
One class	24	24	29	29	--
More than one class	24	25	30	29	--
Alberta					
One class	24	25	31	27	28
More than one class	24	25	30	27	29
British Columbia					
One class	28	31	32	33	30
More than one class	25	28	30	31	32

Note: In the above table, data for teachers with more than one class are based on the *average* size of class taught by the teachers.

Source: Dominion Bureau of Statistics (special tabulation).

In Ontario, this minimum level seemed to be about 50 students for elementary schools and about 150 students for secondary schools (see Table 7-9).

Table 7-9

STUDENT-TEACHER RATIOS
BY SIZE OF SCHOOL ENROLMENT, ONTARIO, 1966-67

| | Student-Teacher Ratio | |
School Enrolment	Elementary	Secondary
0 - 9	6	--
10 - 29	22	(1)
30 - 49	27	(1)
50 - 99	28	15
100 - 149	29	15
150 - 199	29	16
200 - 249	29	16
250 - 299	30	17
300 - 349	29	16
350 - 399	29	16
400 - 449	29	18
450 - 499	29	17
500 - 549	28	16
550 - 599	28	17
600 - 649	28	17
650 - 699	29	17
700 - 799	28	18
800 - 899	29	18
900 - 999	29	18
1,000 - 1,099	29	18
1,100 - 1,199	27	18
1,200 - 1,299	27	18
1,300 - 1,399	--	19
1,400 - 1,499	(1)	19
1,500 - 1,599	(1)	19
1,600 - 1,699	--	18
1,700 - 1,799	--	19
1,800 - 1,899	--	(1)
1,900 and over	--	18
Total	29	18

[1] Less than five schools, so the ratio was not calculated for this table.

Source: Based on Ontario Department of Education, *Report of the Minister, 1966*.

In general, the conclusion is that only elimination of the unusually small school districts and schools has had any very considerable effect on the scale of

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operations at the *class* level. Consolidations at other
size levels would appear not to have any very marked
effect. However, the effect at the *task* level could be
important.

One can only illustrate this in terms of hypothetical
cases. It would obviously be a task of considerable
magnitude to make any interprovincial comparisons of the
scale of operations at the task level or even to develop
meaningful data within one province, indicating the
observed effect on task scale of increasing size of
school.

One might consider the significant differences in
the scale of operations at the task level which is
possible in different schools even though the student-
teacher ratio is the same in all cases. Three cases
might be postulated: a multi-grade one-room school; a
single-grade one-room school; and a single-grade multi-
room school, assuming a student-teacher ratio of 30,
five subjects and five class periods a day. One might
define a single task as a lesson in Grade 8 mathematics.

In the multi-grade, one-room, one-teacher school
(assuming 10 grades with three students in each), the
teacher could perform the indicated task for three
students and would not be able to proceed to the next
lesson in Grade 8 mathematics until two weeks later
since, in the interim, he would have to teach other
classes and other subjects. In the single-grade, one-
room, one-teacher school, he would teach 30 students a
lesson in mathematics, teach other subjects for the
remainder of the day and proceed to the next lesson in
mathematics the following day. In the single-grade,
multi-room, multi-teacher school, he could perform the
task for 150 students in one day (five groups of 30)
and proceed to the next lesson in mathematics the
following day.

Thus, with the same student-teacher ratio, one may
have three different scales of operation at the task
level -- 3, 30, and 150, with school size of 30, 30,
and 150 respectively. One example indicates a change
in scale at the task level, even though school size is
the same; another indicates a correlation between
increased school size and increased scale at the task
level.

Evaluation of these differences from a pedagogical point of view would seem to depend on the importance of: (1) preparation time, and training specialization, to the quality of the teacher's performance and (2) the importance of the formal teaching situation to the student.

If significant preparation time is required before the giving of each lesson, the economies of teacher time obtainable in a larger school are obvious. It is likely that in the single-room, multi-grade school, given as an example, the teacher would not have sufficient preparation time. If the quality of the performance is also related to specialized knowledge and training in a particular subject, the extent to which the larger school contributes to the efficient employment of the teacher is also apparent.

Moreover, if the time spent by the student in a formal student-teacher relationship is a superior use of his time, the advantages of the larger school are again apparent. The student in the multi-room school could have his time fully utilized in the teacher-student relationship -- with five different teachers. In the single-grade, one-room school, the student could also have his time fully utilized in the teacher-student situation but with the same teacher. In the multi-grade, one-room school referred to, the student would spend only one-tenth of his time in a teaching situation, implying that nine-tenths of his time would be utilized in inferior ways.[1]

The size of school would also constitute an indication of the extent to which optional subjects might be efficiently presented. In the single-grade, multi-room, multi-teacher school previously referred to, the optimum size with a rigid curriculum of five subjects would be 150 students. On the other hand, if an optional subject were offered which only 10 per cent of the students would take, the optimum scale of operations would be increased to 1,500 were the same student-teacher ratios maintained and were there a specialized teacher in that optional subject.

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[1]This is purely for illustrative purposes. Some educators may suggest that this would be an advantage rather than a disadvantage.

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Much of the previous discussion is based on the assumption of a single-grade school. Such a school is, of course, rare. Most schools would have a minimum of two or three grades, a fact which raises the optimum size of school with any given set of assumptions but which also makes possible a wider range of organizational alternatives.

Finally, there is the basic question of how the scale of operations is related to the objectives of educational systems. If there is emphasis on the provision of maximum opportunities for each elementary and secondary school student to develop his potential, a much greater variety of courses and programs is indicated. This implies a relatively large school -- i.e., increased scale of operations at the school level. On the other hand, some of the course options may not attract a full class of students, and so student-teacher ratios may fall; i.e., a decreasing scale of operations at the class level may occur. Moreover, some of the new course offerings may also be more appropriate in terms of smaller classes. In general, the scale of operations in existence at any one time may be seen as reflecting past operations (because of inflexibility of capital) and a compromise between desired practice and cost factors.

CHAPTER 8

PROVINCIAL DIFFERENCES IN
ELEMENTARY AND SECONDARY SCHOOL EXPENDITURES

The magnitude of expenditures in dollar terms provides some indication of the magnitude of total inputs into an educational system. When allowance is made for changes in price levels, increases in expenditures suggest an increase in the quantity or quality (or both) of real inputs utilized. Increases in expenditures (in constant dollars) per student seem to be indicative of an increase in quantity or quality of inputs per student. Similarly, interprovincial differences in expenditures per student provide at least a surface indication of differences in real inputs per student. Yet such differences must be interpreted cautiously.

In this chapter, data for publicly controlled elementary and secondary schools are examined. Three basic questions are considered; first, the provincial differences in *operating* expenditures on public elementary and secondary education in terms of costs per student enrolled;[1] secondly, factors accounting for changes in the magnitude of expenditures over time; and thirdly, inferences regarding the significance of provincial differences in expenditure levels or, in other words, the extent to which they appear to indicate quality differences.

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[1] Capital expenditures were considered in Chapter 5. It should be noted that, for various reasons, the operating expenditures per secondary student are generally considerably higher than for elementary students. However, these are not examined separately because in most cases the financial accounts of school boards do not show elementary and secondary school expenditures separately.

National Trends in Expenditures per Student

Operating expenditures per student in elementary and secondary schools have been increasing sharply, both in current dollars and in constant dollars, adjusted to take account of price increases. In current dollars, the expenditures per student in 1968 were $526, more than triple the amount in 1956 and more than double that in 1960 (see Table 8-1).

Table 8-1

OPERATING EXPENDITURES[1] PER STUDENT IN
PUBLIC SCHOOLS, CANADA, 1956 TO 1968

	Current Dollars	Constant 1961 Dollars[2]	Constant 1961 Dollars[3]
1956	172	187	207
1957	186	191	213
1958	203	205	226
1959	221	218	238
1960	238	233	246
1961	253	253	253
1962	269	265	262
1963	290	282	273
1964	322	309	292
1965	356	334	305
1966	395	359	318
1967	455	400	342
1968	526	445	369

[1] Excludes expenditures for capital assets and interest on funded debt.

[2] Adjusted by the Gross National Product implicit price index.

[3] Adjusted by the implicit price index of government current expenditures on goods and services.

Source: Based on data from Dominion Bureau of Statistics.

A number of adjustments may be made to the data on expenditures in current dollars to express them in constant dollars or in real terms. Deflating by the Gross National Product implicit price index makes an allowance for the estimated average increase in price levels over the whole economy. In such constant-dollar figures, school operating expenditures per student in 1968 were about 140 per cent higher than in 1956 and not quite double the level in 1960.

A price index more specifically related to the
education industry would provide some indication of the
change in the magnitude of inputs in real terms into the
education industry. The implicit price index for govern-
ment current expenditure on goods and services has some
relevance since education expenditures make up a large
part of the total.[1] After adjustments with that index,
the input per student in elementary and secondary schools
is estimated to have increased by about 80 per cent from
1956 to 1968 and by 50 per cent from 1960 to 1968.[2]

In a later section of this chapter, some of the
factors appearing to account for these increases will
be examined.

Provincial Differences in Expenditures per Student

The range of differences in operating expenditures
per public school student among the provinces in Canada
was substantial in 1968, varying from a low of $239 per
student in Newfoundland to a high of $587 in Alberta.
Yet this range, large as it was, was narrower than in

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[1] Prof. P. J. Atherton of the University of Alberta,
Department of Educational Administration concluded in
his study, *The Impact of Rising Price Levels on Expendi-
tures for School Operation in Alberta, 1957-1965* (Ph.D.
dissertation, University of Alberta, Edmonton, July
1968), that "the Implicit Price Index for current
government expenditures is an appropriate indicator of
the price level increase in educational inputs provided
that allowance is made for the different pattern of
salary increases for the teaching force" (p. 161). In
fact, the elementary and secondary education price
index he developed for Alberta exhibited very much the
same trend as the implicit price index for current
government expenditures.

[2] The trend in the index of Real Domestic Product of
elementary and secondary schools (published in Dominion
Bureau of Statistics, *Indexes of Real Domestic Product
by Industry, 1961-1969*) also supports this conclusion.
Real Domestic Product of elementary and secondary
schools is estimated to have increased by about 48 per
cent per student from 1961 to 1968.

1956 -- from $76 per student in Newfoundland to $238 per student in British Columbia -- or in 1960 -- from $108 per student in Newfoundland to $335 in British Columbia (see Table 8-2). The index of dispersion[1] measuring the average differences among the provinces has been reduced from 35 in 1956 and 1960 to 25 in 1968.

Table 8-2

OPERATING EXPENDITURES PER STUDENT IN PUBLIC SCHOOLS
CANADA, BY PROVINCE, SELECTED YEARS

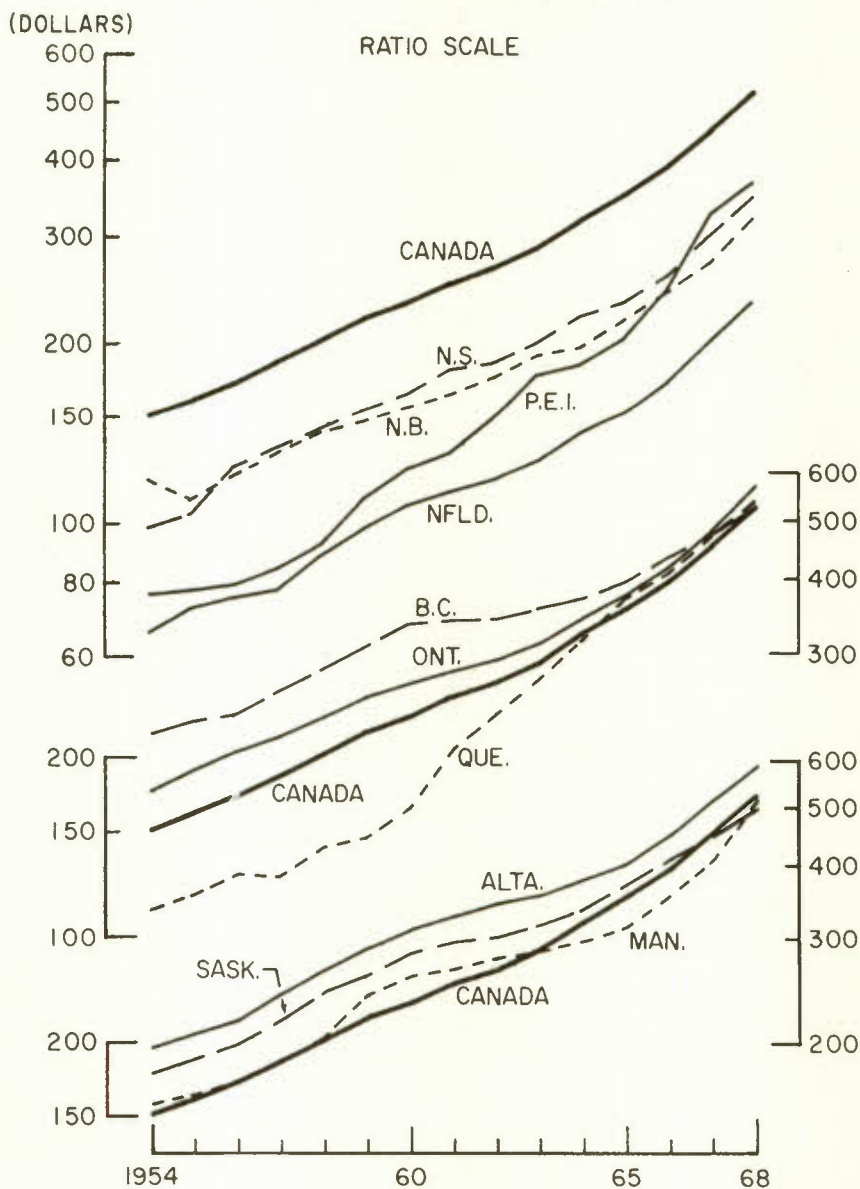|	1956	1960	1964	1966	1968
		(Dollars)			
Newfoundland	76	108	147	177	239
Prince Edward Island	80	125	188	248	376
Nova Scotia	125	166	223	261	354
New Brunswick	121	158	200	246	328
Quebec	127	180	318	407	541
Ontario	204	268	344	417	571
Manitoba	172	260	296	352	514
Saskatchewan	199	282	337	407	497
Alberta	219	311	378	452	587
British Columbia	238	335	370	436	524
Canada	172	238	322	395	526
Index of Dispersion	35.2	35.1	28.2	27.4	24.9

Source: Based on data from Dominion Bureau of Statistics.

As one might expect, there has been a correlation between income levels and the levels of operating expenditures per student, particularly in the late fifties and early sixties.[2] Operating expenditures per student in the Atlantic Provinces and Quebec have been below the national average, although Quebec in recent years has moved above the national average. In general, Ontario and the Western Provinces have tended to be above the national average although by 1968 operating expenditures per student in both Saskatchewan and Manitoba were below the national average.

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[1] The index of dispersion used in this Study is the coefficient of variation which is the standard deviation of the distribution divided by the arithmetic mean.

[2] See Table 3-5 for the ranking of provinces in terms of personal income per capita in 1961.

OPERATING COSTS PER STUDENT, CANADA, BY PROVINCE, 1954-68

(DOLLARS)

RATIO SCALE

CANADA

N.S.

N.B.

P.E.I.

NFLD.

B.C.

ONT.

QUE.

CANADA

ALTA.

SASK.

MAN.

CANADA

1954   60   65   68

As suggested, divergences from the pattern expected on the basis of average income differentials became greater towards the end of the sixties. In 1968, Quebec's expenditures per student were exceeded only by Alberta and Ontario. In the same year, expenditures per student in Prince Edward Island became the highest of any province in the Atlantic Region although the province occupies third place in the Atlantic Region in terms of income. Throughout the period, Alberta ranked higher than its income position would indicate, although this probably reflects the favourable provincial revenue position because of petroleum and natural gas revenues.

In Chart 8-1, the trends in operating costs per student are shown for each province. The considerable convergence is apparent with the rate of growth in Quebec and Prince Edward Island being above the average and the increase in British Columbia substantially below the average.

Components of Operating Expenditures

Teachers' salaries make up the largest part of operating expenditures of public schools, ranging between 65 and 70 per cent of the total. In recent years, at the national level, teachers' salaries have shown a slight tendency to decrease as a proportion of total expenditures. In 1968, they were estimated to amount to about 65 per cent of the total compared with 69 per cent in 1960 (see Table 8-3).

Almost without exception,[1] the Atlantic Provinces have shown a higher proportion of operating expenditures in the form of teachers' salaries than other provinces. The relative positions of other provinces has tended to shift over time.

While teachers' salaries have declined slightly as a proportion of total school expenditures for Canada as a whole, this trend has not been recorded in all provinces. For instance, in Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia, there was relatively little change. Other provinces registered proportionate declines, which, in two or three cases, were quite remarkable.

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[1] The exception was Prince Edward Island in 1967 and 1968.

Table 8-3

TEACHERS' SALARIES AS PERCENTAGE OF OPERATING
EXPENDITURES, CANADA, BY PROVINCE, SELECTED YEARS

	1956	1960	1964	1966	1968
Newfoundland	80	78	76	73	69
Prince Edward Island	80	78	75	71	65
Nova Scotia	74	74	74	74	75
New Brunswick	72	73	76	73	71
Quebec	68	71	73	59	61
Ontario	68	70	66	67	67
Manitoba	68	70	68	66	63
Saskatchewan	66	67	65	65	67
Alberta	62	66	68	68	68
British Columbia	64	66	67	66	66
Canada	67	69	69	65	65
Index of Dispersion	8.4	5.9	5.9	6.5	5.7

Source: Based on data from Dominion Bureau of Statistics.

Available data do not permit anything more than a
cursory examination of the significance of these trends.
One question might concern the relationship between
inputs of teachers and inputs of other factors expressed
in real terms. In this connection, one might note
Professor Atherton's findings for Alberta -- that "the
rates of increase of price levels for inputs other than
teaching services have increased less than the price
levels of teaching services".[1] If this is justified for
Canada as a whole, even an *unchanged* proportion of
expenditures going to teachers' salaries would indicate
a *rise* in the proportion of nonteacher inputs in real
terms being utilized. Since, in fact, teachers' salaries
as a proportion of operating expenditures have declined,
there is a strong implication that there has been a
significant increase in the proportion of nonteacher
inputs in real terms.

Some information has been given regarding this in
Chapters 3 and 5. It was indicated in the former chapter
that the proportion of nonteachers among school staff
increased somewhat in the sixties. In the latter chapter,
an increase in the number of books per student was noted
although this would comprise only a small proportion of
nonteacher operating expenditures. Much of the hypothesis
put forward in the preceding paragraph must remain untested,
however.

[1]Atherton, *op. cit.*, p. 145.

Another question concerns the implications of the differences among the provinces in the proportions of operating expenditures that go for teachers' salaries. This raises the matter of the relationships between the prices of teachers' services and the prices of nonteacher inputs in the various provinces. If this relationship is the same in each province, the data in Table 8-3 do measure the extent to which there are differences in real terms in the ratio between teacher inputs and nonteacher inputs. The extent to which this might be true is not completely known, however. Again, some indication is given in Chapter 3. A comparison of Tables 3-8 and 8-3 will reveal, for instance, that generally the provinces with the lowest proportions of teaching staff had the lowest proportions of operating expenditures spent on teachers' salaries. But Quebec and Newfoundland were exceptions.

Another approach is to examine teachers' salaries and other operating expenditures separately in per-student terms (see Table 8-4). It is apparent that there is a greater variation in other operating expenditures than for teachers' salaries.

Table 8-4

COMPONENTS OF OPERATING EXPENDITURES PER STUDENT
CANADA, BY PROVINCE, 1966 TO 1968

	Teachers' Salaries			Other Operating Expenditures		
	1966	1967	1968	1966	1967	1968
	(Dollars)					
Newfoundland	129	152	164	48	58	75
Prince Edward Island	175	212	243	73	119	133
Nova Scotia	193	230	266	68	75	88
New Brunswick	180	199	233	66	77	95
Quebec	241	278	331	166	192	210
Ontario	278	316	380	139	167	191
Manitoba	233	284	326	119	160	188
Saskatchewan	265	298	333	142	151	164
Alberta	307	350	400	145	169	187
British Columbia	288	317	348	148	162	176
Canada	256	293	344	139	162	182
Index of Dispersion	23.9	22.5	23.1	36.6	33.8	30.9

Source: Based on data from Dominion Bureau of Statistics.

Factors Affecting Expenditure Increases

Factors affecting operating expenditures have been considered on two levels -- increased enrolment and increased expenditures per student. Each of these factors in turn has been considered in relation to certain subfactors. The effect of increased enrolment was allocated between the two factors of the increase in population (5-17 age group) and the increased atten- dance rate. The factor of increased expenditure per student was allocated between increased expenditure for teaching and increased expenditures for other items. Finally, the factor of increased expenditure for teachers was differentiated as to the effect of increased median salaries and the decrease in student-teacher ratio. In the result, one obtains a percentage distribution among all relevant factors of the total increase in operating expenditures.[1]

The results are shown for two periods, 1956-66 and 1961-66, in Tables 8-5 and 8-6.

On the basis of these calculations, increased enrolment accounted for about 31 per cent of increased operating expenditures in Canada as a whole in the 1956-66 period, ranging from 46 per cent in British Columbia to 12 per cent in Prince Edward Island. For the period 1961-66, this factor accounted for somewhat less of the increase in Newfoundland, New Brunswick, Quebec, and Ontario than was true of the 10-year period, but somewhat more in the other provinces.

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[1] Basically two approaches may be taken. One is to isolate the effect of change in one factor by holding it constant over time and allowing the others to change. However, if this method is applied for each factor in turn, one obtains a total change that exceeds the actual recorded change. A second approach is to calculate the share of each factor in the total obtained by the first approach and then apply this proportion to the actual change. This was one of the methods employed by Selby-Smith and Skolnik in their study of Ontario expenditures on educa- tion (C. Selby-Smith and M. Skolnik, *Concerning the Growth of Provincial Expenditures on Education in Ontario, 1938-1966*, Ontario Institute for Studies in Education, Occasional Paper No. 3, Toronto, 1970). It is the method employed here in analysing the change in expenditures in all provinces.

Table 8-5

INFLUENCE OF SELECTED FACTORS ON THE GROWTH OF EXPENDITURES
ON PUBLIC SCHOOL EDUCATION, CANADA, BY PROVINCE, 1956-66

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
						(Per cent)					
Increased enrolment	24.3	12.3	20.1	22.5	21.4	39.3	27.0	23.2	36.7	46.0	30.6
Increased population (5-17)	18.3	9.1	14.0	16.2	14.2	33.6	22.4	17.2	35.1	41.2	24.4
Increased attendance rate	6.0	3.2	6.1	6.3	7.2	5.7	4.6	6.0	1.6	4.8	6.2
Increased expenditure per pupil	75.7	87.7	79.9	77.5	78.6	60.7	73.0	76.8	63.3	54.0	69.4
Increased expenditures on teachers	50.9	58.0	58.7	57.7	43.2	39.9	47.0	49.1	46.7	36.9	43.6
Increased median salary	*44.1*	*51.7*	*52.5*	*51.2*	*n.a.*	*33.3*	*42.1*	*46.3*	*38.8*	*33.0*	*n.a.*
Rising teacher-pupil ratios	*6.8*	*6.3*	*6.2*	*6.5*	*n.a.*	*6.6*	*4.9*	*2.8*	*7.9*	*3.9*	*n.a.*
Increased expenditures on other items	24.8	29.7	21.2	19.8	35.4	20.8	26.0	27.7	16.6	17.1	25.8

n.a. - not available.

Source: Based on data from Dominion Bureau of Statistics.

