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PRESIDENT'S ADDRESS

C. Kenneth Tanner*

CHANGING CONDITIONS FOR EDUCATIONAL PLANNING

What are some of the new conditions for educational planning? This question has been addressed by educators, politicians and statesmen for decades, yet it seems now to be a top priority item, especially with the hazards of inflation and uncertainties of social change becoming more prevalent. To further complicate the matter, as Hans N. Weiler has observed, today the principles, methods, philosophies and techniques of educational planning vary from one country to another more than ever.[1] Yet, this variation notwithstanding, educational planning is no longer what it was in the sixties or even the early seventies.

For example, consider the philosophical question: Can something as personal as education really be planned by some central or anonymous authority? Weiler contends that while countries such as the United States, Japan, and the Federal Republic of Germany undertake many governmental activities which are concerned with systematic preparation of the future of their educational systems, there is still a profound distrust of both the notions and connotations of educational planning. Conversely, there are some countries that have adopted, without misgivings, some form of educational planning as well as the label that goes with it.. It is in these countries that the diversity of approaches to the task of planning future educational systems is increasing. Many developing countries have moved from a strictly straightforward model of planning for given output patterns, generally based on manpower needs, to more complex social and economic models which take into consideration national and international policy. Because of a better understanding of complexities in the relationship between education and social, political and economic change, and resulting doubts about the appropriateness of the initial assumptions underlying educational planning, there have been significant departures in planning the educational development.

With demographic, economic, and social conditions rapidly changing in every country it is wise to study the guidelines of the International Institute of Educational Planning, consider these new departures and possibly develop a new typology and methodology of educational planning. What are the changes in emphasis, and the new assumptions? What are the training and re-training strategies for the preparation of personnel to cope with the future tasks of educational development and planning?

IIEP has proposed five tasks: The first one concerns educational planning as social research. The argument here is that educational systems do not develop according to plans, but to a complex set of social, political, and economic factors such as status aspirations, group interests, the influence of large corporations, etc. When plans fail, often the planner is at fault for being oblivious to, or ignorant of, this complex set of conditions. It is proposed that those in charge of planning must develop a thorough understanding of the factors likely to affect the success of any educational policy. Education is not an

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independent variable. Systematic social inquiry is one of the planner's first and most important tasks.

Another is planning the distribution of education. Many developing countries have been confronting the problem of low rates of schooling. Initially their planners were preoccupied with the need for growth – growth in the number of students and educational facilities. Weiler implies that while the problem of achieving an adequate capacity of the educational system has by no means been solved in many countries, a second policy concern has moved up alongside this original attention to growth. This second concern considers not just the overall volume of educational opportunity and services, but also the way in which these services and opportunities are distributed across the population along regional, social, ethnic, age or sex lines.[2]

Although this has become an important item on the agenda of policy makers in many countries, it is maintained that educational planning is still very much dominated by the notion of growth and has been slow to develop concepts, methods, and techniques for the design and implementation of plans that take the existing disparities into account. Therefore, the significant task for planners is not only to disaggregate the statistics on disparities, but also to determine those factors that cause the disparities. When this has been done, new plans or formulae may be designed to approach equality. It is certainly time for diagnostic research to understand better why certain groups in a population find it difficult to enter into, and succeed in, an educational program.

The third task pertains to quantity, quality and content in educational planning. A current weakness of planning is that emphasis is on how many people flow through the various levels of education, while a minimum amount of thought is given to what happens to them during this process. "It has been assumed that graduates of the educational system have certain qualifications which make them employable or otherwise useful, but it has never been an explicit concern of educational planning to inquire into the conditions under which certain specified outcomes of the educational process are being achieved."[3] Not only should there be concern for the flow of people, but careful consideration must be given to the kinds of learning experiences to which they are exposed. Therefore, an important research task is the analysis of the processes by which changes in educational systems lead to changes in educational outcomes.

Educational planning at sub-national levels appears to be an area for investigation since the general assumption is that planning has been a function closely attached to national decision-making authority. The Republics in the USSR, and the states in Nigeria, the Federal Republic of Germany, and Brazil all have strong governments of a central character. The assumption that this level of government is the appropriate one for educational planning should not be taken unquestioned, however, because planning bodies responsible for smaller population areas are believed to be more in touch with reality and able to produce realistic plans than remote planning authorities in a distant capital. Decentralized planning is meant to increase the participation of students, parents, teachers, and local administrators in the process of planning. Problems such as the relationship of education and the world of work frequently are better understood and managed at the regional than the national level. This is one reason, among others, for recent attempts to establish planning mechanisms at sub-national, regional and local levels. However, care must be taken here to avoid the confusion and misuse of funds which are especially characteristic of the state, local and regional planning undertaken in the United States.

Task number five Weiler calls "beyond the design of educational plans". Ever since the term educational planning appeared in the literature it has had different meanings. Most of them deal with the design of plans and cover such steps as obtaining information on both the status quo of the educational system and its future needs and, matching targets with achievements. As a result, the training of educational planners has been directed primarily to mastering various techniques involved in plan design. IIEP points to the obvious failure of many seemingly well-designed educational plans to make us aware of the other things involved than merely the *design* of the plan. Could it be that implementation and evaluation of educational plans are also part of the total concept of planning? If only at the abstract level, it is wise to think in terms of planning as a cyclical process extending from design to evaluation. "The dangers of limiting the planning of educational development to design plans and of isolating 'planners' from the problems of implementation and the insights of evaluation are such that a serious effort has to be made to rethink the relationship and interaction between those administrative units which are, respectively, in charge of designing, implementing and evaluating plans for educational development and to redesign the profile of competence for those whose role it will be to integrate these various components more effectively than has been the case in the past."[4]

In some countries the tasks of plan implementation and evaluation of plan success have always been perceived as integral parts of educational planning and in some countries these tasks are being performed well. But, because of the changing conditions for educational planning it is important that our record in performing these five general tasks be re-examined. I have no reservations in recommending that all national and international agencies in the business of training educational planners evaluate their study programs in light of them. The least we can do is be aware of the need to photograph alternative futures carefully and systematically look at the planning process in its entirety.

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1. Hans N. Weiler, "New Directions in Educational Planning: Implications for Training," *Supplement to the.IIEP Bulletin*, December 1976, pp. i-iv.
2. *Ibid.*, p. ii.
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PANEL

R.W.B. Jackson*

ECONOMIC AND SOCIAL FACTORS AFFECTING EDUCATIONAL PLANNING IN ATLANTIC CANADA

Madame Chairman, perhaps I should just explain to our United States "cousins" that I am a typical Canadian, except in age! My grandparents came from Ireland to settle in Southern Ontario over 100 years ago, and my father and his brothers and sisters, and my mother and her brothers, joined the great land rush to Western Canada over 70 years ago. So I was born on a homestead in Southern Alberta (Seven Persons, near Medicine Hat). I spent my youth and early adulthood years on a farm near Calgary, Alberta, where we "enjoyed" the Great Depression, and the Great Drought and Prairie Dust Bowl years – which left an indelible stamp on all of those who survived. Having just finished World War I (and later World War II) you'll appreciate (if you know the West) why I had developed a slightly cynical attitude towards life in general, and had cultivated a warped sense of humor. Then I married an English girl, one of the benefits of graduate school in another country, and returned to Ontario in 1939 (with a Ph.D., two years postgraduate work experience, a wife, and a salary of $1,600 per year), where I became involved in planning for education with the provincial government, through the University of Toronto. I had a hand in the development of school financing, vocational school expansion, the complete plans for our university system, and our system of community colleges of applied arts and technology. Two years ago, following retirement as Director of OISE, I moved down East to Halifax, Nova Scotia, where I now write terrible "science fiction" memos about the relationships of demography and education! I have lived through one horrible period of decline and depression, a couple of wild and incredible world wars (I especially remember the blood bath of World War I, and the flue epidemic which followed it and which wiped out more of us in the isolated homesteads than did the war), and the exhilarating but exhausting post war period of the late 1940s, 1950s and early 1960s. The latter was associated with the frenzy of births and the expansion of education (school building and staffing), but we are sobered again by the recent unprecedented drop in the fertility of our people (the product of the Pill and Abortion) which has landed all of us in the soup again.

So much for the background to my presentation. Let us now look at the Atlantic region of Canada. It is composed of four provinces (Newfoundland, Prince Edward Island, Nova Scotia and New Brunswick). These provinces are isolated in many ways. Not only are they isolated; they are as poor as church mice, and just as proud, living in part on money from the rest of Canada, through equalization payments, regional expansion grants, payments of family allowances and old age pensions. Economic conditions are bleak; they have been for generations. We have some coal mines (mostly closed now), a steel mill and a few other dying industries, but the best hope for many of our young people is to get out. For most, this means moving to the despised heartland of Canada, Ontario, the province which has attracted industry, money and people. Our largest

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export has been of the ablest, most ambitious and well-educated young men and women – up to 30 percent of them, over many long years. In the Maritimes, enough babies have been produced (up to now, that is) to keep the total population growing, although percentage-wise we are losing quite steadily in the total Canadian picture. There are just under 2¼ million of us out of 23¼ million Canadians – 840,000 in Nova Scotia; 690,000 in New Brunswick; 560,000 in Newfoundland, and 120,000 in the "garden farm" in the Gulf of St. Lawrence which we call Prince Edward Island.

Unemployment is very high in the region. Among the 18-24 years age group it is an acknowledged 20 percent, but more likely nearer 40 percent. This is a highly explosive situation, giving rise to grave concern among those of us who remember the 1930s. The only "safety-valve" is in the form of escape to Ontario, Alberta, or the United States. Recently we have discovered to our utter dismay that the position has been aggravated by the *return* of "natives" who left years ago, coming back to weather the recession which has occurred in other provinces and the United States. At first, we thought these might be illegal immigrants, but this is doubtful because immigrants don't even come to us legally, not even in the best of times. These are "natives" bringing their children back with them. At present this is rather overloading our school systems, but when conditions improve and they go back to Ontario or Alberta, they will leave us holding the bag with empty classrooms and surplus teachers. All of which makes planning a fascinating exercise in dangerous living; no matter which way you project, the chances are you are going to be wrong! I have been having sheer unadulterated fun running three sets of population projections: the first, assumes that our fertility rates never dropped; the second, that the "return of the natives" will be a permanent feature of our life, but our fertility declines for a few more years; the third, that our fertility declines, the "strangers" leave us, and we go back to the old "export of people" game again.

But to deal specifically with the topic of our panel, let us first have a look at fertility declines and the consequent lack of babies, then pupils, students, and prospective parents. A glorious example of compound interest gone rampant, but spread over the generations and expressed in people not dollars. The Atlantic pattern of fertility and births has been the usual one for Canada, although traditionally at higher levels: lower fertility and number of births during the Great Depression (so a shortage of 40-50 year olds at present); a roaring Baby Boom which started early and stayed high (for some reason unknown to the writer), and started to reduce as late as 1962 in Nova Scotia. Births have been dropping steadily ever since (possibly there is a levelling off now but these "ripples" are not very significant) *despite* the entry into the most fertile age groups of the large numbers of girl babies born during that Baby Boom. As a matter of fact, the first wave (of 1946) is now 31 years old. Our pattern is the same as that of the rest of Canada and of the United States: few births after women reach about age 32 and few births (mainly illegitimate) before age 18. And this narrow band is shrinking rapidly to the ages 24 to 30.

By the way, as educators we must not overlook our own selfish interests in the illegitimate births: they run at 12-13 percent in Nova Scotia and reach levels of one-third of all births in some urban centres. These are only the *admitted and recorded* ex-nuptial births. Since the majority are for mothers under 20 years of age, they cause another different kind of educational problem. Since pregnancies run at an even higher rate, therapeutic (legal) abortions are high in these young ages.

The number of live births in Nova Scotia is a typical example. It dropped below the simple replacement level of a gross reproduction rate of 1.00 around 1975, and is still going down:

NOVA SCOTIA

YEAR	NUMBER OF LIVE BIRTHS
1936-1940	12,100 (average)
1946	17,900
1947	19,300
1962	19,400
1974	12,900
1977	13,000 (estimate)

Since we are almost at the peak of the 18-32 age group (another 3 years, probably), the future is not a very promising one, at least not in this respect. What should the region do? Shrink in size of population? Push economic development? Discourage family planning? Try to attract a new brand of immigrants? Immigration has yielded poor pickings, at least in numbers, in our provinces – a fact of life which we have to face. Why do so few come? Why do so many leave so soon? For the period 1970 to 1976 the net "yield" of children under 18 years of age was meagre: negative for Newfoundland; negative at first but gaining up to 60 per year recently in Prince Edward Island; for Nova Scotia, again negative at first, but up to around 300 per year recently; in New Brunswick, again a negative start, but now up to 700 per year. But there is not much help here. Apparently if one looks at the long-term historical trend (a depressing negative "net") this is the possible pattern again in the future.

Are the Atlantic provinces likely to gain population from the rest of Canada? The historical trend gives us a resounding No! In 1969-1970, for example, considering only children recorded in Family Allowances transfers (under 16 years until recently, but now the 16 and 17 years olds without taxable income), the *losses* were as follows:

Net Interprovincial Migration of Children, 1969-70

Newfoundland	3,445
Prince Edward Island	687
Nova Soctia	1,783
New Brunswick	2,950

BUT

Net Interprovincial Migration of Children, 1975-76

Newfoundland	+ 210
Prince Edward Island	+ 185
Nova Scotia	+ 913
New Brunswick	+ 1,799

The flip-over from net losses to net gains started a couple of years ago, at the expense of Ontario, much to their chagrin. It sure hurt their enrollment picture, since a decline had

set in there despite the cover of immigration and interprovincial migration. At the moment (I keep a running record month by month) we are dithering around from plus to minus and back again. The biggest loser of children recently has been Quebec: a net loss of 2,100 children in August, and still climbing. We don't know exactly which group, but we are guessing this is a loss of Anglos and immigrants.

