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A HISTORICAL REVIEW OF  
OF  
HQM IN CANADA



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## I. Introduction

During the 1960's, Canada witnessed a rapid expansion of the post-secondary educational system. Aided by the view that a large supply of highly educated personnel was necessary for a high and sustained rate of economic growth, for greater cultural development, and for social equity, expenditures and enrollment in the post-secondary sector increased at an unprecedented rate.

The economy as a whole was changing during these years, and with it, the role of highly qualified manpower. Industrialization and the rapid application of technical progress altered the structure of production and distribution methods in the economy. As occupational patterns changed to meet this transformation, the economic and political role of highly qualified personnel became more important.

This paper will look at trends in the education and development of highly qualified personnel during the 1960's and early seventies. Chapter II provides the statistics of the increases in enrolments, education levels, degrees granted, participation rates and educational expenditure and financing. Educational data for Canada are compared with similar data from other western, industrialized centres to show Canada's position vis a vis other countries in matters of education.

Chapter III examines some of the reasons behind the expansion described in Chapter II. The first section traces the views of the Economic Council of Canada concerning education. This section serves two purposes. Firstly, it discusses many of the reasons for the educational expansion and provides introductions to other reasons which are discussed more fully later on. Secondly, by presenting the ideas as they appeared each year in the Annual Reviews, it traces the evolution of the body of thought on the importance of education. The next four sections discuss the main issues relating to the expansion of the educational system and to highly qualified personnel, namely; education and equity, the returns to education, the demand for education, and the education-employment link.

The Conclusion summarizes the main educational issues of the 1960's which should be considered in the proposed General Review because of their possible importance to highly qualified personnel in the future.

## II. The Expansion of the Sixties

### 1) Trends in Enrollment, Education Levels and Degrees Granted

In this section, data which reflect the expansion of Canada's post-secondary educational system in the 1960's are presented. The decade saw a rapid expansion in the number of enrollments in, and degrees received from, Canada's post-secondary institutions. This, of course, was accompanied by an increase in the average educational level of the population.

Total enrollment in the education system increased 46% over the decade to 6.4 million (Table 1). The post-secondary system expanded much more rapidly with total enrollment increasing 191% to nearly half a million. Enrollment in universities increased even more over the decade (213%).

A more disaggregated breakdown of enrollment in the post-secondary system (Table 2) shows that the highest educational levels of the system are the ones which have expanded the most. While non-university level enrollment increased 141%, total university level enrollment increased 213%, and graduate enrollment increased over 400% from a rather small base of 6,500 in 1960-61 to over 33,000 in 1970-71. The decade was also characterized by higher proportions of students in the youth age group enrolling in post-secondary education. Almost 10% of students in the 18-24 year age group were enrolled in post-secondary institutions in 1960-61. This figure increased to 18.1% in 1970-71. It should be noted that the university level showed a larger relative increase over the period, from 6.7% to 13.6%.

At the provincial level, Ontario and Quebec had the largest numbers of students enrolled at the beginning and end of the decade (Table 3). In 1970-71, almost 2/3 of all post-secondary students were enrolled in these two provinces. The participation rates in these two provinces (19.3% and 17.5% respectively) were among the highest in the country in 1970-71.

Within the university sector, different subject areas increased in popularity to varying degrees. (Tables 4 & 4(b) ). The pure sciences showed the greatest increase in enrollment at the undergraduate level (almost 450%) with social work, education, arts, commerce and business, law and nursing increasing by large percentages. In absolute terms, the largest increases in enrollment were in arts, pure sciences, education, commerce and business, and engineering. The increase in students studying education was a result of the expansion of the education system and the demand for teachers at all levels.

These large increases in enrollments meant that the education levels of the population were increasing (Table 5). Over the three-year period, 1966 to 1969, the percentage of the labour force with complete secondary education rose from 16.1% to 18.9%. Over the same three-year period the percentage with complete university education rose from 4.0% to 9.8%. These percentages rose over the period for both males and females, although fewer females continued their education after high school.

The pattern of increases in degrees awarded corresponded to the pattern of enrollment. The highest level of degree (doctorate) increased by 430% and the number of bachelor's degrees awarded increased by 240% (Table 6). By field of specialization, the largest increases in bachelor degrees awarded were in arts, science, education, engineering, commerce and business administration (Table 7). The largest number of masters degrees awarded over the decade were in social sciences, humanities and related areas. Over one-half of all Ph.D.'s awarded were in the mathematical and physical sciences and the agricultural and biological sciences (Tables 8 and 9).

## 2) The Participation Rate

To a large extent the rapid expansion in enrollment in the post-secondary education system was a result of the post-war baby boom. But a much more important factor in the expansion of enrollment was the increasing participation rates throughout the 1960's. As Table 10 shows, the percentage of students participating in post-secondary education in the 18-24 age group increased from 11% in 1962 to 18.9% in 1972.

Since changing enrollment is due to changing population and participation rates, it is useful to break the increase in enrollment down into its components of growth.

If  $S$  = enrollment,  $P$  = relevant age population and  $r$  = enrollment rate, then  $S = Pr$  and  $\Delta S = \Delta(Pr)$ . This change can take three forms:  $\Delta S = (\Delta P)r$ , or  $\Delta S = P(\Delta r)$  or  $\Delta S = \Delta P \Delta r$ . Thus, the total change in enrollment can be due to all three factors (i.e.  $\Delta S = \underset{(a)}{(\Delta P)r} + P \underset{(b)}{(\Delta r)} + \underset{(c)}{\Delta P \Delta r}$ )

Table 11 shows the contribution to growth made by the three components a) the growth in population base b) improved participation and c) the interaction of the two effects on each other. As can be seen from the table, the participation rate is by far the most important factor to be considered when examining the increase in enrollment. It explains 87% of the increase in 1961-62 and decreases to 45% in 1970-71, where the other two factors share the remaining 55% of explanatory value.

During the 1970's, the participation rate will be important in determining the size of post-secondary enrollment and thus the resources devoted to the education system. The population in the 18-24 age group is projected to increase, but at a decreasing rate throughout the seventies. The rate of growth of the post-secondary system will then depend on trends in the participation rate. The rate reflects the discretionary part of individual enrollment decisions. If attitudes change in favour of leaving the education system after high school, or if students are required to pay more for higher education in terms of fees or lost earnings and respond adversely to this, then participation rates and enrollments may fall.

Variations in participation rates by age, sex, region or income class are useful for analyzing inequalities of access to educational opportunities for individuals. As was seen in Table 3, the participation rates vary widely among the provinces. In 1960-61, they ranged from a low of 3.9% in Newfoundland to a high of 11.0% in Quebec. In 1970-71 Newfoundland continued to have the lowest participation of the 18-24 year group in post-secondary education (11.8%) while Alberta had the highest (21.1%).

Participation rates also vary between males and females (Table 12). Although all post-secondary participation rates for males and females have increased over the decade, the rates for males have been consistently higher. Participation rates for males in post-secondary education have increased from 11.9% in 1960-61 to 21.9% in 1970-71. The corresponding figures for females are 7.4% in 1960-61 to 14.3% in 1970-71. The participation rate for females is roughly two-thirds that of males. Females have increased their participation in university more rapidly than males. While male rates increased from 10.2% to 17.4%, the rate for females has tripled from 3.3% to 9.8%.



### 3) Educational Expenditure

As Canada's education expanded it became the country's largest "industry", commanding a large proportion of the country's resources. Total expenditure on education in Canada increased from \$1,706 million in 1960 to \$7,408.9 million in 1970, a 334% increase (Table 13). Expenditure on post-secondary education showed an even larger increase of 548% over the decade. The universities absorbed an increasing proportion of funds spent on education, ranging from 16% to a high of 24.2% in 1969, almost  $\frac{1}{4}$  of total expenditure. The proportion allocated to universities dropped slightly to 23.8% in 1970. Table 14 shows post-secondary expenditure by province at the beginning and end of the decade. Ontario and Quebec account for over one-half of the expenditure in 1970.

In response to the expansion of the system and the heavy demands placed on it by increasing enrolments, the various levels of government increased their educational expenditures to meet the need for funds. Government funding of post-secondary education increased from 69% of the total in 1960 to 81% in 1970 (Table 15). At the same time fees declined as a source of funds from 15% in 1960 to 10% in 1970. The pattern was similar for the university sector of post-secondary education (Table 16). In this sector, government financed slightly less in 1970 (76%) and fees financed slightly more (12%) compared with the total post-secondary sector. Education financing shifted from the private to the public sector as fees declined in importance and government funds increased in importance. The percentage of financing from fees and grants is shown by region in Table 17. Except for Quebec, the percentage of financing from fees has declined from 1951 to 1966, and the percentage from government grants has increased. Ontario and the western provinces (which include the three "have" provinces of Ontario, Alberta and B.C.) receive the largest proportion of government financing. Quebec and the Maritimes (which include the "have not" provinces) receive smaller proportions. However, Ontario, Alberta and British

Columbia receive large numbers of out of province students (Canadian and foreign) who receive money while attending institutes of higher education and then return home after completing their education.

The importance of education in the government budget can be seen in Table 18. In 1969, education expenditure represented one fifth of government expenditure, the largest single destination for government funds. Moreover, government expenditure on education, as a proportion of total government expenditure, increased throughout the decade from 14.0% in 1960 to 21.8% in 1969. In comparison, the proportion spent on health was the only other category which also increased while defense and veterans pensions, social welfare and transport declined.

It is also interesting to note the increase in education expenditure in relation to some socio-economic indicators in the Canadian economy (Table 19). In 1960 education expenditure amounted to 4.5% of GNP. By 1970 this had almost doubled to 8.8% of GNP. Thus, educational expenditures grew faster than the gross value of goods and services produced in Canada. Education expenditure also grew as a proportion of personal income in Canada - from 5.8% in 1960 to 11.1% in 1970. Expenditure per person enrolled full-time increased 198% to \$1,165; per capita expenditure on education increased 266% from \$95 per capita in 1960 to \$348 in 1970.

Two uses of the government funds to education are for financial awards and for operating expenditures of the post-secondary institutions. Table 20 shows numbers of awards given and average values of the awards for 1966-67 and 1970-71 by province, as well as a separate breakdown of data for graduate student awards in 1970-71. Ontario and Quebec students together receive 58% of all government financial awards while Ontario graduate students alone receive 63% of the awards given by governments to graduate students. The large increase in post-secondary operating expenditures (573% over the decade) reflects the large increase in enrollment (to nearly one-half million in

1970) as well as rising costs per full-time students (\$3.246 in 1970). The larger costs per student are due in part to the shift towards more expensive graduate studies which are characterized by more sophisticated laboratory equipment and smaller classes (Table 21).

Table 22 shows how prices relevant to the post-secondary sector have increased relative to national expenditure. The post-secondary price index was 37.7 in 1941 (where 1961 = 100) and increased to 160.4 over a 29 year period. In comparison, the GNE price index was 49.3 in 1941 and increased to 133.6 in 1969-70. Clearly, prices in the post-secondary educational sector have increased faster than prices in the rest of the economy.

#### 4) International Comparison

Canada has significantly improved her enrollment ratios vis a vis the United States since 1951. In 1951-52 only 46% of 14-17 year olds were enrolled in secondary school in Canada, compared with 77% in the U.S. By 1975-76 Canada expects to have 94% of the 14-17 year olds enrolled, almost catching up with the expected U.S. rate of 98% (Table 23). Canada's accomplishments in the 18-24 age group are even more impressive. From a low of 5% enrolled full-time in university in 1951-52 (less than one-half the U.S. rate of 12%), it is projected that 18% will be enrolled in 1975-76, which is 75% of the expected U.S. figure.

The significance of the educational expansion in Canada during the 1960's is more clearly illustrated in Table 24, where Canadian educational statistics are compared with those in other OECD countries. In 1968, Canada had 2,423 students enrolled per 100,000 population. This value was surpassed only in the United States. In 1968-69, Canada's post-secondary enrollment as a percent of the 20-24 year population stood at 30.1%, second only to the U.S. at 43.3%. These values are much higher than Sweden (18.8%), France (18.6%) and Japan (18.2%), which have the next highest terms of public expenditure on education as a percent of GNP. Canada's expenditure is 7.7% of GNP while Sweden ranks slightly higher at 7.9%. Expenditure on education accounted for 23.6% of total government expenditure in Canada in 1968. The only countries which reported larger expenditures were the Netherlands with 27.7% in 1967 and Sweden with 26.9% in 1968.

### III REASONS FOR THE EXPANSION

#### 1. The Views of the Economic Council of Canada (ECC)

In 1964, the position taken by the Economic Council of Canada regarding education might be summarized in the following quote:

Under conditions of dynamic industrial growth in the future, there will be diminishing opportunities for employment for those who have little education and are unskilled. There undoubtedly will also be advancing levels of minimum educational requirements for many occupations and jobs. It is vitally important that general education and training should be given a very high priority in our economic system.<sup>1/</sup>

In 1964, the need to emphasize education arose from the changing structure of the economy, particularly the change in the rate of growth of the primary industries (agriculture, fishing, forestry and mining). As the output of these industries grew, employment opportunities were expanded in the rest of the economy, but they were declining in importance as a direct source of employment as other parts of the economy grew more rapidly. The primary industries were characterized by rapid technological change, increasing capital intensity, rising productivity, and general declining labour requirements. In 1946 the primary sector employed 1.4 million people. By 1963 this total had decreased 600,000 to 800,000. The educational level of a large part of the work force in primary industries is low. Table 25 shows the distribution of males in the labour force by selected occupation and education in 1961. The primary industries had the highest percentage of workers (69.2%) with less than a grade nine education and the lowest percentage of workers (1.6%) with some university education. These industries were heavy users of relatively unskilled manual workers. Their decreasing employment possibilities meant a shift towards jobs requiring higher levels of education. The labour force had to adjust its educational standards accordingly.