Table 8-6

INFLUENCE OF SELECTED FACTORS ON THE GROWTH OF EXPENDITURES
ON PUBLIC SCHOOL EDUCATION, CANADA, BY PROVINCE, 1961-66

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
						(Per cent)					
Increased enrolment	19.8	13.3	20.8	15.0	19.6	34.0	35.1	27.5	38.1	50.6	28.5
Increased population (5-17)	13.7	8.8	12.4	8.3	11.4	26.3	22.2	21.7	35.5	40.8	20.5
Increased attendance rate	6.1	4.5	8.4	6.7	8.2	7.7	12.9	5.8	2.6	9.8	8.0
Increased expenditure per pupil	80.2	86.7	79.2	85.0	80.4	66.0	64.9	72.5	61.9	49.4	71.5
Increased expenditures on teachers	52.2	53.8	60.1	60.5	37.4	40.0	35.9	42.5	43.3	31.9	40.3
Increased median salary	*35.6*	*43.6*	*48.9*	*49.2*	*n.a.*	*26.5*	*27.2*	*34.7*	*31.8*	*26.0*	*n.a.*
Rising teacher-pupil ratios	*16.6*	*10.2*	*11.2*	*11.3*	*n.a.*	*13.5*	*8.7*	*7.8*	*11.5*	*5.9*	*n.a.*
Increased expenditures on other items	28.0	32.9	19.1	24.5	43.0	26.0	29.0	30.0	18.6	17.5	31.2

n.a. - not available.

Source: Based on data from Dominion Bureau of Statistics.

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Increased elementary and secondary enrolment, in turn, was largely accounted for by increased population of the relevant age group rather than by increased enrolment ratios, although, as noted in Chapter 5, the enrolment ratios at the secondary level have increased significantly.

Perhaps the most intriguing picture is obtained in the area of increased expenditures per student. Most of the increased expenditures per student, naturally enough, were accounted for by increases in expenditures for teachers. Increased expenditures on other items showed up unexpectedly strongly in some provinces for the period 1961-66, most notably in Quebec, where it seemed to account for more of the additional cost than expenditures on teachers, but also in Manitoba, Saskatchewan, Ontario, and Prince Edward Island. In nearly all cases, nonteacher expenditures contributed a larger proportion of the increase in total operating expenditures per student for the period 1961-66 than for the 10-year period as a whole.

Moreover, a decrease in the student-teacher ratio accounted for a larger proportion of the increased expenditures for teachers in the 1961-66 period than for the whole of the period 1956-66. It was true, of course, that increased median salary accounted by far for most of the expenditures related to expenditures on teachers.

Educational "Need" and "Load"

Demographic factors in a province may also serve to explain some of the differences in operating expenditures per student. Provinces, for instance, with a high ratio of students to labour force may be expected to find it more difficult to increase school expenditures than one with a low ratio. One may approach this on two levels -- first, by an examination of potential school enrolment, as indicated by the number of young people of school age, and second, by an examination of actual enrolment. Both might be related to the population aged 20-64 years, which will provide a good measure of the available labour force. Professor Cheal has defined these as measurements of educational "need" and educa-

tional "load", respectively.[1] Educational "need" is a weighted[2] ratio of the total number of school-age children (5-19) in a province to the number of adults in the 20-64 age group. Educational "load" is a weighted[3] ratio of enrolment in elementary and secondary grades to the number of adults in the 20-64 age group. These may be expressed both in terms of ratios and in terms of an index with Canada = 100.

The "need" ratio in 1966 ranged from a high of 1.04 for Newfoundland to a low of 0.65 for British Columbia -- a quite substantial variation. All four of the Atlantic Provinces had high "need" ratios. Ontario, like British Columbia, had a relatively low "need" ratio. The Prairie Provinces and Quebec occupied a middle position (see Table 8-7).

Table 8-7

INDEXES OF EDUCATIONAL "NEED" AND "LOAD"
CANADA, BY PROVINCE, 1966

(Canada = 100)

	Need Ratio	Need Index	Load Ratio	Load Index
Newfoundland	1.04	144	0.77	135
Prince Edward Island	0.88	122	0.66	116
Nova Scotia	0.79	110	0.62	109
New Brunswick	0.90	125	0.67	118
Quebec	0.74	103	0.58	102
Ontario	0.67	93	0.55	96
Manitoba	0.71	99	0.53	93
Saskatchewan	0.77	107	0.59	93
Alberta	0.75	104	0.58	102
British Columbia	0.65	90	0.53	93
Canada	0.72	100	0.57	100

Source: Based on data from Dominion Bureau of Statistics.

[1] J. E. Cheal, *Investment in Canadian Youth* (Toronto: Macmillan, 1963), pp. 55, 70.

[2] The age group 15-19 years is given a weight of 1.6 to allow for the higher cost of educating pupils at the secondary level.

[3] *Ibid.*

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A similar situation is shown for the "load" ratio. The "load" ratio was highest in the Atlantic Region and lowest in British Columbia, Manitoba, and Ontario.

When these ratios are expressed in index form, it becomes clear that, typically, provinces with "need" indexes of more than 100 had somewhat lower "load" indexes, and vice versa. This may be thought of as an attempted adjustment on the part of the high "need" index provinces expressed by the lower enrolment ratios referred to in Chapter 6.

But another effect may well be recorded in terms of operating expenditures per student. If all provinces had the same average income, one would expect the provinces with the highest "load" index to have the lowest expenditures per student. Since typically the provinces with high "load" indexes also have lower incomes, one would expect both factors to reinforce each other in inhibiting increases in school expenditures. It is apparent that these relationships exist, although they are not currently as consistent as they once were. This would seem to reflect the effect of federal programs involving fiscal transfers to the lower-income provinces, i.e., some of the revenues available for provincial and local government expenditures are not derived directly from the lower-income provinces so that expenditure levels may be higher than would be indicated by their income positions. In addition, distinctive policy decisions seems to be playing a greater role. [1]

Educational "Effort"

It is true, as has been indicated in the Atlantic Development Board study, [2] that "the ability to support educational programs is a function not only of provincial income and the proportion of that income taxed by provincial and local government authorities, but also of

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[1] A more extended discussion of education "need" and "load" may be found in *Profiles of Education in the Atlantic Provinces*, Atlantic Development Board, Background Study No. 5 (Ottawa: Queen's Printer, 1969), pp. 2-3 to 2-21.

[2] *Ibid.*, p. 2-37.

transfers from the federal government to provincial governments".[1] But the relationship of school operating expenditures and school revenues to personal income will in the context of this Study at least provide useful insights. In fact, public school revenues, which cover operating expenditures plus some portion of capital expenditures, are close approximations of the true burden of education.[2]

Table 8-8

MEASURES OF EFFORT TO SUPPORT ELEMENTARY AND
SECONDARY EDUCATION, CANADA, BY PROVINCE, 1955, 1966 AND 1968

	School Board Revenues as Percentage of Personal Income			School Board Operating Expenditures as Percentage of Personal Income		
	1955	1966	1968	1955	1966	1968
Newfoundland	3.2	4.7	5.6	2.5	4.1	4.8
Prince Edward Island	2.9	5.2	6.4	2.5	4.6	5.9
Nova Scotia	2.8	4.7	5.2	2.4	4.0	4.6
New Brunswick	3.7	4.6	4.6	2.8	4.2	4.7
Quebec	2.4	5.4	6.4	1.8	4.7	5.5
Ontario	2.8	4.7	5.6	2.3	3.9	4.8
Manitoba	2.7	4.4	5.1	2.4	3.8	4.6
Saskatchewan	3.6	5.4	6.0	3.2	4.7	5.3
Alberta	3.7	5.6	6.5	3.1	4.9	5.6
British Columbia	2.8	4.5	5.0	2.4	3.8	4.3
Canada	2.8	5.0	5.8	2.3	4.2	5.0

Source: Based on data from Dominion Bureau of Statistics.

In 1968, school board operating expenditures as a percentage of personal income ranged from a high of 5.9 per cent in Prince Edward Island to a low of 4.3 per cent in British Columbia. The percentage in the other Atlantic Provinces was equal to, or not much below, that in Ontario. The percentage factor in Alberta, Quebec, and Saskatchewan was above that in Ontario.

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[1] Revenues obtained from the disposition or production of natural resources may not need to be financed internally, and their magnitude may also not be determined by the income position of a province.

[2] See also Johns and Morphet, *Financing the Public Schools* (Englewood Cliffs, New Jersey: Prentice-Hall, 1960).

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    In 1955, the situation was much the same, although
the ratio of operating expenditures to personal income
tended to be higher in the Atlantic Region in relation
to Ontario than was true in 1968.   The principal excep-
tion was Quebec, among the highest in 1968, the lowest
by a considerable margin in 1955.

CHAPTER 9

EDUCATIONAL OUTPUT AND LABOUR FORCE QUALITY

In the previous chapters, attention was focused on
some of the differences in the resources or inputs
employed in the various provincial educational systems
in Canada. In this chapter, consideration is given to
some of the results of the operation of educational
systems as reflected in the formal educational qualifica-
tions of members of the labour force within a region or
province. This assessment will be in terms of man-years
of schooling so that it represents one measurement of
the output of educational systems.[1] The educational
qualifications of the labour force in any province are
the cumulative effect of many years of educational
effort (as well as immigration and emigration). Since
the existing labour force is always large in relation
to the numbers of new entrants, changes in levels of
educational attainment take place rather slowly. Never-
theless, within the period of this analysis (1951 to
1966), changes were noteworthy. Regional differences
in the rate of change of the average level of educational
attainment are examined in this chapter. Educational
attainment is regarded as one measure of labour force
quality.

One may suggest several ways in which increased
education contributes to the quality of labour and thus
to an increase in labour productivity.[2] Most apparent,
of course, are the effects of education and training in
providing the skills or knowledge required for specific
occupations.

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[1] It should be noted that man-years of schooling may also
be regarded as an input measure indicating the time the
student resource was engaged in the educational system.

[2] E. F. Denison, "Measuring the Contribution of Education
to Economic Growth", in *The Residual Factor and Economic
Growth*, Study Group in the Economics of Education
(Paris: Organisation for Economic Co-operation and
Development, 1964), pp. 36-38.

But education also operates in more subtle ways. For instance, additional education seems to make individuals more receptive to new ideas and more aware of better ways of doing things. At the level of the ordinary manual or white-collar worker, it is thought to reduce resistance to the introduction of better methods. Owners, managers, supervisors, professionals, and technical personnel tend to be more aware of practices followed elsewhere and more willing and able to adapt to, and adopt, them.

Increased education widens the range of occupations open to individuals and enhances their appreciation of alternatives, enabling them to grasp chances for economic advancement and also to find other employment when the demand for a specialized skill declines. This wider range of alternatives may result in a better matching of a worker's abilities and aspirations and have notable effects on his job motivation.

In this chapter, attention is focused on formal education, which in Canada is largely attained before people enter the labour market. Adult education -- formal or informal -- as well as on-the-job training also affect the quality of the labour force. Although these are of growing importance, pertinent data are not available, nor is there any information on the possible quantitative effects of these forms of training on productivity and income.

There are other aspects of labour force quality too -- experience, health, strength, intelligence, and social and cultural attitudes. It would require sophisticated, multivariate analysis to isolate the effects of any one factor on labour productivity, even if complete data were available.

The Stock of Education of the Labour Force, by Region[1]

There are several methods of expressing in quantitative terms the stock of education of the labour force of

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[1] No reference is made in this chapter to the education of people not in the labour force, although their indirect contribution to labour force quality could be important. For instance, a better-educated mother not in the labour force will likely be more inclined to encourage her children to attain higher education levels and will also have other important effects on labour force quality.

any region. One approach is to calculate the total
number of years spent in educational institutions,
assuming that one school year is equivalent to any other
school year. A second approach is to give different
weights to the time spent in different types of educa-
tional institutions. A third alternative is to estimate
the cost of the education obtained by members of the
labour force. A fourth alternative is to estimate the
market value of the education obtained.

In this chapter the first approach is given major
attention. Because of the need to make provincial or
regional comparisons, the education stock of the labour
force is described in two ways -- in terms of the
percentage distribution of the various levels of educa-
tional attainment in the labour force in each province
or region, and in terms of the mean years of schooling
of the labour force within each province or region.

Changes in the stock of education are mainly
determined by the combined effects of three flows --
the flows of younger people into the labour force after
leaving school, the outflows resulting from retirements
and deaths, and the net flows from immigration and
emigration.[1] The inflows of younger persons tend to
raise the stock of education, since young people today
stay in school longer than older people did at school
age. Similarly, the outflows, especially those due to
retirement of older persons, also tend to increase the
average level of education of the remaining labour
force, since older persons usually have less schooling
than the overall average.

The rate of change of the education stock of the
labour force will therefore be a resultant of the educa-
tional differential between the inflows and the outflows,
and the magnitude of these flows. In recent years, the
combination of large net inflows and a substantial
educational differential has led to a significant
increase in the average level of educational attainment
of the labour force.

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[1]Net flows due to migration will have more significant
effects on some provinces than on others, but no attempt
has been made to adjust for this factor.

Distribution of levels of educational attainment --
Labour force estimates, by sex and level of schooling,
and by province and region, were prepared for this Study
on the basis of Census of Canada data for 1951 and 1961.
The census data required some adjustment because of some
conceptual differences between the two years. The
methodology employed in making these estimates is fully
described in Appendix C, and the results are reported in
Appendix D. The 1966 estimates of the stock of education
are based on DBS special labour force surveys, and again
the method employed in making these estimates is indicated
in Appendix C.

Table 9-1 indicates the improvements in the stock
of education of the total labour force, by region, between
1951 and 1966. A prominent feature of the changes is the
decline in the proportion of persons with only elementary
schooling. In 1951, 48 per cent of the labour force had
only elementary education or less; by 1966, the propor-
tion had fallen to 34 per cent. This decline was
particularly marked in the Atlantic and Prairie Regions,
but it was shown in all regions.

For Canada as a whole, the proportion of the labour
force with secondary education increased from about
42 per cent in 1951 to 50 per cent in 1966. The propor-
tion of the labour force with at least some postsecondary
educational attainment increased more spectacularly,
however -- increasing from 10 per cent of the total in
1951 to 16 per cent in 1966.

Another feature is the substantial regional
differences in the concentration of higher levels of
education in the labour force. In British Columbia,
more than 20 per cent of the labour force had at least
some postsecondary education in 1966, compared with
slightly over 10 per cent in the Atlantic Region and
Quebec. The other regions were distributed within these
two limits. These differences were also to be found in
the earlier period. In 1951, in British Columbia, 12 per
cent of the labour force fell in the university category,
while in the Atlantic Region, the corresponding percentage
was 6 per cent.

Of course, these regional differences reflect the
age structure of the population, patterns of international
and interprovincial migration, as well as the operations
of provincial educational systems.

Table 9-1

EDUCATIONAL DISTRIBUTION OF THE TOTAL LABOUR FORCE
CANADA, BY REGION, 1951, 1961 AND 1966

	Atlantic			Quebec			Ontario		
	1951	1961	1966	1951	1961	1966	1951	1961	1966
Elementary(1)	57.9	45.1	35.4	50.2	48.5	41.1	45.5	38.5	32.5
Secondary	36.3	44.9	52.8	41.5	42.9	47.7	41.2	43.7	48.0
Postsecondary(2)	5.8	10.0	11.8	8.3	8.6	11.2	13.3	17.8	19.5

	Prairies			British Columbia			Canada		
	1951	1961	1966	1951	1961	1966	1951	1961	1966
Elementary(1)	49.8	38.3	31.9	36.9	27.3	21.5	48.1	40.8	34.0
Secondary	41.7	48.4	52.9	50.7	52.7	56.0	41.7	45.2	49.9
Postsecondary(2)	8.5	13.3	15.2	12.4	20.0	22.5	10.2	14.0	16.1

(1) Includes those with "no schooling".

(2) Includes those with "some university" or "university degree".

Source: Based on data from Tables D-1 to D-3.

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Mean years of schooling of the labour force -- Data on the educational attainment of the labour force are not available for each year of school attended but have been obtained in the Canadian censuses for groups of school years. For instance, in 1961, data were obtained for people who had attended school for five years or less but no information was obtained on how many had attended school specifically for one, two, three, four or five years. Therefore, in estimating the mean years of education for the labour force as a whole, certain assumptions had to be made regarding the distribution of years of education within each level of education. In general, an assumption of an even distribution within each level of education was adopted. A full explanation of this point and other methods used for arriving at the estimates may be found in Appendix C.

Table 9-2 gives the estimates of the mean years of schooling of the labour force, by both province and region, for 1951 and 1961, and by region for 1966.

For Canada as a whole, the labour force mean years of schooling increased from 8.6 years in 1951 to 9.1 years in 1961, or one-half year over a 10-year period. But in only five years from 1961 to 1966, a further increase to 9.6 years was recorded, indicating a marked acceleration in the rate of increase. Throughout the period, the mean years of schooling of the female members of the labour force has been consistently higher than of males, although some narrowing in the differential has been taking place as a higher proportion of women enter the labour force.

The regional pattern was fairly consistent through-out the period 1951 to 1966. British Columbia and Ontario, in that order, were consistently above the national average in terms of mean years of schooling. Quebec and the Atlantic Region were below the national average, and the Prairie Region tended to occupy the middle position, at about the national average.

Table 9-2

MEAN YEARS OF SCHOOLING OF THE LABOUR FORCE
CANADA, BY PROVINCE AND BY REGION, 1951, 1961 AND 1966

	1951			1961			1966		
	Male	Female	Total*	Male	Female	Total*	Male	Female	Total*
Newfoundland	6.5	8.9	6.9	7.8	9.7	8.2			
Prince Edward Island	8.0	9.5	8.3	8.5	9.9	8.8			
Nova Scotia	8.2	9.8	8.5	9.0	10.1	9.2			
New Brunswick	7.3	9.1	7.7	8.1	9.6	8.5			
Atlantic	7.4	9.4	7.9	8.4	9.8	8.8	9.0	10.1	9.3
Quebec	7.9	8.7	8.1	8.0	8.7	8.2	8.5	9.1	8.7
Ontario	8.8	9.9	9.1	9.4	9.9	9.5	9.7	10.2	9.9
Manitoba	8.2	9.4	8.5	9.1	9.7	9.3			
Saskatchewan	7.9	9.6	8.2	8.6	9.6	8.8			
Alberta	8.5	10.0	8.8	9.4	10.1	9.6			
Prairies	8.2	9.7	8.5	9.1	9.9	9.3	9.6	9.9	9.7
British Columbia	9.1	10.2	9.3	9.9	10.6	10.1	10.4	10.6	10.5
Canada	8.5	9.6	8.6	9.0	9.7	9.1	9.5	10.1	9.6

* Weighted average.

Source: Based on data from Dominion Bureau of Statistics, *Census of Canada, 1951* and *1961*, and estimates for 1966.

Some relative changes in position occurred, however. Quebec's labour force had a slightly higher average of years of schooling than that of the Atlantic Region in 1951; by 1961, it was lower than the Atlantic Region and continued to be so in 1966, in spite of a sharp increase in mean years of schooling in Quebec from 1961 to 1966. The Prairie Region was slightly lower than the national average in 1951; it was slightly higher in 1961 -- a position maintained in 1966.

With one exception, similar regional differentials are shown when the male and female labour forces are analysed separately. That exception is the Atlantic Region where the mean years of schooling of the female labour force were consistently at about the national average over the period as contrasted with the substantially lower position for the male labour force. The difference between the educational attainment of the female and male labour forces in the Atlantic Region was consistently larger than in other regions.

Some of the provincial differences within the Atlantic and Prairie Regions are indicated for 1951 and 1961. The differences within the Atlantic Region are nearly as great as those between the Atlantic Region and other regions. Newfoundland was considerably lower than the other Atlantic Provinces and although the margin was narrowing, the difference between Newfoundland and Nova Scotia in 1961 was about one year of schooling. Nova Scotia tended to place relatively high, standing fifth among the provinces in 1961.

In the Prairie Region, similar provincial differences existed, although the range of variation was not as wide. Alberta was the highest of the three provinces in 1951 and 1961 in mean years of schooling for the total labour force, with Saskatchewan the lowest. In 1961, Alberta stood slightly higher than Ontario and thus ranked second among the provinces.

As indicated in Table 9-3, the rise between 1951 and 1966 in the average schooling of the labour force was more rapid in the Atlantic Region than in any other region. This increase was influenced to a considerable extent by the substantial gain recorded in Newfoundland[1] between 1951 and 1961, but even if Newfoundland were

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[1] See Appendix C for a discussion of the accuracy of the Newfoundland data.

excluded from the Atlantic index, this conclusion would remain correct. This suggests that a narrowing of disparities in labour force quality between the Atlantic Region and the rest of the country occurred over the period.

Table 9-3

INCREASES* IN THE MEAN YEARS OF SCHOOLING OF
THE LABOUR FORCE, CANADA, BY REGION, 1951 TO 1966

	1951-61	1961-66	1951-66
Atlantic	1.08	1.11	1.09
Quebec	0.12	1.19	0.48
Ontario	0.43	0.83	0.56
Prairie	0.90	0.85	0.88
British Columbia	0.83	0.78	0.81
Canada	0.57	1.08	0.74

* Average annual rate of change.

Source: Based on data from Table 9-2.

The Prairie Region and British Columbia also indicated a faster rate of growth in labour force mean years of schooling than the national average for the 1951-66 period, while the two central provinces of Ontario and Quebec exhibited a slower rate of growth.

When the 1951-66 period is divided into two periods, a somewhat different picture emerges. Only the Atlantic Region and Ontario have been reasonably consistent throughout, in that the Atlantic Region showed a rate of growth above the Canadian average in both periods while Ontario was below. On the other hand, the Prairie Region and British Columbia showed a rate of growth above the Canadian average from 1951 to 1961 but was below in 1961-66. Quebec, which showed scarcely any increase in mean years of schooling from 1951 to 1961, had the highest rate of growth of any region from 1961 to 1966.

Indeed, the period from 1961 to 1966 was noteworthy in that there was a marked reduction of the regional differentials in labour force educational attainment that existed in 1961.

Quality indexes based on cost differentials -- In
the computation of averages in the previous section,
each year of schooling was considered of equal value
from the first grade up. It would be possible, of course,
to allow for the fact that the costs of education per
student-year become progressively higher as one moves
from the elementary to the secondary to the postsecondary
educational levels. This would be done by giving the
student-years at higher levels of education a greater
weight. While such an adjustment has not been undertaken[1]
because cost data are not available for educational sub-
levels within the two major educational systems --
elementary and secondary schools, and universities -- it
is possible to indicate the general nature of the results.
It would mean a percentage change in the stock of educa-
tion greater than that shown in Table 9-3. It would
also increase the regional differences in education
stock.

Quality indexes based on income differentials --
Another procedure is to follow that employed by Denison[2]
in his growth studies when he developed a weighting
system for different levels of education based on the
income earned by people at those educational levels.
This serves to *reduce* the education stock differentials
among the regions, since the average income of males
with, say, secondary education in 1961 was only about
23 per cent higher than the average income of people
with elementary education only, although the average
number of years of schooling is estimated to be about
twice as great. The same situation is true for those
with "some university" who, with an average number of
years of schooling about 35 per cent greater than those
with secondary level attainment, received an average
income only about 22 per cent greater. Indeed, those
with *no* formal education received fully 50 per cent as
much income as those with education at the secondary

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[1] This would be in accord with the conventional procedures
of expressing capital stock in terms of cost.

[2] E. F. Denison, *The Sources of Economic Growth in the
United States and the Alternatives Before Us* (New York:
Committee for Economic Development (Supplementary Paper
No. 13), 1962); E. F. Denison, assisted by J. P. Poullier,
*Why Growth Rates Differ: Postwar Experience in Nine
Western Countries* (Washington: The Brookings Institution,
1967).

level. However, for those with university degrees, the Denison adjustments provide a greater weight than that based on number of years of education.