What, you may ask, do I see as the future fertility and number of live births, say, in Ontario and the Atlantic provinces? Fertility rates are still dropping, and my guess is that we haven't hit the bottom yet. After that, we will likely level off at a constant rate far below simple replacement level. Could it be that one child per family will become the norm soon? The number of live births? That will level off in a few years; there may be a little ripple upwards in the next few years until the number of prospective parents peaks around 1982, but thereafter there is likely to be a steady decline unless and until we can lick our economic problems (and thereby give our young people some hope for a better future). Unless the fertility rate climbs back up (and I *very* much doubt that it will) the decline in "parents" means fewer babies. There is an alternative, I suppose, but most unlikely: there could be a change in attitudes, a rejection of family planning, and even soon a spurt of births which have been postponed.

I can see no evidence that the much touted "echo of the Baby Boom" will be heard – at most we shall hear a faint whisper, perhaps, or a resounding sob as we wave goodbye forever to the babies who were never born, and to their descendants who would have been born had our fertility rates been maintained at earlier levels. An interesting stage in this regard in the Atlantic provinces, and in Ontario, at this time: for every baby born, there is a ghost baby who wasn't born; for every Grade 1 classroom (and soon for all classrooms), there is a classroom of ghost pupils who were never born, taught by a ghost teacher who was born, educated, certificated, and never employed as a teacher.

Now, we finally come to the school situation and the sad story (or is it an opportunity?) of declining enrollments. In the Maritimes, our elementary school enrollments started to drop about six years ago, except where they were artificially propped up (Newfoundland, for example, has added kindergarten for all children and jumped special education from 500 to 6,500 students). Of course when you come to the end of that road, the drop will be even greater. The other factor hiding the effects of decline, in the other three provinces, has been the "return of the natives" referred to earlier. In projecting Grade 1 enrollments from live births, for example, I had to use "inflation" factors: a 13 percent bonus in New Brunswick; 10 percent in Prince Edward Island; and 5 percent in Nova Scotia. Of course, as you project ahead the upper grades get puffed up too, and the total school enrollment (and costs) reach levels that hurt.

The lower grades of secondary education (Junior High School) are being affected now, and the top grades of the senior high school will feel the pinch about 1981 or 1982. The full effects of decline may be masked for a while, since the participation rates of 16, 17 and 18 year olds may increase because of youth unemployment. (In 1976, Grade 12 in Nova Scotia jumped in enrollment by nearly 9 percent above projected values, and Newfoundland is talking about adding a Grade 12 to their system – which may wreck their only university by removing the first year, and thereby almost half the enrollment!) This pattern of youth staying on in school because there are no jobs is not new to me; we did the same thing in the Great Depression. The schools were dry and warm, with lots to do, and all our friends were there anyway.

For elementary and secondary schools in the Atlantic Region, the picture as I see it is as follows:

	TOTAL SCHOOL ENROLLMENT			
PROVINCE	1971	1976	1986	2000
Newfoundland	163,000	157,000	132,000	112,000 to 120,000
Prince Edward Island	31,000	28,000	22,000	20,000 to 23,000
Nova Scotia	219,000	206,000	175,000	154,000 to 181,000
New Brunswick	176,000	163,000	152,000	150,000 to 160,000

For an audience such as this, I do not need to spell out the implications of figures like these. People are going to be hurt more than a little in terms of jobs – both instructional and non-instructional staff. Overall supply will far exceed demand. We have to seriously consider the possibility of *negative demand* over a period of years. Teacher education will be affected almost immediately. Great Britain has closed half its teacher training institutions and is turning critical attention on about half of those remaining. Possibly some can switch from pre-service to in-service education (retraining, upgrading, updating, etc.) in the guise of "quality" improvement? Some would even claim that teacher education is an excellent form of general education. This might be a little difficult to argue, particularly in view of the cost involved and our previous claims about the need for special professional training.

Of course, we shall have to close many schools – sell, lease, or give away the buildings and sell or lease the sites (worth plenty of money in urban areas). Parents will complain and lobby. The transportation of pupils, one possible solution, is a mixed blessing. But other taxpayers *without* children will soon be in the vast majority, and they are becoming pretty restless and disillusioned about rising educational costs and the lack of evidence about educational benefits. If we let the unit costs go through the roof, and total costs climb out of control while the enrollment continues to decline, then, in my opinion, educators are in for real trouble. There is considerable evidence of a change in the public's attitude towards education in Canada.

What really worries me is the probable effect which the enrollment decline will have on school programs, as we blindly lop off this limb and that. All those educational "improvements" which we built-in as the systems.expanded – will they be considered "frills" and therefore expendable? What a reversal of philosophy and policy! It is presumed that our children will be hurt as a result. But, can we prove that they would be adversely affected by such changes? A realistic needs-assessment combined with a rigorous evaluation (by non-educators!) of what our programs and methods do achieve might well give us some unpleasant but much needed jolts to the old ego and self-image.

In spite of everything, I remain an optimist. If we collect and analyze all the facts and opinions, study them carefully and objectively (from the head, not from the heart),

prepare the necessary short-term and long-term plans, and have the foresight and guts to make decisions and implement them, then education can weather this particular storm and emerge even stronger, if a little leaner. I don't wish to sign off on a sour note. You know as well as I do that these demographic and associated social changes are going to affect every aspect of our lives, and the lives of our children and grandchildren. Although the school systems are among the first to be affected (after the maternity wards, the pediatricians, and the baby food and clothing manufacturers), before this series of hills and valleys works itself through the generations to a reasonably steady state once more, the educational problems which now loom so large will pale into insignificance. Set your imagination free to consider the implications of some possible scenarios:

The Labour Force: A shortage at the top of the heap, from age 45 on, because of the Great Depression and the Second World War (in which we picked the best youth and sent them out to die); a bulge at the middle ranges of the occupational ladder, the crop of the Baby Boom; and impending shortage looming in 1990 to 2000 when the babies not born in the Baby Bust are not there as workers.

The Political Scene: The very elder statesmen who should be there are fewer, because men were butchered in World War I; the next skinny group of leaders are the escapees, a small group because of the numbers who were *not* born in the hungry 30s and the wartime 40s; then for some years we shall have a bulging pack of eager and competitive young, anxious to displace their elders and pushing hard enough to wreck the joint; and at the bottom a group of disillusioned youth in their late teens and early twenties who see their way hopelessly blocked. To cap it all, soon we will have the conservative political force of the middle-aged and the old-age pensioners controlling the majority votes. If their conservative attitudes tie down the "safety valves" of the young and there is a direct clash of interests, we could well see a social and political explosion.

Clothing, Food, Transportation, Recreation, etc.: Well, that is a pretty kettle of fish, isn't it? Shorts and bikinis don't look so good on the middle-aged and ancient. Loose teeth, dentures, and sore gums from poor plates point to a new low in food. As for transportation, the hot-rod and motorbike must yield to the rocker and the nuclear-powered wheel chair. In recreation – ski jumps and mountain trails look a "leetle" daring; the bathtub is a greater lure than the blazing beach and skidding surfboard.

Crime, Cops, Courts and Coops (jails): Our law.enforcement brothers are stricken with dismay at the thought that they, too, must adapt to a new order. Just imagine the middle-aged or old criminal of the future, hobbling along with a cane and clicking his false teeth! And the juvenile court for the aged? Not necessarily new crimes – but a new breed of criminals!

Medical Care: A switch from one brand of dependents to another will make more difference than is generally realized. The costs for the "young old" and the very old are high; they get ill frequently, and all of them eventually die. We pay for all this under universal medicare. But eventually there will be few in the labour force (the product of the Baby Bust) to pay for the hordes of the old (the product of the Baby Boom). There must be quite a change in attitude, too, from caring for babies with a glorious future before them, to feeding and cleaning the old (the halt, the lame and the blind) with their future behind them.

Pensions: As a parting thought: who is going to pay for your pensions? Not you, since in

the new scale of benefits you are in part a freeloader. With a smaller work force coming along in the future, this will be a heavy burden to hand them. In Canada, we admit that most of our government (and teacher) pension plans are shaky if not a downright fraud; their benefits cannot be paid unless the taxpayer bails them out.

Muhammad Fiaz* and Nelly Fiaz**

OCCUPATIONAL DISTRIBUTION OF THE HEARING IMPAIRED IN ONTARIO: A STATISTICAL PROFILE

Introduction

What kind of work do deaf people do? How does a hearing handicap influence their occupational status? What is the effect of education on their occupational mobility? On their occupational stability? What is the relationship between the demographic characteristics of the hearing impaired and the jobs they hold? How much do they earn? This paper attempts to provide tentative answers to questions such as these, and in doing so generates other questions and indicators of the relationship between the occupational status of the deaf and their various ethiological, socio-economic, and other characteristics. This type of statistical profile presented is the essential first step to studying these complex, multidimensional relationships. To our knowledge, there has been no research in Ontario or Canada on this topic. There is, moreover, little study of any aspect of the problems or characteristics of the working deaf. Such critical areas as the counselling, job placement, vocational skills training, career development, career stability, upward occupational mobility of hearing handicapped Canadians are largely undocumented, and the effect of parental SES as a predictor of the occupational status of the deaf has been completely ignored. The paper, then, will pose more questions than it answers.

The questions posed in the opening paragraph will be explored by means of data collected from the files of the Canadian Hearing Society in Toronto, Ontario. The CHS is a non-profit organization offering five types of services: audiological assessment, interpreting, information, vocational counselling and job placement. Most of its clients are those afflicted by a severe hearing handicap. Certain of its records on placements were transcirbed using the form reproduced at the end of this paper. They include information on client's date of registration with the CHS, date and place of birth, sex, marital status, number of children in the family, ability to use speech, sign language or lip-reading, age of onset of deafness, degree of deafness, type of school, number of placements, types of placements (full-time or part-time), occupation and wages.

The first time a client seeks employment help he/she is given the registration number through which all subsequent visits are recorded. Our selection of cases involved two steps: (1) a general sample of 710 cases was drawn randomly on the basis of client's latest visit to the CHS (regardless whether he was placed or not); (2) on the basis of the duration of placement, cases were selected for the analysis of occupational status. Summer placements, part-time and temporary employment were eliminated, leaving only the cases showing full-time employment on a permanent basis. The final random sample thus obtained (380 cases) provided the information most relevant for this study. Variables pertaining

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to client's education, demographic characteristics and characteristics of the handicap were used as correlates of his occupational status. The results provide an occupational profile of this severely handicapped, young, urban group.

Characteristics of the sample

Age and sex: 58.9% were males, 41.1% were females; their mean age was 27.6 years; 30.3% were below the age of 20 and 40.7% were between 20 and 30. Only 11.4% of the sample is over 40, and 2.8 over 60. It is not surprising that it is the young who are actively seeking either a new job or different job; this probably reflects the situation in the general population.

Marital status: 20.2% of the males are married, and 77.6% have never married, the remainder are divorced or separated. The corresponding proportions for females are: 30.4%, 62.9% and 6.7%. The sample could be called young, urban pop. but many of them must have rural background. We suspect very few deaf people remain in small towns. Our sample might be much more representative than we speculate (i.e., representing only heavily handicapped, young deaf from Toronto). Following a similar pattern to the general population, the proportion of single people among the deaf declines sharply up to age 30, after which it remains fairly constant up to age 60. Beyond that age, the proportion of single individuals increases sharply again. But compared to general population, the proportion of deaf persons who marry is much smaller and when they do marry, they marry at an older age.

In fact, the most noticeable feature of the sample is that the proportion of married males by the age of 24 (the prevalent marrying age in general population) is only 13.2% of the total, and that of married females, 20.6% of the total. Part of the explanation for the infrequent marriages before the age of 24 may be found in the large proportion who attended residential schools. This implies a rather restircted side of acquaintance and close supervision of their heterosexual relations.

Size of family: Of those who are married, 39.1% have no children, 22.5% one or two, 10.1% three children, and 5.9% between 4 and 6. The average of 1.7 children per family is almost identical to the national average.

Place of birth and ethnicity: Although the CHS clients seek jobs in or around Toronto, only 22.1% of the sample are born Torontonians; over half (52.9%) were born in Ontario, the remainder are from other Canadian provinces or from outside Canada; 70.6% are of Anglo-Saxon origin, the French account for 7.4% and the Italians for 4.6%. In both the place of birth and ethnicity, there is no significant difference between the sexes.

Distribution of the hearing impairment: There is no agreement on the definition of the word "deafness". In our analysis of the statistical data the word "deafness" refers to the inability to hear and understand speech; the term "hearing impairment" refers to all significant deviations from normal hearing, including deafness. Otherwise the terms "deaf" and "hearing impaired" have been used interchangeably. Classifications of degrees of hearing impairment (such as "mild", "moderate", "severe", and "profound") vary from institution to institution. To some extent they are a function of institutional norms, expectations and settings. Since the perennial controversy surrounding definitions is not our concern, the definitions used are those of the Canadian Hearing Society. They classify degree of the hearing loss of hearing in four categories:

i) Mild: loss of 50db. or less;
ii) moderate: 50 - 70db;
iii) severe: 70 - 90db;
iv) profound: 90db and more.

Wallace in 1973 estimated that there are, in Canada, about 50,000 hearing impaired persons, of whom 13,000 are in Ontario.[1] It is a small group. In an OISE study carried out on contract for the Ontario Ministry of Education, from records transcribed from schools and hospitals, mild loss of hearing was attributed to only 4.5%, moderate to 24.9%, severe to 23.7% and profound to 46.9%. In other words 70.6% of the studied population suffered an extreme handicap, and about 10% had at least one additional handicap such as mental retardation, cerebral palsy, epilepsy, or a behavioural disorder.[2]

In view of the above, the reader should keep in mind that this group represents the population with a severe and profound hearing loss only. This is borne out by the fact that those who come to the CHS for help obviously are unable to find a job on their own. People with only a mild hearing impairment, seldom need to seek the assistance of specialized agencies. Also, as indicated in a recent study,[3] there is usually a highly significant relationship between an agency and the degree of the hearing loss of the population it serves. By definition, the provincial schools for the deaf absorb most of those with severe (or multiple) handicaps and the CHS, in turn, mostly receives applicants who have attended the schools for the deaf.

Onset of deafness: Deafness has been characterized as a disorder of communication in the same sense that blindness has been called a disorder of mobility.[4] The age of onset of deafness is an added dimension of the hearing impairment. The degree of interference in the person's life (in terms of communication) depends to a great extent on the developmental stage at which loss occurred.