In 1964, agriculture was affected to the greatest extent by this changing educational structure. Agricultural employment

<sup>1/</sup> Economic Council of Canada, First Annual Review, Queen's Printer, Ottawa, 1964, p. 203.

decreased from 1,186,000 in 1946 to 641,000 in 1963. At the same time there was a rapid increase in the amount of capital (machinery and equipment) used. In comparison with previous years and with other Canadian industries, agriculture became relatively capital intensive. The lower level of education was a particular problem because a person with relatively little education was required to provide increasing skills, managerial ability, and capital resources for what was becoming an increasingly complex business.

It was difficult for younger generations to obtain more education because of higher costs for students from rural farm areas. Living and travelling expenses were higher since institutes of higher education were usually in urban centres. There was also the indirect cost of the loss of time that could have been spent working on the farm. As farm youths did not continue their education, the tradition of the low level of education for farmers was maintained. Problems associated with low levels of education were also present for those farm youths who left the farm and sought employment elsewhere. Often they had to move to an urban area where they had difficulty finding anything but a low paying job because of a lack of education.

The employment of unskilled workers also decreased in mining and forestry. Worker productivity had been increasing as mechanization took place and the operations became more capital intensive. Employment opportunities for the less educated had been diminishing as labour requirements shifted from a relatively unskilled work force to a smaller, more highly skilled work force.

The Economic Council also stressed the value of education as a source of increased productivity, and thus as a factor in the economic growth of the whole economy. The council stated that:

During the post-war period it has become increasingly apparent that the future prosperity of a nation will depend in large measure on its success in creating and maintaining an adequate supply of professional, technical, managerial, and other highly skilled manpower. . . . . a growing body of economic analysis indicates that education, research and the advance of knowledge relevant to production contributed at least as much as increases in the physical supply of labour and capital to the spectacular growth which occurred in the United States and in other leading industrial countries in this century.<sup>2/</sup>

<sup>2/</sup> Economic Council of Canada, First Annual Review, (pp 160-161).

In manufacturing industries, technological change had been raising educational and skill requirements. More complex machinery required a higher level of human response. Many tasks which required little in the way of basic education or training were being eliminated. Research and development throughout the economy was important for the continuing prosperity of the Canadian economy. The Council's view was that one of the main difficulties for private industry in this regard would be the scarcity of professional and highly skilled manpower.

In summary, the educational problem as seen by the Economic Council of Canada in 1964 was twofold:

- (1) The shift of employment opportunities from the primary sector with low educational requirements to the industrial and service sectors, which required higher levels of education.
- (2) Within each sector, the higher capital intensity, the higher productivity, and the increasing complexity of operations required more highly educated people.

In order to further stress the need for higher education, the Council compared Canada's educational record with that of the United States. Since the United States is an industrial competitor and the recipient of a large proportion of Canada's exported goods, it was thought important to maintain adequate levels of business, technical and professional skills vis à vis the United States. But our record had not been good. From 1956 to 1963, Canada's civilian labour force increased one-sixth as much as that of the United States but the number of bachelor degrees only increased by one-twentieth. The ratio of doctoral degrees earned was one (for Canada) to 33 (for the United States). In 1961, Canada had forty percent fewer scientists and engineers than the United States, as a percentage of the labour force.

The number of postgraduate degrees being granted was of particular concern to the Council. Holders of postgraduate degrees became university teachers and high level research workers. Univer-

sity enrollment was expected to increase throughout the decade but in 1964 the number of advanced degrees being awarded was too small to provide sufficient qualified teachers for the rest of the decade. The Council's discussion of the need to stress education ended with the warning:

In the short run it will be necessary to expand efforts to attract new skilled workers from other countries and to retrain the ones we now have. But in the longer run a much larger part of the solution must be sought in educating and training a sufficiently high proportion of our own young people in the levels of skills required by a modern industrial society. In particular, the numbers proceeding to postgraduate degrees must be greatly expanded.<sup>3/</sup>

In the Second Annual Review, 1965, the Economic Council devoted a chapter to education and its importance in economic growth. While recognizing the value of education as a factor enhancing the quality of life of individuals and of whole societies, the Council was primarily interested in the more recent issue of the economic aspects of education.

Canadian and American educational figures were again compared to show the gap between the two countries (see table 26). The gap is further shown (see table 27) by the educational attainments of different age groups.

There were substantially greater proportions of the male labour force with high school diplomas or university degrees in the United States than in Canada. This situation appeared to be getting worse as the gap was more pronounced for younger age groups.

The link between education and income was also discussed:

Accumulating evidence and analysis point more and more to education as a pervasive and basic element contributing to the income potential of people, and therefore also of a whole economy or society, or of particular regions and localities.<sup>4/</sup>

Table 28 shows the average level of annual income from employment, by levels of employment. The figures indicate a strong relationship between income levels and educational attainment. The average income

<sup>3/</sup> Economic Council of Canada, First Annual Review, (p.169).

<sup>4/</sup> Economic Council of Canada, Second Annual Review, (p.85)



of those with four-five years of high school education is one and a half times that of persons with elementary education. Those with a university degree earned on average, an income two and one half times that of persons with elementary education. Besides higher initial earnings those persons with university education had more pronounced increases in income which lasted for a longer time period throughout the individual's career.

Even within occupational groups, average lifetime earnings tended to be higher for higher levels of educational attainment. There were wide income disparities between those with high levels of education and those with low levels. For all occupations in 1961, the average lifetime earnings for those persons with 0-8 years of education was \$131,000, while it was \$354,000 for those with a university degree.

Not only were those in the highly educated occupational groups earning higher incomes in 1961, but these incomes were also rising more rapidly than the average incomes of all individuals. The average percentage increase in all incomes over the period 1948-1962 was 30% while income increases for professionals ranged from 40% to 110%.

This link between education and income led the Economic Council to view the economic value of education as an investment which yielded increased future income benefits. They reported that private returns on the human investment in high school and university were in the range of 15 to 20 percent per year. The public returns to the economy for total investment in education were in the range of 10 to 15 percent. These rates of return compared favourably with rates of return on total capital investment in physical and financial assets. The Council concluded that education was one of the most important factors required for long-term growth of income and productivity:

...especially when it is viewed as a form of investment which enhances the quality and productive capabilities of any nation's most important resource - its people.<sup>5/</sup>

<sup>5/</sup> Economic Council of Canada, Second Annual Review (pp 91-92).

They suggest that greater emphasis should be placed on the expansion of investment in education in relation to expansion of investment in other assets.

In the Fifth Annual Review (1968) the Economic Council began to emphasize the need for improving the quality of education as well as restating the education-income link.

The prospects for improved labour quality were brighter than at any time previously, due to the increasing proportion of better-educated and better-trained people in the labour force. The accelerating expansion of education at the post-secondary level gave Canada an important built-in element of growth. Thus it was thought important that investment in the education system should remain high on the list of national priorities. The Council also urged that new technology be applied to education at all levels. These new technologies (especially in the fields of communication) would then be put to good use, given the large economic, social and cultural values of education.

Lack of education was shown to go hand-in-hand with poverty. Families, whose heads had less than secondary education, showed a high incidence (37%) of low income in 1961 (Table 29). These families also accounted for more than two-thirds of all low income families. The Council also states that the relation between education and income was not a one-way causal connection. There was some interaction between the variables. The education levels of family heads were likely influenced by the income and education of their parents. The resulting circumstances were likely to affect the education levels achieved by their children. The Council recommended that a very important part of a policy against poverty should be the provision of higher education and special efforts to help those whose family circumstances discouraged the pursuit of higher education.

In 1969, the importance of education was again stressed, as exemplified by the following passage:

Education is a process that has many facets and many values. It can enhance the quality of life and enrich the lives of individuals. It quickens appreciation of the wonders of knowledge and stimulates the yearnings

of mankind for a better world. It stirs the imagination, sharpens the intellect and stimulates creativity. It can also help to generate economic growth; it increases the mobility, adaptability, and productivity of people, and raises their level of living.<sup>6/</sup>

The chapter devoted to education focused on recommendations on improving the quality of education and on regional differences in education.

During the 1960's the most rigorous educational expansion took place at the post-secondary level. The expansion in enrollment had been due in part to high post war birth rates and, more important, to the longer retention of students in the educational system. Between 1951-52 and 1967-68, secondary school enrollment more than tripled, increasing from 395,000 to 1,325,000. In the same period full-time university enrollment quadrupled from 71,000 to 284,000 students. Education enrollment in Canada in the post war period had increased faster than in any other industrialized country. This rapid growth, it was thought, could not continue forever and projections indicated that growth in enrollment would be less rapid in the future. This would provide an opportunity for making improvements in the quality of Canadian education. The Council felt that this would be necessary in preparing Canadians to meet the complex demands of a rapidly changing social and economic environment.

It was noted that a serious barrier to equality of education was regional differences in education. Some people were living in areas where educational facilities and the quality of teaching were good. For others, educational standards in the area were low, or institutions of higher education were a long way from home, adding to the cost of education.

It was hypothesized that educational disparities could be one of the significant elements involved in regional income disparities. There were substantial regional differences in retention rates and educational levels, with traditionally depressed areas having the lowest values. Table 30 shows the average years of schooling by region.

<sup>6/</sup> Economic Council of Canada, Sixth Annual Review, (p.123).

Table 31 shows that in per capita terms, fiscal transfers to the provinces are not progressive. To the extent that highly educated manpower contributes to the prosperity of the provinces, differences between provinces are being maintained by the size of per capita transfers. Although there have been large increases in all provinces in the four year period, the wealthier provinces received higher per capita transfers in base periods. This is more clearly illustrated in Chart 1 (Pg. 47). With the exception of British Columbia there seems to be a relationship between per capita post-secondary education entitlements and per capita personal income. The wealthier provinces are the ones receiving the highest per capita fiscal transfers for education. There appears to be an even closer relationship between educational level and per capita income in the provinces. As chart 2 shows a higher provincial per capita income is consistent with a higher percentage of university graduates in the male labour force (Pg. 47).

In 1970 and 1971 the Council alters its view from extolling the virtues of higher education to taking a closer look at what in fact has been happening over the past decade and what should we expect from education in the future. The Council stresses the need to specify the policy objectives of education and to decide on their relative importance. It emphasizes the need for better measures to determine the effectiveness and efficiency of the means used to obtain the objectives. It examines some returns from education (which will be discussed in a later section) and the distributional aspects of financing postsecondary education.

(a) Objectives

Government finances ninety percent of formal education and vocational training in Canada. Total expenditures on education by all levels of government rose from fifteen percent of all government expenditure in 1960 to twenty percent in 1967, and continued to rise during the early seventies.<sup>7/</sup> As more and more taxpayers money goes toward higher education, both the government and the general public have been concerned with the objectives of education, whether or not

<sup>7/</sup> A detailed discussion of enrollments and costs of higher education follow later.

the objectives are being achieved, and the benefits accruing from education in relation to the costs.

Ensuring economic growth has traditionally been among the objectives of education. Educational expenditures may be viewed as an investment in human capital, resulting in the acquisition of knowledge and skills by individuals which have a value in the labour market. This increases the efficiency of production and the earnings of educated individuals. Education may also improve productivity indirectly by facilitating advances in knowledge, that is, through the discovery of new ideas and technology and their subsequent diffusion through society.

Another objective of education is cultural development. This involves training intellectual abilities, developing character, tastes, attitudes and good citizenship. Education aids in the acceptance of certain social values and behavioural norms to the benefit of society.

The final objective stated by the Council is equality of opportunity. This can be achieved because education distributes through society the skills and attitudes which contribute to economic growth and cultural development. Equality of opportunity is usually thought of as equitability of access to education and the major efforts in this direction in Canada have been in reducing financial barriers to further education and in reducing differences in the quantity and quality of resources allocated to similar institutions. However, there are other factors such as motivation, home environment and academic ability which play an important part in accessibility of education.

(b) Measuring the Success of the Objectives

In order to measure the success of the above objectives, it is necessary to measure the output of the education system. This entails quantifying the benefits and costs to obtain a measure of the net output. Since this is difficult, if not impossible, proxies for educational output are often used. These include enrollments, student flows, average years of education, degrees granted and cost of education. Other proxies used are those indicating the degree to which

the education system functions equitably, for example, retention rates of students, participation rates for various income and ethnic groups. The trends in these variables over the last decade will be discussed in a later section. Another proxy measure of output is the estimation of the monetary value to the individual or society of additional education, and this too will be discussed in a separate section.

One important aspect of education which will be discussed here is that of distribution. Since education is financed largely through taxes, it has the power to redistribute income by distributing the benefits and costs of education among income groups and regions. The goal of redistribution should be to ensure that access to educational opportunity should be in accordance with the distribution of ability in society. The Council does not precisely determine the equity of the benefits of education through access to the system, but it does examine some of the distributional aspects of the costs of education in relation to the patterns of use.

(c) Regional Distribution

Taxes are collected by the federal government and then distributed to the provinces as subsidies for use as education expenditure. The distributions are examined here to see whether or not they are progressive, i.e. whether or not costs are distributed among income groups and regions in such a way that higher income regions pay proportionately more relative to their participation rates than the lower income regions. Table 32 shows fiscal transfers and the fiscal transfers in relative terms. The figure shows the difference between the federal subsidies to all post-secondary education for each province and the estimates of the federal tax revenues (originating in each province) that are used to finance such subsidies (the net fiscal transfers). These transfers are also shown as a percentage of the relevant federal tax revenues from each province. Fiscal transfers are made primarily from Ontario, British Columbia and to a small extent from Manitoba to all the other provinces. The Council notes, however, that these transfers from Ontario

and British Columbia are partially offset by return flows of human capital from the lower income provinces. Quebec is the largest absolute recipient of funds while Nova Scotia, Prince Edward Island and Newfoundland are the largest relative recipients. In general, revenues are transferred from provinces with above average income to provinces with below average income. One exception to this is Alberta, a relatively high income province which is a net beneficiary of fiscal transfer payments. However, as was seen in table 31, per capita transfers do not appear to be as progressive as these net transfers.