Following the Denison procedures, the 1961 education-income differential weights have been applied to the educational distribution of the 1951, 1961 and 1966 labour forces in each region. (This is explained in greater detail in Appendix E. Appendix E also describes the data on which the income weights were based, as well as the additional estimates that were required for deriving them.) Such calculations provide estimates of the change in average income per worker assumed to be due to increases in the formal-education content of the labour force over that period. Expressed in index form (1951=100), these averages may be regarded as indexes of labour force quality (see Table 9-4).

Table 9-4

LABOUR FORCE QUALITY INDEXES[1]
CANADA, BY REGION, 1951 TO 1966

(1951 = 100)

| | 1951 | 1961 | 1966 | Average Annual Rates of Change | | |
				1951-61	1961-66	1951-66
Atlantic	100.0	103.7	106.4	0.36	0.52	0.41
Quebec	100.0	100.6	103.2	0.06	0.52	0.21
Ontario	100.0	102.2	103.9	0.22	0.32	0.25
Prairies	100.0	102.7	104.7	0.27	0.39	0.31
British Columbia	100.0	102.4	104.3	0.24	0.37	0.28
Canada	100.0	102.2	104.3	0.22	0.42	0.28

[1] These indexes were calculated separately for the male and female labour forces and then combined.

Source: Based on data from Tables D-1, D-2 and E-3.

An adjustment was made to account for the apparent fact that, as Denison pointed out in his U.S. study, [1] incomes of individuals are influenced by many factors other than education, such as natural ability, intelligence, effort, the socio-economic status of an individual's family, and chance. There is, of course, some relationship between the level of education and these other factors. Denison assumed that only three-fifths of the income differences were attributable to differences in education. The same assumption was adopted in this Study.

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[1] Denison, *op. cit.*, pp. 68-70.

The above indexes reflect the changes in the quality of the labour force as reflected in the presumed market value of various amounts of education, with amount of education being measured by the number of years. This assumes that the *quantity* of education associated with a year of attendance has remained unchanged. But, in fact, the length of the school year and rates of school absenteeism changed significantly over the years during which the three or four generations in the present labour force were being educated. Moreover, there are regional differences in these factors. An adjustment to the "years" calculation would have been advisable to reflect this aspect of the quality of education.[1] Denison, Bertram and Walters made such adjustments[2] in their studies. The assumption underlying the adjustment was that the increase in the number of days spent in school per year is likely to increase a worker's contri- bution to production. This correction has raised a certain amount of controversy among economists, and in his second study, Denison reduced "the measured increase in the number of days by one-third to allow for possible over-statement". Such adjustments were not made in this Study, mainly because of a lack of adequate data on a regional basis. Consequently, the indexes probably tend to understate the real improvement in labour force quality.

Table 9-4 indicates substantially slower rates of change in terms of labour force educational quality than was true of mean years of schooling of the labour force shown in Table 9-3. Although this indicates the diffi- culties of deciding on the most appropriate method of valuation, it should be noted that both methods show a narrowing of interregional disparities in education stock.

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[1] D. Walters, *Canadian Income Levels and Growth: An International Perspective*, Economic Council of Canada Staff Study No. 23 (Ottawa: Queen's Printer, 1968), pp. 59-60.

[2] D. Walters, *ibid.*, pp. 209-210; G. W. Bertram, *The Contribution of Education to Economic Growth*, Economic Council of Canada Staff Study No. 12 (Ottawa: Queen's Printer, 1966), pp. 52-54.

CHAPTER 10

SUMMARY AND CONCLUSIONS

General Observations

Any statement of conclusions must be limited by the
fact that some of the essential elements of the opera-
tions of provincial educational systems are not at this
time capable of objective comparative analysis. The
necessary data do not exist nor has it been clearly
established what social and cultural context would be
most appropriate for such analysis. This is particularly
true of the matter of the output of educational systems,
a question that has been explored in Appendix A of this
Study. Because of the difficulties of determining
educational output, the effectiveness or efficiency of
provincial educational systems cannot be evaluated in
any definitive way.

Nevertheless, it has been established that, in the
1960's, there were substantial interprovincial differences
in the resources used in provincial educational systems.
Moreover, some observations may be made that relate
specifically to two important current themes in the
public discussion on education -- the question of inter-
provincial educational disparities and the question of
educational costs. Discussion in this chapter, as far
as educational resources are concerned, is confined to
elementary and secondary schools, but reference is also
made to average levels of educational attainment of the
labour force (which, of course, includes people who
have attended at postsecondary levels).

The differences among the provinces in resources
employed in elementary and secondary school systems
were quite large in some cases. The greatest differences
were to be found in the factors of school operating
expenditures per student and the gross capital stock
per student, which, in part, reflect the different price
levels that exist in the different provinces. Differences
in factors assessed in non-monetary terms tended to be
less, with the least apparent difference being in the
median size of class.

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Some of the differences appear to be related to the income levels of the provinces; others do not. Factors that appear to be positively correlated with provincial income levels are: the proportion of nonteacher staff among total school staff; the educational qualifications of school teachers; operating expenditures per student; school capital stock per student; and student retention rates. Those factors that do not appear to be closely related to income are tenure and experience of school teachers, number of students per classroom, the student-teacher ratio, and the median size of class. Obviously, the last three factors measure the same phenomenon, although in different ways.

The average level of educational attainment of the labour force in the provinces is also seen to be related to the income position of the province. Discounting migration, differences in the mean years of schooling of the population would reflect differences in student retention rates over a period of several decades. Thus, if a relationship between student retention rates and provincial income levels does exist, a similar relationship would be apparent between mean years of schooling and income levels.

There is little doubt, however, that a relationship exists on another level between mean years of schooling of the labour force and average income in a province. In general, it can be demonstrated that the income of a person in the labour force is related to the level of his educational attainments. This is presumed to reflect, at least in part, the effect of education in improving productivity. Thus a province where the level of educational attainment is high would be expected to have a high relative income standing. In general, this is the case.

On the other hand, there are interprovincial differences in income for people even with the same educational standing. Some differences remain even when adjustments are made for differences in the occupation mix. One cannot, in fact, demonstrate with precision the relationship between average educational standing in a province and average income because there are many factors that cannot be taken fully into account. These include the derivation of proper weights for experience and age in any measurement of labour force quality; an assessment of the degree to which a given educational

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level should be assumed to be of the same quality over time and between regions; an assessment of the lag, if any, that should be assumed to exist between the achievement of a given educational level and its effect on productivity, etc.

Interprovincial Differences in 1960

At the beginning of the 1960's, the Atlantic Provinces (with the exception of Nova Scotia) and Quebec formed the lowest group on all the income-related factors. The Western Provinces and Ontario were relatively high, but Nova Scotia was higher than Saskatchewan in terms of mean years of schooling and was about the same as Ontario and Alberta in terms of the percentage of secondary school teachers with Level 2 certificates or higher (see Table 10-1).

This is not to say that the rank-order correlation was complete within the two main groups that were identified. Ontario tended to be relatively low within the "high" group on almost all of the income-related factors but particularly in terms of capital stock per student and operating expenditures per student. Moreover, Quebec tended to be relatively low within the "low" group, particularly in regard to school retention rates and the mean years of schooling of the labour force. However, British Columbia, as the province with the highest personal income per capita at that time (average of preceding 10 years), was highest on all the income-related factors except capital stock per student, and Newfoundland, as the province with the lowest personal income per capita, was lowest on all the income-related factors except student retention rates.

Interprovincial Differences in 1968

By 1968, the rank-order correlation between personal income per capita and the income-related factors appeared to have weakened slightly.[1] Nevertheless, as might be expected, a pattern similar to that which prevailed in 1960 may be detected. However, although all provinces showed increases in the factors assessed, some showed above-average increases.

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[1] Part of this is accounted for by the fact that the rank in terms of income had changed in some cases. Ontario had moved ahead of British Columbia, and Quebec had moved ahead of Saskatchewan.

Table 10-1

SUMMARY OF INCOME-RELATED EDUCATIONAL FACTORS, (1) BY PROVINCE, 1960

	Personal Income Per Capita (2)	Non-professional Staff (3) (Per cent)	Non-professional Staff Per 10,000 Students	Capital Stock per Student (1961 constant dollars)	Class Operating Expenditures per Student (Current dollars)	Student Retention Rates (4) (Per cent)	Teachers' Qualifications (Per cent) Elementary (5)	Teachers' Qualifications (Per cent) Secondary (6)	Mean Years of Schooling of Labour Force (7)
British Columbia	1,646	25.0	153	1,012	335	68	87.1	86.6	10.1
Ontario	1,633	21.3	112	745	268	56	83.7	76.4	9.5
Alberta	1,432	20.8	115	1,142	311	64	84.6	76.7	9.6
Manitoba	1,344	16.9	106	851	260	61	77.4	90.9	9.3
Saskatchewan	1,261	17.5	112	892	282	56	95.7	87.1	8.8
Quebec	1,198	15.1	82	703	164	33	39.9	59.4	8.2
Nova Scotia	1,026	13.2	84	708	166	47	62.8	76.1	9.2
New Brunswick	918	11.8	75	635	158	44	26.9	51.7	8.5
Prince Edward Island	770	9.6	57	675	125	36	10.3	37.5	8.8
Newfoundland	725	7.9	29	548	108	38	14.2	52.6	8.2

(1) Data are for elementary and secondary schools except for the column on mean years of schooling of the labour force.

(2) Average of period 1951-60, in current dollars.

(3) As proportion of total staff. Excludes bus drivers.

(4) Grade 11 enrolment as a percentage of Grade 2 enrolment. Data have been adjusted to account for student migration.

(5) Percentage of teachers with Level 2 certificates or higher.

(6) Percentage of teachers with Level 3 certificates or higher.

(7) As of June 1, 1961. This includes all levels of schooling.

Source: Based on various tables throughout text.

Table 10-2

SUMMARY OF INCOME-RELATED EDUCATIONAL FACTORS, ELEMENTARY AND
SECONDARY SCHOOLS, BY PROVINCE, 1968

	Personal Income Per Capita (1)	Nonteachers per 10,000 Students	Capital Stock Per Student (1961 constant dollars)	Operating Expenditures per Student (Current dollars)	Student Retention Rates (2) (Per cent)	Teachers' Qualifications (Per cent)	
						Elementary (3)	Secondary (4)
Ontario	2,298	176	1,166	571	75	91.0	86.6
British Columbia	2,203	182	1,172	524	85	96.6	90.9
Alberta	1,945	215	1,634	587	83	90.4	88.2
Manitoba	1,919	167	1,115	514	82	90.9	62.0
Quebec	1,760	132	947	541	73	70.3	45.3
Saskatchewan	1,743	178	1,198	497	75	96.6	91.5
Nova Scotia	1,507	109	854	354	69	77.8	87.3
New Brunswick	1,355	115	787	328	62	63.2	63.4
Prince Edward Island	1,192	186	962	376	67	40.5	68.8
Newfoundland	1,098	66	687	239	54	26.0	67.1

(1) Average of period 1959-68, in current dollars.

(2) Grade 11 enrolment as percentage of Grade 2 enrolment. Data have been adjusted to account for student migration.

(3) Percentage of teachers with Level 2 certificates or higher.

(4) Percentage of teachers with Level 3 certificates or higher.

Source: Based on various tables throughout text.

Notable were Quebec, Ontario, Prince Edward Island, and Alberta. Both Quebec and Ontario moved considerably closer to the position indicated by their rank in terms of personal income per capita. Prince Edward Island and Alberta showed gains in some factors that placed them considerably above provinces with higher incomes (see Table 10-2).

Class-Size Factors

It has been noted that certain factors do not appear to be income-related. Most notable of these are the factors related to class size -- i.e., students per classroom, the student-teacher ratio, and median size of class. These, of course, are related but do not show the same relationship in all provinces (see Table 10-3). The average size of class will be larger than the average number of students per classroom or the average number of students per teacher since not all classrooms are fully engaged at all times and there are nonteaching principals and vice-principals included in the teachers.

Table 10-3

SUMMARY OF CLASS-SIZE FACTORS
BY PROVINCE, 1960-61 AND 1967-68

	1960-61			1967-68		
	Students per Class-room	Median Size of Class	Student-Teacher Ratio	Students per Class-room	Median Size of Class	Student-Teacher Ratio
Newfoundland	30	32	30	26	30	26
Prince Edward Island	25	26	25	23	25	21
Nova Scotia	27	30	27	25	29	24
New Brunswick	26	28	26	26	28	24
Quebec	28	--	24	23	--	23[1]
Ontario	29	31	28	27	31[1]	24
Manitoba	30	28	25	25	27	23
Saskatchewan	24	27	24	22	26	22
Alberta	25	27	25	22	27	22
British Columbia	27	32	27	27	32	25

[1] 1966-67 data.

Source: Based on various tables throughout text.

It is seen that the class-size factors in 1960-61 appeared to be related in part to the relative importance of agriculture. Prince Edward Island, Saskatchewan, and Alberta tended to be the lowest on all factors, although Quebec was also relatively low in terms of student-teacher ratios. This apparent relationship continued to 1967-68.

A principal feature of the change to 1967-68 was that, while the median size of class remained nearly constant, the average number of students per classroom, and the average number of students per teacher, declined -- in some cases sharply.

Conclusions

It is not difficult to identify two trends in that portion of the 1960's which has been examined in this Study. The first is essentially the theme of this report -- the improvement in all provinces of those factors believed to be associated with educational quality. Nevertheless, it must be reiterated that it is not known *to what extent* the following factors constitute an improvement in the educational system: more teachers or nonteachers per student, higher teachers' qualifications, more capital stock per student, higher operating expenditures per student, more books and materials per student, and higher student retention rates. It is particularly difficult to say anything meaningful about "trade-offs", such as the trade-off that might exist, to cite one example, between a lower student-teacher ratio and higher teacher qualifications. Nevertheless, it is apparent that decisions have been made in relation to such matters.

It will be recognized that other factors may bear just as close a relationship to educational quality as those considered in this Study. Indeed, they may be more central to the whole question but, because data for additional factors do not exist, it has been impossible to examine them.

The second trend that has emerged is the reduction in interprovincial differences in educational factors. It may, first of all, be noted that at the beginning of the 1960's the range of personal income per capita among the provinces was relatively large. The index of dispersion of personal income per capita (average of the 10 preceding years) stood at about 26. Several educational factors exhibited about the same range of variation, or even greater. Most notable perhaps were operating expenditures per student with an index of dispersion of about 36 and the qualifications of elementary teachers (as measured by the proportion of teachers with Level 2 certificate or higher) with an

index of dispersion of about 53.[1]   On the other hand,
class-size factors, such as students per classroom,
median size of class, and student-teacher ratio, showed
much less variation (see Table 10-4).

Table 10-4

INDEXES OF PROVINCIAL DISPERSION, CANADA
1960 AND 1968[1]

	1960	1968
Personal income per capita	26.25	22.76
Nonprofessional staff as percentage of total	32.77	n.a.
Nonprofessional staff per 10,000 students	35.68	28.20[2]
Capital stock per student	21.87	24.29
Operating expenditures per student	35.78	24.92
Student retention rate	23.40	12.83
Teachers' qualifications		
Elementary	52.80	31.51
Secondary	24.63	20.13
Mean years of schooling of labour force	9.33	n.a.
	1960-61	**1967-68**
Students per classroom	7.45	7.48
Median size of class	7.48	9.22
Student-teacher ratio	6.97	6.03

[1] Data cover the periods identified in Tables 10-1, 10-2
and 10-3.

[2] Nonteachers.

Source: Based on Tables 10-1, 10-2 and 10-3.

By 1968, the index of dispersion of personal income
per capita had declined somewhat but, in general, the
index of dispersion for the educational factors with
high dispersion rates had declined even more.   The index
of dispersion of both operating expenditures per student

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[1]The index of dispersion for the *average* qualifications
of elementary teachers would, of course, be less.

and elementary teachers' qualifications declined signifi-
cantly as it did for the student retention rate. On
balance, relatively little change was shown in the
interprovincial variation of class-size factors. An
apparent increase in the index of dispersion of the
median size of class is recorded, matched by a decrease
in the index of dispersion of the student-teacher ratio.

The index of dispersion of the mean years of
schooling of the labour force was also relatively low
(about 9) at the beginning of the 1960's. While no data
are available by province for 1968, it is apparent that
at least at the regional level the range of differences
had been further reduced by 1966. The sharp reduction
in the provincial index of dispersion of the student
retention rate by 1968 will almost certainly be reflected
in a reduction in that of the mean years of schooling of
the labour force in 1968.

This Study suggests many fruitful areas for further
examination. Most notable among these are the implica-
tions for the educational quality and effectiveness of
the provincial differences in patterns of resource
utilization. Basic to such an evaluation is the
development of more uniform appraisal techniques of the
effects of educational systems on the students and on
society as a whole. Until this is done, little more can
be done to definitively compare the educational perfor-
mance of different provincial systems.

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APPENDIX A

A CONSIDERATION OF OUTPUT AND
INPUT-OUTPUT RELATIONSHIPS IN EDUCATION

A fundamental economic exercise is the achievement in a particular industry of a maximum output for a given input, i.e., the attainment of maximum productivity and, in a broader sense, the allocation of resources among industries so as to obtain maximum production for the economy as a whole. Education may be approached in this context as an industry and, theoretically at least, its operations may be considered in terms of productivity or in terms of input-output relationships.

Doing so implies an ability to specify with some precision the magnitude of inputs and outputs. In this Study, educational "inputs" have been considered at length. Apart from the question of whether the student should be regarded as an input, it is apparent that the analysis of inputs into the education industry is not basically more difficult than that for any other industry. The concept of educational "output" is quite a different matter. It is extremely difficult to measure differences in educational output or even to specify the nature of an educational output with any exactitude. This suggests that input-output analyses of the education industry can only be at best of a pioneering nature.

Yet some *idea* of educational output and of effectiveness of educational processes must underlie even the narrower consideration of inputs if such is to be meaningful. Therefore, it seems appropriate to explore some of the recent attempts that have been made by economists to define educational output and to describe an educational input-output model.

Definitions of educational output generally have placed considerable emphasis on that aspect of education which is concerned with the communication of something, whether it be a set of attitudes, knowledge, information, or the ability to perform certain mental or physical

tasks. For instance, Correa takes a definition by educational psychologists, Commins and Fagin,[1] and reinterprets it as follows:

> "... it appears that the good called education consists of two elements (1), facts and skills acquired by the learner (this aspect will be called knowledge) and (2), changes in the learner's motives, needs and goals."[2]

For the purposes of their study, Burkhead, Fox, and Holland stated: "Educational product is the product of the system measured in terms of the skills and aptitudes transmitted to students."[3] Bernard stated that, for the purpose of the general optimization model for the French economy, "education is regarded mainly as an industry producing the knowledge required by future workers of various skills".[4] Machlup defines education as "the production of old knowledge in new minds".[5]

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[1]W. D. Commins and B. Fagin, *Principles of Educational Psychology*, 2nd edition (New York: The Ronald Press Co., 1954), pp. 38-39.

[2]H. Correa, *The Economics of Human Resources* (Amsterdam: North-Holland Publishing Co., 1963), p. 92.

[3]J. Burkhead, T. Fox, and J. Holland, *Input and Output in Large-City High Schools* (Syracuse: Syracuse University Press, 1967), p. 4.

[4]J. Bernard, "General Optimization Model for the Economy and Education" in *Mathematical Models in Educational Planning* (Paris: Organisation for Economic Co-operation and Development, 1967), p. 207. Bernard goes on to identify the functions of education in more detail as follows:

> "(a) It provides pupils with the knowledge essential for the general or occupational skills they will later possess as members of the labour force (including teachers and research scientists);
>
> (b) It raises their cultural level and so influences the choices they will make and their ability to

The next stage is the difficult one -- giving some numerical dimensions to educational outputs. Generally, for lack of anything better, these have been expressed in terms of the length of time a student has been exposed to the educational system, i.e., in terms of student-days or student-years of school attendance. This is based on the assumption, which is valid enough, that the number of facts and skills acquired by the student is related in some way to the time spent in the educational institu- tion. Whether this is a proportional relationship, however, is not known, although this is obviously a critical factor in evaluating the usefulness of such an output measure. Moreover, one is left with the question of whether a student-day at one educational level should be regarded as equivalent to a student-day at another educational level or, in an examination of interprovin- cial differences such as has been undertaken in this Study, whether a student-day of school attendance in one province is equivalent to a student-day of school attendance at another, or whether a student-day in one year should be regarded as equivalent to a student-day in another year.

A modification of this approach is to consider graduates of an educational institution as output. Woodhall and Blaug were unusually blunt in justifying the use of degrees as a measure of output in their study of the productivity of British university education when they stated:

> absorb fresh knowledge during their working
> lives;
>
> (c) It develops scientific research within the
> universities themselves;
>
> (d) Lastly, it helps to disseminate cultural,
> scientific and technical knowledge within the
> population as a whole through books and reviews,
> broadcasts, and the extra-mural activities of
> teachers."

[5]See particularly Chapter 2 of F. Machlup, *The Production and Distribution of Knowledge in the United States* (Princeton: Princeton University Press, 1962) for a full discussion of his *schema* of types of knowledge production.

> "... our measure of productivity is confined to
> what we can now measure; it is subject to altera-
> tion the moment other dimensions come to be
> quantified."[1]

Here again the obvious question is whether a degree in
science in 1970 should be regarded as equivalent to a
degree in science in 1950 or 1930.

Efforts to move beyond these relatively crude output
measures have proceeded along a number of lines. One of
these has been to attempt to measure directly the change
in skills and aptitudes through various standardized
tests. For instance, Burkhead, Fox, and Holland in their
study of large-city high schools (mainly of two cities,
Chicago and Atlanta) related various input factors in
different schools to an output measure of various student
test scores. Another approach has been to measure the
changes in quality of inputs such as education and
experience of teachers and incorporate these into the
output measure as a quality adjustment. This seems to
have greater merit than the assumption of no quality
change but one is still left with the question of "How
much quality change?" A third approach has been to
assess the quality of different levels of education in
terms of the income obtained by members of the labour
force with different levels of educational attainment.

An ambitious and extensive model developed under
the direction of C. C. Abt (for the U.S. Office of
Education to evaluate alternative U.S. Elementary and
Secondary Education Act of 1965 Title I programs for
the disadvantaged) attempted to incorporate all three
of these approaches. This model not only included a
submodel relating inputs to outputs expressed partly in
terms of academic achievements and changes in attitude,
but incorporated assumptions about quality of instruc-
tions and took the further step of relating academic

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[1]M. Woodhall and M. Blaug, "Productivity Trends in
British University Education, 1938-62", *Minerva: A
Review of Science Learning and Policy*, vol. 3, no. 4,
Summer 1965, p. 485.

outputs to a postulated upgrading in occupations and incomes.[1] In the Abt model, the important instructional process submodel would compute academic achievement and attitude changes from the changes in the scholastic environment. The scholastic environment was considered to include instructional and sociophysical environment components. The instructional component was evaluated in terms of quality and quantity of instruction. Quality of instruction was evaluated in terms of such factors as the education and experience of teachers and teacher turnover. Quantity of instruction was measured in terms of intensity (student-teacher ratio and equipment per student) and duration.

Perhaps the most complete recent review of models designed to relate educational systems to the economy as a whole has been given by Correa.[2] Among others, he described[3] a macro model with the objective of maximizing a weighted function of the elements in the output of the educational system. The model is basically simple and versatile, involving the aggregation of student graduates and student drop-outs at the various grades or levels of the educational system. Weighting these with the economic returns presumed to be associated with each level of education would result in a total economic return as a measurement of output. Weighting graduates and drop-outs by number of years of education for each level would result in a total of the number of years of education as output.