Persons born deaf or whose deafness occurred at the age of the usual acquisition of language (0-3 years) are less likely to acquire speech than those who became deaf after the age of three. Consequently, they will have more difficulties in their working life. Similarly, those who became deaf after the acquisition of language but before the age when skill or professional training is given (usually age 16) are less likely to acquire a profession or vocation without skillful help. They may have some advantage over those who were born deaf, but would be at a disadvantage as compared with those who became deaf after acquisition of language and professional or vocational training (or the acquisition of a job). We shall describe these two groups as:

- Pre-lingually deaf, those who lost hearing before the age of three, and
- Pre-vocationally deaf, those who lost hearing before the age of sixteen.

The table on the following page shows the distribution of the sample by age of onset. By far the majority are pre-lingually and pre-vocationally deaf: those born deaf or whose hearing loss was before their third year of life constitute 74.4% of the sample. There is some unreliability of response which should be noted; this type of data is often based on the memory of the client.

	Percentage	Cumulative
Prelingually Deaf:		
Born deaf	48.0	48.0
Less than 1 year old	20.9	68.9
2 years old	0.9	69.8
3 years old	4.6	74.4
Prevocationally Deaf:		
11 years old	14.2	88.6
16 years old	3.0	91.6
20 years old	4.5	93.1
20 years and over	6.9	100.0

The degree of hearing handicap is reflected in the ability to use speech, sign language or lipreading. Although the data show that 95.4% of the sample have some use of speech, the picture becomes much less impressive when the degree of communication ability is assessed. Only 14.5% are rated as having "excellent" use of speech, 32.9% "good", 41.6% "fair", 6.8% "poor", and 4.2% appear to be totally mute. Besides speech, sign language and lipreading are the deaf persons' means of communicating among themselves and with the rest of the world. Almost one-third are reported to have "good" use of sign language, but one-third do not use it at all and the remainder are said to have "fair" or "poor" use. The statistics on the use of lipreading are comparable to those on the use of speech; 93.5% have some use, but only one-third are rated to be "good" or "excellent".

One cannot infer easlly from the statistical picture the degree of the deaf person's overall ability to communicate, because some with little or no use of speech can (and usually do) use sign language or lipreading, or both; and those with a good command of speech may feel no need to acquire additional communication skills. However, one thing appears certain: about half of the severely and profoundly deaf are good in, at least, one of the communication skills.

Education: The Ontario schools for the deaf offer an educational program which is basically the same as that of the province's public elementary and secondary schools. Differences lie in the methods and facilities used. Most deal with both the academic and vocational aspects of education, which explains the emphasis on vocational education received by majority of our sample, and the schooling can extend up to 15 years. As a rule a school for the deaf is a residential school.

Attendance at either one of the Ontario schools or a school for the deaf outside the province was reported by 64.2%; 30.5% had attended regular schools, and 4.2% special classes in regularsschools; 1.1% had no formal academic or vocational formal education – an extremely favorable comparison with the general population. Attendance at a regular school usually implies successful integration of the student, but this is not always the case.

Our inquiry concerning the pupil's orientation during schooling revealed that for two-thirds the stress was on vocational training, for the remainder it was on academic subjects.

Of those whose programs had an emphasis on academic subjects, 14.3% left with an education of grade 8 level or less, 22.3% had completed grade 12, and 5.6% grade 13; 2.1% went on to a community college without completing the programme, and 2.0% had one or two years of university study. There were 3.5% who completed community college programs, 3.1% obtained Bachelor's degrees, and 0.3% received Master's degrees. In other words, out of 710, 25 hold college diplomas, 22 first degrees, and 2 Master's degrees.

Occupational placement: The 710 cases described are persons who came to the Canadian Hearing Society in the period between 1970 and 1977 for help in finding a job. The CHS records show that on average one hundred registration per year yield an average of sixty job placements. A person registering for job placement is not necessarily unemployed. Nor was the placement studied here necessarily the person's first placement. Included are persons who were also placed in jobs prior to the one being studied, and persons who sought placement while employed. The occupation coded was not the one the individual might have wished to have, but the one actually obtained at the time of the last placement. The table below shows the distribution by industrial category.

Category	Number	Percentage
Agriculture	2	0.4
Food and Beverage	4	0.9
Rubber and Plastics	3	0.7
Textile and Clothing	21	4.7
Wood and Furniture	21	4.7
Paper and Printing	34	7.6
Metal	10	2.2
Machinery	18	4.0
Chemical	14	3.1
Construction	52	11.6
Transportation	48	10.7
Trade	46	10.3
Finance	10	2.2
Service	146	32.7
Public Administration	18	4.0
TOTAL	447	100.0

It is evident that the deaf are employed in all industries but the heaviest concentration is in service, transportation, construction and chemical industries. This refutes the common notion that they are confined to a very few types of jobs.

Earnings: The statistics on the occupational distribution becomes more meaningful when supplemented by information on earnings, a vital part of an individual's occupational status. These data are expressed in weekly or hourly wages, which in itself indicates the absence of managerial or executive-type occupations. Thus, while it is clear that the deaf are represented in all industrial categories, their personal income suggests that they hold

positions on the lower end of the occupational hierarchy. Constantly, throughout this 7-year period (January 1, 1970 to December 31, 1976) the personal incomes of hearing impaired males and females lagged behind those of other Canadians. The following table illustrates this:

	HEARING IMPAIRED				
Year	Male Average $	Female Average $	Total Average $	Canada Total Average $	Ontario Total Average $
up to 1970	73.43	53.31	65.81	–	–
1970	86.91	68.40	81.12	126.82	131.55
1971	94.50	73.65	84.57	137.64	143.04
1972	102.00	90.28	98.02	149.22	154.92
1973	112.62	87.53	103.92	160.46	165.61
1974	103.00	113.82	110.28	178.09	181.43
1975	140.42	122.92	134.59	203.34	204.85
1976	158.89	137.88	150.95	227.97	228.40
1977	163.33	130.50	155.13	241.29*	241.09*

Source: Canada. Statistics.Canada, *Employment, Earnings and Hours, Ontario Statistics 1976*, Vol. 2.

*For the months of January-March, 1977.

In 1970, the average personal weekly income shown by our sample was $81.12 compared to $126.82 for Canada and $131.55 for Ontario. In other words the average personal weekly income of a deaf person was 63.9% that of other Canadians. The gap has hardly changed over the years. In 1976 it was 66.2% that of the average Canadian. As expected, the difference in wages between deaf males and females is as pronounced as that found between the sexes in the general population. Deaf women earn less. In fact, their incomes come close to the provincial minimum wages. In 1970, the minimum wage in Ontario was $1.50 per hour. Our sample's female weekly wage was $68.40; for a 40-hour week this would be slightly above that minimum. The situation has not improved much.

Occupational status

The occupational status of an individual is the evaluation of his prestige in the community as attained primarily through his occupation and income. The evaluation may be subjective or objective, but generally both refer to the degree of specialized training required and the amount of responsibility involved. Thus income and years of schooling are reliable indicators on which a ranking of occupations can be based (as is the case with Blishen Scale*).

*For a detailed presentation of the Blishen Scale, which is composed of seven rank ordered classes, the reader is referred to Bernard Blishen's article "The Construction and Use of an Occupational Class

This scale was applied to the occupations of this sample of deaf in order to study what effect, if any, their deafness had upon their occupational status. We were also interested in the relationship between their educational and occupational status. The following hypotheses thus prompted this study:

1. The more severe the hearing handicap, the lower the occupational status.
2. The higher the education of the deaf person, the higher their occupational status.

Testing of these hypotheses begins with the distribution of occupational classes among our deaf. This may be seen in the following table:

Occupational Class	Male %	Female %	Total %
4	10.7	39.4	22.4
5	35.6	21.3	29.7
6	39.1	29.7	15.3
7	14.7	9.7	12.6
Total	59.2	40.8	100.0
N =	225	155	380

$x^2 = 44.17287$
dif. = 3
sig. at $\leqslant .001$

The startling finding is that *all* our deaf are to be found in the lowest four classes of this scale. While Blishen found the largest proportion of the Canadian population in Class 5, the largest proportion of the deaf are concentrated in Class 6; in both instances, they represent about one-third of the total. Another surprising finding is the predominance of the deaf females in the highest occupational class attained by the deaf (Class 4). At the first glance this would seem to indicate the opposite trend to that found among the general population. One explanation is that such traditionally female jobs as clerks, machine operators and bookkeepers, have the lower status among the general population but are at the top of the occupational classes attained by the deaf.

Hearing handicap and occupational status: In any discussion of the onset of deafness there is the implicit assumption that the earlier the hearing is lost, the more serious is the handicap and, therefore, the more devastating its effect upon the person's life. The pre-lingually deaf almost never develop the ability to speak properly. The prevocationally deaf are assumed to have a significantly different set of problems than the prelingually deaf.

Scale", *Canadian Journal of Economics and Political Science*, Vol. 24, 1958, pp. 519-531. In this scale, Class I includes such occupations as judges, physicians, architects; Class II, professors, finance managers, accountants, air pilots; Class III, actors, draftsmen, radio operators, stenographers; Class IV, bookkeepers, toolmakers, undertakers, cashiers; Class V, policemen, telephone operators, pattern makers, photographers; Class VI, postmen, waiters, carpenters, guards; Class VII, cooks, janitors, fishermen, shoemakers.

What is of interest here is the economic effects of these handicaps. To be precise, to what extent, if at all, is the onset of deafness reflected in the occupational status? The table below cross classifies those characteristics.

Occupational Class	Born Deaf	Preling.	Prevoc.	Post Voc.	Total
4	21.0	26.9	15.4	26.7	21.9
5	33.1	19.2	36.9	40.0	30.1
6	36.5	37.5	33.8	13.3	35.3
7	9.4	16.3	13.8	20.0	12.6
Total	49.6	28.5	17.8	4.1	100.0
N =	181	104	65	15	365

We found that there was no significant relationship between the age of onset of deafness and the person's occupational status. Contrary to the widely held assumption that the earlier the age of onset the lower the occupational status, the lowest occupational category (Class 7) shows the smallest proportion of prelingually deaf (9.4% of those born deaf, and 16.3% of those who became deaf before the age of 3). About one quarter of the prelingually deaf are employed in occupations of the highest class attained by the deaf population (Class 4).

No clear pattern is to be observed among the pre- and post-vocationally deaf. While the first group shows concentration in Classes 5 and 6, the latter concentrates in Classes 4 and 5. The uncertainty of relationships is further compounded if we relate degree of hearing loss and occupational status. This cross classification is shown below.

Occupational Class	Mild Loss	Moderate	Severe	Profound	Row Total
4	11.1	19.0	29.1	21.1	22.3
5	44.4	36.7	24.4	29.1	30.0
6	33.3	36.7	31.4	35.7	34.9
7	11.1	7.6	15.1	14.1	12.9
Total	2.4	21.2	23.1	53.4	100.0
N =	9	79	86	199	373

$x^2 = 8.25226$
d.f. = 9
n.s.

The highest class (4) attained by the hearing impaired population contains the smallest proportion of those with mild hearing loss (11.1%) and larger proportions of those with moderate (19.0%) or severe (29.1%) hearing losses. The proportion of the profoundly deaf in Class 4 is almost twice the proportion of the mildly handicapped. However, it should be noted that the occupational categories with the lowest status (Class 7) contain the smallest proportions of each group.

The edge that the person with a mild handicap may have over the one with the more serious hearing loss can be observed in two places: (1) in class 5, where the percentage with a moderate hearing loss is larger than that with a severe loss; and further, the percentage with a mild loss is the largest of all; and (2) in Class 7, occupations lowest in prestige, where the proportion of severely and profoundly deaf is almost double that of the moderately deaf. Nevertheless, our first hypothesis cannot be upheld. It is not the case that the milder the handicap the higher the occupation attained.

Communication skills and occupational status: Most deaf people are poly-modal communicators – using speech, lipreading and sign language in their private and business interactions. In the three tables on page 20, the ability to communicate and the occupational status are cross classified and they show a more significant relationship than that found between the onset of deafness and occupational status. Apparently, a better command of speech yields a better job, and, by the same token, the lesser speech ability is linked to lower occupational status. A similar direction of relationship is observed when lipreading is the communication tool. The proportion of the sample in the more prestigious job classes (4 and 5) grows as the skill increases. Conversely, as the skill decreases, so does the proportion of the sample in the higher occupational classes.

Education and occupational status: 36.3% of those who attended schools for the deaf are concentrated in Class 4 compared to 17.0% of those who attended regular schools. The table below indicates that the relationship between the deaf person's type of schooling and occupational status is statistically significant. Those who attended schools catering especially for the severely handicapped seem to have obtained more prestigious occupations than those who attended regular schools.

Occupational Class	No Formal Education	Regular School	Deaf School	Total
4	20.0	17.0	36.3	22.3
5	40.0	31.5	25.5	30.0
6	40.0	38.1	27.5	35.3
7	0.0	13.3	10.8	12.5
Total	1.3	71.6	27.1	100.0
N =	5	270	102	377

$x^2 = 16.81570$
sig. at .01 level
df. = 6

Occupational	SPEECH			
Occupational Class	None or Poor	Fair	Good or Excellent	Total
4	12.8	19.7	27.8	22.3
5	28.2	27.3	33.1	29.8
6	43.6	38.8	28.5	35.1
7	15.4	14.2	10.6	12.9
Total	10.5	49.1	40.5	100.0
N =	39	183	151	373

$x^2 = 9.62519$ d.f. = 6 sig. at .01 level

	ABILITY TO LIPREAD			
Occupational Class	None or Poor	Fair	Good or Excellent	Total
4	14.7	20.8	25.7	22.2
5	20.6	30.7	31.1	29.9
6	47.1	33.9	33.8	35.0
7	17.6	14.6	9.5	12.8
Total	9.1	51.3	39.6	100.0
N =	34	192	148	374

$x^2 = 6.85542$ d.f. = 6 sig. at .03 level

	USE OF SIGN LANGUAGE			
Occupational Class	None or Poor	Fair	Good or Excellent	Total
4	35.7	15.2	22.8	23.1
5	28.6	35.2	26.3	29.5
6	24.3	36.2	37.7	34.5
7	11.4	13.3	13.2	12.9
Total	20.5	30.7	48.8	100.0
N =	70	105	167	342

$x^2 = 12.24266$ d.f. = 6 sig. at .05 level

However, the relationship does not seem to hold for the length and level of education and the occupation obtained. The tables on page 22 show that there is no statistical significance between the distribution of occupations and the distribution of the sample by kind of program, years of schooling and educational level completed. For example, 40.0% of those who went to schools for the deaf and had eight or fewer years of education are in Class 6, but so is the largest proportion of those with 14 years of education, (40.7%). Similarly, 46.2% of those who completed Grade 8 or less are to be found in Class 5 together with 40.0% of the Grade 13 graduates. The graduates of the community colleges and university tend to concentrate in Class 4, but in these two tables some of the numbers are too small to use the chi square test of significance.