The distributional effects of education can also be seen by examining the fiscal transfers among income groups. Fiscal transfers, in this case, are the differences between government subsidies received by various income groups and the government tax revenues collected from these groups for financing education. Table 33 shows net fiscal transfers and relative net transfers. In general, these transfers are progressive. Low income groups receive greater amounts in subsidies than they pay in taxes for post-secondary education, while the opposite is true for high income groups. The exception to this is the under \$2,000 group. Reasons for this are the heavy impact on this group of regressive taxes (e.g. sales tax, taxes on tobacco and alcohol) and to the relatively large proportion of pensioners and unattached persons in the group. Although the fiscal transfers are progressive, these figures do not answer two questions:

- (1) Are the transfers progressive in all fields of study? That is, do students from higher income classes enter the more expensive and more financially rewarding fields such as medicine, law and dentistry?
- (2) Are the transfers progressive enough? Students from lower income groups may have greater ability than their present representation in the post-secondary educational system would suggest.

The answers to both of these questions (particularly the second one) require more knowledge of the distribution of ability by income groups.

In spite of Table 33 the view can be taken that even though lower classes do not fully participate in post-secondary education, they fully participate in the tax system which largely supports the post-secondary system. Those students who gain entrance to post-secondary institutions include a proportionately large representation from higher income families. Within the post-secondary sector, students from higher income families benefit more from public subsidies than do other students. As seen in table 3 they participate more in the heavily subsidized institutions (universities as opposed to community colleges) and programs (graduate rather than undergraduate). The support of education through taxes represents a transfer from the poor, who drop out early in their educational career, to the rich who stay on through post-secondary levels.

The differences in these views on financing education through taxes cannot be resolved until more is known of the distribution of ability by income groups. It could be that students from higher income classes have greater ability to complete post-secondary education. If this were so, support of the post secondary education system by taxes would be the most efficient use of human resources.

## 2. Education and Equity

Education is an important determinant of one's position in the social hierarchy. Education means opportunity - the opportunity to raise one's standard of living and social class above that of one's parents or the opportunity to retain a position in a high social class from generation to generation. Statistics from the 1961 Census<sup>8/</sup> show that males aged 25-64 with a high school education will have lifetime earnings of \$209,484, while earnings for those with a university degree will be \$353,624 (69% higher). Moreover, the highly paid prestigious professions (medicine, law, etc.) are almost exclusively restricted to university graduates.

An equitable distribution of educational opportunity would suggest that everyone who had the desire and ability to obtain a

8/ J. Podaluk, Incomes of Canadians, (p.106).



post-secondary education could do so regardless of social background or economic status. But there are financial, social and psychological barriers preventing equal access to the post-secondary educational system in Canada.

The most obvious of these barriers is the inequality of income and wealth. Education costs money for tuition, books, transportation and living expenses. Even if it were free, families from lower income classes tend to take their children out of school at an earlier age and send them to work. In this way, lower income families are penalized when it comes to higher education. Another barrier exists for the large family. It cannot afford to keep children in school and may make a choice as to which children should be allowed to remain in school. Since lower income groups usually have larger families, a doubly depressing process is at work. Table 34 and Diagram 1 show the tendency for students attending university to be drawn from higher income families.

In 1956, 54% of all families had income below \$4,000 but only 37% of university students were from this group. On the other hand, while just over 3% of Canadian families had incomes over \$10,000, 15% of students were from families in this income class.

The Lorenz curve shows how all income classes are not equally represented in universities. Points of equality are on the diagonal line. For example, the point 50% and 50% would indicate that 50% of all Canadian families were below a certain income level and that 50% of university student families were also below this level. A point on the curve indicates, for example, that while 50% of all families are below a certain income level, only 35% of university student families are below this level. The degree of curvature shows that there is a fair amount of inequality in the representation of social classes in universities.

Education for the professions is even more dominated by the higher income classes. While the median family incomes of all students' families was \$4,908, the median family income was \$6,293 for those in law and \$5,663 for those in medicine; 28% of law

students and 22% of medical students came from families with incomes of more than \$10,000, compared with 15.2% of all students in the survey and 3.3% of all Canadian families.

But the economic aspects of social class as a barrier are not the only ones to be considered. Increased government funds could lessen or remove economic barriers. Sociological and psychological barriers arising from a family's social class position would still remain and influence the individual's chance in the education system. There are values and attitudes towards education which exist in a household and which are transmitted from generation to generation:

Where parents have high occupational status they will also have more education, higher incomes and smaller families. Their children will have a greater chance to complete their education and inherit parental status than children with parents of lower occupational status who will have to improve their position. The lower class family does not value education so highly because in part it is a privilege beyond their horizons of opportunity, and at the same time, lacking education themselves, they fail to appreciate its value and to encourage their children.<sup>9/</sup>

This type of class bias of university students can be seen in table 35 which shows fathers' occupations.

Proprietors, managers and professionals represented 15.4% of the labour force, but 50.6% of the students had fathers in these occupations. While 20.5% of the population were labourers, only 5.1% of the students came from this background. Thus the higher occupational levels were over-represented and the lower levels under-represented in the universities and the "social right" of education was unequally distributed throughout society.

Twelve years later (1968) figures show that a class bias continued to exist between post secondary and non post-secondary education and it also existed within the post-secondary system itself (see table 36).

More than one third of all post-secondary students came from families with incomes over \$10,000 while less than one fifth of all families likely to have children in the 16-25 age group had

<sup>9/</sup> Source: J. Porter, The Vertical Mosaic (p.195),

income over \$10,000. One-third of such families had income of less than \$5,000 while only 17% of students came from families in this income range.

The class bias is evident between three levels of post-secondary education; community colleges and CEGEP's, university undergraduates, and university graduates. The median family income of students attending community colleges and CEGEP's is \$7,003 while it is 23% higher for families of university undergraduates and 21% higher for university graduates. Less than 25% of students in community colleges and CEGEP's come from families with incomes over \$10,000 while almost 40% of university students came from this income group. There may be greater barriers (financial and social) to universities than to community colleges for students from low income groups. The social classes appear to be preserved by the different types of post-secondary institutions. The universities draw students from higher social and economic classes and by providing a professional or prestigious training, send the students back into the world with high social and economic opportunities. Community colleges, on the other hand, draw students from lower classes and provide vocational training which often results in jobs with lower salaries than university graduates receive. But no definite conclusions can be reached regarding equity until more is known about the distribution of ability by income groups.

There seems to be some justification for the class bias in education on the basis of intelligence, as measured by I.Q. tests. Porter<sup>10/</sup> reports on a study of Ottawa public school children in which it was found that, on the average, those with I.Q.'s over 130 came from more expensive houses, were from smaller families, and had fathers with high incomes, more education, and higher occupational status than did children with I.Q.'s under 90. Low I.Q. scores and poor school achievement were associated with lower social class position. The study found that on average, the gradient of childrens' I.Q.'s corresponded with the gradient of social class, as measured by the above indicators. There are objections to these

10/ Source: Vertical Mosaic (p.197).

results which state that the I.Q. test may be a class biased instrument since children from higher classes are more familiar with the types of problems to be solved. But to the extent that the observations are true, they should caution us when discussing the over-representation of higher social classes in higher education. The cause and effect relationship may not be one in which students from higher social class families have the money to continue their education while lower classes do not, as is often implied. The relationship may be circular with students from higher social classes being, on the average, more intelligent and having the desire and ability to enter post-secondary education. This in turn enables them to maintain or improve their social class position, and instill in their children the value of post-secondary education. The social classes are maintained by the difficulty of bringing people from lower classes into this cycle. The lower social classes contain, in absolute numbers, more of the highly intelligent than do the higher classes which make up a much smaller proportion of the population. If Canada is to strive for equality and for efficient use of her human resources, efforts will have to be made to overcome financial and social barriers to higher education.

### 3. The Returns to Education

Benefits from higher education can be classified roughly into the following two categories:

- (1) the higher rate of economic growth in a country due to a more highly educated population;
- (2) the private and social returns to investment in education.

These returns have been quantified in recent years, especially during the 1960's when the results were used to augment arguments for more and more emphasis on education.

#### (a) Education and Economic Growth

Previous to the 1960's the growth literature emphasized physical capital and number of workers as the most important factors in growth. During the past decade, more and more emphasis has been placed on the quality of the labour force and increasing levels of

education. The social attitude towards education became "stay in school", "get a diploma", or "get a university degree". What shaped these attitudes? What facts backed up the popular idea of the benefits of education?

In 1964, A. Maddison<sup>11/</sup> expressed the view that education was fundamental and even vital to the maintenance of growth. He pointed out that Italy, with a low productivity level, had a very high illiteracy rate and the United States, with a high level of productivity, had a high proportion of graduates from higher education. One year later, the Economic Council of Canada<sup>12/</sup> stressed that education was a crucially important factor contributing to economic growth and to rising living standards.

Two studies quantifying the contribution of education to economic growth have been made by Edward Denison<sup>13/</sup> in the United States and Gordon Bertram<sup>14/</sup> in Canada. Denison found that the contribution of education to the improvement in the quality of labour inputs and thus its contribution to economic growth was 42% of growth in income per employed person, or 23% of the growth in national income, for the United States, 1929-57. This contribution of education was larger than any other single factor for that period.

Bertram found similar results for Canada. In his study he attempted to find what the real income per person would have been in 1961 if the quality of the labour force, as measured by its educational attainment, had not changed since 1911. He concludes that approximately one quarter of the increase in real per capita income over this period can be attributed to the increased education of the labour force. This value is lower than the comparable value for the United States (which was 42%). Bertram concludes that the

11/ A. Maddison, Economic Growth in the West, George Allen and Unwin Ltd., London, 1964.

12/ Economic Council of Canada, Second Annual Review, Ottawa, 1965.

13/ E.F. Denison, The Sources of Economic Growth in the United States and the Alternatives Before Us, Committee for Economic Development, Washington, D.C., 1962.

14/ G.W. Bertram, The Contribution of Education to Economic Growth, Staff Study No. 12, Economic Council of Canada, Ottawa, 1966.

lower average educational level of the Canadian labour force accounts for part of the lower per capita income in Canada. In 1961, the Canadian average income would have been 7 to 8% higher if the Canadian labour force had the educational level of that in the United States.

(b) Private and Social Returns to Education

The efficiency of investment in physical capital is measured by the rate of return on the investment. In the same way that the purchase of machinery is regarded as investment in physical capital, education can be regarded as an investment in human capital. Like any investment, it should yield a return to compensate for the cost of acquiring the education as well as a profit, comparable to that which could be earned on alternative investments. There are two ways of considering the returns from education: the return to society for the public resources allocated to education and the return to an individual for the costs incurred by himself and his family.

Calculating the rate of return is based upon evaluating the monetary costs and benefits of education. Benefits associated with achieving a particular level of education rather than stopping at some lower level, are put into monetary terms and they are compared with the related costs of obtaining that increment of education. The benefits are derived from the market value of the skills acquired through higher education. There are limitations to the usefulness of rate of return calculations because not all benefits are included in the market valuation. Monetary values cannot be put to the value of education in creating more informed and responsible citizens and enhancing the quality of life. The benefits of education which enter the rate of return calculations may, as a result, understate the full benefits of education.

The Economic Council of Canada estimated that the rates of return from university education in 1961 and 1967, for all of Canada and for five regions. The results are presented in table 37<sup>15/</sup>.

<sup>15/</sup> Economic Council of Canada, Eighth Annual Review, Ottawa, 1971, (p.210).

These rates of return are to the increment of education representing the completion of a university education over the completion of secondary schooling. For both years the private returns exceed the social returns, that is, individuals gain more from higher education than does society which provides much of the resources. In 1967, the largest returns, both social and private were in Quebec, Ontario and the Prairies. The efficiency of the education system was greatest in these areas as measured by rates of return. However, the rates of return all decreased from the values in 1961. This could result from higher costs in 1967 and a lower incremental benefit from each student as more and more graduated from university. Another possible reason for the lower returns is that, in the short run, inefficiencies tend to grow in a rapidly expanding system.

An overall rate of return calculation for all university education hides many variations within the university sector. Some subject areas and levels of study have high returns and some have low or negative returns. It is necessary to separate the low and high rate of return areas of study to allocate resources more efficiently within the education system.

Dodge and Stager<sup>16/</sup> provide a summary of studies done in Canada for returns to one particular level of education, the bachelor degree (Table 38).

For each of the three years considered, there are fairly high returns to the bachelor degree, making it a worthwhile investment. However, it shows higher returns to individuals than to society as a whole for each year in which both private and social returns were calculated. Individuals who go to university appear to be the ultimate beneficiaries from the resources of society.

Other studies have disagreed with these high rates of return to investment in education. One argument has been that large proportions of earnings differentials are due to natural intelligence and ability between groups of persons with different

<sup>16/</sup> D.A. Dodge and D.A.A. Stager, see p.22, table 3, and accompanying footnotes for the sources used.

levels of education. Another argument is that much of the earnings differential is due to difference in occupation rather than differences in schooling. David A. Dodge<sup>17/</sup> proposes that while there is a strong correlation between occupation and schooling, the occupational differentials are due mainly to artificial barriers to entry to high paying occupations.

Dodge recalculates rates of return in which he attempts to deal with the above two arguments. Adjusting for natural ability and intelligence he finds the following results for Ontario which are compared with the Economic Council calculations. When rates of return to university education are calculated in this way, they are considerably lower and thus less efficient than other forms of investment (Table 39).