The model would become more complex in form if attempts were made to introduce the effects of the utilization of different kinds of resources in different ways within the constraints of a given volume of expenditures. Different patterns of resource utilization

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[1]See C. C. Abt, "Design for an Education System Cost Effectiveness Model", *Efficiency in Resource Utilization in Education* (Paris: Organisation for Economic Co-operation and Development, 1969), pp. 65-97.

[2]H. Correa, "A Survey of Mathematical Models in Educational Planning", *Mathematical Models in Educational Planning* (Paris: Organisation for Co-operation and Development, 1967).

[3]*Ibid.*, p. 69.

could simply be reflected in changes in the output
weights employed in the model. An example might be the
substitution of more highly qualified teachers and an
unchanged student-teacher ratio for a lower student-
teacher ratio and unchanged teachers' qualifications.
But again, the critical question concerns what change
in output weight should be associated with a particular
change in resource utilization. There is no empirical
data that would provide the basis for the inclusion of
a particular weight in the model.

In our Study, the major direct consideration of
output has been made in Chapter 9. In that chapter
educational output was assessed in terms of the formal
educational attainment of the labour force in a province
or region following two of the approaches outlined in
this Appendix. The first is unadjusted student-years
of school attendance; the second is student-years
adjusted for the income differences associated with
different levels of education.

In other chapters of the Study, output factors
were considered implicitly only. In general, the view
is accepted that quality of output and quality of input
are positively related but no attempt has been made to
express this quantitatively.

APPENDIX B

NOTES ON TEACHERS

Qualification Levels

Typically today, teachers require certificates,
permits, letters of authority, or similar documents
issued by provincial authorities before they can teach.
The teaching certificates normally issued are generally
graded according to the professional and academic
training of the teachers. Certificate systems vary from
province to province, however, and the Dominion Bureau
of Statistics has attempted to equate the certificates
issued in the different provinces on the basis of the
minimum number of years of academic and professional
training required (beyond the junior matriculation
level) for the given certificates. The DBS certificate
levels are as follows:

Level	Required years of training beyond junior matriculation level
7	7)
	)
6	6)
	)
5	5)
	)of which at least one year
4	4)is professional training.
	)
3	3)
	)
2	2)
	)
1	1)

0 -- Commonly junior matriculation plus less than
     one year (usually 6 but sometimes 12, 18, or
     24 weeks) of professional training; or no
     professional training regardless of academic
     standing.

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In actual fact, the certificate systems are not graduated for successive years of education in all provinces. In the Prairie Provinces, only two or three basic certificates are issued. In Alberta, for instance, some teachers that have been classified at DBS Certificate Level 4 would have qualifications equivalent to DBS Certificate Levels 5, 6 and 7 in other provinces. Therefore, in Chapter 4, reference was made only to the proportion of elementary teachers with Certificate Level 2 or higher and to the proportion of secondary teachers with Certificate Level 3 or higher. This would seem to avoid most of the misleading comparisons. Nevertheless, the actual data showing teachers by certificate levels are shown in Appendix F, and a summary table (Table B-1) gives the average qualification levels for teachers in each province.

Table B-1

AVERAGE QUALIFICATIONS[1] OF TEACHERS
CANADA, BY PROVINCE, 1960-61 AND 1967-68

| | 1960-61 | | 1967-68 | |
	Elementary	Secondary	Elementary	Secondary
Newfoundland	.9	2.6	1.4	3.5
Prince Edward Island	.9	2.3	1.6	3.5
Nova Scotia	2.0	4.1	2.6	4.3
New Brunswick	1.3	3.2	1.8	3.4
Quebec	1.6	2.5	1.8[2]	2.2[2]
Ontario	1.9	4.3	2.5	4.7
Manitoba	2.0	3.3	1.5	3.8
Saskatchewan	2.4	4.0	2.1	3.7
Alberta	2.2	3.3	2.3	3.8
British Columbia	2.6	4.7	3.1	4.7
Canada	1.8	3.6	2.4[3]	4.3[3]

[1] Average number of years of professional training after junior matriculation.

[2] For 1966-67.

[3] Except Quebec.

Source: Based on data from Dominion Bureau of Statistics.

Other reservations are necessary, however. First, while the classification refers to the number of years of training beyond junior matriculation, the terminal year for junior matriculation is not the same in all provinces. Thus, for purposes of the teacher certificate tables, the Dominion Bureau of Statistics has defined

junior matriculation as Grade 11 in a narrow majority
of the provinces but as Grade 12 in British Columbia,
Ontario, New Brunswick, and Prince Edward Island. Second,
not all provinces issue certificates recognizing only one
year of education beyond high school. Last, one must
note the effect of the requirement of the uniform certifi-
cate system that at least one year of the training be
professional training. This means that those teachers
with a university degree but no professional training
are classified at Level 0. This happens more frequently
at the secondary level than at the elementary.

For this Study, the DBS data on teachers' qualifica-
tions are employed for all provinces except Quebec. The
Quebec data were obtained directly from the Quebec
Department of Education and independently classified
according to the DBS uniform certificate level system.

For Quebec, for the years 1965-66 to 1968-69, the
following equivalents were established:

Quebec Certificate or Diploma	Equivalent DBS Certificate Level
Brevet A	4+
Certificat Superieur	3
Brevet B	2
Brevet C	1

For 1960-61, considerable adjustment difficulties were
encountered since there were as many as 25 different
teachers' certificates or diplomas applicable in Quebec
at that time. Nevertheless, an attempt was made to
classify all of them in terms of the minimum years of
academic and professional training required.[1]

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[1] However, for 1960-61, the classification of teachers by
type of diploma was not given separately for specialists
and principals. Therefore, it was necessary to arbi-
trarily distribute specialists and principals to the
elementary and secondary levels. Specialists were
distributed in the same proportion as the number of
classes at both levels; principals, on the basis of the
number of schools.

The average level of teachers' formal qualifications is given in Table B-1. This indicates the average number of years of professional training after junior matriculation, as indicated by the teaching certificates granted in each province.[1] To obtain this average, each level has been weighted by the corresponding number of years of professional training; for instance, at Level 7 the number of teachers has been multiplied by 7 to get the total number of years of training. Level 0 has been arbitrarily weighted by 0.5.

Comparison of Teachers' Salaries with Other Wages and Salaries

When teachers' salaries are compared with other wages and salaries, it is recognized, of course, that it is impossible to fully allow for differences in training and skill levels. No attempt is made to do so in this Study. The comparison is designed merely to illustrate roughly what relationship appears to exist between the level of teachers' salaries and that of other wage- and salary-earners.

Comparisons are made between average teachers' salaries on a school-year basis and other salaries and wages on a calendar-year basis. For example, average teachers' salaries for the school year 1960-61 are compared with other salaries and wages for the year 1961. Average teachers' salaries may thus be slightly understated.

Data on teachers' salaries for nine provinces are from the DBS publication *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools* (various years), where salaries are given by level (elementary and secondary), covering school principals and full-time teachers instructing in public schools on an annual salary. The data for Quebec teachers' salaries are from publications of the Department of Education of that province. The same definition is employed except that religious teachers are excluded from the calculation of the average salaries in 1960-61, and the secondary level includes some teachers at the college level for 1966-67 (which represent 8.2 per cent of the group).

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[1] Thus the average for the Prairie Provinces and Quebec is probably understated.

These data on teachers' salaries are compared with two aggregates of wages and salaries -- wages and salaries of employees of the "industrial composite" and income of employees as reported in taxation statistics.

"Industrial composite" average wages -- "Industrial composite" includes the industry divisions of forestry; mining; manufacturing; construction; transportation, communication and other utilities; trade; finance, insurance and real estate; and parts of service. The wages data are based on reports from establishments having 20 or more employees,[1] and the figures refer to the last seven days in the specified months. The survey covers all wage-earners and salaried employees of reporting establishments and includes salaries; straight-time wages; overtime wages; cost-of-living allowances; commissions; payments to persons absent because of holidays, vacation, sickness, etc; and regularly paid incentive, production, and shift bonuses. The establishments are classified according to the "Standard Industrial Classification". The annual average weekly wages and salaries are calculated from the aggregate of the monthly data, not from monthly averages, and the annual wages and salaries are obtained by multiplying the annual average weekly wages and salaries by 52 (see Tables B-2 and B-3).

Generally speaking, the definition of wages and salaries in this publication is about the same as for teachers' salaries, but, contrary to the case of teachers, the figures refer to industries and not to occupations and, because of that, reflect a range of very different occupations within the same industry.

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[1]All the establishments of a multiple-establishment firm are included if the firm had 20 or more employees in total in any month of the year, even though any particular establishment may have only a few employees. This limitation to larger firms results in a large and relatively even coverage of total employment in the surveyed industry divisions in most provinces, but the industrial representation, though large, is more uneven. For example, for Canada as a whole, larger firm employment as a percentage of total estimated employment by industry divisions ranged, in 1964, from 81 per cent to 94 per cent (83 per cent to 93 per cent in 1967) except for service with a 50 per cent coverage, and construction and trade with a 62 per cent coverage (22 per cent and 64 per cent in 1967).

Table B-2

AVERAGE ANNUAL WAGES AND SALARIES FOR TEACHERS
(1960-61) AND INDUSTRIES (1961)
CANADA, BY PROVINCE

(Dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Teachers											
Elementary	2,236	2,315	2,923	2,585	2,960	4,346	3,863	3,888	4,497	5,047	3,745
Secondary	3,686	3,066	4,305	4,169	4,882	7,230	5,674	5,887	6,058	6,672	6,059
Manufacturing	3,766	2,576	3,446	3,444	3,980	4,460	3,757	4,090	4,280	4,620	4,241
Construction	4,143	--	3,687	3,357	4,452	4,569	4,378	4,413	4,911	5,406	4,520
Transportation and communication	3,721	3,376	3,535	3,763	4,284	4,524	4,259	4,117	4,354	4,817	4,288
Trade	2,677	2,382	2,725	2,759	3,270	3,453	3,392	3,291	3,409	3,643	3,356
Finance, insurance, and real estate	--	--	3,501	3,308	3,875	3,839	3,660	3,435	3,613	3,765	3,787
Service	--	--	2,240	1,932	2,958	3,100	2,610	2,456	2,787	3,214	3,009
Industrial Composite	3,695	2,855	3,313	3,308	3,935	4,228	3,830	3,868	4,175	4,419	4,068

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, 1960-61*, and Dominion Bureau of Statistics, *Review of Employment and Average Weekly Wages and Salaries, 1957-67*.

Table B-3

AVERAGE ANNUAL WAGES AND SALARIES FOR TEACHERS
(1966-67) AND INDUSTRIES (1967)
CANADA, BY PROVINCE

(Dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Teachers											
Elementary	3,065	3,527	4,306	3,652	4,663	5,759	4,660	5,210	5,878	6,286	5,179
Secondary	5,144	5,092	6,164	5,685	6,743	8,684	6,981	7,442	7,391	8,010	7,467
Manufacturing	4,661	3,278	4,366	4,557	5,215	5,790	4,817	5,285	5,419	6,224	5,540
Construction	5,273	--	4,883	5,195	6,993	6,871	6,017	6,087	6,408	8,654	6,803
Transportation and communication	4,831	4,501	4,837	5,180	5,989	6,061	5,511	5,417	5,752	6,430	5,884
Trade	3,636	3,071	3,615	3,525	4,206	4,313	3,982	3,988	4,252	4,606	4,224
Finance, insurance, and real estate	--	--	4,529	4,539	5,189	5,305	4,902	4,649	4,890	5,054	5,149
Service	--	--	2,830	2,513	4,192	4,033	2,955	3,234	3,461	4,088	3,899
Industrial Composite	4,728	3,670	4,297	4,433	5,260	5,505	4,781	4,980	5,245	5,954	5,344

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, 1966-67*, and Dominion Bureau of Statistics, *Review of Employment and Average Weekly Wages and Salaries, 1957-67*.

Table B-4

AVERAGE INCOME AND SALARIES, CANADA, BY PROVINCE, 1961[1]

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Average income of total employees ($)	3,937	3,319	3,656	3,572	3,980	4,290	3,954	3,844	4,107	4,368	4,134
Average salary of elementary teachers ($)	2,236	2,315	2,923	2,585	2,960	4,346	3,863	3,888	4,497	5,047	3,745
As percentage of average income of total employees (%)	56.8	69.7	79.9	72.4	74.4	101.3	97.7	101.1	109.5	115.5	90.6
Average salary of secondary teachers ($)	3,686	3,066	4,305	4,169	4,882	7,230	5,674	5,887	6,058	6,672	6,059
As percentage of average income of total employees (%)	93.6	92.4	117.7	116.7	122.7	168.5	143.5	153.1	147.5	152.7	146.6

(1) Salaries.

Source: For teachers: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, 1960-61*; Quebec data from *Report of the Superintendent of Education, 1960-61*. For employees: Department of National Revenue, *Taxation Statistics* -- 1961 data in 1963 edition.

Table B-5

AVERAGE INCOME AND SALARIES, CANADA, BY PROVINCE,[1] 1967

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
Average income of total employees ($)	4,541	3,997	4,579	4,495	5,144	5,528	4,979	4,872	5,260	5,657	5,300
Average salary of elementary teachers ($)	3,065	3,527	4,306	3,652	4,663	5,759	4,460	5,210	5,878	6,286	5,179
As percentage of average income of total employees (%)	67.5	88.2	94.0	81.2	90.6	104.2	89.6	106.9	111.7	111.1	97.7
Average salary of secondary teachers ($)	5,144	5,092	6,164	5,685	6,743	8,684	6,981	7,442	7,391	8,010	7,467
As percentage of average income of total employees (%)	113.3	127.4	134.6	126.5	131.1	157.1	140.2	152.7	140.5	141.6	140.9

(1) Salaries.

Source: For teachers: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools, 1966-67*; Quebec data from Quebec Department of Education, *Statistiques de l'enseignement, 1966/67, Personnel enseignant, Salaires*. For employees: Department of National Revenue, *Taxation Statistics* -- 1967 data in 1969 edition.

Average income of employees on tax returns -- The data on average income for employees shown in Tables B-4 and B-5 include some nonwage components. However, in aggregate, this is not very significant since, for Canada as a whole, this amounted to only about 4 per cent of their total income. It should also be pointed out that the data are for taxable returns. The average income reported for taxable tax returns would, of course, be larger than the average for all tax returns. However, many of the nontaxable returns would be for persons who worked only part-time. Accordingly it is more legitimate to compare the wages and salaries of full-time teachers with the earnings of employees reported on taxable tax returns.

APPENDIX C

METHODOLOGY OF ESTIMATING LABOUR FORCE
BY SEX AND LEVEL OF SCHOOLING

The basic data employed were obtained from the *Census of Canada, 1951* and *1961*. Adjustments were required in order to bring both sets of data within a common educational framework since the data on educational attainment were not tabulated in precisely the same manner. The 1966 estimates were based on DBS special labour force surveys.

Conceptual Differences, 1951 and 1961

The two decennial censuses of 1951 and 1961 on the educational attainment of the labour force are not based on precisely the same concepts. In 1961, the question regarding the number of years of schooling referred to the highest grade or year attended, while in 1951, years of schooling referred to the total number of years spent in school, implying that school years completed were measured. On the other hand, such data could also include repeated years of schooling. The 1961 question, however, clearly means that completion of any year attended was not necessary for that year to be counted.[1] The two censuses, therefore, report data on educational attainment which would somewhat overstate the number of school years completed. Furthermore, the 1951 Census data, in comparison with those of 1961, probably tend to overstate the grade achieved, since in 1951 the concept of educational attainment centred on the "number of years attended" (including repeated years), while in 1961 it referred to the "highest grade attended" (excluding repeated years). It must be recognized that all such comparisons of levels of educational attainment over the last two decennial censuses are therefore approximate, since the two sets of census data cannot be reconciled.

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[1] Gordon W. Bertram, *The Contribution of Education to Economic Growth*, Economic Council of Canada Staff Study No. 12 (Ottawa: Queen's Printer, 1966), pp. 7 and 96.

Differences in Educational Grouping, 1951 and 1961

In addition to the change in the concept of educational attainment, there are differences in the particular schooling groups tabulated in the two censuses. Table C-1 shows the schooling groups tabulated for 1951 and 1961.

Table C-1

SCHOOLING GROUPS TABULATED
IN THE DECENNIAL CENSUSES OF 1951 AND 1961

Years of Schooling 1951	Years of Schooling 1961
	No Schooling (0)
Elementary (0-8) 0-4 5-8	Elementary (1-8) Less than 5 5 and over
Secondary (9-12)	Secondary (9-13) 9-11 12-13
Postsecondary (13 or more)	Some University (14-15)
	University Degree (16 or more)

Source: Dominion Bureau of Statistics, *Census of Canada, 1951* and *1961*.

The available data for 1951 were not detailed enough to allow an adjustment of the 1951 groupings to make them comparable with those of 1961. On the other hand, the conversion of the 1961 groupings to those of 1951 was ruled out, since it implied the amalgamation of crucial educational levels. The schooling groups shown in Table C-2 were adopted.[1] The above-mentioned groupings were obtained through some statistical manipulations and estimations. The following sections describe the techniques used to derive the schooling groups not directly available from published sources.

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[1] The available income data by level of schooling were also a constraint in the selection of appropriate schooling groups. See Appendix E.

Table C-2

SCHOOLING GROUPS APPROPRIATE TO AVAILABLE
DATA IN 1951 AND 1961 CENSUSES

Group	Years of Schooling
No schooling	0
Elementary	1-4
	5-8
Total	1-8
Secondary	9-12
Some university	13-15
University degree	16 or more

Source: See text.

Estimation of the Labour Force with "No Schooling", 1951

As shown in Table C-1, the available tabulations from the 1951 Census do not provide a distribution of the labour force having either "no schooling" or "one to four years' elementary". It was therefore necessary to separate these two groups. This was done by using the 1961 information in the following way. The proportion of the population 15 years of age and over having "no schooling" in 1961 was calculated for each sex. Then the percentage share of the labour force 15 years of age and over having "no schooling" was calculated for each sex for the same year. The relationship of these two proportions was then applied to the proportion of population 15 years of age and over in 1951 with "no schooling" (data available from the census) in order to derive the corresponding proportions of labour force having "no schooling" at that time. The calculations were made for each of the provinces, and Canada separately, and a linear adjustment was required in order to make the provincial total equal to the Canada total. Table C-3 shows, as an example, how the Canada shares were derived.

The calculated percentage shares were then applied to the total labour force in order to get the absolute figures. Note that this procedure takes account of the fact that, as the average level of education was lower in 1951 than in 1961, the proportions of labour force members with "no schooling" were likely to be higher than in 1961.

Table C-3

DERIVATION OF THE MALE LABOUR FORCE
WITH "NO SCHOOLING", CANADA, 1951

	1961	1951
Proportion of the male population 15 years and over having "no schooling"	1.5	1.6
Proportion of the male labour force 15 years and over having "no schooling"	0.8	0.9*

* Calculated by a linear adjustment.

Source: See text.

Separation of Four and Five Years
of Secondary Schooling, 1961

The schooling groups adopted and shown in Table C-2
implied that the fifth year of secondary schooling
(i.e., Grade 13) should be included in the category
"some university" in 1961. This transfer seems appro-
priate since students completing their fifth year of
high school are generally accepted as second-year students
in many Canadian and U.S. universities.[1] The available
tabulation from the 1961 Census did not provide a separa-
tion of four and five years of high school. However, we
obtained that split from unpublished cross-tabulations
of the 1961 Census made available by the Dominion Bureau
of Statistics. Table C-4 shows those unpublished data.

Although Quebec is listed in this table, its fifth
year of high school is not transferred to "some university"
because a special treatment is required for that province.[2]
For the nine other provinces, the fifth year of secondary
school is included in "some university".[3]

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[1]Bertram, *op. cit.*, p. 9.

[2]This problem is discussed later on.

[3]This transfer was also required in order to make possible
comparisons with the 9-12-year group tabulated in 1951.

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Table C-4

LABOUR FORCE, BY SEX, HAVING FOUR OR FIVE YEARS OF
SECONDARY SCHOOLING, CANADA, BY PROVINCE, 1961

	Male Labour Force		Female Labour Force	
	4 years	5 years	4 years	5 years
Newfoundland	3,201	1,642	1,803	722
Prince Edward Island	1,275	583	1,192	512
Nova Scotia	12,010	3,311	9,235	1,988
New Brunswick	7,619	2,953	7,068	2,641
Quebec	79,545	92,041	53,362	60,175
Ontario	162,861	135,505	110,697	86,819
Manitoba	21,543	8,697	14,223	6,109
Saskatchewan	26,852	3,926	16,884	2,709
Alberta	41,962	18,022	22,385	10,762
British Columbia	64,462	29,144	37,049	17,122
Canada	421,330	295,824	273,898	189,559

Source: Based on special tabulation of census data for 1961
by Dominion Bureau of Statistics.

Separation of "Some University" and "University Degree", 1951

The 1961 Census splits the number of persons with university education into two groups: those with "some university", and those completing university. As shown in Table C-1, the same groupings were not available from the 1951 Census, and it was necessary to try to split the postsecondary group into "some university" and "university degree". This was done by assuming that the 1961 relationship between the number of people with a university degree and those, as a whole, who attended university could be used to derive the corresponding shares in 1951. Table C-5 illustrates the estimations made for Canada.

Similar calculations were performed for each sex and each province; a linear adjustment was required in order to make the provincial total equal to the national one. The category "some university" was obtained by taking the difference between "total university" and "university degree".

Table C-5

DERIVATION OF THE PROPORTION OF MALE LABOUR FORCE
WITH A UNIVERSITY DEGREE, CANADA, 1951

	1961	1951
University degree	229,254	146,321
Some university (including Grade 13)	404,635	241,520
Total university (including Grade 13)	633,889	387,841
University degree as percentage of total university	36.2	36.2*

* Assumed.

Source: Based on data from DBS *Census of Canada, 1951* and *1961*.

It is very hard to appraise to what extent this
method of estimation may overstate or understate the
effective number of university graduates who were in
the labour force in 1951. On the one hand, one may be
induced to believe that, as the retention rates generally
increase over time, this method would tend to overstate
the number of people with university degrees in 1951
since this approach implies similar retention rates over
the two decades. On the other hand, as access to univer-
sity was much more difficult in the past, it is possible
that people entering university were more likely to
persevere and obtain a degree. In that case, this method
would tend to slightly understate the proportion of the
labour force having a university degree in 1951.

Estimates for Quebec

As mentioned earlier, additional adjustments were
required for the Quebec data. In that province, elemen-
tary schooling comprises only seven years of schooling,
and data were collected as such by the census.[1] In the
1951 Census, however, the year-of-schooling question
referred to the total number of years spent in school
and people declaring "eight years of schooling" in
Quebec were classified as being in the five-to-eight-
years-of-schooling group. A comparison of the Quebec
labour force having more than five years of elementary

[1]Dominion Bureau of Statistics, *Enumeration Manual, 1961*,
Appendix E, p. 111. In the other nine provinces, census
data on elementary schooling have been collected on the
basis of eight years of schooling.

schooling in 1961 and 1951 is then distorted by this
change in grouping. In order to make the comparison
possible over that period of time, the number of people
in the Quebec labour force having eight years of schooling
in 1951 was estimated and transferred to the 9-12-year
category. The estimation was made in the following way.