As we mentioned earlier, two-thirds of the sample had taken educational programs whose focus was on the vocational training, the remainder concentrated on the academic subjects. But 83.8% of those who were placed in full time jobs had vocational training. However, there was no statistical significance in the relationship of the occupational status to the type of education. There is some slight indication that those with a predominantly academic education obtained better jobs since most are found in the higher occupational class categories. The concentration of those with vocational training is in categories 5 and 6.

Class	Academic	Vocational	Total
4	15	61	76
	27.1	21.1	22.0
5	16	90	106
	27.1	31.1	30.7
6	115	106	121
	25.0	36.7	35.1
7	10	32	42
	20.8	11.1	12.2
Column	56	289	345
Total	13.9	83.8	100.0

x^2 = 6.87598 d.f. = .06 sig. at .03 level

In summary: neither the type of educational program, nor the duration of schooling appears to affect the level of the individual's occupation. The only significant relationship revealed was that between type of school (regular schools and schools for the deaf) and occupational status. Those attending schools for the deaf attained higher occupational status. Whether this is because the schools cater exclusively for the hearing handicapped and, therefore, better serve their needs or whether they provide better information and contacts and thus facilitate the acquisition of better first jobs, we cannot tell.

	YEARS OF SCHOOLING COMPLETED					
Occupational Class	1 - 8	9 - 11	12	13	14	Total
4	17.1	12.5	20.9	25.0	25.9	18.9
5	31.4	42.9	27.9	41.7	29.6	35.1
6	40.0	30.4	39.5	20.8	40.7	34.6
7	11.4	14.3	11.6	12.5	3.7	11.4
Total	18.9	30.3	23.2	13.0	14.6	100.0
N =	35	56	43	24	27	185

	GRADES OR LEVEL OF EDUCATION COMPLETED						
Occupation Class	Grade 8 or less	9 - 11	12	13	College and 2	B.A. & M.A.	Total
4	2	12	5	1	12	3	35
	15.4	44.4	22.7	20.0	42.9	42.9	34.3
5	6	6	4	2	6	2	26
	46.2	22.2	18.2	40.0	21.4	28.6	25.5
6	3	7	11	1	8	1	31
	23.1	25.9	50.0	20.0	28.6	14.3	30.4
7	2	2	2	1	2	1	10
	15.4	7.4	9.1	20.0	7.1	14.3	9.8
Total	12.7	26.5	21.6	4.9	27.5	6.9	100.0
N =	13	27	22	5	28	7	102

Conclusion

This paper reports the first analysis of data gathered from the records of the Canadian Hearing Society. It does not exhaustively present material gathered, it merely provides evidence on those data items which were considered important for the questions posed. For most of the analysis of occupational status the demographic characteristics listed were not found to be of statistical significance.

While the level of hearing loss and age of onset remain critical factors in the explanation of the degree of hearing impairment, they are not in themselves sufficient to explain or rationalize the attainment of a given occupational status. Our findings show that neither the degree of loss nor the age of onset has a significant relationship with job obtained. The highest occupational class attained by the deaf (Blishen's Class 4) contained the smallest proportion of those with late onset of impairment and those whose handicap is termed "mild". Therefore, the data fail to support our first hypothesis that the milder the handicap, the higher the occupational status, and, conversely, the more severe the handicap, the lower the occupational status. Factors other than deafness may well prove to be more powerful predictors of a deaf person's occupational status than any analysed thus far. Variables such as parental socio-economic status, the stabilization process during schooling years, the effects of integration *vs.* segregation as practiced in Ontario schools might shed more light on the forces which determine the person's occupational attainment. The attitude of employers is also an important area to be explored. Schein reports that some employers (and school administrators) rate deafness as being a worse handicap than having tuberculosis or being wheel-chair bound, but better than epilepsy, or being a former prison inmate or mental hospital case. The stereotyping of the deaf worker is rooted in such notions as "safety risks", "inflexible", "difficult to train", etc.

The type of school attended by the deaf child differs according to the degree of hearing loss and probably with the home background, too. The majority of the severely handicapped attend schools for the deaf, while those with milder handicaps frequent the regular schools or special classes in the schools. Is the type of school attended dictated to a greater degree by the home background and the parents' involvement than the degree of handicap? How correlated are these relationships? Does the school matter? The evidence produced thus far shows that students from the schools for the deaf attain higher occupational status than those from the public schools. Why? How much is this due to schools?

The most important finding from the initial analysis is that the deaf are distributed occupationally in all industries but at the lower end of occupational hierarchy. It must be noted that, thus far we have studied a young, urban population and because of their youth their occupational status may not be final. Nevertheless it is disquieting to find our sample only in the last four occupational classes of the seven in the Blishen Scale. Continuously, over this 7-year period, the male and female average wages for the deaf are closer to the provincially prescribed minimum than to the provincial or national average. Moreover, although the majority of the deaf females held higher status jobs than the deaf males, they earned less than the deaf males and less than their female counterparts in the general population.

In his study which has received wide publicity, Wallace had nothing but scathing criticism of the Ontario schools for the deaf. He found that many of their graduates had the equivalent of a Grade 5 to Grade 8 education. He considered that their pupils were kept in a geographical and social isolation which deprived them of parental, professional

and community involvement. In his opinion the leavers of special schools emerge into society ill-equipped emotionally, psychologically and linguistically and for these reasons take the first dead-end job that comes along. We cannot tell whether the population studied in this paper has ended up in "dead-end" jobs. We do know that one of the indirect costs of severe deafness to a young person seeking a job in an urban centre such as Toronto is the foregoing of occupational status in the highest classes of the Blishen Scale (1, 2 and 3). To check how much a cost this represents we have to compare the jobs of normal yough of comparable age and educational attainment, and this we shall do in later analyses. To check whether Wallace's criticism of the schools for the deaf is not equally true of all schooling for the deaf will also require further analysis. Certainly this first look at the statistics provides no room for complacency.

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APPENDIX

EMPLOYMENT PATTERNS OF THE DEAF – TRANSCRIBING FORM

Question No.	Question	Coding Instructions		Col. No.
1	Identification No.	Registration No.	☐☐☐☐	1 - 5
2	Date of Registration	Month/Year	☐☐☐☐	6 - 9
3	Date of Birth	Day/Month/Year	☐☐☐☐☐☐	10 - 15
4	Sex	1 Male 2 Female 0 Insufficient Info.	☐	16
5	Place of Birth	See List No. 1	☐☐	17-18
6	Ethnicity	1 Anglo-Saxon 2 French 3 Italian 4 Portuguese 5 Ukranian 6 Other: Specify _____ 0 No response	☐	19
7	Rules of Inference No. 6	1 Given 2 Inferred from "IS" 3 Inferred from Correspondence 4 Inferred from "IS" and correspondence 5 Inferred from names 6 Other: Specify _____ 0 No response	☐	20
8	Marital Status (Most recent)	1 Married 2 Single 3 Separated 4 Divorced 5 Widowed 0 No Response	☐	21
9	Number of children (Most recent)	0 No children 1-7 1-7 children 8 8 or more 9 No response	☐	22
10	Use of signs	1 Yes 2 No 0 No response	☐	23
11	Ability to use signs	1 None 2 Poor 3 Fair (Some) 4 Good 5 Excellent 0 No response	☐	24

Question No.	Question	Coding Instructions		Col. No.
12	Use of speech	1 Yes 2 No 0 No response	☐	25
13	Ability to use speech	1 None 2 Poor 3 Fair (Some) 4 Good 5 Excellent (Normal) 0 No response	☐	26
14	Use of lipreading	1 Yes 2 No 3 No response	☐	27
15	Ability to lipread	1 None 2 Poor 3 Fair (Some) 4 Good 5 Excellent 0 No response	☐	28
16	Use of telephone	1 Yes 2 No 3 Some 0 No response	☐	29
17	Use of Hearing Aid	1 Yes 2 No 0 No response	☐	30
18	Frequency of the Use of Hearing Aid	1 Never 2 Rarely 3 Occasionally 4 Regularly 0 No response	☐	31
19	Age at which first acquired Hearing Aid	1-99 1-99 years 00 No response	☐☐	32 - 33
20	Age of onset	01-97 Years 98 Born deaf 99 Up to 1 year 00 No response	☐☐	34 - 35
21	Is this person hard of hearing?	1 Yes 2 No 0 No response	☐	36
22	Did this person ever have normal hearing?	1 Yes 2 No 0 No response	☐	37

Question No.	Question	Coding Instructions		Col. No.
23	Degree of Hearing Loss	1 Mild (50dc or less) 2 Moderate (50-70 dc) 3 Severe (70-90 dc) 4 Profound (90 dc and more 0 No response	☐	38
24	Formal Education	0 No formal education 1 Attended regular classes 2 Special classes in regular school 3 Schools for the Deaf in Ontario 4 Schools for the Deaf outside province 5 No response		
25	Number of years of OSD Education	00 Years up to 14	☐☐	40-41
26	Grade completed in OSD	1 Years up to 14 00 No response	☐☐	42-43
27	OSD Program	1 Academic 2 Vocational 3 Other 4 No response	☐	44
28	Level Attained in Regular Programs	01 No formal education 02 Grades 1-3 03 Grades 4-6 04 Grades 7-8 05 Grades 9-10 06 Grade 11 07 Grade 12 08 Grade 13 09 Community College (uncompleted) 10 Community College (completed) 11 University 1-2 years 12 B.A. 13 M.A. 14 Ph.D. 00 No response	☐☐	45-46
29	Type of certificate or license obtained from formal education other than No. 28	Refer to Code List No. 2	☐☐	47-48
30	Number of Placements		☐☐	49-50
31	Number of Years the Above Placements Refer To		☐☐	51-52

Question No.	Question	Coding Instructions		Col. No.
32	Placement Date (Latest)	Day/Month/Year	☐☐☐☐☐☐	53-58
33	Type of Placement (Latest)	1 Full time 2 Part time 3 Summer	☐	59
34	Placement: Occupation (Latest)	Refer to Code List SICM	☐☐☐	60-62
35	Placement: Source of Info.	1 Given 2 Inferred from "IS" 3 Inferred from Cardex 4 Inferred from Correspondence 5 Inferred from "IS" and Cardex 6 Inferred from "IS" and Correspondence 7 Inferred from Cardex and Correspondence 8 Inferred from Combination of all three 0 No response	☐	63
36	Placement: Remuneration	Dollars per week based on 40 hour week	☐☐☐	64-67
37	Remuneration: Source of Info.	Refer to Code List Question No. 35	☐	68
38	If classified as unemployable, why?	1 Too restrictive in job type or location 2 Low Ability 3 Language Barrier (i.e., other than English) 4 Medical Problems – Temporary (i.e., accident) 5 Medical Problems – Permanent (i.e., handicap) 6 Emotional Problems 7 Other _____ 0 Not applicable/no response	☐	69
39	Source of Information	1 CHS Counsellors Comments 2 Vocational Rehabilitation Report Branch of Government _____ 3 Psychological Assessment 4 Ontario School for the Deaf Report 5 Other: _____ 0 No response	☐	70

Richard Featherstone*

PLANNING IN COLLEGES AND UNIVERSITIES

Titles of articles and speeches seem important to me as a consumer because they should give me enough information to allow me to decide whether I want to read the article or hear the speech. The title of this presentation might have been more definitive. I am going to talk about planning in colleges and universities, a subject about which I have some first-hand knowledge. Further, the information that I bring to this group is based upon my personal experiences, not on research in the formal sense. Since 1971, I have studied, acted as a critical reviewer, and participated in long-range planning projects for colleges and universities. These experiences have led me to the observations that I shall share with you.

The first observation relates to the preparation for planning. It seems to me that successful planning ventures all have a plan for planning. This is not an exercise in redundancy. Individuals who are responsible for planning in complex organizations must develop a plan for planning if they expect the process to succeed. Such a plan must take into consideration the type of organization (decentralized or centralized power), and the participants and their roles must be established before the actual planning process begins.

The second observation concerns mission identification. The post-secondary plans that I have seen have only been successful when the planning was related to the stated and perceived mission of the institution. The larger and more complex the institution, the more likely that mission statements published by the college or university will be interpreted freely at the professional level. In brief, it should be recognized that the individuals who carry out the planning will tend to perceive the mission of the college or university as necessary to rationalize their own goals. Many believe that some type of participation from the ranks of the professors contributes to the success of long-range planning.

My third observation relates to the definition, or rather the lack of an agreed definition, of planning. To assume that all the persons involved in planning have the same understanding of the words planners use is naive. The plans which are successful start with a set of definitions. The planner must differentiate between operational planning, long-range planning, and futures. From my experience, operational planning is that which occurs in the immediate decision-making process, and the decisions reflect recent relevant data and information. Operational planning is time-related; it occurs for 0-1 year. Long-range planning may be described as that which occurs in a time period of 1-5 years, and futures as anything conceived or expected to occur beyond the five year period. These are my definitions.

My next observation relates to a word that makes the average professor angry; the word is control. To the entrepreneur type professor, the concept of long-range planning is a threat. Some professors see the control aspect in the long-range planning process, and if the plans are congruent with their personal operational planning, they approve the efforts of the planning group. However, when there is threat of discontinuity, one can be sure that howls of anguish and strong criticism will be forthcoming.