Using 1967 data, Dodge then calculates rates of return for accountants and engineers by three methods. The first is the traditional method which considers only income and cost differentials. In the second method, Dodge standardizes for family background, work function, speciality, sector of employment, self-employment, seniority, and hours worked. Finally, the third method standardizes for occupational differences by considering as the base with which to compare graduate incomes the earnings of all high school graduates regardless of occupation, rather than earnings of engineers or accountants with high school diplomas. With the exception of Doctorate vs Bachelor's Degree for engineers, the rates of return by method two are lower than by method one. This means that some of the efficiency or "profitability" attributed to higher education is really due to other factors associated with a person's ability and intelligence. The incorrect higher values could have serious implications for resource allocation in the economy. It may be that society is over investing in education when the decision to invest is made on the basis of the higher rates of return (Table 40).

<sup>17/</sup> David A. Dodge, Occupational Wage Differentials, Occupational Licensing, and Returns to Investment in Education: An Explanatory Analysis, reprinted in Canadian Higher Education in the Seventies, Economic Council of Canada, Ottawa, 1972.



Method three gives rather interesting results (Table 41). When earnings of accountants with honours B.A. degrees are compared with all high school graduates, regardless of occupation, the internal rate of return is found to be 11.7%. When the incomes of these same accountants were compared with income of accountants without university degrees, the rate of return was found to be 5.8%. In other words, the earnings differential is greater between honours B.A. accountants and all high school graduates than between honours B.A. accountants and accountants who were high school graduates. Similar results were found for accountants and engineers with bachelor degrees. This means that there is an extra rate of return to being an accountant or an engineer. The extra rate of return does not come about through a higher education level beyond high school. Therefore, when rates of return to higher education are calculated, they include this return to the occupation, as well as the return to education. Again, this would overrate the returns to higher education, with many implications for the allocation of resources. Dodge concludes that a large part of the returns to investment in post-secondary education are a measure of the quasi-rents accruing to members of professions for which entry has been artificially restricted. Removing these barriers to entry and thus improving the allocation of human resources will result in high social returns.

D.A. Dodge and D.A.A. Stager<sup>17/</sup> have disaggregated the returns to university education even more by calculating returns to graduate study - PhD and Master's - and for specific areas of study - business administration, engineering, chemistry, physics and mathematics. It is necessary to know the relative returns to different levels and fields of study for policy purposes. In combination with other indicators of the market situation for various types of manpower, they are useful in determining where, for growth purposes, the emphasis should be put in educational systems.

<sup>17/</sup> D.A. Dodge and D.A.A. Stager - "Returns to Graduate Study in Science, Engineering and Business", Institute for the Quantitative Analysis of Social and Economics Policy, University of Toronto, 1970.

Table 42 shows the private and social returns to graduate study. In all cases for which returns were calculated, the private returns were considerably greater than the social returns. Individuals were benefiting more from higher education than was the society which was supplying the resources for the educational system. For chemistry and physics, the doctorate degree brought higher rates of return. Where the return to a master's degree over a bachelor's degree was negative, the return to the PhD over the bachelor's was positive (.9% and .7% respectively) and the return to the PhD over the master's was slightly higher at 1.3% in both cases. However, these rates of return are extremely low, and better returns could be had from many other forms of investment. In the case of mathematics and engineering degrees the pattern is the opposite. Higher level degrees have lower rates of return. A PhD does not seem worthwhile from either the private or social point of view as the returns are negative when compared with a master's degree.

Table 43 shows the public and private returns in the public sector. Again, the private returns are higher than the public returns. Chemistry, Physics and Mathematics follow the pattern of a lower return for a PhD vs a bachelor's degree than for a master's degree vs a bachelor's degree and an even lower return for a PhD vs a master's. Engineering has higher private returns for a PhD but the social returns are low for both master's and PhD degrees. These results must be interpreted with several factors in mind. First of all, the calculations assume that the entire earning differential can be attributed to further education. The returns to education may be overstated if higher incomes are due in part to ability and intelligence of individuals, to work functions or to self-employment. The rate of return calculations are also criticized on the grounds that external and personal non-monetary benefits are not taken into account. It could be argued that while direct monetary returns to graduate study may be low in comparison with undergraduate study, the non-monetary returns are so much greater

that the overall returns may be similar. For example, for PhD's the non-monetary benefits of academic life may more than compensate for the lower earnings in the universities, as compared with industry or the public sector.

Rates of return can be valuable aids in providing information for educational planning and financing. In the various studies surveyed here the returns to bachelor's degrees are high, while the return to PhD's or master's degrees over bachelor's degrees are very low or negative. As was seen in table 6, the number of bachelor's degrees awarded annually increased 240% over the decade of the sixties while the master's and doctorates increased 340 and 430% respectively. The type of university education with the lowest returns to individuals and society is the type which has been increasing most rapidly. Educators and governments will have to decide whether higher degrees should continue to expand as in the past. As the Economic Council of Canada pointed out, the rates of return to university education as a whole have decreased between 1960 and 1971. Educators and governments may, in fact, have to make the decision of allowing the number of degrees to expand for all levels of university education, and not only for higher degrees. They may decide that in the seventies higher social returns can be had by putting relatively more money into other types of education (community colleges, vocational schools) or into other areas such as health and welfare and social development.

The rates of return may also show which areas of study should be allowed to continue expanding. As seen in table 5, arts and pure sciences showed large percentage increases in enrollment over the decade as did social work, education, commerce and business administration and law. It may be that certain of these areas have high rates of return and should be encouraged to expand. For example, Dodge and Stager (table 42) calculate that relative to a bachelor of science, a master's degree in business administration had social and private rates of return of 9.0% and 16.3%. Similarly, the PhD degree in Chemistry and Physics had much higher returns than the

same degree in engineering and mathematics.

The financing of education could also be studied too. Which subject areas, degree levels, or geographic regions receive heavy government support. Data on the level of government financing in universities for the various regions of Canada (table 17) could be compared with the rate of return to university education by region (table 37). To the extent that the data in these two tables are comparable, there does not seem to be a relation between percentage of financing from government grants and the rate of return. That is, more government financing does not seem to result in higher rates of return. A more careful analysis and better data are necessary before any conclusions can be drawn.

Most of the rate of return calculations show that private returns are greater than social returns. Many argue that because of this, those receiving the higher education should pay more of the cost through paying higher fees themselves or by loans which would eventually have to be repaid. The government would then participate less in the financing of post-secondary education. But this argument is supported by figures which have one weakness that has previously been pointed out. The rate of return calculations consider factors which can easily be put into monetary terms. The pursuit of higher education contributes to a wide range of scientific and cultural activities, and to an enlightened, informed population, all of which enhance the quality of Canadian life to an extent which cannot be measured.

#### 4) The Demand for Education

As discussed in section II-2, the participation rate is of prime importance in determining the number of students enrolled in Canada's post-secondary educational institutions. A closer look at the participation rate will show that it is determined by several factors. This section will take a brief look at several studies done on the determinants of the demand for education.

a) Handa and Skolnik<sup>18</sup> discuss two models of education, the consumption model and the investment model. The activities of consumption and investment in education are not mutually exclusive, but they are separated to give a clearer explanation of each.

In the consumption model, the variable to be explained is the quantity of education demanded. This is taken to be enrollments relative to the eligible population (usually the 18-24 year age group). The demand for education is theorized to depend upon the price of education (tuition, books, etc. and sometimes income foregone) and income (per capita or per family).

$$N^D = f(P^E, Y)$$

$N^D$  = ratio of enrollment to the appropriate eligible population base

$P^E$  = price of education (deflated)

$Y$  = income per capita or per family (deflated)

In the investment model, the demand for education is a function of the expected rate of return to education. This in turn is dependent on several factors. The demand can be expressed as

$$N^D = f(\text{expected probability of completing the course,} \\ \text{expected working life, expected costs of acquiring} \\ \text{the education, expected stream of future earnings.})$$

b) Campbell and Siegel<sup>19</sup> examined the demand for education in the United States. As the dependent variable, they used the ratio of enrollment in four year institutions to persons aged 18-24, possessing

18) M.C. Handa & M.C. Skolnik - "Emperical Analysts of the Demand for Education in Canada" in Canadian Higher Education in the Seventies, E.C.C., Information Canada, Ottawa, 1972.

19) Handa & Skolnik, op.cit., pg.40.

a high school diploma and not in the armed forces. This variable was proposed to depend upon real disposable household income and tuition charges deflated by the Consumer Price Index. The results showed an income elasticity and a price elasticity with high levels of statistical significance and the authors concluded that price was an important factor in determining the demand for education.

c) M.L. Handa<sup>19</sup> studied enrollment in Ontario universities. He used a composite price variable which included tuition, books, opportunity wage loss less scholarships. His complete estimated equation for Ontario is:

$$N_t = -123,783 + 14.898 C_t - 122.2001 \frac{1}{t} + 138.678 L_t$$
$$(t = -1.338) \quad (t = 2.391) \quad (t = 9.920)$$
$$R^2 = 0.9 \quad DW = 0.75$$

where  $N_t$  = enrollment demands

$C_t$  = composite price variable

$1/t$  = per capita disposable income

$L_t$  = eligible population

Handa obtained larger price and income elasticities than Campbell and Siegel and concluded that price is important in the demand for education.

d) J. Schaafsma<sup>19</sup> designates five factors as likely to influence decisions about post-secondary education. These are 1) an individual's time preference between present and future income, 2) the costs s/he must incur in acquiring the education, 3) the efficiency with which s/he can, through education, transform present foregone earnings into future realized earnings, 4) his or her access to the capital market 5) and cash gifts received. Since these variables are difficult to measure, Schaafsma used as proxies; income, father's education, and number of children in the family. The dependent variable was the proportion of 18-24 year olds attending university to all 18-24 year olds. It was found that 97% of the variance in the dependent variable was explained by income and father's education.

After surveying these studies as well as a few others not mentioned here, Handa concludes that the price elasticity of demand for education may be greater than unity (ie. price is an important determinant of the demand for education).

e) R.B. Freeman<sup>20</sup> proposes a more complete model with a demand and supply side. A student's career decision and thus his demand for education in that field depends on financial aid to the students, expected salary after graduation, and the state of the labour market in the particular specialty.

The supply of education is taken to be the supply of university facilities and this depends upon the supply of university professors and the amount of money received from the government. By considering the supply function in the model, the process of adjustment between demand and supply can be analyzed.

These studies are useful in determining which variables have the greatest influence on the demand for post-secondary education. They can be used for planning and policy purposes to control the number of students demanding post-secondary education and to see the effects on the post-secondary education system of various government actions.

20) R.B. Freeman, The Market for College Trained Manpower, Harvard University Press, Cambridge, Massachusetts, 1971

5) Education and Employment

The calculations of the rate of return to education considers as the return to the job held by the student after s/he graduates, with no attention paid to the type of job in relation to the education received. This section concerns itself with the correspondence between post-secondary education and type of occupation.

That there is some relationship between education and whether or not a job is found afterwards is apparent from Table 44.

While 10.2% of those with grade VIII education or less were unemployed in April, 1972, only 2.3% of those with university degrees were unemployed. The likelihood of being unemployed drops as one improves his or her educational qualifications. But this says nothing of the suitability of the job for a person with any given set of educational qualifications. The job may be directly related to what was studied at university or a community college, or the job may be competently carried out from graduates from many fields and have no direct relation with any one field.

The relation between education and occupation can be shown in an education - occupation matrix. This is a rectangular matrix, in which the rows denote fields of study and the columns are occupations. An element  $A_{ij}$  shows the number (or percentage) of persons educated in field  $i$  and working in field  $j$ . The matrix typically will not be a one-for-one correspondence between education and occupation as there may be several ways of entering any particular career. The dispersion of values along the rows of the matrix indicates the strength or weakness of the educational - occupational link. There are several factors which determine the strength of the educational - occupational link.<sup>21/</sup>

<sup>21/</sup> R.B. Freeman - The Market for College-Trained Manpower, Harvard University Press, Cambridge, Massachusetts, 1971.



a) The vocational content of education - Some fields of study (medicine, accounting, dentistry) offer specific training. The row coefficients tend to be clustered around a few occupations, indicating strong educational - occupational links. Education in these fields is job-oriented with most graduates seeking work in related occupations.

b) The existence of alternative training routes - Some occupations (such as managerial work) do not require specific kinds of education and can be reached by several methods of preparation. Many column coefficients will be nonzero for such occupations.

c) Licensing restrictions - Government regulations may restrict entrance to some occupations to people who have passed through approved training.

d) State of the labour market - When the labour market is in disequilibrium there will be incentives for persons to change their area of specialization into occupations removed from their principal area of study.

e) The time dimension - After a period of time in the labour market, there are greater opportunities for changing jobs. A graduating class that may initially have an educational-occupational matrix with little dispersion along the rows and columns will show greater dispersion as time goes by.

The matrix will show which fields of study are most vocationally oriented. Expansion of this subject in the university or college, or expansion of financing in the field of study will show direct results in the occupation. The matrix also identifies those subject areas which are not oriented towards a specific job. Graduates from these fields (eg. social sciences) enter a variety of occupations and the results of policy directed at any one field of study will not show in any specific occupation.

There are arguments in favour of both types of education - vocationally oriented and the more flexible, non-vocation oriented. In the former, the students are employed in jobs directly related to their education. The investment in education seems to be worthwhile because the results (the job) are obvious. For the non-vocation oriented student in a job unrelated to his or her area of study, the question arises of whether or not the investment in several years of postsecondary education was worthwhile. Perhaps the job could have been done equally well without the extra education and the person may feel underemployed. However, if this is not the case and the person feels gainfully employed, then this group as a whole may experience less unemployment. These graduates may be more flexible because they can go into a number of occupations. When labour market conditions are such that nurses, teachers or technicians may have trouble finding jobs, persons in the more flexible occupations will not be restricted to a certain area of employment and thus will have a better chance of finding a job.