The 1941 Census provides a distribution by specific
years of schooling for the population having five to
eight years of formal education. This information was
used to estimate the labour force with exactly eight
years of schooling in 1951. To do this, participation
rates, by level of schooling, were required. The 1941
Census does not provide that information but the 1961
Census does. The 1961 participation rates were then
used and applied to the 1941 data on population (with
exactly eight years of schooling) to derive the labour
force with eight years of schooling.[1] Other methods
were attempted and as the results were always very close
to the ones obtained with the above-described technique,
it was considered that the estimations were reasonably
satisfactory.

For 1951, it was assumed that the 1941 relationship
between the percentage of workers having one to seven
years of schooling and the percentage of those with one
to eight years could be used to derive the corresponding
share of those having one to seven years of schooling in
1951. Those calculations permitted one to estimate that
about 10 per cent of the male labour force had eight
years of schooling in 1951. The corresponding share for
the female labour force was 7.4 per cent. The final
step was to transfer those labour force members with
eight years of schooling in Quebec into the 9-12-year
group in 1951.

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[1]For the male labour force, it was assumed that the male
 participation rate for people having elementary schooling
 was the same in 1941 as in 1961. For the female labour
 force, the participation rate of females having less
 than five years of schooling in 1961 was used (that
 rate being lower than the one for females having, on
 the average, an elementary education) to take account
 of the fact that female participation rates were
 generally lower in 1941 than in 1961.

As mentioned in the previous section, people in Quebec with five years of secondary schooling in 1961 were not transferred into the "some university" category since five years' high school in that province corresponds to Grade 12; that grade was considered as the terminal year of schooling in the 1951 Census. For similar reasons, Grade 13 or the fifth year of secondary schooling in the other provinces was moved into the group "some university".

All these statistical adjustments were required in order to make more accurate some comparisons of the educational attainment of the labour force by province over the last two decennial censuses. However, the interprovincial "level comparison" in 1961 still remains imperfect since schooling groups in Quebec are not identical with those in the nine other provinces. This question is also discussed in Appendix E.

Table C-6

COMPARISON BETWEEN THE SCHOOLING GROUPS USED IN QUEBEC
AND THOSE USED IN THE NINE OTHER PROVINCES, 1961

	Quebec	Other Provinces
No schooling	0	0
Elementary	1-7	1-8
Secondary	8-12	9-12
Some university	13-15	13-15
University degree	16 or more	16 or more

Source: See text.

Estimation of the 1966 Stock of Education of the Labour Force by Region

Data on labour force by region, sex, and level of schooling were not available from the census or any other official sources for 1966. Some estimates for that year (for Canada only) were prepared by L. Auer of the staff of the Economic Council of Canada, but the schooling groups adopted for that exercise are not strictly comparable to the educational categories used in the census. Special surveys[1] conducted by the Dominion Bureau of

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[1] F. J. Whittingham, *Educational Attainment of the Canadian Population and Labour Force: 1960-1965*, Special Labour Force Studies No. 1, Dominion Bureau of Statistics, Ottawa, 1966.

Statistics provided data on labour force by region, sex, and educational attainment for 1960 and 1965. These data were obtained by adding questions to the Labour Force Schedules of February 1960 and February 1965. Although the 1960 and 1965 sample survey statistics are again not strictly comparable to the census information on education because of differences in coverage, in the forms of the relevant questions, in timing, and in the quality of enumeration, they can be used on certain assumptions to approximate the 1966 stock of education of the labour force, by region and sex, on a basis roughly comparable to 1961.

The approximation was made by assuming that the relationship between data obtained at the 1960 survey and those computed at the 1961 Census could be applied to figures compiled at the 1965 survey to derive the 1966 numbers. Table C-7 shows the various steps of the estimation procedure.

Table C-7

DERIVATION OF THE STOCK OF EDUCATION
OF THE MALE LABOUR FORCE, ATLANTIC REGION, 1966

(Per cent)

	Whittingham 1960	Census 1961	Ratio (2) ÷ (1)	Whittingham 1965	Census Basis 1966 (4) x (3)	Adjusted to 100%
	(1)	(2)	(3)	(4)	(5)	(6)
Elementary	61.8	51.6	83.495	50.1	41.8	40.0
Secondary	32.1	39.4	122.741	42.3	51.9	49.7
University	6.2	9.0	145.161	7.5	10.9	10.3
Total	100.1	100.0		99.9	104.6	100.0

Source: Based on data from Frank J. Whittingham, *Educational Attainment of the Canadian Population and Labour Force: 1960-1965*, Dominion Bureau of Statistics, Special Labour Force Studies No. 1, 1966, Tables C19 and C31; and Dominion Bureau of Statistics, *Census of Canada, 1961*.

The percentage shares shown above were multiplied by the June 1966 labour force in order to translate the stock of education into absolute numbers. Those calculations were made for each of the regions and Canada. Linear adjustments were then required to make the regional totals add to the national ones. The separation

of "some university" and "university degree" (from total university) was done in the same way as was done for 1951 (see p. 163). The number of female workers with "no schooling" was assumed to be negligible in 1966; for males, the rate of decrease observed between 1951 and 1961 in that schooling group was extended to 1966 and used to derive the corresponding absolute numbers.

The Results

Data on the percentage distribution of the labour force by sex and level of schooling are reported in Appendix D.

Estimating Mean Years of Schooling

In estimating the mean years of schooling, it was necessary to try to estimate the mid-point within each educational group. In the absence of a more acceptable procedure, it was necessary to assume that the members of the labour force were evenly distributed within each class. Special weights have been adopted for Quebec since its elementary level contains only seven years while the secondary level includes Grades 8 to 12.

Table C-8 gives the weights that were employed for each level of schooling.

Table C-8

WEIGHTS USED IN THE COMPUTATION
OF MEAN YEARS OF SCHOOLING

	Quebec	Other Regions
Elementary		
1-4	2.5	2.5
5-8	6.0*	6.5
Secondary		
9-12	10.0**	10.5
Some university		
13-15	14.0	14.0
University degree		
16 or more	16.5	16.5

* "5-7" in Quebec.

** "8-12" in Quebec.

Source: See text.

The decision regarding the weight for those having 16 or more years of schooling was a difficult one to make. In most of the provinces other than Quebec, 16 years of schooling are required (on average) to get the first university degree, although in some cases it is granted after 15 years. On the other hand, the number of those obtaining a second (or more) university degree is relatively limited. Consequently, 16.5 years seem to be a realistic estimate. In Quebec, the first university degree is granted after 15 or 16 years in the case of "classical colleges". For those in the public sector, the first degree may be obtained after 16 or 17 years. Therefore, 16.5 years again appear as a satisfactory estimate.[1]

Accuracy of the Results

Although adjustments were performed to make data more comparable over time, there naturally are a number of limitations. Some of them were mentioned earlier. An additional limitation concerns the data on the members of the labour force who had completed five years of high school in 1961. According to the Census Division of the Dominion Bureau of Statistics,[2] "it would appear that in an undetermined number of cases, enumerators have erroneously marked High School 5 to indicate that the person had completed High School, i.e., in most provinces High School 4 should have been marked". It is not known to what extent this "error" tends to overstate the educational attainment of the 1961 labour force as compared to 1951. However, it is suspected that the overstatement is more pronounced in some provinces than in others. In Newfoundland, for instance, high school level comprises only three years (Grades 9 to 11) and the overstatement attributable to that mistake is likely to be more pronounced there than, let us say, in Nova Scotia where the secondary school system covers Grades 9

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[1] A. Raynauld, C. Marion, R. Béland, *La répartition des revenus selon les groupes ethniques au Canada,* unpublished study prepared for the Royal Commission on Bilingualism and Biculturalism, 1966, pp. 6.71-6.72.

[2] Quoted by N. M. Meltz in *Manpower in Canada, 1931 to 1961: Historical Statistics of the Canadian Labour Force,* Department of Manpower and Immigration, Ottawa, 1969, p. 7.

to 12. This overstatement is reflected in the very high increase in the average educational attainment of the Newfoundland labour force between 1951 and 1961, from 6.9 years to 8.2.

A detailed assessment of the probable range of error in the results has not been attempted. While these estimates have been prepared with as much care as possible, they should be regarded as expressive of general magnitudes, general trends and general levels of difference among the provinces and not as being correct to the last decimal point. The results do, however, seem to be supported by other observations such as regional differences in school enrolment ratios.

APPENDIX D

ESTIMATES OF LABOUR FORCE

BY SEX AND LEVEL OF SCHOOLING, CANADA,

BY PROVINCE AND REGION, 1951 AND 1961

AND BY REGION, 1966

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Table D-1

LABOUR FORCE, BY SEX AND LEVEL OF SCHOOLING,
CANADA, BY PROVINCE AND BY REGION, 1951

(Per cent)

Years of Schooling	Nfld.	P.E.I.	N.S.	N.B.	Atlantic Region	Que.	Ont.	Prairie Region	B.C.	Canada
MALE										
No schooling	4.9	0.5	0.8	2.2	2.1	0.7	0.6	1.3	0.7	0.9
1-8	67.0	60.6	52.8	65.2	60.1	53.0(1)	49.2	52.9	40.6	51.4
9-12	25.0	33.9	40.2	27.7	32.7	37.9(2)	38.0	38.4	47.6	38.3
13-15	2.3	3.6	3.8	3.2	3.3	3.9	8.5	4.9	8.2	6.0
16 or more	0.7	1.5	2.4	1.7	1.8	4.5	3.7	2.4	3.0	3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
FEMALE										
No schooling	0.8	0.1	0.3	0.4	0.4	0.3	0.4	0.8	0.4	0.4
1-8	38.3	31.8	27.9	36.4	32.8	38.2(1)	29.6	28.4	20.1	31.4
9-12	54.1	59.1	58.8	55.4	56.8	53.5(2)	52.9	57.1	63.1	54.9
13-15	6.1	8.3	9.7	6.8	8.0	4.9	15.0	11.7	14.2	10.9
16 or more	0.6	0.8	3.3	1.0	1.9	3.1	2.3	2.0	2.1	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) 1-7 years.

(2) 8-12 years.

Source: Based on data from Dominion Bureau of Statistics, *Census of Canada, 1951.*

Table D-2

LABOUR FORCE, BY SEX AND LEVEL OF SCHOOLING,
CANADA, BY PROVINCE AND BY REGION, 1961

(Per cent)

Years of Schooling	Nfld.	P.E.I.	N.S.	N.B.	Atlantic Region	Que.	Ont.	Prairie Region	B.C.	Canada
MALE										
No schooling	3.5	0.6	0.7	1.9	1.6	0.5	0.5	1.1	0.6	0.7
1-8	50.5	52.1	41.3	54.9	48.1	51.8(1)	41.4	40.9	30.0	43.7
9-12	38.9	38.9	48.5	33.9	41.3	38.7(2)	40.7	45.7	50.8	42.0
13-15	5.4	5.9	5.7	6.0	5.7	4.0	11.9	8.1	13.4	8.6
16 or more	1.8	2.6	3.8	3.4	3.2	5.0	5.5	4.2	5.2	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
FEMALE										
No schooling	0.7	0.2	0.3	0.5	0.4	0.3(1)	0.4	0.8	0.4	0.4
1-8	24.9	24.6	21.5	31.8	25.7	37.6(1)	28.7	26.2	17.6	29.5
9-12	61.9	61.6	65.8	54.6	61.1	54.8(2)	52.1	57.9	59.1	55.0
13-15	11.2	12.3	9.1	11.3	10.4	4.3	16.2	13.5	19.6	12.4
16 or more	1.3	1.3	3.4	1.8	2.3	3.0	2.7	2.5	3.2	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(1) 1-7 years.

(2) 8-12 years.

Source: Based on data from Dominion Bureau of Statistics, *Census of Canada, 1961.*

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Table D-3

LABOUR FORCE, BY SEX AND LEVEL OF SCHOOLING,
CANADA, BY REGION, 1966

(Per cent)

Years of Schooling	Atlantic Region	Quebec	Ontario	Prairie Region	British Columbia	Canada
MALE						
No schooling	1.3	0.4	0.4	1.0	0.4	0.6
1-8	38.7	44.8(1)	35.6	32.6	22.2	36.7
9-12	49.7	43.1(2)	44.9	51.8	55.0	46.9
13-15	6.0	4.9	12.0	8.7	15.2	9.2
16 or more	4.3	6.9	7.1	5.8	7.2	6.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
FEMALE						
No schooling						
1-8	23.1	31.3(1)	24.9	27.7	19.0	26.2
9-12	61.3	58.7(2)	54.7	55.6	58.3	56.9
13-15	11.6	3.8	16.1	12.6	18.0	12.1
16 or more	4.0	6.2	4.3	4.0	4.7	4.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

(1) 1-7 years.

(2) 8-12 years.

Source: Based on data from Frank J. Whittingham, *Educational Attainment of the Canadian Population and Labour Force: 1960-1965*, Dominion Bureau of Statistics, Special Labour Force Studies No. 1, 1966, Tables C19 and C31.

CALCULATION OF INCOME WEIGHTS FOR
LABOUR FORCE QUALITY INDEXES

Available Data and Their Relevance

In order to estimate the improvement in the quality of the labour force that may be assumed to result from increased education over the period 1951 to 1966 in the various regions, a set of weights was needed to combine individuals with different amounts of education. An attempt is made in this section to establish such a set of weights based on education-income differentials.

The 1961 Census provides average income data[1] by age, sex, province, and level of schooling for the non-farm population. As they are the only data available on a provincial basis, they must be taken as a proxy for average income or earnings of people in the labour force. The use of those data, however, presents a serious drawback since they cover only the nonfarm segment of the population while the labour force data include the farm labour force.

In the absence of information on education-income differentials for people in the farm population, it was assumed that, although the level of average incomes earned from farming is lower, more highly educated persons would earn more than persons with less education. This assumption does not seem unrealistic.[2] However, the use of income weights based only on nonfarm income averages may lead to some understatement of the contribu-tion of improved education to growth. As Bertram said,[3] the average educational attainments of the farm labour

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[1] They are unpublished but available on request from the Dominion Bureau of Statistics.

[2] This question was discussed by Bertram since his income weights were also based on nonfarm income. See Gordon W. Bertram, *The Contribution of Education to Economic Growth*, Economic Council of Canada Staff Study No. 12 (Ottawa: Queen's Printer, 1968), pp. 117-118.

[3] *Ibid.*, p. 118.

force are typically lower than those of the nonfarm labour force and the net effect is reflected in the educational structure of the entire labour force. The inclusion of farm incomes by level of schooling, based on an educational distribution of the farm labour force containing proportionately more people in the lower levels of schooling than the nonfarm labour force, would tend to slightly reduce the average income per person with lower educational attainments in relation to those with higher educational attainments. Thus, to the extent to which this would result in a widening of education-income differentials, the contribution of improved schooling to growth in income would be under-stated. If this were so, the understatement would be relatively more pronounced in provinces where the farm labour force constitutes a relatively larger share of the total labour force (the Western Provinces, for instance).

Income Estimates of People with Five Years of Secondary Schooling

Estimates of the average incomes associated with the fifth year of secondary schooling were required since people with that level of education were trans-ferred into the "some university" category (see Appendix C). Those estimates were made[1] by taking the average incomes of groups with one to three years of secondary schooling as equal to the incomes of persons with about two years of secondary schooling and the average incomes of groups with four and five years of secondary schooling as equal to the incomes of persons with about 4.5 years of secondary schooling. The difference in average incomes of these two groups, assumed to be separated by an average of 2.5 years, provided an estimate of the addition to income associated with a change in one year of schooling at the level of high school. As the average incomes of people having four and five years of high school were assumed to correspond to the average incomes of those with 4.5 years of secondary schooling, half of the yearly incre-ment (described above) was added to the average income of the four- and five-year group in order to derive the average incomes of those with five years of high school.

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[1] This procedure was used by Bertram for similar purposes. Bertram, *op. cit.*, pp. 115-116.

The above series of calculations were repeated for each of the provinces.[1] The resulting estimates of average incomes associated with five years of secondary schooling were then combined with the average incomes of those with "some university" education in order to get new average incomes for persons in the "some university" category (including the fifth year of secondary schooling).

The Case of Quebec

As indicated in Appendix C, the fifth year of secondary schooling in Quebec has not been transferred into the "some university" group because it corresponds in fact to Grade 12 (which has been considered as the terminal year of secondary schooling in the nine other provinces). For the same reason, average incomes associated with five years of high school in Quebec have not been shifted to the "some university" category. This means that the average incomes figures associated with elementary and secondary schooling in Quebec are not strictly comparable to those in the other provinces. A more extensive examination of this question is required.

Average incomes associated with elementary schooling in Quebec are based on the incomes of persons having one to seven years of education while, in the other provinces, they cover an elementary level comprising eight years of schooling. The result of this is to increase the apparent income disparity between Quebec and the other provinces. The same problem occurs at the secondary level because, in Quebec, it ranges from Grades 8 to 12 while, in the other provinces, it includes persons with 9 to 13 years of schooling (or 9 to 12, taking account of the adjustments described in Appendix C). Because of that, income comparisons between Quebec and the other provinces are not as appropriate as they might be and, by the same token, income averages for the country as a whole could be distorted.

Professor A. Raynauld encountered the same difficulty in a study prepared for the Royal Commission on

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[1]Linear adjustments were made to the provincial figures in order to produce a total of the provinces corresponding to the national figure.

Bilingualism and Biculturalism.[1] In order to appraise
the degree of distortion that such a difference could
introduce in the interprovincial comparisons, he esti-
mated income averages (by level of schooling) for Quebec
that were roughly comparable to those in the other
provinces. Those estimates were based on the distribu-
tion of the Quebec labour force by level of schooling
and on the average value of a typical year of schooling.

A comparison between the index of corrected income
and the index of actual income shows that the differences
are very small -- so small that Professor Raynauld
decided to simply ignore them. However, he observed
that average incomes associated with elementary schooling
in Quebec were about 2.5 per cent higher than the actual
incomes and 3.8 per cent higher at the secondary (1-2
years) level. Under these circumstances, the same
assumption is used in this Study.

Table E-1

COMPARISON BETWEEN ACTUAL AND CORRECTED AVERAGE INCOMES
BY LEVEL OF SCHOOLING, QUEBEC, 1961

	Actual Income	Corrected Income	Percentage Difference	Index of Corrected Income	Index of Actual Income
Elementary	3,124	3,203	102.5	100.0	100.0
Secondary (1-2 years)	3,695	3,837	103.8	119.8	118.3
Secondary (3-5 years)	4,614	4,614	100.0	144.1	147.7
University	6,961	6,961	100.0	217.3	222.8

Source: A. Raynauld, G. Marion and R. Béland, *La Répartition des Revenus selon
les Groupes Ethniques au Canada*, unpublished study prepared for the
Royal Commission on Bilingualism and Biculturalism, 1966, p. 6.34 and
Table 94.

Results

The end results are shown in index form in Table
E-2. After adjustment to reduce the differentials by
two-fifths, the results shown in Table E-3 were obtained.

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[1]Raynauld, Marion, and Béland, *op. cit.*, pp. 6.31-6.34.

Table E-2

INDEX OF AVERAGE INCOME FOR MALES

CANADA, BY PROVINCE AND BY REGION, 1961

(Secondary 9-11 = 100)

	No Schooling 0	Elementary 1-8	Secondary 9-11	Secondary 9-12	Some University 13-15	University Degree 16 or more
Newfoundland	57.1	74.2	100.0	101.3	129.9	254.3
Prince Edward Island	52.0	74.6	100.0	103.9	123.8	218.1
Nova Scotia	51.9	73.6	100.0	102.9	127.5	223.4
New Brunswick	46.1	71.6	100.0	100.1	106.6	205.3
Atlantic Region (excl. Nfld.)	49.1	73.2	100.0	101.9	118.8	216.9
Atlantic Region (incl. Nfld.)	51.4	73.3	100.0	102.3	121.4	223.8
Quebec	51.6	84.6	100.0	110.2	137.5	235.5
Ontario	59.1	89.0	100.0	104.4	127.2	227.0
Manitoba	46.7	81.2	100.0	102.4	114.0	211.4
Saskatchewan	35.4	85.2	100.0	103.8	111.7	227.6
Alberta	44.0	86.7	100.0	103.1	115.5	222.0
Prairie Region	42.2	84.6	100.0	103.1	113.8	220.4
British Columbia	52.0	90.5	100.0	102.8	112.4	216.6
Canada (excl. Nfld.)	50.9	85.0	100.0	104.1	126.5	277.3
Canada (incl. Nfld.)	50.4	84.6	100.0	104.1	127.1	228.3

Source: Calculated from unpublished DBS census data pertaining to nonfarm population, and estimates described in Appendix E.

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Table E-3

MALE AVERAGE INCOME DIFFERENTIALS* USED TO REPRESENT EFFECT OF EDUCATION CANADA, BY PROVINCE AND BY REGION, 1961

	No Schooling 0	Elementary 1-8	Secondary 9-11	Secondary 9-12	Some University 13-15	University Degree 16 or more
Newfoundland	74.2	84.5	100.0	100.8	118.0	192.6
Prince Edward Island	71.2	84.8	100.0	102.3	114.2	170.8
Nova Scotia	71.2	84.2	100.0	101.7	116.5	174.0
New Brunswick	67.7	83.0	100.0	104.4	108.3	167.5
Atlantic Region (excl. Nfld.)	69.4	83.9	100.0	101.1	111.3	170.1
Atlantic Region (incl. Nfld.)	70.8	84.0	100.0	101.4	112.8	174.3
Quebec	71.0	90.8	100.0	106.1	122.5	181.3
Ontario	75.5	93.4	100.0	102.7	116.4	176.3
Manitoba	68.0	88.7	100.0	101.5	108.5	166.9
Saskatchewan	61.2	91.1	100.0	102.3	107.0	176.5
Alberta	66.4	92.0	100.0	101.9	109.3	173.2
Prairie Region	65.2	90.6	100.0	101.7	108.8	172.2
British Columbia	71.2	94.3	100.0	101.7	107.5	170.0
Canada (excl. Nfld.)	70.5	91.0	100.0	102.5	115.9	176.4
Canada (incl. Nfld.)	70.3	90.8	100.0	102.4	116.2	176.9

* Differentials reduced to three-fifths.

Source: Calculated from unpublished DBS census data pertaining to nonfarm population, and estimates described in Appendix E.

Comparison Between Three Sets of "Income Weights"

　　Education-income differentials derived for Canada were obtained by averaging provincial income figures. Comparisons between the resulting Canadian weights and those already calculated in other studies provide a basis for cross-checking their accuracy.

Table E-4

COMPARISON BETWEEN THREE SETS OF EDUCATION-INCOME
DIFFERENTIALS*, CANADA, 1961

Years of Schooling	Bertram (Male)	Walters Male	Walters Female	This Study Male	This Study Female
0				70.3	76.7
0-4	75.3	74.3			
5-7	84.8				
8	92.1				
5-8		88.1			
1-8				90.8	90.7
0-8			86.1		
9-11	100.0	100.0	100.0	100.0	100.0
12	113.1			110.3	114.0
12-13		114.7	119.4		
14-15	125.1	123.8	142.6		
13-15	121.6			116.2	126.2
16 or more	170.0	169.7	175.0	176.9	166.8

* Differentials reduced to three-fifths.

Note:　The "weights" have been recalculated on the basis of incomes associated with Grades 9 to 11 being equal to 100.

Source:　Gordon W. Bertram, *The Contribution of Education to Economic Growth*, Economic Council of Canada Staff Study No. 12 (Ottawa: Queen's Printer, 1966), Table 20, p. 48; and Dorothy Walters, *Canadian Income Levels and Growth: An International Perspective*, Economic Council of Canada Staff Study No. 23 (Ottawa: Queen's Printer, 1968), Table N-10, p. 207. The "weights" for this Study have been computed from income data pertaining to nonfarm population.