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The fifth observation relates to faculty governance. College or university long-range planning that does not take into consideration the definitive role of the faculty in academic governance is headed for severe problems. When advisory or decision-making responsibilities have been assigned to faculty governance groups, this must be provided for in the planning process.

My sixth observation relates to communications and the long-range planning process. The successful programs which I have observed overcommunicate. They flood the population to be affected by the planning process with data and information. Their assumption is that an informed population will be more receptive to open long-range planning than to plans conceived and developed in a secretive manner.

Another observation is that if long-range planning means the addition, elimination, or reorganization of existing colleges, divisions, or departments, the planners should be prepared for severe trauma on the part of the faculty and affected administrators. The addition of a new unit is suspect if there is a possibility of an overlapping or duplicating of the territory now being covered by an existing unit. The elimination of a unit is so fraught with problems that it is seldom accomplished. Crisis of extreme nature may be the only way in which elimination of a unit actually occurs. Reorganization of existing units creates more faculty anxiety than any other outcome of long-range planning. In reorganization, those who will be affected by the moves are still a part of the organization and may well be quite vocal and effective in their protests. In fact, their arguments can be so logically developed that the original plans have to be modified. Therefore, those having responsibility for long-range planning must be particularly careful of plans whose outcomes involve adding, eliminating, or reorganizing units of the institution.

My eighth observation is that both social and party politics affect the outcome of long-range planning. By social politics, I mean those relationships between colleagues, friends, and acquaintances who must coexist on a particular campus. Party politics also play an important role, particularly in state-supported colleges and universities. Long-range planners must allow for their impact.

My final observation concerns the weakest part of college and university long-range planning processes – the lack of an appropriate and fairly accurate process to cost the proposed changes. In some cases this seems to have been the fatal weakness. Participants in long-range planning often do not have the cost data necessary for decision-making. Costing, that is projecting the cost of a planned change in a complex organization like a college or university, is a difficult but necessary task. Any proposed action that requires substantial additional funding or the reallocation of existing monies may be top priority, in the ideal sense, but it may well become priority zero in a practical sense.

I have seen one university planning process which addresses most of these observations, that which was in use at the University of Houston. I don't know its current status but would suggest that if you are interested in their procedures that you write to Dr. Douglas McLean at the University.

For the remainder of my time, I would like to describe to you a plan for planning in a large university. The plan addresses some of the observations I have made in the last six years. It was developed by Dr. Thomas Freeman the director of the Institutional Research Department at Michigan State University. However, before we start to work through the plan chart here are some definitions:

A.E.R. – Annual evaluation and report
O.I.R. – Office of institutional research
Planning Council – An all-university council chaired by the university President and consisting of: 4 university (vice-president level) officers, 2 deans, 2 (departmental) chairpersons, 4 academic governance representatives, 6 faculty members, 2 students (liaison groups), 4 members of the Student Council, 2 members of the Administrative Professional Association

The letters O.I.R. are probably familiar to persons working in post-secondary education. However, the A.E.R. is probably a unique designation of Michigan State University. These are annual reports submitted by department chairpersons or by individuals. The report forms have suggested categories but are not restrictive. For example, the one shown in the Appendix was submitted by an individual who happens to be in an administrative position. Please note the various suggested categories. Section one is a request for designating the university organizational units that might be affected by the proposal. Section two requires a brief statement of the proposal; section three asks for advantages or disadvantages; section four asks for groups or offices that might provide information relating to the proposal; section five relates to time requirements; section six asks for an expanded statement of proposals, and section seven for the comments of university officers at department and college levels. The A.E.R. is an important part of the planning proposal and from this point I will show you the proposed procedure for handling planning proposals, commenting on the various steps outlined in the chart in the Appendix. Step A is the first step in the process. Individuals or units may submit A.E.R. forms to the O.I.R. Thus, an effort is made to be open to the entire university community. The O.I.R. carries out the clerical task of duplicating and categorizing them and forwarding them to the planning council. The planning council is divided into three subgroups with representation from the various university communities on most of the subgroups. At this time, Step B, the council may accept proposals from individuals or initiate proposals from among its own members or groups. At Step B the council also deletes and returns proposals (with the reason for doing so) and selects those which shall receive further study. In fact, the council makes a priority listing of the proposals selected for further study. At Step C, the O.I.R. asks all units which will be affected by the proposal to comment on it. Comments are consolidated by the O.I.R. and returned to the appropriate council subcommittee. Then in Step E the subcommittee chairperson assigns the proposal and all comments to an individual or subcommittee for further input and establishes a deadline date for action. After the proposals are returned, Step F, a summary of the data is made together with a written recommendation of the subcommittee(s), and these summaries are sent to the planning council. In Step G, the proposals are either disapproved, and returned to the organization with the reasons for disapproval, approved and sent for action to the Board, Provost, President, appropriate faculty committee or the O.I.R. It is assumed that the cycle will be repeated each year.

Now let me comment on the process I have just described: At no point has cost been treated on a realistic basis. Frankly, the cost of any plan is such an important factor that the entire process may be ineffective because of its superficial treatment. In addition, this planning process is based on the assumption that contributors of proposals agree with the stated mission of the university. Such an assumption may or may not be valid, but the possibility that it is not valid should not be ignored.

APPENDIX

SCHEDULE C – COLLEGES AND MAJOR ADMIN. UNITS

Originating individual, group, or unit _____

Section 2.11 **Format for Proposals to the Planning Council**

1. Proposals may be submitted by any group or individual
2. This format should be used for submission of your proposal(s).
3. Two copies are needed for each proposal. One copy goes directly to the Planning Council c/o the President's Office. The other copy should pass through the usual administrative channels – unit director or chairperson, dean, Provost. (If written up during the Annual Evaluation and Report process, forward the second copy by including it with your unit/department Annual Evaluation and Report).

1. Unit(s) affected by your Proposal:

   University College; CAP; UCC; other colleges with General Education interests

2. Brief statement of your proposal: (A more detailed description is asked for on the next page.

   Reconsider the revolving University policy on general education with a view of re-establishing University College as the unit with the primary responsibility for general education.

3. What advantages would accrue from the implementation of your proposal? Are there any disadvantages or problems?

   Advantages: It would improve the coherence of the University's general education requirement, and it would cost less than the alternatives that are currently being proposed.

4. In reviewing your proposal and analyzing its implications, what groups, committees, individuals should the Council contact to obtain the widest spectrum of viewpoints and data?

   CAP; UCC; University College; the Assistant Provost for Undergraduate Education; relevant colleges and departments.

5. Is there any recommended deadline which should be met for implementation or resolution?

   As soon as is feasible.

6. Expand on your statement in 2:

   In my judgment, the long-evolving University policy in general education may be misguided both with respect to coherence (as evidenced by the UCC's difficulty in applying guidelines for approving particular courses) and with respect to costs (a more flexible general education program is likely to be more expensive). Ironically, while all this has been taking place, many major universities have been moving away from a distributive model for general education and back to a more tightly defined curriculum. That there are University College faculty members who would like to teach upper-division courses and that there are degree-college faculty who would like to teach general education courses are problems that could be resolved by (a) arranging for ad hoc cross-unit faculty transfers between University College and other units and (b)

establishing a general studies degree in University College that could be linked to the University's lifelong education efforts.

7. Comments:

Unit/department chairperson or director:

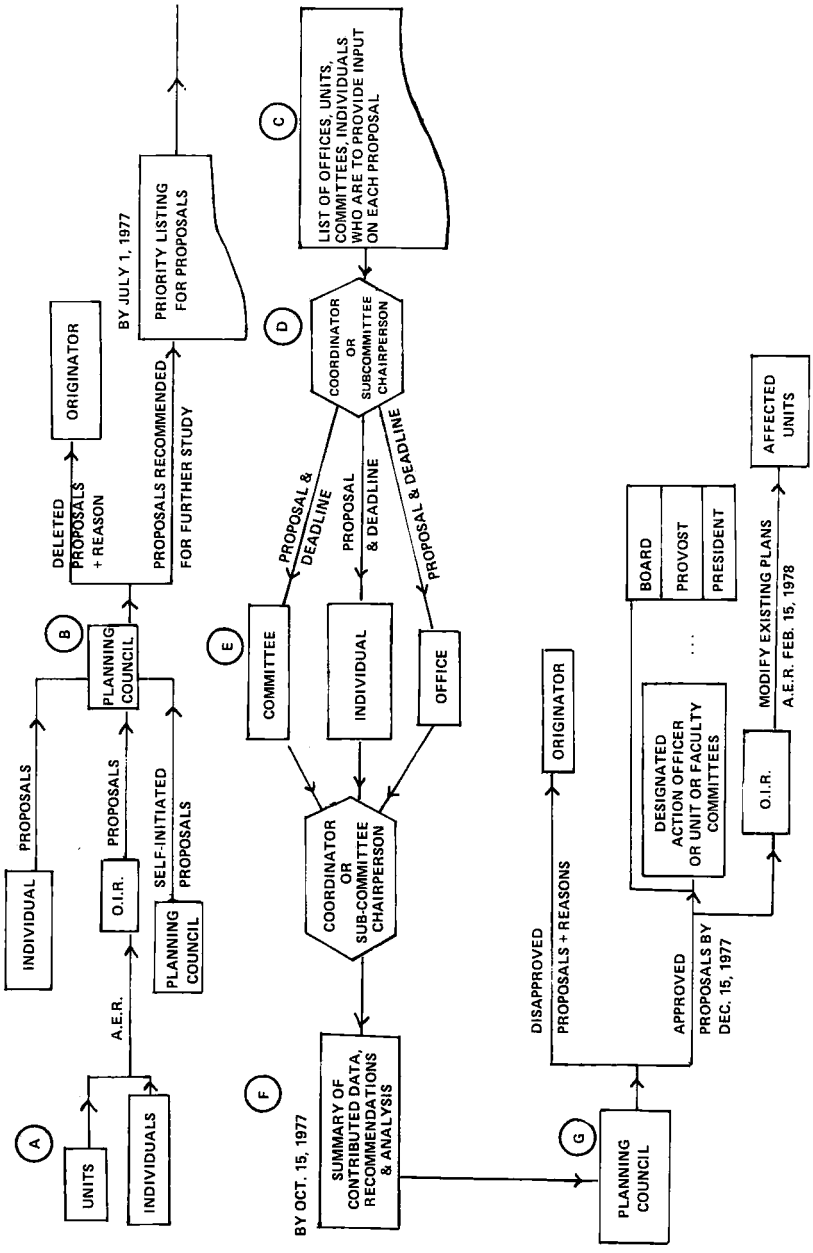
NA

Dean:

NA

APPENDIX

PROPOSED PROCEDURE FOR HANDLING PLANNING PROPOSALS



P. Hooper Gramlich*

THE PATTERN OF EDUCATIONAL PLANNING FOR HIGHER EDUCATION IN POSTWAR JAPAN

Introduction

The most salient feature of effective planning for higher education in Japan today is its conspicuous absence. Of course, this condition is not very different from that of other industrialized nations, but Japan's circumstances over the past thirty years have intensified her planning problems. Starting from a low economic base line in the late 1940s, totally reorganized, the higher education system expanded enormously *without* the assistance of adequate planning. In fact, it was government policy during the 1960s to make no plans to expand the public sector to meet student demand, but rather to allow the private universities to respond to this need without adequate planning or financial assistance.[1]

The issues discussed in this paper are frequently mentioned in the literature on Japanese education but they are rarely part of the discussion of the dynamics of planning. This paper will present an overview of Japan's recent educational planning history and then analyze her particular problems in the context of systems theory.

Overview of Japanese Higher Education

Universities in Japan are extremely hierarchical both in terms of organization and status. There are three types – national, public and private. Unlike those in the United States, the private universities in Japan are generally low in prestige; the national universities rank the highest; at the apex stands Tokyo University. Entrance to colleges and universities is meritocratic, based on a rigorous entrance exam. Despite efforts to standardize these exams (which I will discuss later) each institution has applicants sit its own particular exam. 'Ronin' or 'masterless samurai' are students who have failed the entrance exam and spend their time studying to take the annual exam of the desired university again. Cram schools are big business.[2]

As a result of these practices, competition among students is severe and begins in the early grades of school. Moreover, job opportunities are often dependent on the college from which one graduates and that adds to the pressure of competition. Parents know which elementary and secondary schools graduate the highest percentage of students transferring to the top universities and they are determined to give their children the best opportunities. Vogel has written extensively on this subject.[3]

It is ironic that all this achievement competition is focused on university entrance for, after admission, it is virtually impossible to flunk out. Higher education in Japan serves more of a certification than an educational function. As a result, by American standards, the quality of classroom teaching leaves a great deal to be desired. Much of the learning from grade school on involves a great deal of rote memorization in preparation for entrance exams.

*University of Michigan

Higher Education Before 1945

There was little doubt about the function of higher education in Japan before 1945. Its primary purpose was to serve the national welfare. This was evident as early as 1872 when a system of public education was created by the "Fundamental Code of Education" (*Gakusei*). Indeed the educational reforms of 1872 were central to the transformation of Japan from a feudal country to a modern and unified national state.

In 1868 there had occurred in Japan an event which is referred to today as the Meiji Restoration. During the two and a half centuries prior to 1868 the Tokugawa family had controlled the country through a series of military dictators acting in the name of the Emperor, and Japan had been cut off from the outside world. In actuality, the imperial family exercized little power during this period. By 1868 rival clan leaders managed to overthrow the Tokugawa control. The hierarchical, Confucian-style class system in Japan was breaking down and the foreign threat from the Americans and the British was growing. The rival leaders succeeded in restoring the Emperor Meiji to power and leading the country by means of an oligarchy composed of their own people.