The matrix can also show if the association between education and occupation has become stronger or weaker over time. For example, does a graduating class of 1961 have a matrix with less dispersion for the first 5 or 10 years after graduation than does a graduating class of 1971? The answer to this will give an indication of the nature of the link - that is, is the educational-occupational structure determined by the demands of the occupations in the economy or by the supply of the various types of trained manpower. Technology has increased over the decade of the sixties and many occupations are more sophisticated and demanding. If educational attainments are determined by the technological requirements of jobs, we would expect the matrix of the 1971 graduates to be less dispersed. Jobs would be filled by those trained in that field, as others would not be able to perform the tasks required. On the other hand, the matrix of 1971 graduates may show more dispersion. Since the average education level of the labour force has risen over the past decade, the changes in the educational structure of occupations may simply reflect the influence of supply factors in

the labour market. Now that more highly educated people are available, employers may hire a M.Sc. rather than a B.Sc., or a B.A. instead of a high school graduate. Since the jobs were formerly done by less qualified people, the question remains as to whether or not they could be done by less qualified people today. If Denison and Bertram are to be believed, there would be less efficiency and lower productivity if we returned to the lower educational levels of the past. Thus, even if the occupational-educational structure has changed in response to supply factors, there have been benefits in terms of higher output and productivity.

Another aspect of the education-occupation link which should be considered is the "qualification" of highly qualified manpower. Are university graduates really more qualified? We are speaking of the more educated manpower as the more qualified - but are the two terms synonymous? Are university degrees becoming less relevant to the requirements of the labour market and to the needs of society? There may be a gap between the orientation of education and the social demand for education vs. the demand for employment. If so, highly educated people do not have the type of qualifications required by the economy. Persons with community college or vocational school training may possess the qualifications for more and more jobs in the economy, while university graduates become underemployed in their jobs. A person's attitude towards a job determines his or her qualification for the job as much as does his or her specific knowledge in the area. University trained people come to expect better jobs and regard their education as insurance against subordinate employment. They spurn jobs as labourers or semi-skilled workers and because of this attitude, could be considered unqualified for this type of job. Peoples' attitudes must be changed so that everyone realizes that s/he cannot have the best job. People with higher education may have to realize that they are at the same level vocationally as high school graduates and should be ready to do the same job.

If society is going to stress the education-occupation link so that it feels it is getting maximum benefit out of the educational system, it must define the function of the post-secondary institutions, especially the university. Is it to be an "employee machine"? Should everyone be denied more education other than that necessary for his or her job? Education can serve the purpose of not only informing, but of teaching ways of thinking and of posing the questions relevant to current problems. As mentioned previously, the contributions of educated persons include efficient administration and informed and rational decisions. Education provides personal enrichment and development and allows people to develop a capacity to appreciate and participate in artistic and cultural aspects of life. In Canada, national social purposes can be served through more minority language study and ethnic courses in universities. With the current wealth of analytical studies on higher education, we must not lose sight of the nonstatistical and non-economic aspects of education to ensure that attention is drawn to educational objectives which do not lend themselves to traditional statistical processes.

#### IV Conclusion

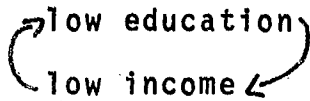
The preceding chapters have outlined the rapid expansion of Canada's post-secondary education system during the decade of the 1960's. The magnitudes of the increases in enrollment, degrees granted, and expenditures, as well as some of the reasons behind the expansion have been examined. In conclusion, by reviewing the main issues regarding higher education in the 60's that have been presented here, I would like to suggest some questions and issues that the "General Review" should address itself to regarding higher education and the development of HQM in the future.

- Is the structure of the economy continuing to change in the seventies. That is, is the proportion of the labour force employed in the primary industries with their low skill and low education requirements, still decreasing?
- Within each sector of the economy, is the porportion of jobs requiring less skill and education decreasing in favour of more highly skilled and demanding jobs or has the educational structure of the economy reached the stage where it is remaining static?
- Is there still a gap between Canadian and American educational achievements. If there is a gap, does it appear to be an important factor in the relative economic achievements and living standards of the two countries? If there is a gap, is it increasing or decreasing in size?
- Is the link between education and employment as strong as it was in the sixties?
- Can post-secondary education still be considered as the key to higher lifetime earnings? Are there high returns to post-secondary education or have we reached the point of diminishing or even negative returns? Is there some optimal average level of education in the economy?
- Is the quality of education being improved now that the number of enrollments isn't increasing as fast as in the past?

- To what extent is the one-way causal relationship holding?

low education → low income

and to what extent is it a "vicious circle" of causation?



In other words is there an opportunity for the poor to break out of their poor environment by getting more education?

- Will the participation rate remain as high as it was at the end of the sixties or will it decrease? Which variables most strongly influence the participation rate (eg. the price of tuition etc., foregone earnings, the state of the labour market) and can these variables be controlled by government policy?
- Do regional disparities continue to exist in the availability of and the quality of higher education. Is there an established pattern of inter-regional migration of post-secondary students and/or highly qualified personnel? Is the regional distribution of education funds equitable?
- Is there still an unequal distribution of university students by income class and by fathers' occupation or is there a growing proportion of students from working class families? If there is, is it the greater availability of student financial aid that is responsible?
- Will community colleges gain in popularity at the expense of universities?
- Would higher education levels contribute more to economic growth? Even if they would, economic growth is no longer stressed as an important economic goal, so education need no longer be stressed because of its importance in growth.
- Are private returns to education still higher than social returns? Are the non-monetary benefits of education becoming more important as society becomes more complex?

- Is the educational-occupational link becoming stronger or weaker? Which factor is the main determinant of the link - the demand for highly trained personnel or the large supply of such people? Should vocationally oriented education, or general education which doesn't lead to a specific occupation be emphasized during the seventies?
- Are highly educated personnel really highly qualified personnel?
- Should educational expenditure continue to increase more rapidly than GNP or should the expenditures be restricted to growing at the same rate as the rest of the economy? Does education already command more than its fair share of Canada's resources?
- What is the present and future function of the various post-secondary institutions and what are their objectives? Are these objectives currently being met?

DIAGRAM I

Lorenz Curve - Percentage Distribution of University Student Families and all Canadian Families, by Increasing Family Income Groups

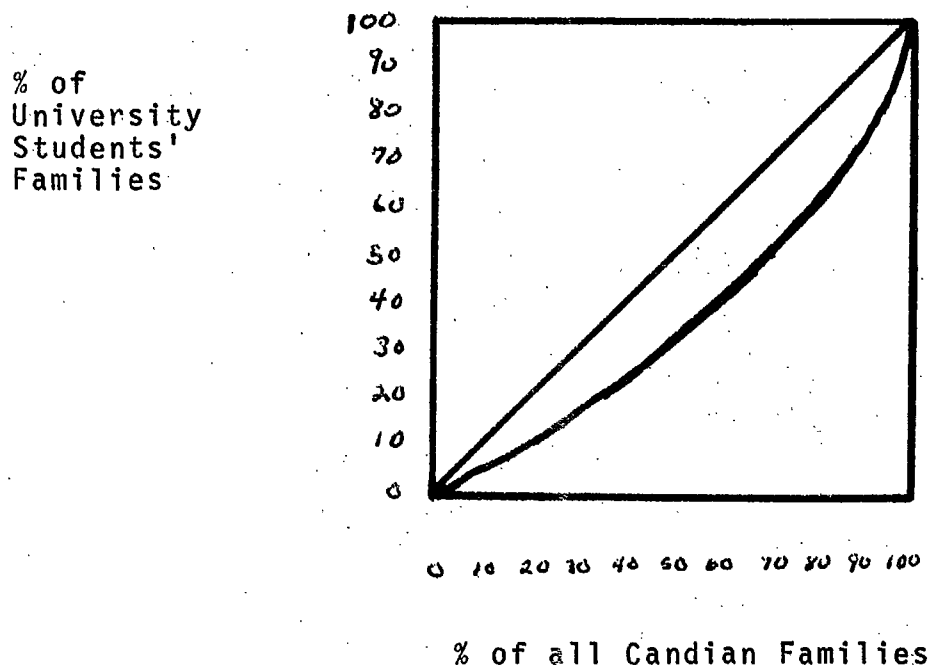




CHART I

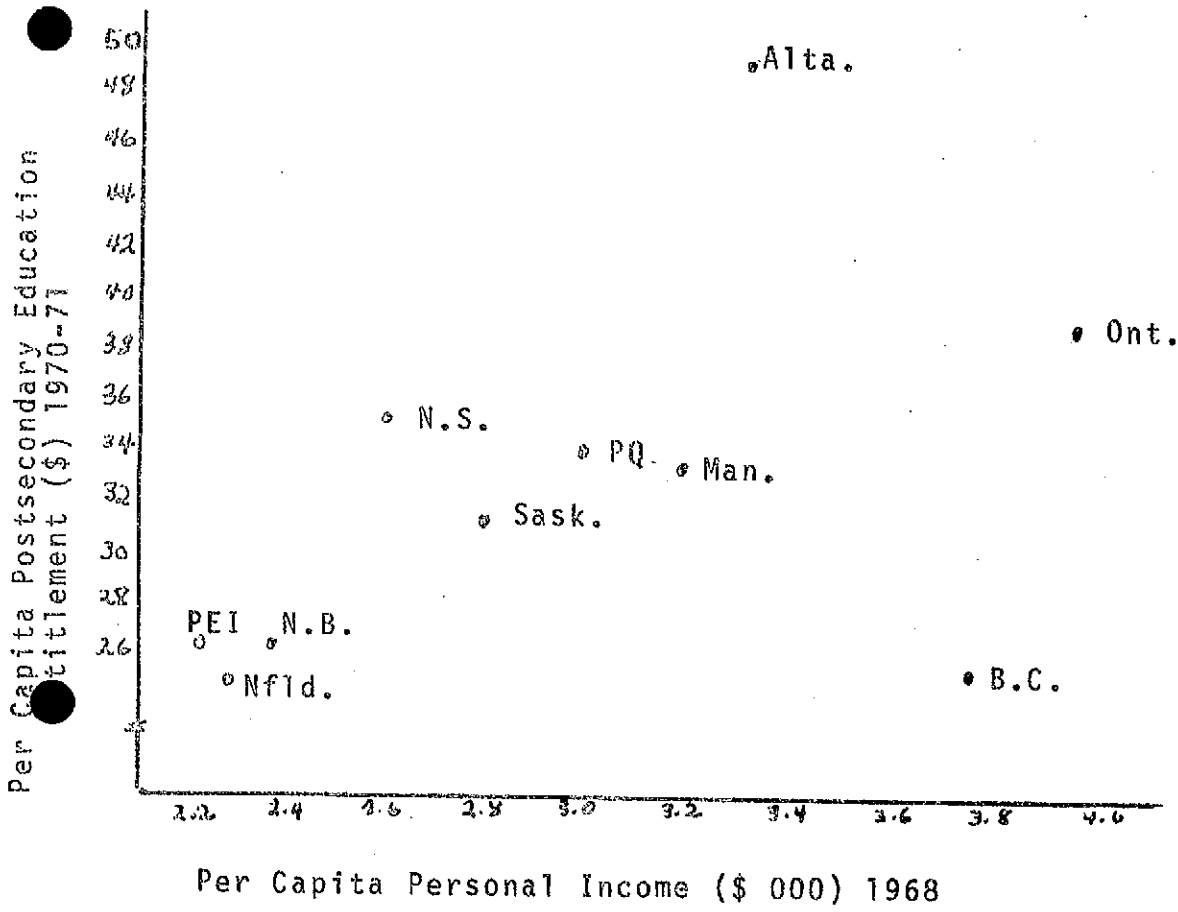
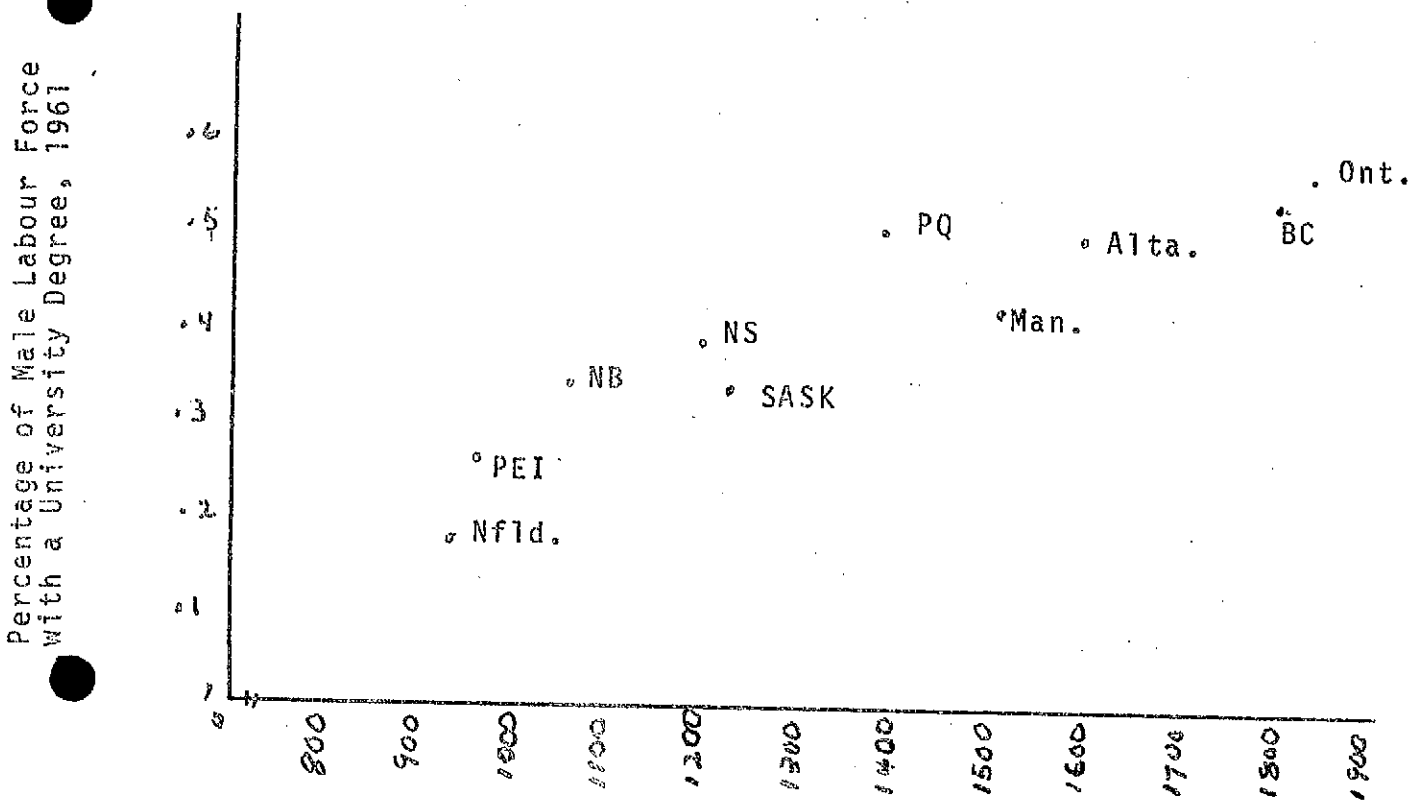