　　Table E-4 shows that the male income differentials calculated for this Study were roughly comparable to those computed for the two other studies, although differentials associated with Grade 12, Grades 13 to 15,

and university degree are slightly different from those calculated by Bertram (and Walters).[1] On the other hand, female income differentials associated with "some university" and "university degree" are substantially lower in this Study than in Miss Walters' study. The fact that the incomes of part-time female workers and females not in the labour force are included in income data pertaining to female nonfarm population introduces some distortions in the corresponding average income figures. The only solution, therefore, was to apply male income weights to female labour force.

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[1]Bertram, *op. cit.*, and Dorothy Walters, *Canadian Income Levels and Growth: An International Perspective*, Economic Council of Canada Staff Study No. 23 (Ottawa: Queen's Printer, 1968).

APPENDIX F

STATISTICAL APPENDIX

Table F-1

NUMBER OF PUBLIC ELEMENTARY AND SECONDARY SCHOOL TEACHERS
BY PROVINCE, 1960-61 TO 1968-69

Year	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1960-61	4,317	969	6,664	5,866	45,694	49,292	7,460	8,638	11,762	11,868	152,530
1961-62	4,502	1,013	6,951	6,039	49,586	52,444	8,069	8,997	12,414	12,514	162,529
1962-63	4,789	1,072	7,176	6,268	53,885	55,787	8,253	9,246	13,136	13,311	172,923
1963-64	5,036	1,132	7,423	6,358	54,249	60,011	8,534	9,556	13,884	14,067	180,250
1964-65	5,351	1,166	7,638	6,577	57,753	64,129	8,975	9,996	14,702	14,879	191,166
1965-66	5,545	1,209	7,897	6,812	55,421	68,602	9,232	10,500	15,518	15,759	196,495
1966-67	5,644	1,318	8,033	6,927	60,938	73,943	9,432	10,923	16,358	16,966	210,482
1967-68	5,855	1,397	8,487	7,252	71,299	79,300	9,926	11,109	17,492	18,272	239,389
1968-69	6,206	1,458	8,912	7,537	74,888	84,790	10,819	11,489	18,770	19,486	244,355

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools,* various years. Quebec data for 1965-66 to 1968-69, however, are from Quebec Department of Education, *Statistiques de l'enseignement, Personnel enseignant.*

Table F-2

MEDIAN TENURE OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS
1960-61 AND 1967-68

Provinces	1960-61 Elementary			1960-61 Secondary			1967-68 Elementary			1967-68 Secondary		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Newfoundland	0.0	1.4	1.2	2.2	2.3	2.2	1.4	1.7	1.6	2.0	1.7	1.9
Prince Edward Island	1.4	2.0	1.9	2.8	2.5	2.7	1.6	2.4	2.3	2.0	2.3	2.1
Nova Scotia	2.5	4.4	4.2	3.7	3.8	3.8	2.7	5.8	5.2	3.1	4.0	3.4
New Brunswick	1.3	2.7	2.5	2.7	4.0	3.1	2.0	4.6	4.2	3.2	3.7	3.4
Quebec	--	--	--	--	--	--	2.8[1]	3.9[1]	3.8[1]	2.8[1]	2.6[1]	2.6[1]
Ontario	3.0	2.8	2.8	3.5	2.7	3.2	3.6	2.6	2.8	2.9	1.9	2.6
Manitoba	1.6	2.4	2.1	2.2	3.3	2.6	2.2	2.0	2.0	2.8	2.4	2.7
Saskatchewan	1.9	2.4	2.2	3.5	2.7	3.2	2.9	2.9	2.9	3.0	2.7	2.9
Alberta	2.9	3.1	3.1	3.9	3.7	3.8	3.3	3.8	3.7	3.0	2.9	2.9
British Columbia	3.2	3.0	3.0	4.8	4.0	4.6	3.7	2.5	2.8	4.0	3.1	3.8
Canada[2]	--	--	2.7	--	--	3.5	3.2	2.8	2.9	3.0	2.4	2.8

(1) 1966-67 data.

(2) Does not include Quebec since data for 1960-61 were not available.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools*, various years; and Quebec Department of Education.

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Table F-3

MEDIAN YEARS' EXPERIENCE OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS
CANADA, BY PROVINCE, 1960-61 TO 1968-69

NEWFOUNDLAND

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	2.1	3.4	2.9	8.9	12.3	9.8
1961-62	2.1	3.5	3.1	7.3	11.1	8.6
1962-63	2.7	3.4	3.2	6.0	10.0	7.2
1963-64	2.7	3.6	3.3	6.1	8.9	6.7
1964-65	2.7	3.5	3.3	5.7	10.1	6.9
1965-66	2.9	3.7	3.5	6.3	9.4	6.9
1966-67	3.0	4.0	3.8	6.5	8.9	7.0
1967-68	3.5	4.3	4.0	6.6	8.0	6.9
1968-69	4.2	4.8	4.6	5.7	6.9	6.0

NOVA SCOTIA

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	5.7	10.1	9.7	8.7	12.1	10.2
1961-62	5.2	10.4	10.0	8.9	12.7	10.5
1962-63	5.3	10.8	10.3	8.7	12.2	10.5
1963-64	5.3	11.2	10.6	7.7	11.5	9.6
1964-65	4.9	11.3	10.6	8.1	11.7	9.9
1965-66	5.6	11.5	10.9	7.4	11.4	9.9
1966-67	5.8	11.7	10.9	7.1	11.5	8.6
1967-68	5.9	11.8	10.9	6.9	10.5	8.2
1968-69	6.2	11.2	10.2	6.0	9.3	7.2

QUEBEC

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	8.4	6.6	6.8	10.7	13.9	12.3
1961-62	--	--	--	--	--	--
1962-63	--	--	--	--	--	--
1963-64	--	--	--	--	--	--
1964-65	--	--	--	--	--	--
1965-66	5.0	6.5	6.3	7.5	9.7	6.4
1966-67	4.9	6.5	6.3	6.9	8.5	7.6
1967-68	--	--	7.6	--	--	7.0
1968-69	--	--	7.9	--	--	5.9

PRINCE EDWARD ISLAND

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	4.2	6.9	6.8	6.9	13.8	12.1
1961-62	4.3	7.6	7.2	5.7	12.7	9.9
1962-63	4.0	7.5	7.3	5.5	11.7	9.3
1963-64	4.3	8.0	7.7	3.9	10.7	7.8
1964-65	3.8	8.7	8.1	4.2	10.0	6.9
1965-66	3.8	9.1	8.6	4.7	10.1	6.5
1966-67	6.8	8.9	8.7	4.5	8.9	6.1
1967-68	4.8	9.0	8.7	5.0	8.8	6.0
1968-69	5.3	9.2	8.7	5.6	9.7	6.9

NEW BRUNSWICK

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	3.2	8.0	7.3	6.6	11.0	8.5
1961-62	3.0	8.0	7.2	6.7	10.4	8.3
1962-63	3.9	8.7	8.0	7.8	11.9	9.5
1963-64	4.2	8.7	8.0	6.9	10.3	8.1
1964-65	3.8	8.9	8.3	6.7	10.3	7.7
1965-66	4.1	9.1	8.4	6.5	9.3	7.6
1966-67	3.4	9.3	8.5	5.9	9.0	7.1
1967-68	3.7	9.1	8.4	6.0	8.4	6.9
1968-69	4.4	8.7	8.0	6.2	8.3	6.8

ONTARIO

	Elementary			Secondary		
	Male	Female	Total	Male	Female	Total
1960-61	6.2	7.1	6.9	8.8	6.8	8.2
1961-62	5.8	7.0	6.6	7.8	5.9	7.1
1962-63	5.6	6.8	6.5	6.7	5.4	6.3
1963-64	5.6	6.9	6.6	5.9	4.9	5.6
1964-65	5.6	6.9	6.5	5.8	4.7	5.4
1965-66	5.7	6.4	6.2	5.6	4.3	5.2
1966-67	5.8	6.0	5.9	5.6	4.7	5.3
1967-68	6.5	6.0	6.2	5.6	3.9	5.1
1968-69	--	--	--	--	--	--

(cont'd.)

Table F-3 (concluded)

MANITOBA

Year	Elementary Male	Elementary Female	Elementary Total	Secondary Male	Secondary Female	Secondary Total
1960-61	5.1	7.5	6.9	8.9	10.8	9.4
1961-62	5.1	7.4	6.7	7.7	9.8	8.4
1962-63	5.3	7.6	6.8	7.3	9.3	8.0
1963-64	5.1	7.6	6.8	7.1	9.1	7.8
1964-65	5.1	7.5	6.7	7.3	8.2	7.4
1965-66	5.6	7.0	6.6	7.4	7.1	7.3
1966-67	5.8	6.2	6.1	6.9	7.1	7.3
1967-68	6.5	6.3	6.4	6.6	5.7	6.6
1968-69	7.1	6.0	6.3		5.4	6.2

ALBERTA

Year	Elementary Male	Elementary Female	Elementary Total	Secondary Male	Secondary Female	Secondary Total
1960-61	8.0	9.1	8.9	11.4	12.0	11.6
1961-62	7.8	9.5	9.3	10.9	12.0	11.3
1962-63	6.8	9.6	9.2	10.4	11.8	10.9
1963-64	6.6	10.0	9.4	9.2	11.3	10.1
1964-65	6.5	10.0	9.3	8.5	10.6	9.3
1965-66	6.8	9.9	9.3	7.7	10.2	8.5
1966-67	7.3	9.4	9.0	7.1	9.1	7.7
1967-68	7.8	9.5	9.2	6.9	8.5	7.2
1968-69	7.1	9.0	8.4	7.0	7.7	7.2

SASKATCHEWAN

Year	Elementary Male	Elementary Female	Elementary Total	Secondary Male	Secondary Female	Secondary Total
1960-61	6.4	8.2	7.9	12.2	12.5	12.2
1961-62	6.0	8.3	7.8	12.5	11.9	12.3
1962-63	5.3	8.3	7.5	12.3	12.1	12.2
1963-64	5.0	8.4	7.4	11.9	12.5	12.1
1964-65	5.3	7.9	7.1	11.0	12.2	11.4
1965-66	-	-	-	-	-	-
1966-67	5.4	6.6	6.3	9.5	10.2	9.7
1967-68	6.3	6.7	7.3	8.7	9.5	9.0
1968-69	6.3	7.6	7.2	8.3	8.2	8.2

BRITISH COLUMBIA

Year	Elementary Male	Elementary Female	Elementary Total	Secondary Male	Secondary Female	Secondary Total
1960-61	6.6	7.6	7.3	10.0	10.9	10.2
1961-62	6.6	7.5	7.2	10.3	11.2	10.5
1962-63	6.9	7.5	7.2	10.4	10.7	10.5
1963-64	7.3	7.5	7.4	10.4	10.7	10.5
1964-65	7.6	7.2	7.3	10.0	10.1	10.0
1965-66	7.6	6.9	7.0	9.8	9.2	9.7
1966-67	7.5	6.7	6.9	9.4	8.9	9.2
1967-68	7.5	6.5	6.7	8.9	8.4	8.8
1968-69	7.8	6.5	6.9	8.6	7.8	8.4

CANADA

Year	Elementary Male	Elementary Female	Elementary Total	Secondary Male	Secondary Female	Secondary Total
1960-61	-	-	7.1	-	-	10.5
1961-62	5.6	7.6	7.0	9.2	9.5	9.3
1962-63	5.5	7.5	7.0	8.3	8.9	8.5
1963-64	5.5	7.6	7.1	7.7	8.3	7.9
1964-65	5.5	7.6	7.0	7.2	7.7	7.4
1965-66	5.7	7.2	6.8	6.7	6.7	6.7
1966-67	5.8	6.8	6.6	6.6	6.6	6.6
1967-68	-	-	7.3	-	-	6.5
1968-69	-	-	-	-	-	-

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools*, various years, and Quebec Department of Education.

Table F-4

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] NEWFOUNDLAND, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	54.5	31.3	8.2	2.4	3.6	8.0	21.7	17.4	12.9	39.7
1961-62	52.4	32.3	8.9	2.6	3.8	7.4	21.1	18.3·	13.8	39.0
1962-63	48.4	35.2	9.4	3.0	3.6	7.0	19.2	18.6	13.0	41.7
1963-64	45.5	38.0	9.0	3.0	4.4	5.1	22.2	19.5	13.0	40.2
1964-65	43.2	38.7	9.8	3.6	4.8	4.5	18.3	19.2	12.6	45.4
1965-66	39.5	40.5	10.8	3.8	5.4	3.1	18.1	18.3	13.5	46.8
1966-67	35.6	42.2	11.3	4.0	6.9	2.9	17.8	17.1	12.2	49.9
1967-68	32.6	41.4	12.1	4.4	9.5	3.5	15.3	14.1	11.2	55.9
1968-69	25.9	40.2	14.4	5.8	13.7	2.5	13.5	14.7	10.8	58.6

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

Table F-5

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL, [1] PRINCE EDWARD ISLAND, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	42.1	47.5	6.5	2.1	1.7	5.7	38.2	18.5	12.7	24.8
1961-62	36.6	50.6	7.8	2.8	2.3	5.1	32.2	19.2	11.3	29.9
1962-63	29.7	53.8	10.0	3.7	2.8	2.3	30.0	15.0	12.7	39.9
1963-64	25.5	53.6	11.8	4.9	4.0	1.3	25.1	17.4	11.5	43.0
1964-65	26.8	48.9	14.9	4.8	4.5	3.0	17.7	20.3	10.7	46.1
1965-66	26.6	47.3	16.9	5.1	3.8	6.7	16.0	21.0	10.3	43.7
1966-67	22.8	44.8	21.3	5.2	5.9	7.1	12.6	15.9	13.7	50.7
1967-68	20.5	38.9	24.4	7.5	8.6	5.6	12.7	12.9	10.9	57.9
1968-69	17.0	37.9	25.6	8.7	10.9	1.0	10.9	10.2	9.5	68.4

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

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Table F-6

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] NOVA SCOTIA, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	12.8	24.4	41.8	6.5	14.5	3.0	3.5	15.1	8.7	67.4
1961-62	10.9	23.9	42.9	7.2	15.0	2.8	3.5	13.6	8.8	68.5
1962-63	10.4	22.3	42.2	8.9	16.2	2.4	3.5	13.8	8.4	69.8
1963-64	9.9	20.2	42.2	10.0	17.6	3.5	3.0	11.7	10.0	68.6
1964-65	10.0	18.5	39.9	12.5	19.0	3.2	2.5	10.8	9.7	69.7
1965-66	9.9	16.8	38.7	13.9	20.6	4.3	2.2	8.4	10.4	71.3
1966-67	9.5	15.3	35.5	16.8	22.9	3.8	1.5	8.1	11.1	75.5
1967-68	8.6	13.6	33.2	18.3	26.3	3.2	1.8	7.6	11.8	75.5
1968-69	7.3	11.9	30.2	19.1	31.5	3.2	1.4	5.6	12.5	77.4

[1] The totals do not add to 100 per cent in all cases because of the exclusion of teachers classified as holding special or vocational unclassified certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools*, various years.

Table F-7

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] NEW BRUNSWICK, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	19.1	54.1	17.9	3.6	5.4	4.0	25.5	18.6	8.0	43.7
1961-62	17.3	53.2	19.4	4.4	5.7	3.4	22.2	20.7	9.4	43.2
1962-63	16.2	49.0	22.9	5.8	6.0	3.3	18.1	20.4	10.8	46.5
1963-64	17.7	42.6	24.2	7.5	7.9	2.9	14.0	19.4	13.5	49.8
1964-65	18.1	36.9	24.9	11.8	8.3	2.7	14.2	15.0	15.8	51.7
1965-66	17.7	31.5	22.7	18.3	9.9	2.5	11.0	12.3	18.3	54.9
1966-67	15.9	28.0	42.5	5.7	7.9	2.5	9.3	28.2	9.2	50.3
1967-68	12.1	24.6	47.5	6.9	8.8	1.1	6.3	29.2	11.6	51.8
1968-69	9.3	19.9	45.5	10.9	14.3	1.4	5.2	23.3	11.9	58.1

[1] The totals do not add to 100 per cent in all cases because of the exclusion of teachers classified as holding special or vocational unclassified certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers in Public Elementary and Secondary Schools*, various years.

Table F-8

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] QUEBEC, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	10.7	47.1	24.6	12.1	5.5	9.5	10.2	21.5	41.1	17.6
1961-62)										
1962-63) not estimated										
1963-64)										
1964-65)										
1965-66	28.3	13.1	45.4	7.2	6.0	35.6	1.4	15.6	17.6	29.9
1966-67	9.2	21.7	54.3	6.3	8.5	30.8	3.3	18.3	14.0	33.6
1967-68	10.3	19.5	51.4	8.1	10.7	36.0	2.5	16.1	10.5	34.9
1968-69	10.3	17.5	52.1	7.5	12.6	39.2	2.2	14.6	8.4	35.6

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Based on data from Quebec Department of Education.

Table F-9

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] ONTARIO, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	6.5	9.8	82.3	0.3	1.1	13.6	--	9.2	--	76.4
1961-62	3.0	9.4	86.1	0.3	1.1	15.9	--	8.8	--	74.3
1962-63	1.3	8.3	89.1	0.5	0.8	18.9	--	9.1	--	72.0
1963-64	1.2	8.0	86.2	0.3	4.2	19.6	--	9.8	--	69.8
1964-65	1.2	7.5	86.1	0.4	4.7	19.5	--	10.7	--	69.2
1965-66	1.3	7.4	85.1	0.6	5.1	16.1	--	14.2	--	68.0
1966-67	1.1	4.7	80.9	0.6	5.2	11.4	[2]	12.3	--	61.2
1967-68	4.9	3.9	55.4	18.1	17.4	0.3	1.7	11.1	3.1	83.5
1968-69	----------------------not available-----------------------									

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

[2] Less than .05.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

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Table F-10

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] MANITOBA, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	2.5	20.2	69.7	--	7.7	9.9	1.7	28.6	--	54.0
1961-62	1.0	18.2	73.9	--	6.6	10.2	1.1	27.0	--	56.2
1962-63	1.1	13.0	78.3	--	7.2	9.1	0.7	26.2	--	58.1
1963-64	2.5	10.3	79.5	--	7.4	8.7	0.7	24.8	--	60.2
1964-65	2.7	12.1	77.4	--	7.5	9.7	1.2	22.3	--	60.9
1965-66	3.2	13.7	74.9	--	8.1	10.3	1.6	22.2	--	62.0
1966-67	4.0	14.3	72.9	--	8.3	10.3	1.9	20.9	--	60.1
1967-68	3.6	5.2	80.6	--	10.3	11.4	0.6	21.0	--	62.0
1968-69	3.5	14.2	68.5	--	13.4	11.5	3.2	18.8	--	66.5

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

Table F-11

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] SASKATCHEWAN, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	1.6	2.7	52.3	34.0	4.4	1.4	0.7	9.1	29.9	57.2
1961-62	1.1	2.3	55.2	36.6	4.6	1.5	0.8	9.2	28.9	56.3
1962-63	0.7	1.6	50.9	41.8	4.8	1.7	0.2	8.1	29.7	57.0
1963-64	0.7	1.6	47.1	44.8	5.7	2.0	0.3	7.4	30.0	57.0
1964-65	1.1	1.2	43.0	48.2	6.3	3.1	0.1	6.4	29.1	59.1
1965-66	----------------------not available----------------------									
1966-67	2.6	1.0	29.9	57.3	9.1	2.6	0.1	4.1	27.2	65.4
1967-68	2.3	0.9	24.7	60.5	11.4	3.9	0.1	3.6	27.4	64.1
1968-69	2.6	0.9	20.0	62.5	13.8	4.6	0.1	2.9	24.9	67.5

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

Table F-12

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] ALBERTA, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	9.0	6.4	52.8	19.9	11.9	3.3	0.7	19.2	20.0	56.7
1961-62	7.5	4.4	51.2	22.9	14.0	2.8	0.3	16.5	22.2	58.2
1962-63	6.2	5.0	51.3	23.1	14.4	2.2	0.6	15.4	20.7	61.1
1963-64	5.8	4.3	47.8	25.0	17.0	2.1	0.5	13.7	20.2	63.3
1964-65	5.5	3.9	44.1	27.5	19.0	2.8	0.5	12.3	19.7	64.6
1965-66	6.4	3.5	40.6	28.2	21.3	3.4	0.4	10.6	20.9	64.7
1966-67	6.7	3.4	36.2	29.7	24.0	3.9	0.3	9.4	21.0	65.4
1967-68	6.8	2.8	31.7	31.8	27.0	2.9	0.4	8.5	22.6	65.5
1968-69	5.5	2.1	26.0	31.4	34.9	2.2	0.2	5.8	21.5	70.4

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

Table F-13

PERCENTAGE DISTRIBUTION OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS,
BY CERTIFICATE LEVEL,[1] BRITISH COLUMBIA, 1960-61 TO 1968-69

Year	Elementary					Secondary				
	0	1	2	3	4+	0	1	2	3	4+
1960-61	1.4	11.2	51.6	15.7	19.8	2.8	1.6	9.0	6.2	80.4
1961-62	1.2	10.0	53.2	16.2	19.4	1.8	1.1	9.3	6.9	80.7
1962-63	1.2	8.3	53.0	17.9	19.6	2.1	0.8	8.2	6.5	79.6
1963-64	1.4	6.8	50.6	19.9	21.2	2.3	0.8	7.8	6.7	81.0
1964-65	1.0	5.7	47.8	23.8	21.6	2.1	0.7	7.5	7.4	81.2
1965-66	0.8	5.0	43.2	25.6	25.5	1.8	0.4	6.8	7.3	83.2
1966-67	1.5	3.5	39.4	27.7	28.0	2.5	0.5	6.0	7.7	82.7
1967-68	0.7	2.8	37.5	28.5	30.6	2.4	0.4	6.2	7.3	83.6
1968-69	0.5	2.0	33.3	28.9	35.2	1.7	0.5	5.3	6.7	85.7

[1] The totals do not add to 100 per cent in all cases because of the exclusion
of teachers classified as holding special or vocational unclassified
certificates.

Source: Dominion Bureau of Statistics, *Salaries and Qualifications of Teachers
in Public Elementary and Secondary Schools*, various years.

Table F-14

PERCENTAGE OF PUBLIC SCHOOL TEACHERS AND PRINCIPALS WITH UNIVERSITY DEGREES, BY PROVINCE
1960-61 TO 1968-69

	Elementary	Secondary	Total	Elementary	Secondary	Total	Elementary	Secondary	Total
	NEWFOUNDLAND			PRINCE EDWARD ISLAND			NOVA SCOTIA		
1960-61	4.4	39.7	10.7	2.2	33.1	7.2	13.8	54.1	23.8
1961-62	4.7	40.0	11.3	2.3	33.1	7.7	14.3	53.3	24.7
1962-63	4.6	41.5	12.1	2.1	33.8	8.4	15.1	54.0	25.7
1963-64	4.6	42.2	12.6	2.9	41.7	11.0	13.0	61.5	27.0
1964-65	4.7	45.1	13.3	2.3	41.0	11.3	13.6	61.7	28.3
1965-66	5.1	45.6	14.0	2.5	41.0	12.1	14.9	61.8	30.0
1966-67	6.0	46.4	15.3	2.8	47.1	15.1	16.5	64.9	32.0
1967-68	8.1	50.8	18.2	5.7	51.3	19.1	19.2	65.1	34.5
1968-69	11.5	53.3	21.6	6.4	54.5	19.7	24.2	68.1	37.5
	NEW BRUNSWICK			QUEBEC			ONTARIO		
1960-61	5.6	38.5	14.1	8.9	36.2	14.8	8.8	88.0	27.4
1961-62	5.8	38.0	14.5	--	--	--	11.1	93.9	32.0
1962-63	5.3	38.1	14.5	--	--	--	9.1	85.6	30.1
1963-64	--	--	--	--	--	--	10.1	83.3	31.7
1964-65	5.9	45.8	18.7	--	--	--	10.6	82.1	32.6
1965-66	6.1	48.1	19.9	4.4	37.6	18.5	11.1	81.2	33.7
1966-67	7.7	49.8	21.4	6.0	41.2	21.6	11.2	74.6	34.2
1967-68	8.8	50.4	23.6	8.7	43.5	24.4	13.0	78.9	35.1
1968-69	14.1	56.6	27.2	10.0	46.8	25.5	--	--	--

(cont'd.)