If the Japanese had learned one thing by watching the disintegration of China during the two prior centuries, it was to borrow technology from the European and American "barbarians" and resist them with the same kinds of weaponry and knowledge. The Meiji oligarchs began to explore the education systems of these countries in systematic fashion, sending representatives and missions abroad. From their findings, certain structures and practices were borrowed which specifically fitted the needs of the emerging national state. The mood was one of westernization with a strong emphasis on utilitarianism. The administrative model for education which was borrowed was that of France – a centralized system under the direct control of an education ministry. In 1871 the Mombushō (or Ministry of Education) was founded. For the university system a model was borrowed from Germany. Public universities were divided into 'faculties', which were the decision-making units of the institutions. The Mombushō - university relationship was not entirely smooth during the early years. Some private colleges had been founded by the political rivals of the government. Two outstanding examples are Keio (founded by Fukuzawa Yukichi) and Waseda (begun by Ōkuma Shigenobu).[4] After considerable pressure was placed upon them these institutions fell into line, and they were rewarded in 1918 by government recognition of their status as full-fledged universities.[5]

The Mombushō exerted less control over higher learning than it did in institutions at lower levels of the educational scale, but this was merely a matter of degree. By the time the Japanese surrendered after World War II, the Mombushō was *the* planning agency for higher education in Japan. It financed public universities, gave final approval to the curriculum in both private and public institutions; professors of public universities were civil servants.

The Occupation Period, 1945-52

In 1945, it was the Americans' intention to entirely overhaul and democratize the Japanese system of education. General MacArthur, the Supreme Commander for the Allied Powers (SCAP), and his staff focused upon the breakup of the Mombushō (Ministry of Education). In higher education they tried this by protecting private colleges and universities from future control by the Mombushō. They also tried to decentralize higher education by creating new colleges and universities in all of the prefectures of Japan. (Sometimes they

were new in name only; they were amalgamations of parts of old institutions.) The Americans did much of the planning for the changes in Japanese education which were proposed during the Occupation. Many of the reforms were actually carried out. The focus of the Occupation's reforms was the *democratization* of the system. To accomplish this MacArthur invited an education mission, composed of thirty American educators, to come to Japan and advise his staff and a Japanese Committee of Education on how the changes might be made. The mission included many college deans and the president of the American Council on Education. It arrived in Tokyo in February 1946 and spent a month surveying educational conditions and making suggestions. Its final report became the master plan for the educational reforms of the Occupation period.[6]

The major thrusts of the higher education reforms included:

- wider access to higher learning through the restructuring of elementary and secondary education into a single-track system, and the introduction of co-education,
- lengthening university education from three years to four years,
- instituting a general education requirement at the beginning of the college curriculum,
- strengthening university autonomy, especially in the private sector, through decentralization of control by the Mombushō,
- introducing part-time education after the compulsory years,
- establishing junior colleges.[7]

Conditions at the End of the Occupation

The second world war had dealt a severe blow to the Japanese economy. Confusion, brought on by the disruption of war, was to be found at all levels of social organization. By 1945, institutions of higher education had been either shut down or were doing research for the war effort. The fire bombings of Tokyo and other urban areas destroyed much of their physical plant (up to one-third of the floor space at some schools). Professors had suffered with the rest of the nation, their real wages declining markedly from the pre-war days.[8]

If the Meiji oligarchs in 1868 had busied themselves with the creation of a centralized, nationalistic system of education, the Americans in 1945 seemed anxious to do just the opposite. In the effort to democratize Japan they went to extremes in rewriting the Constitution and in introducing laws directed at decentralization. One example can be seen in the notion that each prefecture should have a university, similar to the state universities of the U.S. Now, Japan is a small country, and the creation of many new, and relatively unnecessary universities, often by means of a reorganization of the upper secondary schools, placed enormous strains on her resources.

Financial Problems in Post-War Japan

In the immediate post-war period money was scarce and education received less than it had before the war. According to Kitamura and Cummings

> By 1950, money allotted to higher education was less than that spent in the pre-war years despite the fact that the system had doubled in size....The general shortage of money rendered the reforms almost meaningless. New universities were reorganized but their quality was dubious.[8]

Japanese higher education has never overcome the inadequate financing problems which originated during this period. There are many examples. One is the poor wage scale of college professors; their financial status has declined steadily since the war. In 1969 and 1970, even allowing for differences in per capita national income, they receivedabout one-half the salaries received by their counterparts in the U.S., England and Germany.[9] As a result part-time employment has become an economic necessity for them. A survey of 1971 found that about sixty percent of the national university professors and assistant professors were dependent upon supplementary sources of income. In private universities, where finances are much tighter, eighty-one percent of the professors and sixty-three percent of the assistant professors had sources of income outside their major job – usually a second teaching job.[10]

A second example of inadequate financing may be seen in the Japan Scholarship Foundation (*Ikueikai*). Three-quarters of all student financial aid comes from this source, but only fifteen percent of the student population receives these scholarships. The Japan Scholarship Foundation was begun in 1943 as a quasi-governmental foundation funded from the national treasury. Its name is misleading because the monies are lent, rather than given to, students. These scholarships are similar to National Defense Education Act Loans in the United States. Both are based on student need and both expect repayment after graduation unless the graduate becomes a teacher or researcher, in which case all or part of the loan is cancelled. In Japan repayments are over twenty years, without interest, which is certainly more liberal than the terms found in the U.S. However, the Japanese loans are much smaller. Like the NDEA ones, they cover tuition and a living allowance. In the early 1970s these were only twenty to thirty dollars per month for an undergraduate, which does not begin to cover living expenses in an urban area like Tokyo. To make up the rest many students take part-time work (*arubaito*) and the most common is tutoring junior high or high school students for their exams. The more prestigious the student's institution the greater the demand for his or her tutoring services.

Perhaps the most serious example of inadequate financing in the post-war period can be found in the financial condition of private colleges and universities. Occupation reforms limiting governmental powers over private education also limited the amount of financial assistance they could receive from public sources. The funds from endowment are low in Japanese universities. In 1962, the average budget of a private university could be broken down in the following manner: loans – approximately eighteen percent, 'benefactions' – about seven percent, 'attached units' (such as hospitals) – around fifteen pereent, and student tuition – almost fifty percent. The other ten percent was income from 'subsidies', 'capital', auxiliary services', etc.[11] There was enormous reliance on student tuition funds. Inflation, compounded with need, in the 1950s and 60s succeeded in driving up tuition rates at private institutions. A Mombushō White Paper of 1964 points out that, in the pre-war period, representative tuition rates were 120 yen at national institutions and 140 yen and 110 yen respectively at Keio and Meiji University. By 1962, the average private university tuition was four times that of the tuition at the national universities. During the fifties and sixties although the private institutions clearly needed financial assistance, they resisted reforms which would provide broader public support at the expense of losing university autonomy to the Mombushō.

Table 1 FOUR-YEAR COLLEGES AND UNIVERSITIES IN JAPAN BY TYPE, 1948-1970 (UNIT: INSTITUTION)

Type of Institution	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
National	–	68	70	71	71	72	72	72	72	72	72	72
Public	1	18	26	26	33	34	34	34	33	35	32	32
Private	11	92	105	106	116	120	121	122	123	124	130	135
Total	12	178	201	203	220	226	227	228	228	231	234	239

Type of Institution	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
National	72	72	72	72	72	73	74	74	75	75	75
Public	33	33	34	34	34	35	37	39	35	34	33
Private	140	145	154	164	185	209	235	256	267	270	274
Total	245	250	260	270	291	317	346	369	377	379	382

Source: *Tokei Nenkan* 1959, 1963, 1965, 1970, 1971.

Expansion in the Sixties

From the end of the Occupation until the early seventies, the expansion of the student population in higher education amounted to about 200 percent, a rise from 7.5 percent of the 18-22 age cohort to almost 25 percent. Today that percentage has risen to almost 40 percent. Which were the receiving institutions? Table 1 shows a very interesting phenomenon. Between 1952 and 1970 the number of national universities increased only from 71 to 75. Among the public four-year institutions there was no increase. However, the number of private schools increased from 116 to 274. The students new to higher education were enrolling in the new and expanding, but less prestigious and less rigorous, private institutions. They were all too anxious to accomodate applicants because of their dependence on tuition for survival.

What did the government do to regulate this expansion and monitor educational standards? Very little, according to Pempel.[12] However, lack of formal planning should not be equated with lack of government interest. Pempel argues that the government has been intimately involved in the expansion, but in a way "which minimizes the economic and political costs to itself". This has been accomplished by two methods: (1) through the chartering of new universities and (2) by non-enforcement of the minimum legal standards for university conditions. We can see from Table 2 that the era of greatest expansion was during the mid to late sixties. Even more revealing of government policy is that a decreasing proportion of the higher education budget in Japan is coming from public sources. Between 1950 to 1968, the government's share of the cost of higher education shrank from 67.2 percent to 51.4 percent. By 1973, government expenditure per student was only two-thirds that of the pre-war period.

Table 2 APPLICATIONS FOR UNIVERSITY CHARTERS

Year	Number of Applications (A)	Number Approved (B)	Percentage Approved B/A
1959	9	5	56
1960	12	6	50
1961	8	3	38
1962	10	10	100
1963	13	10	77
1964	24	21	87
1965	30	25	83
1966	31	28	90
1967	37	23	62
1968	14	11	78
1969	6	3	50
1970	5	4	80

Source: T.J. Pempel, "The Politics of Enrollment Expansion in Japanese Universities", *JAS*, Vol. 33, November 1973, p. 72. (Based on unpublished data supplied by the Ministry of Education University and Science Division.)

Higher Education Reform in Post-War Japan

By 1952, when the Occupation ended, structurally a new system of higher education was emerging in Japan. The power of the Mombushō was dissipated (at least on paper) but with this decrease in power had also disappeared the responsible and effective planning agency. No powerful planning organ was created to fill the vacuum.

A number of scholars have concluded that Occupation reforms promoting university autonomy simply had the effect of exacerbating Japan's problems because they licensed irresponsibility towards change on the part of all players – the universities, the government and the political parties.[13] In the sixties, when demands for reform were made by students and faculty, the universities used the autonomy issue to shield themselves from criticism. Few took any initiative to promote programs independently of the Mombushō. Its power was restrained on paper, but the actual government control of education did not decrease. The hands-off attitude of the government was reflected in its non-involvement in the main issues: (1) the deteriorating financial conditions of private universities, (2) the increased demand for higher education, and (3) the drop in quality of education. The latter is characterized by overcrowded classrooms, low academic standards at some private institutions, part-time faculty who have little contact with students and colleagues, and inadequate library resources. Statistics revealing the conditions are shown in Table 3. In the mid sixties they led to student protests. By the end of the decade, student uprisings were occurring on most major campuses. In various schools, the reasons for rebellion differed – ranging from rising tuition fees to overcrowded classrooms. Many universities were shut down for months at a time as a result of the demonstrations. In spring of 1969, after a major battle (Yasuda Hall) on the Tokyo University campus, it became clear that there was a national problem of crisis proportions. The normally tolerant public began to pressure the majority party (the LDP, Liberal Democratic Party) to take some sort of action. When graduations were postponed, parents became concerned that their children would not be able to find jobs. Once again, it was left to the government to solve the problems of the universities.

Table 3 COMPARISON OF VARIOUS CONDITIONS WITHIN NATIONAL, PUBLIC AND PRIVATE UNIVERSITIES IN JAPAN

Condition	Year	National	Public	Private	Total
1. Student-Faculty Ratio					
a. Total	1968	6.4	7.4	18.1	12.0
b. Full-time	1969	8.3	9.5	30.3	18.1
2. Percent Part-time Faculty	1968	22.2	27.8	44.6	34.2
3. Average/Library (000)	1967	89.0	57.0	47.0	63.0
4. Number of Students per Library Seat	1967	9.2	9.3	15.1	12.8
5. Number of Books per Student	1967	96.0	67.0	25.0	43.0
6. Average Space per Student (tsubo)	1970	9.5	–	2.3	–

From: T.J. Pempel, "The Politics of Higher Education in Post-War Japan", 1975, p. 230.

Sources: 1 and 2, calculations from Mombu Nenpo, 1968, p. 344.
3 through 5, calculations from Mombu Tōkei Yoran, 1970 (Tokyo: Mombushō, 1970), p. 49.
6, Nihon Shiritsu Dagaku Kyōkiu, *Jigyō Keikakusho* [Working Plan], 1970 (Tokyo: n.p., 1970), p. 14.

In August of 1969, a prolonged session of the Diet produced the *Daigaku Rippo*, the University Normalization Law (full title, "The Bill for Temporary Measures Concerning University Administration"). It empowered the Mombushō to intervene in student disputes by designating the institution "a university in conflict" if a month after a student disorder erupted, order was not restored.[14] There was widespread opposition to the new law – both from students and the university faculties who began to worry about their autonomy. Most opposition came from the fact that once again the government was refusing to do anything to relieve the problems which were causing the revolts – overcrowding, low salaries and poor facilities.

Meanwhile there was some planning which was going on quietly within the Ministry of Education in the Central Council for Education (CCE). This advisory council has an interesting history; it was the offspring of an Occupation reform group called the Japanese Education Reform Council. The Central Council for Education consists of fifteen distinguished people appointed by the Minister of Education. Usually it includes presidents of universities, members of the press and businessmen. They are said to be chosen for their sympathy toward the Minister's policies, and they are among the very few noncareer civil servants in positions of influence within the Mombushō. The educational problems they choose to study are either self-generated or raised by the Minister of Education.

In June 1971, after four years of study, and in response to a charge from the Minister of Education, the Central Council for Education issued a report calling for reform at all levels of education in Japan. This report, entitled *Basic Guidelines for the Reform of Education*, is the closest the Japanese have come to creating a master plan for the '70s and '80s.[15] The Central Council for Education did not have the power to initiate its proposed reforms, so its *Guidelines* really are a shopping list from which the Japanese people may select items of greatest importance. They propose many kinds of reform: the need to promote greater equality of opportunity through scholarship programs; aid to educational systems in depressed areas; aid to private education; a substantial upgrading of the salaries and the status of teachers at all levels. About half the *Guidelines* were directed towards higher education. Among the reforms suggested are the categorization of colleges and universities into five broad types, the broadening of the academic marketplace (Universities in Japan tend to hire their own graduates as faculty), and the development of public corporations to assume responsibility for national and public universities. The Council also recommended reform of the entrance examination system replacing existing institutional exams with a combination of a nationwide aptitude test and high school grades.