CHART 2



Personal Income Per Person, 1961  
 Source: J. Podoluk, Incomes of Canadians, (pp152-155)

TABLE 1

Total<sup>(a)</sup> Full-Time enrollment by level of study  
for Canada 1960-61 to 1970-71

YEAR	PRE-GR. I TO END OF HIGH SCHOOL	POST-SECONDARY		TOTAL
		UNIVERSITY <sup>(b)</sup>	TOTAL POST SECONDARY	
1960-61	4,204,302	113,864	163,143	4,367,445
1961-62	4,412,828	128,894	182,005	4,594,833
1962-63	4,612,579	141,388	196,721	4,809,300
1963-64	4,805,329	158,388	220,131	5,025,460
1964-65	4,997,105	178,238	243,611	5,240,716
1965-66	5,201,241	205,888	273,612	5,474,853
1966-67	5,355,946	232,672	310,540	5,666,486
1967-68	5,517,092	261,207	352,896	5,869,988
1968-69	5,697,407	293,370	395,371	6,092,778
1969-70	5,808,716	330,081	436,888	6,245,604
1970-71	5,885,798	356,736	475,548	6,361,346

Source: Statistics Canada, Education in Canada: A Statistical Review  
for the Period, 1960-61 to 1970-71  
Ottawa, 1973, p. 90

(a) Does not include enrollment in trade schools, private business colleges  
and apprenticeship programs.

(b) University transfer and CEGEP academic enrollments classified as  
university.

TABLE 2

Full-Time Post-secondary Enrolment by level, related to relevant age group population for Canada 1960-61 to 1970-71

YEAR	POST-SECONDARY		NON-UNIVERSITY LEVEL <sup>a</sup>		UNIVERSITY LEVEL <sup>b</sup>		NUMBER (GRADUATE)	RELATED (%) TO AGE 22-24
	NUMBER	RELATED (%) TO AGE 18-24	NUMBER	RELATED (%) TO AGE 18-21	NUMBER	TOTAL RELATED (%) TO AGE 18-24		
1960-61	163,143	9.7	49,279	5.0	113,864	6.7	6,518	0.9
1961-62	182,005	10.6	53,111	5.2	128,894	7.5	7,347	1.1
1962-63	196,721	11.1	55,333	5.2	141,388	8.0	8,436	1.2
1963-64	220,131	11.9	61,743	5.5	158,388	8.6	11,133	1.5
1964-65	243,611	12.5	65,373	5.5	178,238	9.2	13,797	1.8
1965-66	273,612	13.4	67,724	5.4	205,888	10.1	17,196	2.2
1966-67	310,540	14.2	77,868	5.8	232,672	10.6	19,719	2.4
1967-68	352,896	15.4	91,689	6.6	261,207	11.4	24,187	2.7
1968-69	395,371	16.4	102,001	7.0	293,370	12.2	26,120	2.7
1969-70	436,888	17.3	106,807	7.0	330,081	13.1	30,231	3.0
1970-71	475,548	18.1	118,812	7.6	356,736	13.6	33,172	3.1

<sup>a</sup>Includes students in post-secondary non-university level programs regardless of the type of institution in which they are enrolled.

<sup>b</sup>Includes students in programs at the university level, regardless of the type of institution in which they are enrolled.

Source: Statistics Canada, Education in Canada, p. 148

TABLE 3

Full-Time Post-Secondary Enrollment, Related to Relevant Age Group Population for Canada and the Provinces, 1960-61 to 1970-71

PROVINCE & YEAR	TOTAL POST-SECONDARY		UNIVERSITY LEVEL <sup>a</sup>	
	NUMBER	RELATED (%) TO AGE 18-24	NUMBER	RELATED (%) TO AGE 18-24
NFLD 1960-61	1,747	3.9	1,238	2.7
1970-71	7,798	11.8	6,378	9.6
PEI 1960-61	805	8.5	563	5.9
1970-71	2,105	15.9	1,755	13.3
NS 1960-61	7,488	10.3	5,811	8.0
1970-71	18,481	19.1	15,740	16.3
NB 1960-61	5,401	9.7	4,063	7.3
1970-71	13,278	16.5	10,580	13.1
QUE 1960-61	58,162	11.0	37,843	7.1
1970-71	136,489	17.5	102,575	13.2
ONT 1960-61	48,771	9.0	32,100	5.9
1970-71	175,514	19.3	120,497	13.2
MAN 1960-61	8,023	9.5	6,259	7.4
1970-71	20,318	17.0	16,774	14.0
SASK 1960-61	8,220	9.8	5,652	6.8
1970-71	16,965	15.9	14,587	13.7
ALTA 1960-61	9,814	7.9	7,268	5.9
1970-71	40,967	21.1	31,833	16.4
B.C. 1960-61	14,712	10.8	13,067	9.6
1970-71	43,633	17.5	36,017	14.4
CANA- 1960-61	163,143	9.7	113,864	6.7
DA 1970-71	475,548	18.1	356,736	13.6

Source: Statistics Canada, Education in Canada, p. 400

<sup>a</sup>Includes students in programs at the university level regardless of the type of institution in which they are enrolled.

TABLE 4

Full-Time University Undergraduate Enrollment in  
Arts and Sciences

YEAR	ARTS	PURE SCIENCE
1960-61	42,670	9,795
1961-62	49,332	12,215
1962-63	55,628	14,439
1963-64	60,489	18,668
1964-65	69,404	21,198
1965-66	82,516	24,783
1966-67	94,142	28,564
1967-68	106,693	31,986
1968-69	114,288	42,549
1969-70	131,666	46,948
1970-71	135,711	53,522
%	218%	446%

Source: Statistics Canada, Education in Canada, p. 160

TABLE 4(b)

% Increase for Various Fields of Specialization

SPECIALIZATION	1960-61	1970-71	%
Agriculture	1,886	3,345	77
Architecture	753	1,431	90
Commerce & Business Administration	6,544	19,908	204
Education	11,587	39,251	239
Engineering & Applied Sciences	14,632	22,859	56
Law	2,480	7,260	193
Dental Studies	1,055	1,929	83
Medical Studies	4,244	7,931	87
Nursing	1,659	4,800	189
Pharmacy	1,482	2,096	41
Social Work	618	2,204	257
Veterinary Medicine	466	715	53

Source: Statistics Canada, Education in Canada, p. 160

TABLE 5

Population 14 Years of Age and Over,<sup>(a)</sup> by Sex and Educational Attainment for Canada, 1966, 1967, and 1969

	1966 <sup>e</sup>		1967 <sup>f</sup>		1969 <sup>e</sup>	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Total ('000)	13,305		13,717		14,470	
% without complete elementary	19.5		18.6		17.8	
% with complete elementary <sup>b</sup>	18.3		18.3		15.4	
% with complete secondary <sup>c</sup>	16.1		17.9		18.9	
% with complete university <sup>d</sup>	4.0		4.0		4.8	
Total ('000)	6,593	6,712	6,798	6,919	7,713	7,297
% without complete elementary	21.2	17.8	20.0	17.2	19.0	16.6
% with complete elementary	19.0	17.7	18.7	17.9	15.6	15.3
% with complete secondary	13.1	19.0	14.7	21.0	15.9	21.9
% with complete university	5.3	2.7	5.4	2.6	6.1	3.4

Source: Statistics Canada, Education in Canada, p. 529

<sup>a</sup>Labour force, by conventional Statistics Canada definition

<sup>b</sup>Up to Grade VII in Quebec, Grade VIII in other provinces

<sup>c</sup>Including all academic, technical and commercial high schools. For Quebec, also the first four years of the classical college enrollment.

<sup>d</sup>Percentages do not add to 100 as some intermediate levels have not been included (eg. incomplete secondary & incomplete university)

<sup>e</sup>January

<sup>f</sup>February

TABLE 6

Degrees, Diplomas & Certificates<sup>a</sup> Awarded by Universities  
& Colleges<sup>b</sup> for Canada 1960-61 to 1970-71

YEAR	BACHELORS & FIRST PROFESSIONAL <sup>c</sup> DEGREE	DIPLOMAS	MASTER'S DEGREES	EARNED DOCTORATES
1960-61	19,704	119	2212	306
1961-62	22,788	130	2433	321
1962-63	24,910	265	2756	421
1963-64	28,602	217	3140	481
1964-65	33,126	311	3584	569
1965-66	37,694	346	4472	697
1966-67	42,716	470	5256	780
1967-68	49,056	496	5942	1006
1968-69	54,318	649	7044	1108
1969-70	60,453	1007	8461	1375
1970-71	67,200	856	9638	1625

Source: Statistics Canada, Education in Canada, p. 166

<sup>a</sup>Does not include diplomas and certificates awarded by bodies other than universities and colleges for university studies, such as (a) those granted by professional and para-professional associations, and (b) teaching certificates awarded by departments of education.

<sup>b</sup>Does not include community colleges.

<sup>c</sup>Licences which follow a degree in the same field of study are considered equivalent to a master's. All others are included at the undergraduate level as equivalent to a bachelor's degree.



TABLE 7

Bachelor's & First Professional Degrees Awarded,  
by Selected field of Specialization for Canada  
1961-62 and 1970-71 & Aggregations

SPECIALIZATION	# in 1961-62	% of TOTAL	#in 1970-71	% of TOTAL	TOTAL OVER 1961-1971
ARTS	9,205	40.39	27,585	41.05	186,508
SCIENCE	1,904	8.36	7,730	11.50	43,678
AGRICULTURE	351	1.54	573	0.85	4,681
ARCHITECTURE	102	.45	287	0.43	1,758
COMMERCE AND BUSINESS ADMINISTRATION	1,144	5.02	3,445	5.13	20,208
EDUCATION	3,329	14.61	14,131	21.03	72,936
ENGINEERING AND APPLIED SCIENCE	2,437	10.69	3,898	5.80	27,200
LAW	661	.59	1,949	2.90	10,641
DENTISTRY, Dr. of	229	1.00	364	0.54	2,990
MEDICINE, Dr. of	846	3.71	1,133	1.69	9,491
NURSING	366	1.61	1,258	1.87	7,708
PHARMACY	275	1.21	441	0.66	3,575
SOCIAL WORK (B.SW)	163	0.71	257	0.38	1,413
VETERINARY MEDICINE AND SCIENCE	72	0.32	132	0.20	969

Source: Statistics Canada, Education in Canada, p. 168

TABLE 8

Master's Degrees Awarded by Broad Field of Specialization  
for Canada, 1961-62 and 1970-71 and Aggregation for this  
Period

SPECIALIZATION	# in 61-62	% of TOTAL	# in 70-71	% of TOTAL	TOTAL OVER 1961-1971
AGRICULTURE AND BIOLOGICAL SCIENCES	182	7.48	552	5.73	3,553
EDUCATION	259	10.41	1421	14.74	6,554
ENGINEERING AND APPLIED SCIENCES	286	11.76	1175	12.19	6,341
FINE & APPLIED ARTS	19	.78	86	0.89	476
HEALTH PROFES- SIONS	76	3.12	277	2.88	1,651
HUMANITIES AND RELATED	494	20.30	1998	20.73	10,669
MATHEMATICAL AND PHYSICAL SCIENCES	296	12.17	949	9.85	5,656
SOCIAL SCIENCES, AND RELATED	821	33.74	3180	32.99	17,633
TOTAL	2433	100	9638	100	52,533

Source: Statistics Canada, Education in Canada, p. 168

TABLE 9

Earned Doctorates by Broad Fields of Specialization  
for Canada, 1961-62 and 1970-71, and Aggregation for  
this Period

SPECIALIZATION	# in 1961-62	% of TOTAL	# in 1970-71	% of TOTAL	TOTAL OVER 1961-1971
AGRICULTURE AND BIOLOGICAL SCIENCES	67	20.87	276	16.98	1444
EDUCATION	17	5.30	77	4.74	418
ENGINEERING AND APPLIED SCIENCES	20	6.23	225	13.85	1018
FINE AND APPLIED ARTS			6	0.37	15
HEALTH PROFES- SIONS	25	7.79	102	6.28	532
HUMANITIES AND RELATED	42	13.08	182	11.20	953
MATHEMATICAL AND PHYSICAL SCIENCES	115	35.83	528	32.49	2978
SOCIAL SCIENCES AND RELATED	35	10.90	229	14.09	1023
TOTAL	321	100	1625	100	8381

Source: Statistics Canada, Education in Canada, p. 176

TABLE 10

Population and Participation Rates 18-24 year group

Year	Population of of 18-24 Age Group (000)	Full-Time Students as % of 18-24 Age Group
1962	1796.4	11.0
1964	1973.0	12.3
1966	2149.6	14.4
1968	2370.5	16.7
1970	2591.3	18.1
1972	2782.4	18.9

TABLE 11

Full-time Post-secondary enrollment  
Showing Components of Change from 1960-61

YEAR	TOTAL	DUE TO POPULATION	DUE TO BOTH FACTORS (INTERACTION)	DUE TO PARTICIPATION
1960-61				
1961-62	18,862	11.4%	1.2	87.4
1962-63	33,578	23.3	3.5	73.6
1963-64	56,988	27.1	6.3	66.6
1964-65	80,468	30.3	9.1	60.6
1965-66	110,469	30.6	11.9	57.4
1966-67	147,397	32.9	15.4	51.7
1967-68	189,753	30.5	18.2	51.3
1968-69	232,228	30.1	21.0	49.0
1969-70	273,745	29.4	23.3	47.3
1970-71	312,405	28.9	25.3	45.8

Source: Statistics Canada, Education in Canada, p. 61.