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Table F-14 (concluded)

	Elementary	Secondary	Total	Elementary	Secondary	Total	Elementary	Secondary	Total
	MANITOBA			**SASKATCHEWAN**			**ALBERTA**		
1960-61	12.3	56.4	25.6	4.4	57.4	16.7	14.5	54.1	27.7
1961-62	10.7	57.1	24.5	5.0	56.5	18.0	16.0	55.6	29.6
1962-63	11.1	59.7	25.8	5.4	58.2	19.6	17.7	56.1	31.4
1963-64	8.3	68.8	27.0	5.8	59.3	21.0	14.9	65.5	33.5
1964-65	8.4	69.2	28.3	6.4	60.2	22.8	16.6	65.9	35.9
1965-66	9.0	68.7	29.3	--	--	--	18.9	66.7	38.4
1966-67	9.4	70.1	30.9	9.3	64.0	28.0	21.9	68.4	41.5
1967-68	11.2	72.2	33.4	11.6	63.5	30.3	24.9	69.2	44.2
1968-69	15.6	74.3	36.0	14.2	66.8	32.5	33.9	75.6	48.5
				BRITISH COLUMBIA					
1960-61				25.1	56.6	37.0			
1961-62				23.8	58.4	37.4			
1962-63				24.0	60.6	38.9			
1963-64				18.5	71.9	40.5			
1964-65				19.0	72.4	42.3			
1965-66				22.5	73.3	44.2			
1966-67				25.3	74.8	46.3			
1967-68				28.3	76.0	48.5			
1968-69				32.3	77.3	50.8			

Table F-15

ATTENDANCE[1] IN EDUCATIONAL INSTITUTIONS AS PROPORTION OF TOTAL POPULATION,
BY AGE AND SEX, CANADA, BY PROVINCE, JUNE 1, 1961

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Age 5											
Male	20.8	16.7	6.1	31.9	3.5	7.4	37.3	22.0	12.1	14.6	19.7
Female	21.1	18.2	7.3	33.8	3.4	7.3	37.7	21.7	12.1	14.6	19.7
Total	21.0	17.4	6.7	32.8	3.4	7.4	37.5	21.8	12.1	14.6	19.7
Age 6											
Male	68.5	69.5	62.7	92.9	55.3	55.2	83.9	69.0	60.2	59.1	64.7
Female	69.0	71.3	62.8	93.9	55.2	55.7	84.3	69.5	61.2	60.0	64.3
Total	68.7	70.4	62.7	93.4	55.2	55.4	84.1	69.2	60.7	59.6	64.5
Age 7											
Male	96.1	94.6	96.5	96.5	95.3	95.4	97.1	96.6	95.0	96.7	96.8
Female	96.3	95.3	95.2	96.6	96.0	95.7	97.3	96.6	95.2	96.7	96.9
Total	96.2	94.9	95.9	96.6	95.7	95.5	97.2	96.6	95.1	96.7	96.9
Age 8											
Male	97.2	96.2	98.4	97.5	96.8	96.8	97.7	97.7	96.3	98.0	97.6
Female	97.4	96.1	98.1	98.8	97.4	97.2	97.8	97.9	97.1	97.9	97.6
Total	97.3	96.2	98.3	97.7	97.1	97.0	97.7	97.8	96.7	97.9	97.6
Age 9											
Male	97.4	96.8	98.0	97.4	97.3	97.1	97.7	97.8	96.9	98.0	97.8
Female	97.5	96.6	97.7	97.4	97.4	97.2	97.9	97.8	97.1	98.0	97.8
Total	97.5	96.7	97.9	97.4	97.3	97.2	97.8	97.8	97.0	98.0	97.8
Age 10											
Male	97.5	96.4	97.0	97.3	97.5	97.2	97.7	97.7	96.9	98.0	97.8
Female	97.6	97.2	98.3	97.6	97.7	97.2	97.8	97.8	97.1	98.0	97.8
Total	97.5	96.8	97.6	97.4	97.6	97.2	97.8	97.8	97.0	98.0	97.8

(cont'd.)

Table F-15 (cont'd.)

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Age 11											
Male	97.5	96.8	97.4	98.0	97.7	97.2	97.9	97.8	97.0	97.9	97.7
Female	97.7	96.6	97.3	98.0	97.7	97.4	98.0	97.9	97.1	98.1	98.1
Total	97.6	96.7	97.4	98.0	97.7	97.3	97.9	97.8	97.0	98.0	97.8
Age 12											
Male	96.9	95.7	96.8	96.7	97.3	96.8	97.0	97.3	96.8	97.6	97.3
Female	97.2	96.2	97.4	96.7	97.5	97.0	97.4	97.8	96.6	97.8	97.5
Total	97.1	96.0	97.1	96.7	97.4	96.9	97.2	97.5	96.7	97.7	97.4
Age 13											
Male	97.2	96.7	97.6	97.2	97.0	96.7	97.5	98.0	97.0	98.1	97.5
Female	97.3	96.8	97.5	97.3	97.4	96.6	97.7	97.8	97.4	98.1	97.6
Total	97.3	96.7	97.6	97.3	97.2	96.7	97.6	97.9	97.2	98.1	97.6
Age 14											
Male	96.1	95.9	95.4	96.1	95.6	94.6	96.9	97.0	96.4	97.6	97.4
Female	95.6	95.6	97.2	96.0	94.9	92.7	97.1	97.1	96.6	97.9	97.1
Total	95.9	95.7	96.3	96.0	95.3	93.7	97.0	97.1	96.5	97.8	97.2
Age 15											
Male	89.4	89.3	84.8	89.9	86.8	84.7	92.8	90.7	90.8	92.8	93.4
Female	88.7	88.5	90.3	91.2	87.2	80.5	93.6	92.1	92.4	94.5	93.6
Total	89.1	88.9	87.5	90.5	87.0	82.6	93.2	91.4	91.6	93.6	93.5
Age 16											
Male	76.4	70.2	62.6	75.7	69.2	68.6	81.9	79.6	78.8	83.5	86.1
Female	74.9	66.9	75.4	77.1	72.0	62.8	81.1	81.7	84.2	85.3	86.2
Total	75.7	68.6	68.9	76.4	70.6	65.8	81.5	80.6	81.5	84.4	86.2
Age 17											
Male	60.4	49.8	45.8	57.4	53.2	50.6	65.6	67.2	65.9	70.0	74.4
Female	56.7	42.4	61.1	59.6	57.0	42.6	62.2	63.4	71.7	69.9	73.4
Total	58.6	46.2	53.4	58.4	55.0	46.6	63.9	65.4	68.7	70.0	73.9

(cont'd.)

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Table F-15 (cont'd.)

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Age 18											
Male	44.5	29.7	30.9	37.1	39.3	35.4	49.9	49.4	52.0	53.6	56.8
Female	34.6	20.4	41.6	35.3	38.3	24.8	38.7	36.5	47.0	43.1	46.3
Total	39.6	25.0	35.9	36.2	38.9	30.1	44.4	43.0	49.5	48.4	51.7
Age 19											
Male	28.9	14.3	19.7	22.2	25.9	23.9	34.0	29.5	31.6	33.3	34.5
Female	17.6	8.4	19.7	15.7	18.5	13.4	20.4	17.0	24.2	20.6	21.7
Total	23.3	11.4	19.7	19.1	22.4	18.6	27.2	23.4	28.0	26.9	28.2
Age 20											
Male	18.9	8.5	13.3	12.2	15.4	17.4	22.2	18.8	19.4	19.4	21.6
Female	9.7	4.5	9.0	8.8	8.5	8.1	11.1	8.9	12.9	10.9	11.9
Total	14.3	6.5	11.1	10.6	12.0	12.6	16.6	13.7	16.2	15.1	16.7
Age 21											
Male	13.5	6.2	10.3	7.8	10.0	13.0	15.3	13.9	13.4	13.0	15.8
Female	5.7	3.1	5.1	4.9	5.3	4.9	6.5	5.0	7.3	5.8	7.1
Total	9.6	4.7	7.8	6.4	7.7	8.9	10.8	9.5	10.4	9.4	11.5
Age 22											
Male	10.0	4.6	7.0	6.8	7.8	9.4	8.9	10.3	10.3	9.3	12.0
Female	3.4	1.6	2.8	2.9	3.3	2.8	3.9	3.1	4.2	3.3	4.3
Total	6.6	3.1	5.0	4.9	5.5	6.0	7.5	6.7	7.3	6.3	8.2
Age 23											
Male	7.8	3.7	5.7	5.4	6.2	7.9	8.3	8.1	7.6	7.4	9.2
Female	2.3	1.3	2.4	2.1	1.9	2.2	2.4	2.2	2.2	2.2	2.8
Total	5.0	2.5	4.2	3.8	4.0	5.0	5.3	5.2	4.9	4.8	6.0
Age 24											
Male	5.8	2.9	4.9	4.5	4.2	5.8	6.0	6.9	5.7	5.8	7.3
Female	1.5	1.0	2.1	1.5	1.8	1.5	1.5	1.4	1.8	1.4	1.9
Total	3.7	2.0	3.5	3.0	3.0	3.6	3.7	4.2	3.8	3.6	4.6

(cont'd.)

Table F-15 (concluded)

	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.
Age 25											
Male	4.1	1.8	2.2	2.8	2.8	4.1	4.0	5.1	4.3	4.4	5.1
Female	1.2	1.1	1.7	1.1	1.2	1.2	1.2	1.2	1.5	1.2	1.2
Total	2.6	1.5	1.9	2.0	2.0	2.6	2.6	3.2	2.9	2.8	3.2
Age 26											
Male	3.2	1.3	1.6	3.0	2.0	3.1	3.3	3.8	3.2	3.1	3.8
Female	1.1	1.2	0.8	1.4	0.6	1.0	1.0	1.3	1.3	1.2	1.2
Total	2.1	1.3	1.2	2.2	1.3	2.0	2.1	2.6	2.3	2.2	2.5
Age 27											
Male	2.3	1.1	1.8	2.0	1.4	2.2	2.2	3.0	2.5	2.4	3.1
Female	0.9	0.9	0.9	0.9	0.8	0.8	0.9	1.0	1.0	0.7	1.0
Total	1.6	1.0	1.4	1.5	1.1	1.5	1.6	2.1	1.8	1.6	2.1
Age 28											
Male	2.0	0.9	1.0	1.7	1.7	1.7	2.1	2.5	2.2	2.2	2.6
Female	0.9	1.0	1.1	0.1	1.4	0.8	0.8	1.3	0.9	0.9	1.0
Total	1.4	0.9	1.1	1.4	1.6	1.2	1.4	1.9	1.6	1.5	1.8
Age 29											
Male	1.7	1.4	1.2	1.1	1.5	1.5	1.8	2.4	2.0	1.8	2.8
Female	0.8	1.1	0.8	0.6	0.9	0.8	0.8	1.0	0.9	0.7	1.0
Total	1.3	1.3	1.0	0.9	1.2	1.1	1.3	1.7	1.5	1.3	1.6

(1) A person was considered as attending school if his main daytime activity at any time between September 1960 and June 1, 1961 was attending an elementary or secondary school, university or an institution providing an equivalent type of general education.

Source: Based on special tabulation of census data for 1961 by Dominion Bureau of Statistics.

Table F-16

ENROLMENT IN PUBLIC ELEMENTARY AND SECONDARY SCHOOLS, BY PROVINCE, 1953-54 TO 1968-69

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1953-54	92,364	20,368	146,388	117,381	757,980	933,104	146,619	170,415	201,420	210,744	2,796,783
1954-55	97,800	20,597	151,652	122,359	810,894	979,609	153,233	177,019	212,705	224,448	2,950,316
1955-56	102,633	21,499	156,847	127,134	853,328	1,037,274	160,171	181,152	223,949	241,477	3,105,464
1956-57	108,108	21,967	160,299	131,054	891,598	1,097,501	165,260	182,883	234,397	260,177	3,253,244
1957-58	113,243	21,927	164,255	133,515	942,799	1,174,642	164,046	187,739	247,219	280,181	3,429,566
1958-59	119,279	22,702	171,386	141,786	988,964	1,249,673	167,299	198,847	261,554	292,403	3,613,893
1959-60	124,867	24,151	177,092	147,836	1,033,622	1,319,225	178,116	202,310	277,920	306,021	3,791,160
1960-61	128,917	24,537	179,395	152,289	1,098,057	1,389,163	189,573	208,679	294,435	321,312	3,986,357
1961-62	133,747	25,748	186,326	155,216	1,158,848	1,462,230	194,854	215,625	307,702	341,219	4,181,515
1962-63	137,700	26,277	190,527	156,491	1,208,754	1,528,607	204,172	220,345	322,227	359,320	4,354,420
1963-64	140,735	27,274	194,410	160,801	1,258,688	1,597,374	212,644	227,641	336,652	378,387	4,534,606
1964-65	144,129	27,787	197,496	164,124	1,311,728	1,673,774	218,770	233,213	350,906	399,944	4,721,871
1965-66	146,503	27,854	199,856	165,228	1,361,086	1,738,781	222,249	238,320	362,159	420,847	4,882,883
1966-67	148,352	28,597	200,681	166,750	1,413,245	1,800,897	244,531	242,137	372,894	445,633	5,043,717
1967-68	151,976	29,217	204,607	169,703	1,505,289	1,868,788	231,650	245,526	385,972	468,659	5,261,387
1968-69	156,310	29,442	208,838	172,378	1,568,991	1,931,397	240,132	249,662	401,587	481,426	5,440,163

Source: Dominion Bureau of Statistics and Quebec Department of Education.

Table F-17

OPERATING COSTS OF PUBLIC SCHOOL BOARDS, CANADA, BY PROVINCE, 1954 TO 1968

(Thousands of dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	6,056	1,559	14,489	13,942	83,864	163,882	23,162	30,400	39,667	46,218	423,239
1955	7,186	1,604	15,838	13,405	95,039	187,161	25,182	33,230	44,146	51,525	474,316
1956	7,783	1,713	19,576	15,367	108,185	211,388	27,551	36,000	49,132	57,353	534,048
1957	8,470	1,876	21,707	17,245	123,677	239,281	30,477	40,060	56,650	67,365	606,808
1958	10,118	2,050	23,801	19,132	141,975	273,717	33,802	45,588	66,026	78,963	695,172
1959	11,825	2,512	26,698	21,059	161,805	315,523	40,243	51,951	75,769	90,411	797,796
1960	13,497	3,008	29,425	23,357	185,937	353,875	46,282	57,053	86,304	102,539	901,277
1961	14,722	3,231	32,571	25,254	225,181	389,029	50,701	61,681	96,764	109,327	1,008,461
1962	16,036	3,899	35,104	27,418	274,792	425,879	54,434	64,931	105,509	116,323	1,124,325
1963	18,158	4,727	38,508	30,070	327,041	475,326	58,521	69,968	114,437	127,614	1,264,370
1964	20,707	5,125	43,290	32,096	400,000	550,072	62,937	76,616	127,107	140,168	1,458,118
1965	22,645	5,711	46,631	36,051	488,050	625,596	68,701	86,226	140,958	158,060	1,678,629
1966	25,948	6,912	52,140	40,637	553,780	725,791	78,238	96,948	163,764	183,366	1,927,524
1967	31,193	9,459	61,268	45,949	663,660	869,509	99,607	108,798	193,402	213,445	2,296,290
1968	36,303	10,971	72,416	55,743	791,520	1,066,243	119,145	121,999	226,443	245,392	2,746,175

Source: Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education*, and *Survey of Education Finance*, various years.

Table F-18

ANNUAL PERCENTAGE INCREASE IN OPERATING COSTS OF PUBLIC SCHOOL BOARDS
CANADA, BY PROVINCE, 1954-55 TO 1967-68

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954-55	18.7	2.9	9.3	-3.9	13.3	14.2	8.7	9.3	11.3	11.5	12.1
1955-56	8.3	6.8	23.6	14.6	13.8	12.9	9.4	8.3	11.3	11.3	12.6
1956-57	8.8	9.5	10.9	12.2	14.3	13.2	10.6	11.3	15.3	17.5	13.6
1957-58	19.5	9.3	9.6	10.9	14.8	14.4	10.9	13.8	16.6	17.2	14.6
1958-59	16.9	22.5	12.2	10.1	14.0	15.3	19.1	14.0	14.8	14.5	14.8
1959-60	14.1	19.7	10.2	10.9	14.9	12.2	15.0	9.8	13.9	13.4	13.0
1960-61	9.1	7.4	10.7	8.1	21.1	9.9	9.5	8.1	12.1	6.6	11.9
1961-62	8.9	20.7	7.8	8.6	22.0	9.5	7.4	5.3	9.0	6.4	11.5
1962-63	13.2	21.2	9.7	9.7	19.0	11.6	7.5	7.8	8.5	9.7	12.5
1963-64	14.0	8.4	12.4	6.7	22.3	15.7	7.5	9.5	11.1	9.8	15.3
1964-65	9.4	11.4	7.7	12.3	22.0	13.7	9.2	12.5	10.9	12.8	15.1
1965-66	14.6	21.0	11.8	12.7	13.5	16.0	13.9	12.4	16.2	16.0	14.8
1966-67	20.2	36.8	17.5	13.1	19.8	19.8	27.3	12.2	18.1	16.4	19.1
1967-68	16.4	16.0	18.2	21.3	19.3	22.6	19.6	12.1	17.1	15.0	19.6

Source: Based on Table F-17.

Table F-19

OPERATING COSTS OF PUBLIC SCHOOL BOARDS
CANADA, BY PROVINCE, 1954 TO 1968

(Thousands of constant 1961 dollars)[1]

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	6,789	1,748	16,243	15,630	94,018	183,724	25,966	34,081	44,470	51,814	474,483
1955	8,002	1,786	17,637	14,928	105,834	208,420	28,042	37,004	49,160	57,378	528,192
1956	8,378	1,844	21,072	16,541	116,453	227,544	29,657	38,751	52,887	61,736	574,863
1957	8,935	1,979	22,898	18,191	130,461	252,406	32,149	42,257	59,757	71,060	640,093
1958	10,529	2,133	24,767	19,908	147,737	284,825	35,174	47,438	68,706	82,168	723,384
1959	12,042	2,558	27,187	21,445	164,771	321,307	40,981	52,903	77,158	92,068	812,420
1960	13,579	3,026	29,603	23,498	187,059	356,011	46,561	57,397	86,825	103,158	906,717
1961	14,722	3,231	32,571	25,254	225,181	389,029	50,701	61,681	96,764	109,327	1,008,461
1962	15,815	3,845	34,619	27,039	270,998	419,999	53,682	64,035	104,052	114,717	1,108,802
1963	17,578	4,576	37,278	29,109	316,593	460,141	56,652	67,733	110,781	123,537	1,223,979
1964	19,572	4,844	40,917	30,336	378,072	519,917	59,487	72,416	120,139	132,484	1,378,183
1965	20,680	5,216	42,585	32,923	445,708	571,321	62,741	78,745	128,729	144,347	1,532,995
1966	22,662	6,037	45,537	35,491	483,651	633,879	68,330	84,671	143,025	160,145	1,683,427
1967	26,345	7,989	51,747	38,808	560,524	734,383	84,128	91,890	163,346	180,274	1,939,434
1968	29,491	8,912	58,827	45,283	642,989	866,160	96,787	99,106	183,950	199,344	2,230,849

(1) Based on GNP implicit price index (1961 = 100).

Source: Based on Table F-17.

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Table F-20

ANNUAL PERCENTAGE INCREASE IN CONSTANT-DOLLAR OPERATING COSTS
OF PUBLIC SCHOOL BOARDS, CANADA, BY PROVINCE, 1954-55 TO 1967-68

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954-55	17.9	2.2	8.6	-4.5	12.6	13.4	8.0	8.6	10.5	10.7	11.3
1955-56	4.7	3.2	19.5	10.8	10.0	9.2	5.8	4.7	7.6	7.6	8.8
1956-57	6.6	7.3	8.7	10.0	12.0	10.9	8.4	9.0	13.0	15.1	11.3
1957-58	17.8	7.8	8.2	9.4	13.2	12.8	9.4	12.3	15.0	15.6	13.0
1958-59	14.4	19.9	9.8	7.7	11.5	12.8	16.5	11.5	12.3	12.0	12.3
1959-60	12.8	18.3	8.9	9.6	13.5	10.8	13.6	8.5	12.5	12.0	11.6
1960-61	8.4	6.8	10.0	7.5	20.4	9.3	8.9	7.5	11.4	6.0	11.2
1961-62	7.4	19.0	6.3	7.1	20.3	8.0	5.9	3.8	7.5	4.9	9.9
1962-63	11.1	19.0	7.7	7.7	16.8	9.6	5.5	5.8	6.5	7.7	10.4
1963-64	11.3	5.9	9.8	4.2	19.4	13.0	5.0	6.9	8.4	7.2	12.6
1964-65	5.7	7.7	4.1	8.5	17.9	9.9	5.5	8.7	7.2	9.0	11.2
1965-66	9.6	15.7	6.9	7.8	8.5	10.9	8.9	7.5	11.1	10.9	9.8
1966-67	16.3	32.3	13.6	9.3	15.9	15.9	23.1	8.5	14.2	12.6	15.2
1967-68	11.9	11.6	13.7	16.7	14.7	17.9	15.0	7.9	12.6	10.6	15.0

Source: Based on Table F-19.

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Table F-21

OPERATING COSTS PER STUDENT IN PUBLIC ELEMENTARY AND SECONDARY SCHOOLS
CANADA, BY PROVINCE, 1954 TO 1968

(Dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	66	77	99	119	111	176	158	178	197	219	151
1955	73	78	104	110	117	191	164	188	208	230	161
1956	76	80	125	121	127	204	172	199	219	238	172
1957	78	85	135	132	139	218	184	219	242	259	186
1958	89	93	145	143	151	233	206	243	267	282	203
1959	99	111	156	149	164	252	241	261	290	309	221
1960	108	125	166	158	180	268	260	282	311	335	238
1961	114	132	182	166	205	280	267	296	329	340	253
1962	120	151	188	177	237	291	279	301	343	341	269
1963	129	180	202	192	271	311	287	318	355	355	290
1964	144	188	223	200	319	345	296	337	378	370	322
1965	155	206	236	220	372	374	314	370	402	395	356
1966	175	248	261	246	407	417	352	407	452	436	395
1967	205	331	305	276	470	483	407	449	519	479	455
1968	239	376	354	328	526	571	514	497	587	524	522

Source: Based on Tables F-16 and F-17.