The Council's report certainly summarized the major problems of Japanese higher education in the late sixties, but it was powerless to put through the necessary changes. A good illustration of lack of movement in solving these problems is the issue of establishing standardized entrance criteria for universities. In 1969, when I was in Japan, this was one of the major reform issues under discussion. However, universities are fearful of incursions into their autonomy. And many private institutions charge a high fee to take their entrance exams. This has become a regular source of income which they do not wish to lose. Students (who tend to be anti-establishment – at least until they graduate from college), protest that establishing standardized entrance criteria is but another attempt by the Mombushō to take over the education system. In the eight years since

1969 the situation has not changed much. A headline in the English language edition of *The Japan Times*, July 31st 1977, reads "Planned Reform of Public College Entrance Exam Comes Under Fire". The reformed entrance exam, to be tried out initially in 1979, is still under dispute.

Obviously the reform of Japanese higher education, like educational reform in all countries, is a question of politics. To answer it, William Cummings offers a theory of Japanese politics:

> In the study of Western politics, the study of legislative behavior tells us which bills will make it – the legislature is the forum. But as is well-known, what goes on in the Japanese Diet is relatively unimportant. Decision-making in Japan consists of an elaborate and poorly understood process of consensus-building drawing on a large number of actors. This process may culminate in a bill which is pushed through, even rammed through, the Diet [such as the University Normalization Law of 1969]. On the other hand, it may circumvent the Diet reaching its culmination in an administrative order or in mere agreement among the involved parties. Who is included in the process varies from issue to issue, but it also varies over time.

Higher education has remained peripheral to Japanese politics and, therefore,iit has been difficult to bring about much change. What then occurred in the seventies in the way of change? The answer is "very little". Many universities, in reaction to the disruptions of the late sixties, put together plans for reform but few have done anything concrete about them. An exception is Tokyo University of Education which took the opportunity to raise its prestige by making plans to reorganize and move to a new campus at Tsukuba, some forty miles outside of Tokyo. The first faculty opened in October 1973. When completed, Tsukuba University will be operated on a formula worked out in the 1971 *Guidelines*. To avoid inbreeding, it will exchange students and researchers with other universities and have a program of visiting professors. The government has invested a considerable amount of money in Tsukuba and the Mombushō is hoping that it will serve as a model for about a hundred additional universities which it hopes to build by 1986.[16] Another development of the early seventies was the opening of a Research Institute for Higher Education at Hiroshima University (1972). Devoted to the systematic study of higher education, it is the first of its kind in Japan and comparable to centers for the study of higher education in the United States.

Analysis of Higher Education Planning in Japan

In some respects Japan's problems of planning for higher education are not different from those in other industrialized countries. With almost forty percent of her college age population enrolled in colleges and universities she has already made the transition from meritocratic to mass higher education. However, her planning history is unique, peculiar to her status as a highly literate nation but a late developer. Some scholars blame Japan's problems on the university expansion which led to the loss of a clear image of what role the institution plays in society. According to Nagai, a former Minister of Education, the universities have been caught up in the process of social industrialization. And as this occurred have found themselves closer to society but bound by new ties. He writes:

> Despite the inevitable and acute disorder that accompanies this new relationship between society and higher education, a conscious grasp of the situation and systematic reflection on the reconstruction of the university can lead to a

> way out of the most serious difficulties this relationship poses. In Europe, the United States, and the Soviet Union, higher education has continued to advance because each country has recognized the importance of the problem and has undertaken a thorough going reformation of the university. Japan, in contrast, has not even fully awakened to the confusion. Furthermore, responsible long-term planning is almost completely lacking. At the expense of students and faculty, universities continue to expand and the resulting disorder is consistently neglected. The present crisis in Japanese higher education thus stems more from the absence of responsible planning based on an accurate historical understanding of the origins of this confusion, than from the confusion itself.[17]

In his assessment of the problem, Nagai raises an important point, which is illustrated by the response of the Mombushō to an international agency's assessment in 1970. During that year Japan turned to the Organization for Economic Cooperation and Development for assessment of her education system. A distinguished panel of examiners, including former American Ambassador to Japan, Edwin Reischauer, and Ronald Dore, a leading British sociologist who specializes on Japan, visited the country and interviewed over three hundred people – many of whom were involved in educational policy decisions. The OECD team presented a lengthy report on their findings.[18] It summarized Japan's major educational problems in three points:

- Almost all levels of education place an emphasis on selection rather than on the innate abilities of the student.
- Whenever the issue of authority arises, whether between teachers and students or the universities and the Mombushō, there is a tendency to view it in terms of power and coercion rather than cooperation.
- In Japan, both in government and its opposition, the values of education are confused with political indoctrination.

The Vice-Minister of Education, Amagi Isao, had some interesting responses to these criticisms. By 1970, he was used to attacks from the Japan Teachers Union, the student radicals, and liberals and leftists in general. In reply to the first criticism, he attributed the origin of the problem to Japan's experience as a modernizing nation (i.e. the development of meritocratic education and its emphasis on competition). He blamed the continuance of the problem on the business sector of the society which continues to recruit from prestige universities. In answer to the OECD's criticism of the failure of the parties and groups to cooperate, Mr. Amagi turned again to history. This he blamed on the need of the Meiji leaders to set up a highly centralized government in order to 'catch up' economically with the West. To the third criticism, confusion of the value of education with politicial indoctrination, he reported how, in the postwar period, the government was very careful to keep a separation between education and political indoctrination. The form of Mr. Amagi's defense is interesting. While he blames the problems on historical circumstances, he removes the government from responsibility for solutions. What is significant about Nagai's remarks about the absence of responsible planning, which is also based on historical understanding of the universities in Japan, is that he makes it clear that universities there have no deep historical independent traditions (like those which exist in Europe) in research and in liberal education. Consequently the direct dependence links between universities and the needs of society are strong. In Nagai's eyes the possibility of the university's subservience to society is negative. The price of socioeconomic

Figure 1 FORCES IN THE ENVIRONMENT ACTING AS CONSTRAINTS ON JAPANESE HIGHER EDUCATION

Human Constraints:	
cultural values:	– competition – high value placed on education to get ahead – meritocracy
available skills:	– high literacy rate – development of test-taking abilities – emphasis on rote learning
Technological Constraints:	
knowledge:	– no tradition of general education – no established research traditions – import of basic research from abroad
finance and markets:	– tradition of recruitment by industry from certain select schools – private schools dependent on tuition monies – nature of demand for trained manpower in the economy
Organizational Constraints:	
theories of organizations:	– few universities have planning officers – administration is light on top – universities should be autonomous from the Mombushō – governing body is a university council which includes all full professors
political requirements:	– approval by the Mombushō and party in power is necessary to change

Adapted from ideas in John A. Seiler, *Systems Analysis in Organizational Behavior.* Homewood, Ill.: Richard D. Irwin, Inc., 1967.

development in Japan has been confusion in the image and purpose of the university. Amagi's comments to the OECD team seem to confirm Nagai's conclusions. No one in educational policy promulation was strong enough (or indeed had the conviction that they ought) to take responsibility for establishing the university's independence of the Meji oligarchs' drive for national development in the nineteenth century or the recruitment patterns of big business in the twentieth.

Professors Kitamura and Cummings have developed a theory they call the "Big Bang Theory", based upon what they found to be the Japanese higher education reform pattern. Each reform has come after a 'Big Bang' instigated from outside the university – a war, an international, or a political crisis. The reforms have encompassed the entire educational system. The reforms have come from above or from outside the universities, identified, proposed and implemented by government groups which had sufficient resources, to accomplish their task. The reforms have violated university autonomy and universities have been reluctant to adopt them, always they come around to cooperating in the end. Finally, the reforms have been legitimized by seeking approval of the highest political authority in Japan and demonstrating how they will serve the national interest. Once agreed upon, the reform is executed rapidly from above by government. This has occurred twice – after the Meji Restoration and during the Occupation.

When we look at the separate parts of the university organizational system we begin to see its constraints. Figure 1 is based on the systems ideas of John A. Seiler. The lack of a tradition of independent research and a tradition of general education, and the failure of private support for education are major strains. Pressure comes from the people's cultural values. They exert considerable demand for expansion and for competitive, utilitarian selection and benefit. Within the University-Mombushō relationship, the universities' myth about their autonomy from the Mombushō is directly opposite to what is politically required – that they should work cooperatively for change. The important planning question is: If change is going to occur in Japanese higher education, where will the next 'Big Bang' come from?

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Martha J. Chang*

DEMOGRAPHIC TRENDS AFFECTING STATE EDUCATIONAL PLANNING: A FLORIDA EXAMPLE

Like the decline in college entrance exam scores, the decline in enrollment is a topic that keeps surfacing now, both inside and outside of education circles. The downward trend in the birth rate, the change in the structure of the American family, decreasing enrollments – all are becoming frequent topics for analysis and commentary. What new can be said about them? Despite the coverage given demographic trends by the national press and research done by such agencies as the Census Bureau, the Rand Corporation, the National Center for Education Statistics and the Office of Technology Assessment, there remains a real gap in research on trends at the level of the state or school district. A prime reason for this gap is the lack of basic information needed to measure trends at these levels. Joseph Coates, assistant to the director of the U.S. Congress' Office of Technology Assessment, made this point when he appeared before a House subcommittee in May to present a report on demographic trends affecting elementary and secondary education. He closed his presentation by stating: "The crucial need is to better understand the demographic trends at the state and local level."[1] A related report issued by his office stated:

> The steady decline in school populations, while predictable at the national level, may have little bearing on the situation faced by state and local planners since the details of internal mobility and migration and the special needs of subpopulations create local or regional shifts within the school system which may exaggerate or counter the general downward trends for the nation .... Demographic analysis capabilities are inadequate at the state and local level for understanding and dealing with the major demographic trends. Limitation of data restrict demographic analysis and especially forecasting at the state and local level.[2]

Despite these limitations, the analysis of demographic trends remains a crucial part of educational planning, particularly for states such as Florida, where the size and age distribution of the population are dependent on migration. This paper (1) presents a suggested model for studying the broad range of variables which seem to make an impact on enrollment, (2) reviews the experience that the Florida State Department of Education has had in tracing state demographic trends, and (3) summarizes some of these trends for the United States and Florida.

A Model for Projecting Enrollments

In its simplest terms an enrollment projection can be made if two factors are known – the size of various population groups and the proportion of these groups which will likely participate in a given educational program. In other words, enrollment equals population times the participation rate. To cite an example at the local level, if we know that there are 253 five-year olds in the district, that the participation rate for kindergarten for the last three years has been 75 percent, and that there is no reason to believe

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that this participation rate (i.e., the ratio of the total enrollment of 5-year olds, to the total number of 5-year olds in the district) might change during the next year, we can be fairly confident in projecting a kindergarten enrollment of about 190. But suppose that this is a metropolitan district with hundreds, perhaps thousands, of five-year olds, some of whom have moved into the district during the past year. Without an accurate count of the number of five-year olds over the past few years it would be impossible to know what the participation rate might be or the factors that might make it change. Therefore, how should we go about projecting kindergarten enrollments for the district so that school principals will know how many teachers to hire? We have the simple equation, enrollments = population x participation, but both elements in it are unknown.

Figure 1 presents a model of some of the variables that seem to be related to population and school participation trends in Florida. It depicts two types of components, trends and decisions. The trends are grouped by whether they measure characteristics of the public education system itself or of external factors – characteristics of the socio-economic context outside education. Because they have such a close relationship to both the volume and age distribution of the population, demographic trends are grouped separately. The decision makers which are included in this model are designated as public policy makers and potential students. The two components of this model that bear the closest relationship to population and participation rates are demographic trends and the decisions of potential students. Other components in this model interact with these two in a complex way. Demographic trends determine the size and age composition of the population. Population, in turn, affects demographic trends: the more people there are the more births and deaths there will be if the fertility rates remain unchanged. If the age composition of the population changes, the ratio between births, deaths and the total population will change also. External characteristics, particularly economic trends, affect migration, public policy decisions, decisions made by potential students, and – through rising costs – the education system itself. The characteristics of the education system, such as the time and money that must be invested in order to participate in a given educational program, how convenient postsecondary institutions are to students (proximity), and what kind of programs are available, affect the decisions of potential students. Social norms, particularly those which undergird existing participation rates of various age, sex, and racial-ethnic groups, have a tremendous impact upon students. Public policy determines many of the characteristics of the public education system, attempts to influence migration, and in addition, through affirmative action, is endeavoring to change the participation rates of minority groups. The work of the educational planner cuts across this model in two ways. First, as ways are found to measure the trends and determine their interrelationships, mathematical models for projecting enrollments can be developed. Second, the model pinpoints possible areas for policy decisions, which include the characteristics of the system but also such things as migration, economic development, and participation rates.

In summary, this model suggests a number of tentative relationships to be questioned, explored, accepted, or discarded. The strategy planning unit in the Florida State Department of Education plans to examine many of them. Most of the work thus far has been on the demographic trends.

Martha J. Chang

Establishing State Demographic Trends: A Case Study

The Office of Strategy Planning and Management Information Systems, a unit under the Associate Deputy Commissioner of Education for Florida, was organized in 1975. Its main role has been to analyze present policies in the light of future trends. It is also responsible for assembling data needed for department-level decision making. One specific assignment is to coordinate the enrollment projections of public schools, community colleges, and universities. Since basic understanding of demographic trends is essential, both for analyzing the impact of present policies and coordinating projections, this was one of the first areas of investigation undertaken by the strategy planning unit. Its experience may be useful to other state and local planners.

Enrollment projections for Florida public education have traditionally been made independently by various organizational units within the Department – the Divisions of Public Schools, Vocational Education, Community Colleges, and Universities, as well as the Office of Educational Facilities Construction. First we reviewed the projection methods currently being used by these units. To obtain assistance we contracted with the Center for Population Studies of the Institute of Social Science Research, Florida State University. A team headed by demographers Thomas Espenshade and Charles Nam worked with us over a fifteen-month period to review and evaluate existing projection methods within the Department and to develop improved methods. Since much of the focus of this team was on the actual projection of enrollments rather than the broader domain of demographic trends, this is not the place to report its work. However, general reference to the project is relevant because of the example it provides of a cooperative effort between a state agency and a university research team.