TABLE 12

Post-secondary enrollment as Percentage of Relevant Age Group Population

<u>MALES</u>			
YEAR	TOTAL POST-SECONDARY (%)	NON-UNIVERSITY (%)	UNIVERSITY (%)
1960-61	11.9	2.9	10.2
1961-62	13.8	3.2	11.2
1962-63	13.6	3.1	11.7
1963-64	14.5	3.6	12.3
1964-65	15.3	4.0	12.9
1965-66	6.5	4.4	13.8
1966-67	17.5	5.1	14.4
1967-68	19.0	6.0	15.3
1968-69	20.0	6.7	15.9
1969-70	21.0	6.9	16.9
1970-71	21.9	7.6	17.4
<u>FEMALES</u>			
1960-61	7.4	7.1	3.3
1961-62	8.2	7.3	3.9
1962-63	8.7	7.3	4.3
1963-64	9.3	7.5	4.8
1964-65	9.7	7.1	5.5
1965-66	10.3	6.5	6.4
1966-67	10.8	6.4	6.9
1967-68	11.9	7.1	7.5
1968-69	12.8	7.3	8.3
1969-70	13.6	7.2	9.3
1970-71	14.3	7.5	9.8

Source: Statistics Canada, Education in Canada, p. 150-151.

TABLE 13

Expenditures on Education, by level, for Canada 1960-1970

YEAR	ELEMENTARY & SECONDARY	(\$ millions)			TOTAL EXPENDITURE
		UNIV.	%	TOTAL POST-SECONDARY	
1960	1,328.3	272.9	16.0	330.5	1,706.0
1961	1,499.5	310.6	16.1	369.0	1,930.7
1962	1,808.8	378.7	15.9	452.3	2,377.9
1963	1,879.1	461.4	18.2	543.5	2,540.8
1964	2,066.2	597.3	20.7	690.4	2,889.9
1965	2,410.8	736.6	21.7	835.4	3,399.5
1966	2,790.9	991.6	23.9	1,116.6	4,155.2
1967	3,230.0	1,243.4	24.7	1,443.5	5,025.5
1968	3,775.1	1,360.0	23.5	1,611.2	5,777.1
1969	4,262.8	1,583.0	24.2	1,855.2	6,554.8
1970	4,804.8	1,767.3	23.8	2,140.8	7,408.9

Source: Statistics Canada: Education in Canada p. 91.

TABLE 14

Expenditures on Post-Secondary Education, by Province, 1960 and 1970

thousands of dollars

PROVINCE	NON-UNIVERSITY		UNIVERSITY		TOTAL POST-SECONDARY	
	1960	1970	1960	1970	1960	1970
Nfld.	547	3,556	2,076	22,305	2,623	25,861
P.E.I.	203	899	1,105	5,102	1,308	6,001
N.S.	2,337	7,791	9,551	88,319	11,888	96,110
N.B.	1,244	6,171	6,678	39,477	7,922	45,648
Que.	26,422	121,753	73,269	346,491	99,691	468,244
Ont.	17,850	140,345	99,909	788,039	117,759	928,384
Man.	2,106	9,546	13,100	75,494	15,206	85,040
Sask.	2,459	11,541	10,179	60,224	12,638	71,765
Alta.	2,591	34,433	27,297	170,657	29,888	205,090
B.C.	1,841	30,499	26,244	143,434	28,085	173,933
TOTAL	57,600	373,534	272,940	1,767,301	330,540	2,140,835

Source: Statistics Canada, Education in Canada, p. 212.



TABLE 15

Expenditures on Post-Sec. Education, Percentage Distribution by Source of funds, for Canada, 1960 to 1970.

YEAR	TOTAL	SOURCE OF FUNDS		OTHER
		GOVERNMENT	FEEES	
	000,000	Total = 100%		
1960	330.5	68.9	14.7	16.4
1961	369.0	70.2	15.9	13.9
1962	452.3	70.9	14.3	14.8
1963	543.5	68.5	14.5	17.0
1964	690.4	66.2	13.5	20.3
1965	835.4	68.8	13.7	17.5
1966	1116.6	72.8	12.1	15.1
1967	1443.5	76.4	10.6	13.0
1968	1611.2	80.7	10.9	8.4
1969	1855.1	78.7	10.3	11.0
1970	2140.8	80.7	9.8	9.5

TABLE 16

University expenditures by source of funds for Canada, 1960-1970

YEAR	TOTAL \$000,000	SOURCE OF FUNDS		OTHER
		GOVERNMENT	FEEES	
			total - 100%	
1960	262.4	61.8	17.6	20.6
1961	296.3	63.7	19.0	17.3
1962	356.5	63.9	17.5	18.6
1963	436.0	61.7	17.3	21.0
1964	562.9	59.3	15.9	24.8
1965	684.5	62.6	16.1	21.3
1966	906.8	67.3	14.3	18.4
1967	1,127.0	70.8	12.9	16.3
1968	1,211.6	76.3	13.2	10.5
1969	1,440.5	73.6	12.4	14.0
1970	1,617.8	75.8	11.9	12.3

Source: Statistics Canada, Education in Canada, p. 178.

TABLE 17

Percentage of Revenues of Universities and Colleges  
from Student Fees and Government Grants by Region

Year	Atlantic Provinces	Quebec	Ontario	Western Provinces
1951				
Fees	42.5	31.9	34.7	35.1
Grants	37.6	34.1	48.9	56.3
1961				
Fees	32.0	26.6	25.4	24.3
Grants	52.4	59.2	61.0	67.3
1966				
Fees	27.3	28.7	19.7	18.9
Grants	60.7	52.7	71.4	72.7

Source: Economic Council of Canada, Canadian Higher Education in the Seventies, p. 213.

TABLE 18

Total Expenditures of Governments at 3 levels (a), % age distribution by function, for Canada, 1960-1969

MAJOR FUNCTIONS

YEAR	TOTAL	EDUCATION	DEFENSE & VETERANS PENSIONS	HEALTH (HOSPITALS & OTHERS)	SOCIAL WELFARE	TRANSPORT	OTHER
	000,000		% age	of total or	total = 100%		
1960	10,783.9	14.0	17.0	7.8	15.1	13.5	32.6
1961	11,760.1	14.5	16.9	8.8	14.8	12.2	32.8
1962	12,701.3	16.8	15.2	9.1	15.0	12.0	31.9
1963	13,484.9	16.7	15.2	9.2	15.0	12.2	31.7
1964	14,435.4	17.5	13.3	9.8	15.5	12.3	31.6
1965	16,183.6	18.5	12.2	9.9	15.0	12.8	31.6
1966	18,727.1	19.7	11.0	10.1	14.1	12.1	33.0
1967	21,486.6	21.1	10.2	10.6	15.1	10.3	32.7
1968	23,809.7	22.2	9.3	10.9	15.5	9.8	32.3
1969	27,362.3	21.8	8.0	12.2	14.3	8.8	34.9

Source: Statistics Canada: Education in Canada, p. 94.

(a) a fed., prov., & municipal preliminary

TABLE 19

Total Expenditure on Education at all levels, related to selected socio-economic indicators in Canada

YEAR	EXPENDITURE ON EDUCATION	EXPENDITURE AS % OF GNP	EXPENDITURE AS % OF PERSONAL INCOME	EXPENDITURE POPULATION	EXPENDITURE TOTAL- FULL TIME ENROLMENT
		%	%	\$ per capita	\$
1960	1,706.0	4.5	5.8	95	391
1961	1,930.7	4.9	6.4	106	420
1962	2,377.9	5.6	7.3	128	494
1963	2,540.8	5.6	7.3	134	506
1964	2,889.9	5.8	7.8	150	551
1965	3,399.5	6.2	8.3	173	621
1966	4,155.2	6.8	9.0	208	733
1967	5,025.5	7.6	9.9	247	856
1968	5,777.1	8.1	10.4	279	948
1969	6,554.8	8.3	10.6	312	1050
1970	7,408.9	8.8	11.1	348	1165
% Increase 1960-70	334.3	95.6	91.4	266.3	198.0

Source: Statistics Canada: Education in Canada, p. 93.

TABLE 20

Financial awards to Post-Secondary Students by the Federal and Provincial Governments

PROVINCE	TOTAL # OF AWARDS	AVERAGE VALUE \$	VALUE PER FULL-TIME STUDENT \$	1970-71	
				#TO UNIVERSITY GRADUATE STUDENTS	AVERAGE VALUE \$
<u>NFLD</u>					
1966-67	8,404	436	783		
1970-71	12,069	639	989	182	1,775
<u>P.E.I.</u>					
1966-67	1,044	506	396		
1970-71	2,452	603	702	13	2,692
<u>N.S.</u>					
1966-67	10,085	479	406		
1970-71	19,026	652	671	388	1,611
<u>N.B.</u>					
1966-67	5,060	714	379		
1970-71	14,123	652	694	486	1,152
<u>QUE.</u>					
1966-67	92,595	573	488		
1970-71	79,332	653	380	4,650	1,690
<u>ONT.</u>					
1966-67	647,261	515	355		
1970-71	144,192	650	534	14,528	1,375
<u>MAN.</u>					
1966-67	7,905	517	283		
1970-71	10,648	788	413	440	1,875
<u>SASK.</u>					
1966-67	8,209	643	393		
1970-71	10,980	759	492	263	1,996
<u>ALTA.</u>					
1966-67	18,994	464	395		
1970-71	45,996	536	601	1,218	1,926
<u>P.C.</u>					
1966-67	19,752	476	315		
1970-71	23,337	537	287	976	2,541
<u>CAN.</u>					
1966-67	236,774	535	408		
1970-71	362,155	636	484	23,144	1,536

Source: Statistics Canada, Education in Canada, p. 562, 566

TABLE 21

Post-Secondary Operating Expenditures per Full-time student for Can. 1960 to 1970

YEAR	POST-SECONDARY			UNIVERSITY		
	TOTAL	FULL-TIME ENROLMENT	COST PER FULL-TIME STUDENT	TOTAL	FULL-TIME ENROLMENT	COST PER FULL-TIME STUDENT
	\$000,000		\$	\$000,000		\$
1960	229.7	165,348	1,389	182.6	113,864	1,603
1961	260.4	184,188	1,414	211.3	128,894	1,640
1962	297.8	198,828	1,498	244.0	141,388	1,726
1963	351.3	222,352	1,580	289.9	158,388	1,831
1964	413.5	243,951	1,695	345.2	178,238	1,937
1965	510.2	274,241	1,860	432.7	205,888	2,102
1966	678.9	310,477	2,187	582.3	232,672	2,503
1967	875.0	353,349	2,476	748.9	261,207	2,867
1968	1,101.1	405,861	2,713	896.9	270,093	3,321
1969	1,304.0	431,473	3,022	1,084.2	299,889	3,615
1970	1,544.8	475,865	3,246	1,225.5	310,312	3,949

Source: Statistics Canada, Education in Canada, p. 178, 181.

<sup>a</sup>CEGEP expenditure for academic students are classified as non-university, starting in 1968. Expenditures for transfer students are included with university up to 1969 but with non-university for 1970.

NOTE: Because of differences in coverage, data for finance are not related with those for enrolment which are shown in other tables.

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TABLE 22

Post-Secondary Price Index and GNE Price Index

YEAR	POST-SECONDARY PRICE INDEX	GNE PRICE INDEX
1941	37.7	49.3
1946	43.3	58.0
1951	60.0	84.2
1956	75.6	92.9
1961	100.0	100.0
1966	119.6	114.5
1968/69	150.6	122.5
1969/70	160.4	133.6

Source: D.A.S. Stager, "Allocation of Resources in Canadian Education" in Economic Council of Canada, Canadian Higher Education in the Seventies, Ottawa, 1972.



TABLE 23

Secondary and University Enrolment Ratios, Canada and the U.S.

	1951-52 (as % of 14-17 age group)	1965-66 (as % of 14-17 age group)	projected 1975-76
Secondary enrolment			
Canada	46	80	94
U.S.	77	92	98
Fulltime University enrolment (as % of 18-24 age group)			
Canada	5	11	18
U.S.	12	119	24

Source: Economic Council of Canada, Sixth Annual Review, p. 126.