Table F-22

ANNUAL PERCENTAGE INCREASE IN OPERATING COSTS PER STUDENT IN PUBLIC ELEMENTARY
AND SECONDARY SCHOOLS, CANADA, BY PROVINCE, 1954-55 TO 1967-68

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954-55	12.1	1.9	5.5	-7.8	5.9	8.8	4.0	5.2	5.4	4.7	6.2
1955-56	3.2	2.3	19.6	10.4	8.2	6.7	4.6	5.9	5.8	3.4	7.0
1956-57	3.3	7.0	8.5	8.8	9.4	6.9	7.2	10.1	10.1	9.0	8.5
1957-58	14.1	9.4	7.0	8.9	8.6	6.9	11.8	11.0	10.5	8.9	8.7
1958-59	10.9	18.8	7.6	3.6	8.6	8.2	16.7	7.6	8.4	9.7	8.9
1959-60	9.1	12.3	6.7	6.4	9.8	6.3	8.0	7.9	7.2	8.4	7.7
1960-61	5.6	6.1	9.3	4.9	13.9	4.4	2.9	4.8	5.8	1.5	6.4
1961-62	5.0	15.0	3.8	6.6	15.6	3.9	4.4	1.9	4.3	0.2	6.3
1962-63	7.6	18.5	7.4	8.8	14.1	6.9	2.6	5.5	3.5	4.1	8.0
1963-64	11.4	4.4	10.2	3.9	17.5	10.7	3.3	6.0	6.3	4.2	10.7
1964-65	7.6	9.4	6.0	10.0	17.1	8.4	6.1	9.8	6.3	6.8	10.6
1965-66	13.1	20.6	10.6	12.0	9.4	11.7	12.1	10.0	12.6	10.2	11.0
1966-67	17.4	33.5	16.9	12.0	15.5	15.8	15.6	10.5	14.8	9.9	15.3
1967-68	13.8	13.6	15.9	19.0	11.9	18.2	26.3	10.6	13.1	9.3	14.7

Source: Based on Table F-21.

Table F-23

OPERATING COSTS PER STUDENT IN PUBLIC ELEMENTARY
AND SECONDARY SCHOOLS, CANADA, BY PROVINCE, 1954 TO 1968

(In constant 1961 dollars)(1)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	74	86	111	133	124	197	177	200	221	246	169
1955	81	87	116	122	130	213	183	209	232	256	179
1956	82	86	135	130	137	220	185	214	236	256	185
1957	82	90	142	139	147	230	194	231	255	273	196
1958	93	97	151	149	157	242	214	253	278	293	211
1959	101	113	159	152	167	257	245	266	295	315	225
1960	109	126	167	159	181	270	262	284	313	337	239
1961	114	132	182	166	205	280	267	296	329	340	253
1962	118	149	185	175	234	287	275	297	338	336	265
1963	125	174	196	186	262	301	278	308	344	344	281
1964	136	178	211	189	300	326	280	319	357	350	304
1965	141	188	216	201	340	342	287	338	367	361	325
1966	153	217	228	215	355	364	307	355	395	381	345
1967	173	280	258	233	397	408	344	379	438	405	384
1968	194	305	288	266	427	464	418	404	477	426	424

(1) Based on GNP implicit price index (1961 = 100).

Source: Based on Table F-21.

Table F-24

ANNUAL PERCENTAGE INCREASE IN CONSTANT-DOLLAR OPERATING COSTS PER STUDENT IN
PUBLIC ELEMENTARY AND SECONDARY SCHOOLS, CANADA, BY PROVINCE, 1954-55 TO 1967-68

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954-55	11.4	1.2	4.8	-8.4	5.2	8.1	3.3	4.5	4.7	4.0	5.5
1955-56	-0.2	-1.1	15.6	6.7	4.6	3.1	1.1	2.3	2.2	0.0	3.4
1956-57	1.2	4.9	6.3	6.6	7.2	4.8	5.1	8.0	7.9	6.8	6.3
1957-58	12.5	7.8	5.5	7.5	7.1	5.4	10.3	9.4	9.0	7.4	7.2
1958-59	8.5	16.2	5.2	1.4	6.3	6.0	14.2	5.3	6.1	7.4	6.6
1959-60	7.7	11.0	5.4	5.1	8.6	5.0	6.7	6.6	5.9	7.1	6.4
1960-61	5.1	5.5	8.6	4.3	13.3	3.8	2.3	4.2	5.2	0.9	5.8
1961-62	3.6	13.4	2.4	5.1	14.0	2.6	3.0	0.5	2.9	-1.2	4.8
1962-63	5.6	16.3	5.3	6.8	12.0	4.8	0.7	3.5	1.7	2.4	6.0
1963-64	8.7	2.0	7.6	1.4	14.7	8.1	0.9	3.5	3.8	1.7	8.1
1964-65	3.9	5.7	2.4	6.3	13.1	4.9	2.5	6.1	2.8	3.1	6.8
1965-66	8.2	15.3	5.6	7.1	4.5	6.8	7.2	5.2	7.6	5.4	6.2
1966-67	13.5	29.1	13.2	8.3	11.6	11.9	11.9	6.8	10.9	6.3	11.5
1967-68	9.6	9.3	11.5	14.7	7.6	13.7	21.5	6.4	8.8	5.1	10.4

Source: Based on Table F-23.

Table F-25

PUBLIC SCHOOL TEACHERS' SALARIES, CANADA, BY PROVINCE, 1954 TO 1968

(Thousands of dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	4,849	1,285	10,777	9,621	57,425	110,376	15,645	20,269	24,413	32,102	286,762
1955	5,819	1,298	11,817	9,729	64,880	126,624	17,125	22,630	27,375	33,625	320,922
1956	6,228	1,382	14,529	11,022	73,976	143,511	18,779	23,932	30,333	36,799	360,491
1957	7,010	1,518	16,061	12,337	84,910	163,154	21,051	26,624	35,300	43,319	411,284
1958	8,447	1,651	17,420	13,820	97,529	187,457	23,163	30,987	41,570	51,266	473,310
1959	9,862	2,020	19,454	15,336	112,104	218,059	28,543	35,450	48,999	59,889	549,716
1960	10,519	2,356	21,566	17,156	132,223	246,112	32,263	38,438	56,914	67,901	625,448
1961	11,337	2,527	23,763	18,660	161,678	270,167	35,231	41,822	64,939	72,505	702,629
1962	12,254	3,031	25,580	20,499	196,432	296,014	37,497	42,460	70,967	77,536	782,270
1963	14,271	3,668	28,305	22,497	237,683	327,338	40,277	45,565	77,500	85,572	882,676
1964	15,567	3,847	31,951	24,328	293,000	361,499	42,911	49,758	85,778	94,257	1,002,896
1965	16,960	3,887	34,488	26,392	309,520	412,530	46,040	55,250	95,991	105,759	1,106,817
1966	18,842	4,878	38,539	29,805	328,092	483,897	51,812	63,031	111,018	121,100	1,251,014
1967	22,537	6,060	46,140	33,186	393,060	569,675	63,817	72,152	130,331	141,482	1,478,440
1968	24,998	7,098	54,418	39,618	484,120	710,492	75,583	81,690	154,529	162,973	1,796,243

Source: Dominion Bureau of Statistics, *Survey of Elementary and Secondary Education*, and *Survey of Education Finance*, various years.

Table F-26

OTHER OPERATING COSTS OF PUBLIC SCHOOL BOARDS (EXCLUDING TEACHERS' SALARIES)
CANADA, BY PROVINCE, 1954 TO 1968

(Thousands of dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	1,207	274	3,712	4,321	26,439	53,506	7,517	10,131	15,254	14,116	136,477
1955	1,367	306	4,021	3,676	30,159	60,537	8,057	10,600	16,771	17,900	153,394
1956	1,555	331	5,047	4,345	34,209	67,877	8,772	12,068	18,799	20,554	173,557
1957	1,460	358	5,646	4,908	38,767	76,127	9,426	13,436	21,350	24,046	195,524
1958	1,671	399	6,381	5,312	44,446	86,260	10,639	14,601	24,456	27,697	221,862
1959	1,963	492	7,244	5,723	49,701	97,464	11,700	16,501	26,770	30,522	248,079
1960	2,978	652	7,859	6,201	53,714	107,763	14,019	18,615	29,390	34,638	275,829
1961	3,385	704	8,808	6,594	63,503	118,862	15,470	19,859	31,825	36,822	305,832
1962	3,782	868	9,524	6,919	78,360	129,865	16,937	22,471	34,542	38,787	342,055
1963	3,887	1,059	10,203	7,573	89,358	147,988	18,244	24,403	36,937	42,042	381,694
1964	5,140	1,278	11,339	7,768	107,000	188,573	20,026	26,858	41,329	45,911	455,222
1965	5,685	1,824	12,143	9,659	178,530	213,066	22,661	30,976	44,967	52,301	571,812
1966	7,106	2,034	13,601	10,832	225,688	241,894	26,426	33,917	52,746	62,266	676,510
1967	8,656	3,399	15,128	12,763	270,600	299,834	35,790	36,646	63,071	71,963	817,850
1968	11,305	3,873	17,998	16,125	307,400	355,751	43,562	40,309	71,914	82,419	949,932

Source: Based on Tables F-17 and F-25.

Table F-27

SALARIES OF PUBLIC SCHOOL TEACHERS, PER STUDENT
CANADA, BY PROVINCE, 1954 TO 1968

(Dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	52	63	74	82	76	118	107	119	121	152	102
1955	59	63	78	80	80	129	112	128	129	150	109
1956	61	64	93	87	87	138	117	132	135	152	116
1957	65	69	100	94	95	149	127	146	151	167	126
1958	75	75	106	104	103	160	141	165	168	183	138
1959	83	89	114	108	113	175	171	178	187	205	152
1960	84	98	122	116	128	187	181	190	205	222	165
1961	88	103	133	123	147	195	186	200	221	226	176
1962	92	118	137	132	170	202	192	197	231	227	187
1963	101	140	149	144	197	214	197	207	241	238	203
1964	108	141	164	151	233	226	202	219	255	249	221
1965	116	140	175	161	236	247	210	237	274	264	234
1966	127	175	193	180	241	278	233	265	307	288	256
1967	148	212	230	199	278	316	261	298	350	317	293
1968	164	243	266	233	322	380	326	333	400	348	341

Source: Based on Tables F-16 and F-25.

Table F-28

OTHER OPERATING COSTS OF PUBLIC SCHOOL BOARDS (EXCLUDING TEACHERS' SALARIES)
PER STUDENT, BY PROVINCE, CANADA, 1954 TO 1968

(Dollars)

	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Canada
1954	14	14	25	37	35	58	51	59	76	67	49
1955	14	15	26	30	37	62	52	60	79	80	52
1956	15	16	32	34	40	66	55	67	84	86	56
1957	13	16	35	38	44	69	57	73	91	92	60
1958	14	18	39	39	48	73	65	78	99	99	65
1959	16	22	42	41	51	77	70	83	103	104	69
1960	24	27	44	42	52	81	79	92	106	113	73
1961	26	29	49	43	58	85	81	96	108	114	77
1962	28	33	51	45	67	89	87	104	112	114	82
1963	28	40	53	48	74	97	90	111	114	117	87
1964	36	47	59	48	85	115	94	118	123	121	101
1965	39	66	61	59	136	127	104	133	128	131	121
1966	48	73	68	66	166	139	119	142	145	148	139
1967	58	119	75	77	192	170	146	151	169	162	162
1968	75	133	88	95	204	191	188	164	187	176	181

Source: Based on Tables F-16 and F-26.

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PUBLICATIONS OF ECONOMIC COUNCIL OF CANADA

Annual Reviews

First Annual Review: Economic Goals for Canada to 1970
(EC21-1/1964, $3.50)

Second Annual Review: Towards Sustained and Balanced Economic Growth
(EC21-1/1965, $2.75)

Third Annual Review: Prices, Productivity and Employment
(EC21-1/1966, $2.75)

Fourth Annual Review: The Canadian Economy from the 1960's to the 1970's
(EC21-1/1967, $2.75)

Fifth Annual Review: The Challenge of Growth and Change
(EC21-1/1968, $2.75)

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Eighth Annual Review: Design for Decision-Making—An Application to Human Resources Policies
(EC21-1/1971, $3.00)

Performance in Perspective
(EC21-1/1971-1, $1.50)

PUBLICATIONS DU CONSEIL ÉCONOMIQUE DU CANADA

Exposés annuels

Premier exposé annuel: Objectifs économiques du Canada pour 1970
(EC21-1/1964F, $3.50)

Deuxième exposé annuel: Vers une croissance économique équilibrée et soutenue
(EC21-1/1965F, $2.75)

Troisième exposé annuel: Les prix, la productivité et l'emploi
(EC21-1/1966F, $2.75)

Quatrième exposé annuel: L'économie canadienne des années 1960 aux années 1970
(EC21-1/1967F, $2.75)

Cinquième exposé annuel: Défi posé par la croissance et le changement
(EC21-1/1968F, $2.75)

Sixième exposé annuel: Perspectives 1975
(EC21-1/1969F, $2.75)

Septième exposé annuel: Les diverses formes de la croissance
(EC21-1/1970F, $2.50)

La tenue et le potentiel de l'économie: du milieu des années 1950 au milieu des années 1970
(EC21-1/1970-1F, $1.50)

Huitième exposé annuel: L'État et la prise des décisions—Application aux politiques de développement des ressources humaines
(EC21-1/1971F, $3.00)

Perspectives de rendement de l'économie
(EC21-1/1971-1F, $1.50)

Author—Auteur

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Staff Studies	Author—Auteur	Études préparées par le personnel
1. Population and Labour Force Projections to 1970 (EC22-1/1, $.75)	Frank T. Denton Yoshiko Kasahara Sylvia Ostry	1. Projections de la population et de la main-d'œuvre jusqu'à 1970 (EC22-1/1F, $.75)
2. Potential Output, 1946 to 1970 (EC22-2/2, $1.00)	B. J. Drabble	2. Potentiel de production, 1946 à 1970 (EC22-1/2F, $1.00)
3. An Analysis of Post-War Unemployment (EC22-1/3, $.75)	Frank T. Denton Sylvia Ostry	3. Une analyse du chômage depuis la fin de la guerre (EC22-1/3F, $.75)
4. Housing Demand to 1970 (EC22-1/4, $.75)	Wolfgang M. Illing	4. Demande d'habitations pour 1970 (EC22-1/4F, $.75)
5. Business Investment to 1970 (EC22-1/5, $1.00)	Derek A. White	5. Investissements privés pour 1970 (EC22-1/5F, $1.00)
6. Special Survey of Longer Range Investment Outlook and Planning in Business (EC22-1/6, $.25)	B. A. Keys	6. Enquête spéciale sur les intentions et la programmation à moyen terme des entreprises privées (EC22-1/6F, $.25)
7. Canada and World Trade (EC22-1/7, $.50)	M. G. Clark	7. Le Canada et le commerce mondial (EC22-1/7F, $.50)
8. Export Projections to 1970 (EC22-1/8, $.75)	J. R. Downs	8. Projections des exportations jusqu'à 1970 (EC22-1/8F, $.75)
9. Federal Tax Revenues at Potential Output, 1960 and 1970 (EC22-1/9, $.50)	D. J. Daly	9. Rendement des impôts fédéraux dans l'hypothèse de la réalisation du potentiel de production, 1960 et 1970 (EC22-1/9F, $.50)
10. National Saving at Potential Output to 1970 (EC22-1/10, $.50)	Frank W. Wildgen	10. L'épargne nationale dans l'hypothèse de la réalisation du potentiel de production pour 1970 (EC22-1/10F, $.50)
11. Changes in Agriculture to 1970 (EC22-1/11, $.50)	John Dawson	11. Changements dans le secteur agricole jusqu'à 1970 (EC22-1/11F, $.50)
12. The Contribution of Education to Economic Growth (EC22-1/12, $1.50)	Gordon W. Bertram	12. Apport de l'éducation à la croissance économique (EC22-1/12F, $1.50)
13. Internal Migration in Canada, 1921–1961 (EC22-1/13, $1.60)	Isabel B. Anderson	13. Migration à l'intérieur du Canada, 1921-1961 (EC22-1/13F, $1.60)
14. Interregional Disparities in Income (EC22-1/14, $1.75)	S. E. Chernick	14. Disparités interrégionales du revenu (EC22-1/14F, $1.75)

Staff Studies (concluded)

Staff Studies (concluded)	Author—Auteur	
Personal Consumer Expenditures in Canada, 1926-75: Part 3 (EC22-1/26-3, $1.50)	Thomas T. Schweitzer	†Dépenses personnelles de consommation au Canada, 1926-1975: Partie 3 (EC22-1/26-3F, $1.50)
27. Some Economic Aspects of Provincial Educational Systems (EC22-1/27, $2.00)	J. Cousin J. P. Fortin C. J. Wenaas Dorothy Walters	27. Certains aspects économiques des systèmes provinciaux d'enseignement (EC22-1/27F, $2.00)
28. Canadian Growth Revisited, 1950-1967 (EC22-1/28, $1.50)		
*29. Sources of Growth in Canadian Industries, 1946-68 (EC22-1/29, $0.00)	Wolfgang M. Illing	†29. Sources de croissance dans les industries canadiennes, 1946-1968 (EC22-1/29F, $0.00)
30. Productivity Change in Canadian Mining Industries (EC22-1/30, $1.50)	John Dawson	†30. L'évolution de la productivité dans les industries extractives canadiennes (EC22-1/30F, $1.50)
31. An Analysis of Canadian Manufacturing Productivity: Some Preliminary Results (EC22-1/31, $2.50)	Harry H. Postner	
32. Canada-United States Price and Productivity Differences in Manufacturing Industries, 1963 (EC22-1/32, $1.50)	E. C. West	32. Différences de prix et de productivité dans les industries manufacturières, Canada et États-Unis, 1963 (EC22-1/32F, $1.50)
*33. Development of Community Colleges in Canada (EC22-1/33, $0.00)	Max von Zur-Muehlen	†33. Développement des collèges communautaires au Canada (EC22-1/33F, $0.00)
*34. Some Economic Aspects of Education in Canada (EC22-1/34, $0.00)	J. B. Lacombe	†34. Quelques aspects économiques de l'éducation au Canada (EC22-1/34F, $0.00)

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Special Studies (concluded)	Author—Auteur	Études spéciales (fin)
12. Interregional Competition in Canadian Cereal Production (EC22-2/12, $3.00)	W. J. Craddock	
13. Canadian Hospital Costs and Efficiency (EC22-2/13, $2.00)	R. D. Fraser	†13. Les coûts et l'efficacité dans les hôpitaux canadiens (EC22-2/13F, $2.00)
14. Expenditures, Output and Productivity in Canadian University Education (EC22-2/14, $1.50)	Walter Hettich	†14. Coût, production et productivité des universités canadiennes (EC22-2/14F, $1.50)
*15. Search Behaviour in Canadian Job Markets (EC22-2/15, $0.00)	Dennis R. Maki	†15. Le comportement des personnes cherchant un emploi (EC22-2/15F, $0.00)
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*17. The Progress of Budgetary Reform in the Government of Canada (EC22-2/17, $0.00)	Donald Gow	†17. La réforme budgétaire du gouvernement du Canada (EC22-2/17F, $0.00)
*18. New Approaches to Public Decision-Making (EC22-2/18, $0.00)	Alice M. Rivlin	†18. Nouvelles voies de prise de décisions publiques (EC 22-2/18F, $0.00)
19. Why Distribution Is Important: An Examination of Equity and Efficiency Criteria in Benefit-Cost Analysis (EC22-2/19, $1.00)	Walter Hettich	†19. Les problèmes de la répartition: Étude des critères d'équité et d'efficacité dans l'analyse bénéfices-coûts (EC22-2/19F, $1.00)
*20. Migration, Employment, and Income (EC22-2/20, $0.00)	Thomas J. Courchene	†20. Migration, emploi, et revenu (EC22-2/20F, $0.00)
*21. Research and Experimentation in Labour Market Search Behaviour (EC22-2/21, $0.00)	Dennis R. Maki	†21. Recherches et expériences en matière de comportement des personnes cherchant un emploi (EC22-2/21F, $0.00)

Conference Papers and Reports	Author—Auteur	Documents et rapports de colloques
National Conference on Labour-Management Relations (1964) (EC22-364, $2.00)		Colloque national sur les relations patronales-ouvrières (1964) (EC22-364F, $2.00)
National Conference on Labour-Management Relations (1967) (EC22-367, $2.00)		Colloque national sur les relations patronales-ouvrières (1967) (EC22-367F, $2.00)
Conference on Stabilization Policies, Report of the Conference at University of Western Ontario, August 1965 (EC22-665, $3.00)		Colloque sur les politiques de stabilisation, Rapport du colloque tenu à l'Université Western Ontario, août 1965 (EC22-665F, $3.00)
Conference on International Trade and Canadian Agriculture, Banff, Alberta, January 1966 (EC22-766, $3.00)		Colloque sur le commerce international et l'agriculture canadienne, Rapport du colloque tenu à Banff (Alberta), janvier 1966 (EC22-766F, $3.00)
Conference on Government Information Systems, Ottawa, October 5 and 6, 1967 (EC22-1168, $1.50)		
Papers presented at Conferences on Productivity through New Technology		**Documents présentés aux Colloques sur la productivité par la nouvelle technologie**
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Practical Application of Data Processing in Small and Medium Manufacturing Companies (EC22-4/2, $.75)	H. S. Gellman R. C. Carroll	Application pratique du traitement de l'information dans les petites et les moyennes entreprises industrielles (EC22-4/2F, $.75)
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Other Studies and Reports — Author—Auteur — Autres études et rapports

Other Studies and Reports	Author—Auteur	Autres études et rapports
Annual Report (1964) (EC1-1964, $.50)	John J. Deutsch	Rapport annuel (1964) (EC1-1964F, $.50)
Annual Report (1965) (Fo 1/1965, $.50)	John J. Deutsch	Rapport annuel (1965) (Fo 1/1965F, $.50)
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Annual Report (1967) (EC1-1967)	John J. Deutsch	Rapport annuel (1967) (EC1-1967F)
Annual Report (1968) (EC1-1968)	Arthur J. R. Smith	Rapport annuel (1968) (EC1-1968F)
Annual Report (1969) (EC1-1969)	Arthur J. R. Smith	Rapport annuel (1969) (EC1-1969F)
Annual Report (1970) (EC1-1970)	Arthur J. R. Smith	Rapport annuel (1970) (EC1-1970F)
Annual Report (1971) (EC1-1971)	Arthur J. R. Smith	Rapport annuel (1971) (EC1-1971F)
Medium-Term Capital Investment Survey—1968 (EC21-2/1968)	B. A. Keys, D. S. Rothwell, F. G. Thompson	Relevé des projets d'investissement à moyen terme—1968 (EC21-2/1968F)
Medium-Term Capital Investment Survey—1969 (EC21-2/1969)	B. A. Keys, F. G. Thompson, M. Heath	Relevé des projets d'investissement à moyen terme—1969 (EC21-2/1969F)
Medium-Term Capital Investment Survey—1970 (EC22-2/1970)	B. A. Keys, F. G. Thompson, M. Heath	Relevé des projets d'investissement à moyen terme—1970 (EC22-2/1970F)
A General Incentive Programme to Encourage Research and Development in Canadian Industry, A Report to the Economic Council of Canada (EC22-565, $.60)	Advisory Committee on Industrial Research and Technology – Comité consultatif sur la recherche industrielle et la technologie	Programme général de stimulation des travaux de recherche et de développement dans l'industrie canadienne, Rapport présenté au Conseil économique du Canada (EC22-565F, $.60)
A Declaration on Manpower Adjustments to Technological and Other Change (EC22-866, $.75)	Council – Conseil	Une déclaration au sujet de l'adaptation de la main-d'œuvre aux changements technologiques et autres (EC22-866F, $.75)
Towards Better Communications Between Labour and Management (EC22-967, $.25)	Council – Conseil	Vers une amélioration de la communication entre patrons et travailleurs (EC22-967F, $.25)

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Background Papers (*Concluded*)

	Author—Auteur
The Regulation of Restrictive Practices: Recent European Experience	James P. Cairns
*The Incidence of Selected Taxes, by Province and Income Groups	D. M. Paproski J. Cousin
The Oligopoly Problem in Competition Policy	Donald Eldon

*forthcoming

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†en préparation

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