TABLE 24

Post-Secondary Education in Selected OECD Countries<sup>a</sup>

Country & Year	# Students	Students per 100,000 pop.	Post-sec. enrolment as % of pop. 20-24, 1968-69
Australia 1960	80,710	785	16.8
1968	164,528	1,368	
Austria 1960	38,533	547	10.0
1968	52,527	715	
Belgium 1960	52,002	568	15.5
1967	59,172	618	
Canada 1960	164,982	921	30.1
1968	503,276	2,423	
Denmark 1960	28,270	618	14.9
1968	69,425	1,426	
Finland 1960	23,552	532	11.8
1968	54,886	1,171	
France 1960	272,037	595	18.6
1967	613,964	1,239	
Germany (F.R.) 1960	265,366	499	11.3
1968	430,904	716	
Ireland 1960	12,438	439	10.4
1968	25,660	882	
Italy 1960	191,790	386	13.6
1968	420,417	797	
Japan 1960	709,878	762	18.2
1968	1,526,764	1,510	
Nether- lands 1960	105,995	923	13.4
1967	182,044	1,445	
Norway 1960	9,254	258	11.4
1968	41,790	1,094	
Sweden 1960	37,405	500	18.8
1968	115,610	1,460	
Switzer- land 1960	21,346	398	11.2
1968	38,197	621	
England & Wales 1965	276,459	579	13.4
1967	346,477	716	
Scotland 1965	49,728	958	
1967	57,017	1,099	
U.S. 1960	3,582,726	1,983	43.3
1968	7,513,091	3,735	

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TABLE 24 (continued)

Country & Year	Public Exp. on Education as % of GNP	Public Exp. on education as % of total government expenditures
Australia 1967	4.0	11.9
Austria 1968	4.7	7.6
Belgium 1968	5.0	
Canada 1968	7.7	23.6
Denmark 1968	6.3	18.0
Finland 1968	6.4	23.0
France 1968	4.4	19.1
Germany 1968	3.6	10.9
Ireland 1968	4.7	11.2
Italy 1968	4.8	19.8
Japan 1968	4.0	20.8
Nether- lands 1967	6.9	27.7
Norway 1968	6.1	
Sweden 1968	7.9	26.9
Switzer- land 1968	4.1	19.3
U.K. 1967	5.6	12.3
U.S. 1968	5.8	16.6

Source: Statistics Canada, Education in Canada, p. 493, 502.

<sup>a</sup>For school year beginning in calendar year indicated.

For other footnotes regarding data limitations see source.

TABLE 25

Percentage Distribution of the Male Labour Force by Occupations and Level of Schooling, 1961

	% Age With				
	Less Gr.9	Gr.9-11	Gr.12-13	Some University	University Degree
All occupations	44.4%	31.1	15.3	4.3	4.9
White collar	18.1	30.2	27.2	9.7	14.8
Blue collar	55.1	32.4	10.5	2.0	0
Service	43.5	37.6	14.2	4.7	0
Transport & Communication	51.7	36.5	9.8	2.0	0
Primary	69.2	24.3	5.5	1.6	0

Source: Census of Canada, 1961, Vol. 3.1-9, Table 17 or Porter J., The Vertical Mosaic, University of Toronto Press, Toronto, 1965.

TABLE 26

Median Years of Schooling of Male Labour Force, by Age Groups,  
Canada 1961 and U.S. 1962

Age Groups	Canada (1961)	U.S. (1962)
25-34	10.0	12.4
35-44	9.6	12.2
45-54	9.0	11.1
55-64	8.3	9.0

Source: Economic Council of Canada, Second Annual Review, (p.81).

TABLE 27

Percentage of Male Labour Force Completing High School and University by Age Groups, Canada 1961 and United States 1960

AGE GROUP	4 Years High School		University	
	Canada	U.S.	Canada	U.S.
Total, 25-64	8.7	24.6	5.6	11.1
25-34	8.7	30.8	6.0	14.7
35-44	9.5	29.5	6.3	11.9
45-54	8.5	20.0	5.0	8.8
55-64	7.4	12.2	4.2	7.0

Source: Economic Council of Canada, Second Annual Review (p.81).

TABLE 28

Average Annual Income from Employment by Levels of Education,  
Male Non-farm Labour Force, 1960

EDUCATION	INCOME (\$)	INDEX (0-8Years=100)
0-8 Years elementary	3,526	100
1-3 Years high school	4,478	127
4-5 Years high school	5,493	156
Some University	6,130	174
University degree	9,188	261
TOTAL	4,602	

Source: Economic Council of Canada, Second Annual Review, (p.86).

TABLE 29

Educational Characteristics of all Nonfarm Families and Low Income Nonfarm Families, Year Ending May 31st, 1961.

Education of Head	Number of Nonfarm Families		Incidence of Low Income
	(1) all Families	(2) Low Income Families	(2) As a percentage of (1)
No Schooling or Elementary only	1,681	625	37
Secondary, 1-3 yrs	1,068	208	20
Secondary, 4-5 yrs	551	62	11
Some University	137	13	9
University Degree	190	8	4

Source: Economic Council of Canada, Fifth Annual Review, (p.111).



TABLE 30

Average Years of Schooling of Labour Force, by Region

Region	1951	1961	1966
Atlantic Region	7.9	8.8	9.3
Quebec	8.1	8.2	8.7
Ontario	9.1	9.5	9.9
Prairie Region	8.5	9.3	9.7
British Columbia	9.3	10.1	10.5

Source: Economic Council of Canada, Sixth Annual Review (p.130).

TABLE 31

Per Capita Value of Fiscal Transfers for Post-Secondary Education by Province, 1967 - 1968

PROVINCE	\$PER CAPITA	
	1967-1968	1971-1972
Newfoundland	15	30
Prince Edward Island	15	30
Nova Scotia	21	40
New Brunswick	15	31
Quebec	22	42
Ontario	21	43
Manitoba	19	37
Saskatchewan	21	35
Alberta	27	54
British Columbia	17	28
All Provinces	21	41

TABLE 32

Federal Financing of Post-Secondary Education: Net Fiscal Transfers Among Provinces, Fiscal Year 1968-69

Province	Net Transfer (\$ Millions)	Net Transfer as Percentage of Portion of Federal Tax Revenues Originating in the Province and Going to Postsecondary Education (Percent)
	From (-) to (+)	From (-) to (+)
Newfoundland	3	30
Prince Edward Island	1	35
Nova Scotia	7	50
New Brunswick	2	15
Quebec	28	25
Ontario	30	15
Manitoba	1	5
Saskatchewan	3	15
Alberta	9	20
British Col.	18	30

Source: Economic Council of Canada, Eighth Annual Review, (p.218).

TABLE 33

Federal and Provincial Financing of Post-secondary Education: Net Fiscal Transfers Among Family Income Groups, Fiscal Year 1968-69

	Net Transfer Resulting From Federal and Provincial Government Subsidies		Net Transfer as a Percentage of Tax Revenues Originating from Income Group and going to Post-Secondary Education (percent)	
	(\$millions)			
	From (-)	to (+)	From (-)	To (+)
Under \$2,000	5		55	
2,000-2,999		8		70
3,000-3,999		5		35
4,000-4,999		3		20
5,000-6,999		22		35
7,000-9,999	1		1	
10,000 & over	35		15	

Source: Economic Council of Canada, Eighth Annual Review (p.221).

TABLE 34

Percentage Distribution of University Student Families and all Canadian Families by Family Income Group 1956

FAMILY INCOME (\$)	STUDENT FAMILIES (%)	ALL CANADIAN FAMILIES (%)
Over 10,000	15.2	3.3
7000-9,999	12.2	8.4
5,000-6,999	21.3	18.7
4,000-4,999	14.8	15.7
3,000-3,999	17.5	22.9
2,000-2,999	11.6	17.0
Under 2,000	7.4	14.0

Source: The Vertical Mosaic (p.184).

TABLE 35

Percentage Distribution of University Students' Parents by Occupational Level, 1956.

OCCUPATION LEVEL	STUDENTS' PARENTS (%)	TOTAL LABOUR FORCE (%)
Proprietors and Managers	25.7	8.3
Professionals	24.9	7.1
Clerical & Sales	12.3	16.5
Skilled and semi-skilled	21.1	30.6
Agriculture	10.9	15.7
Labour	5.1	20.5
TOTAL	100	100

Source: Porter, Vertical Mosaic, (p.184).

TABLE 36

Distribution of Post-Secondary Students by Parents' Income, Academic Year 1968 - 1969

FAMILY INCOME GROUP	UNIVERSITY GRADUATE	UNIVERSITY UNDERGRADUATE	COMMUNITY COLLEGES & CEGEP'S	TOTAL
Less than \$2,000	1.4	1.0	0.9	1.0
2,000 - 2,999	5.1	4.1	4.3	4.2
3,000 - 3,999	6.7	4.9	6.3	5.2
4,000 - 4,999	4.8	6.2	8.8	6.5
5,000 - 6,999	21.1	20.7	29.7	22.0
7,000 - 9,999	21.7	24.6	27.0	24.8
10,000 & over	39.2	38.5	23.0	36.3
Total	100.0	100.0	100.0	100.0
Median Family Income	\$8,502	\$8,600	\$7,003	\$8,349

Source: Economic Council of Canada, Eighth Annual Review (p.220).

TABLE 37

Internal Rates of Return from University Education, Males, by Region\*

REGION	RETURNS TO SOCIETY	
	1961	1967
Canada	11.7	11.0
Atlantic	11.5	10.0
Quebec	13.0	12.5
Ontario	11.8	11.5
Prairies	11.8	11.5
British Columbia	11.8	9
REGION	RETURNS TO INDIVIDUALS	
	1961	1967
Canada	14	13
Atlantic	14	11.5
Quebec	14.5	14
Ontario	13.8	13.5
Prairies	15	14.5
British Columbia	14	11.5

\*Approximate values as read from chart 9-3, (p.210, Eighth Annual Review, Economic Council of Canada.



TABLE 38

Returns to Bachelor's Degrees, Canada, Males

Author of Study	Degree	Data Year	Social Returns	Private Returns
Drummond	Bachelor	1959	2.6 (B/C ratio at 5%)	
Podaluk	Bachelor	1961		19.7% (before tax)
Wilkinson	Bachelor	1961		\$12,700 (N.P.V. at 5%, discount to age 14)
Dodge	Bachelor	1961	9.2%	12.2%
Stager	Bachelor	1961	12.5%	15.4%
Dodge and Stager	Bachelor - Science	1966	9.6%	11.8%
	- Engineering		10.5%	14.7%

TABLE 39

Internal Rates of Return from University Education for Ontario

SOURCE	SOCIAL RETURN	PRIVATE RETURN	
	1961	1961	1967
Economic Council	11.8	13.8	13.5
Dodge	5.0	8.0	5.5

TABLE 40

OCCUPATION & DEGREE	METHOD 1 Internal Rate of Return	METHOD 2 Internal Rate of Return
<u>Accountants</u>		
Graduate Degree vs Honours Degree	n.e.*	0.9
Honours Degree vs No Degree	5.8	3.8
General Degree vs No Degree	3.3	< -5.0
<u>Engineers</u>		
Doctorate vs Bachelor's Degree	< -5.0	4.1
Master's vs Bachelor's Degree	2.6	-2.1

n.e.\*- A unique internal rate of return is non-existent

TABLE 41

Method 3 - Internal Rate of Return

Occupation & Degree	%
<u>Accountants</u>	
Honours B.A. vs. all high school graduates	11.7
General B.A. vs. all high school graduates	7.1
<u>Engineers</u>	
Bachelor's vs. all high school graduates	10.5

TABLE 42

Returns to Graduate Study in Selected Fields, Males, Canada, 1966 - 1967

Degree & Field of Study	Social Internal Rate of Return (%)	Private Internal Rate of Return (%)
<u>Master vs. Bachelor</u>		
Business Administration vs. Science B.Sc.	9.0	16.3
Business Administration vs. Engineering B.Sc.	3.5	8.5
Chemistry	(a)	(a)
Physics	(a)	(a)
Mathematics	-0.5	0.6
Engineering	2.0	4.5
<u>Doctor vs. Bachelor</u>		
Chemistry	0.9	5.6
Physics	0.7	7.5
Mathematics	-5.5	0.3
Engineering	-3.5	1.5
<u>Doctor vs. Master</u>		
Chemistry	1.3	5.8
Physics	1.3	9.6
Mathematics	(a)	(a)
Engineering	(a)	(a)

Source: Dodge and Stager, op.cit., (pp 49,50).

(a) Internal rate of return is less than -10 or is non-existent.

TABLE 43

Returns to Graduate Study in the Public Sector, Males, Canada, 1966-1967

Degree & Field of Study	Social Internal Rate of Return (%)	Private Internal Rate of Return (%)
<u>Master vs. Bachelor</u>		
Business Administration vs. Science B.Sc.	9.4	29.6
Business Administration vs. Engineering B.Sc.	(a)	(a)
Chemistry	9.7	23.1
Physics	6.2	14.0
Mathematics	8.4	15.2
Engineering	(a)	(a)
<u>Doctor vs. Bachelor</u>		
Chemistry	2.7	11.4
Physics	4.1	15.0
Mathematics	1.7	10.1
Engineering	-0.2	5.7
<u>Doctor vs. Master</u>		
Chemistry	1.1	5.7
Physics	1.3	10.4
Mathematics	-0.7	4.0
Engineering	1.3	6.7

Source: Dodge and Stager, op. cit., p. 51, 53.

(a) Internal rate of return is less than -10 or is non existent.

TABLE 44

Unemployment Rates by Educational Attainment for Canada, April 1972, (both sexes, 14 years and over)

EDUCATIONAL ATTAINMENT	UNEMPLOYMENT RATE
TOTAL	6.8%
Grade VIII or less	10.2%
Grade IX to end of Secondary	4.7%
Post-secondary non-university (completed)	2.5%
University (completed)	2.3%

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Source: Statistics Canada, Education in Canada, (p.525).