The fifteen months work constituted a real learning experience. The university researchers gained firsthand experience in working with a large state agency and learned more about the structure of the state public educational system. They assumed that they could quickly assemble the necessary data and spend the bulk of their time designing alternative projection methods. Instead they learned that, in the real work of government, assembling the data can be an arduous task. Offices are scattered. Agency staff do not always respond enthusiastically to unknown graduate students who have not learned how to ask the right questions. Data definitions change from year to year, making it difficult to establish trend lines. Since much of the historical data are not automated, and sometimes are scattered in pages of data books, the students sometimes found themselves hunched in corners hand-copying numbers. Being new to state government the personnel of the Office were not always much help. As the year proceeded, however, we interceded more and more, finding the data or at least arranging their appointments. For our part, we came to understand more clearly the concepts, methodology, and available resources within the field of demography. We learned whom to call when we needed the latest information and how to get pre-publication copies of population projections. We also learned where the gaps are, information or projections that we would either have to estimate or do without.

Both research units learned to deal with the tensions set into play because of the differences that exist in need structures between government agencies and university researchers – their need to produce research that is scholarly, systematic, and acceptable within their discipline; our need to produce a timely, useful product. An article for a professional journal can wait until its author has assembled all appropriate data and feels

ready to publish the analysis and findings. A report intended to support the budget process must be produced on time with the best available data or it loses its usefulness. University research emphasizes methodology; government agencies products. Social scientists, in the process of illustrating a new methodology, may produce improbable outcomes just because of the tentative assumptions made along the way. Agency staff seem to care only about the reasonableness of the outcomes, paying scant attention to creative methodology. Demographers produce several alternative projections based on different assumptions; a budget director wants just one figure. University researchers are used to taking risks in order to gain new knowledge; agency personnel prefer to stick to what has already proven useful. All of these differences, known so well to those acquainted with both domains, surfaced during the course of the project, but were handled with a measure of good humor. By the end bridges had been built between the academic community and state government, bridges that remain even though the project has been completed.[3]

Although we worked mainly with the demographers of Florida State University, we also received assistance from Stanley Smith and others of the Division of Population Studies of the Bureau of Economic and Business Research, the University of Florida. This Division is responsible for making county and state estimates and projections, and producing the current population age-group estimates and projections which are essential to projecting enrollments. Until this year, however, they have been by-products of the projections of total enrollments and therefore the methodology for producing them has not commanded the attention that the official population projections have. During the demographic study conducted during the year 1976-77 we calculated our own age group estimates and projections, relying on methods developed by the FSU project team. By the summer of 1977 the University of Florida demographers had updated their methodology sufficiently so that we were able to begin using their projections.

To summarize our experience: we found that state and local data are difficult to obtain. Persistence, however, will often uncover professional resources which either have the data or the necessary expertise to produce it. Moreover, gradually this expertise develops within the planning agency itself.

Demographic Trends in Florida

Population change has two components: natural increase or decrease (i.e., births minus deaths) and migration. In the U.S. as a whole about 25 percent of population growth is due to immigration.[4] The scene is quite different in Florida. Here the ratio between natural increase and migration has changed dramatically over the past fifteen years, as may be seen in Figure 2. Although almost 35 percent of the state's total increase during the 1960-65 period was attributable to natural growth, this is true for only 9 percent of the total growth from 1970 to 1975. At the same time, the proportion of growth arising from net migration increased from 65 percent in 1960 to over 91 percent in 1975.

Florida's pattern of population change has also differed from that of the nation as a whole in the way birth rates have failed to match the trends in total numbers of births. The birth rate (births per 1000 population) in the United States peaked in 1956; the total number of births reached its highest point one year later. By contrast, while Florida's birth rate also reached a peak in 1956, the peak in the actual number of births was not reached until five years later, in 1961. Even then the number of births dropped very

little, so that similar highs were reached in 1971 and again in 1974. These Florida trends may be seen in Figures 3 and 4. The reason why the number of births increased, even though birth rates were declining, was not that the fertility level was higher than elsewhere, but that, due to migration, there was an ever-increasing number of females in the fertile age groups. The result has been that while enrollment in most other states has been declining, that in Florida public schools, colleges and universities has been seesawing, increasing at some levels, declining at others, stabilizing at still others. The babies born in 1961 are our current 11th graders; those in 1971, our current first graders. In between are age cohorts of various sizes. Figures 5 and 6 illustrate the effect of this up-and-down movement. Figure 5 depicts the size of each grade statewide over a three-year period. Figure 6 uses the same data but focuses on age cohorts instead of grade levels.

The decline which followed the post war baby boom has not yet hit the colleges and universities. Therefore growth in postsecondary programs in Florida has been continual, with this growth just now beginning to slow down, as may be seen in Figure 7. Although much of the reason for this growth is the fact that there have simply been more young people of traditional college age in Florida during the last fifteen years, a number of other events and trends related to participation also help to explain the patterns of growth. These events include the Vietnam War and the end of that war, the opening of new community colleges and state universities (the *proximity* element in the model), and changing social norms as evidenced by the rising level of education among such groups as blacks and older women. Such influences need more research at the state and local level. For example, a current influence upon postsecondary enrollment seems to be the number of veterans losing educational benefits. The Florida State University System enrolled almost ten percent fewer students than expected, in fall 1976. Investigation revealed that the drop chiefly was in male students. Data from the Office of Veterans Affairs indicated that 28 percent fewer Florida community college students (some 10,000) and 26 percent fewer state university students (about 3,000) received benefits in 1976 than in 1975.

Although all this emphasis on the past and present is interesting, what we really want to be able to do is to project the trends into the future. To do this we need projections of the size and age distribution of the state's population. It is well known that Florida's population age profile is becoming less and less like that of the United States as a whole. The two profiles in 1960 were quite similar (see Figures 8 and 9). For both, the age distribution forms an irregular triangle, with an identation representing the smaller number of people from age 15 through 30, those persons born during the Depression. The 1976 profiles reveal a pronounced bulge representing the large number of births which took place from 1945 to 1960. Population growth is evident in both 1976 profiles. However, the Florida profiles reveal much more pronounced growth. The contrast by shape is even greater than that by size. Florida has a much greater proportion of older people. Except for the age 10-to14 bulge, Florida's 1976 profile more closer resembles a rectangle than a triangle. The over 75 age group is larger than the next nine age groups. (i.e., older than each five-year group from age 30 to 74). In the nation as a whole only the 65-to-74 age groups are smaller than the over-75 age group. Figures 8 and 9 do not include a profile for the United States for 1985. The 1985 profile for Florida shows all age groups except those 10 to 19 to be somewhat larger than they were in 1976. This bears noting because, of course, it is precisely these 10-to-19 year olds who will be attending Florida's middle and high schools, community colleges and universities in 1985. The largest population gain will be in the over-75 age group, which deserves to be disaggregated into two or more additional age groups.

Another way of looking at the expected 1985 age distribution in Florida is to focus on five broad age groups, as shown in Figures 10 and 11. Figure 10 depicts actual growth in volume in these age groups, while Figure 11 highlights the changing proportions of the groups. From these figures four observations may be made: (1) overall growth will be smaller in the 0-to-14 age group, especially until 1990; (2) growth in the 15-to-24 age group will be negligible over the next 15 years; (3) the over-65 age group, although the smallest in 1960, by 1985 will be the second to largest; and (4) the 0-to-14 age group which in 1960 was by far the largest by 1990 will be the second to smallest.

The population projections used in this report are based on medium-range economic forecasts, and hence a medium-range migration rate. The forecasts may well be too optimistic. Figure 12 takes the five age groups conventionally associated with schooling, and visualizes their size with and without migration. The solid lines indicate the size as given in current official state projections; the dotted lines represent the size of the group if no migration were to take place. Figure 13 traces each cohort age population group from 1970 to 1990. For example, it takes the children who were 0-4 years in 1970 and shows the size of this age group through 1990, by both methods. These figures indicate that, although moderate growth is likely to take place in the early elementary grades, the population upon which middle school enrollment depends will decline at least until 1985. The 15-to-19 age group will likely stay about the same size as it is today. The 20-to-24 age group will continue to grow, at least until 1980. If the economy of the state and nation does not improve markedly, the actual size of these age groups will likely be somewhere between the solid line and the dotted line.

Conclusion

This paper reports work which studied past and future demographic trends and their impact upon education in Florida. It presents only a partial picture of research being carried out to improve statewide enrollment projections and to understand demographic trends for the purpose of program planning. It excludes the other main component of the projections, namely, participation rates. Work is under way to isolate the participation rates in various educational programs by sex, race, and age, and also to measuring the relationship to program participation of school promotion rates and such factors as income and unemployment.

This work suggests that the State of Florida must accustom itself to further fluctuations in enrollment, with some geographic areas and academic levels facing decline while others experience patterns of stability or growth. The state should also pay greater attention to educational programs for mature adults. The statewide campaign on adult illiteracy which has just been launched is one answer to the need for expanded programs for adults. Other programs which have been launched or may be needed are job retraining, programs for the women returning to the labour force, community instructional programs which focus on the personal and community needs of older citizens, and programs in recreation and leisure.

Figure 1 FLORIDA ENROLLMENT PROJECTION MODEL

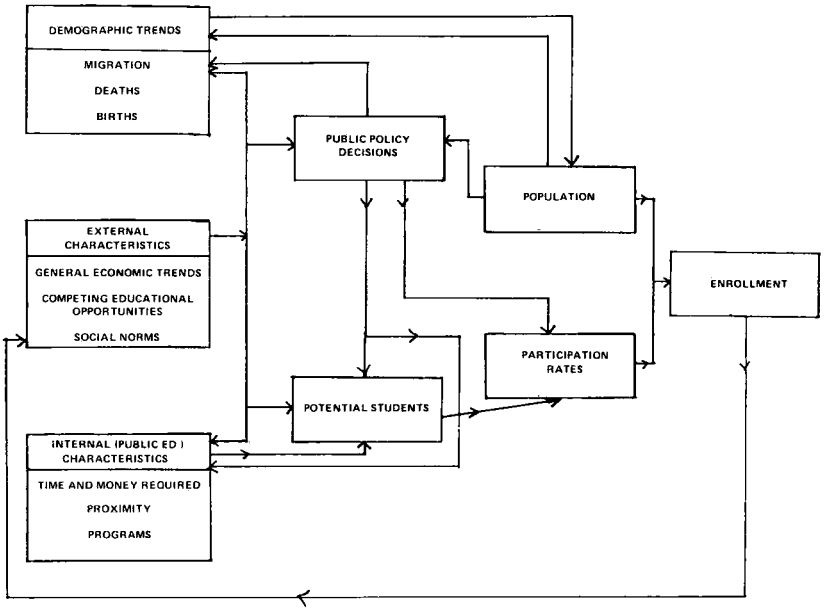
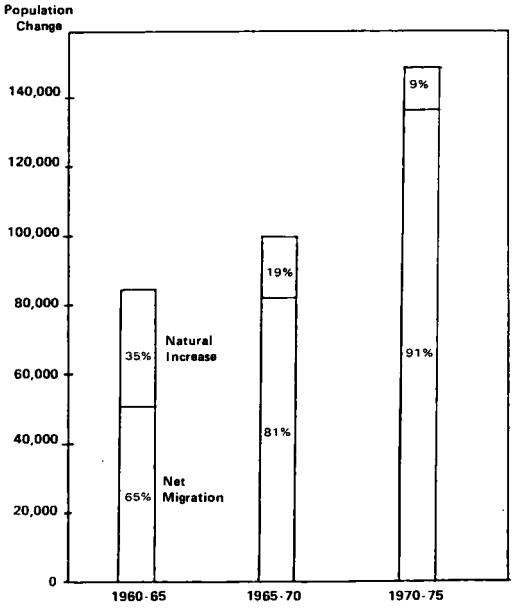
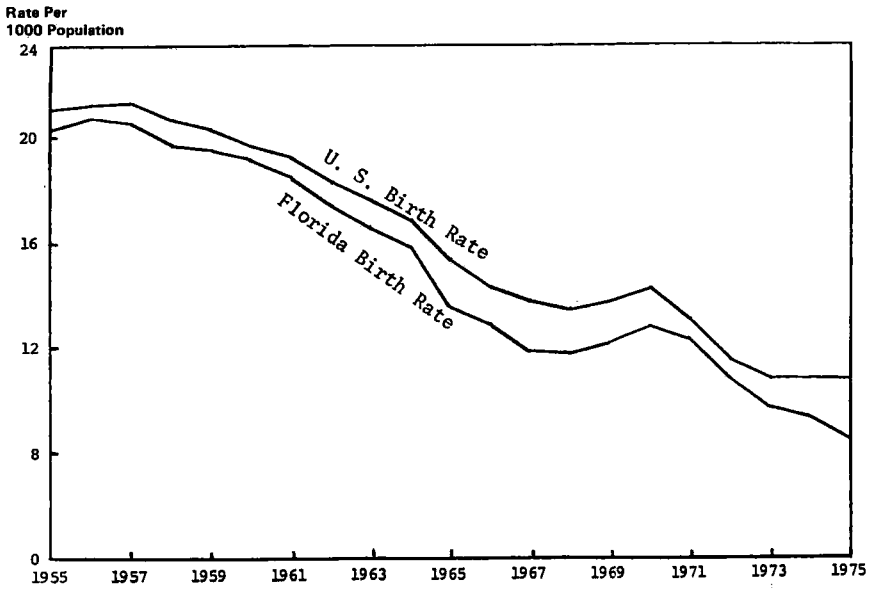


Figure 2 FLORIDA COMPONENTS OF CHANGE, 1960-75



Source: Total population: U.S. Bureau of the Census *Statistical Abstract of the United States*, 1976, Table 10, p. 11; U.S. Bureau of the Census, *Current Population Reports*, Series P-25 No. 642, "Population Estimates and Projections", Table 1, p. 3. Natural increase computed from births and deaths, Florida State Department of Health and Rehabilitative Services, Division of Health, *Florida Vital Statistics*, annual editions.

Figure 3 BIRTH RATES, 1955-75



Source: U.S. Bureau of the Census, *Statistical Abstract*, annual editions; Florida State Department of Health and Rehabilitative Services, Division of Health, *Florida Vital Statistics,* annual editions.

Figure 4 FLORIDA COMPONENTS OF NATURAL INCREASE, 1955-75

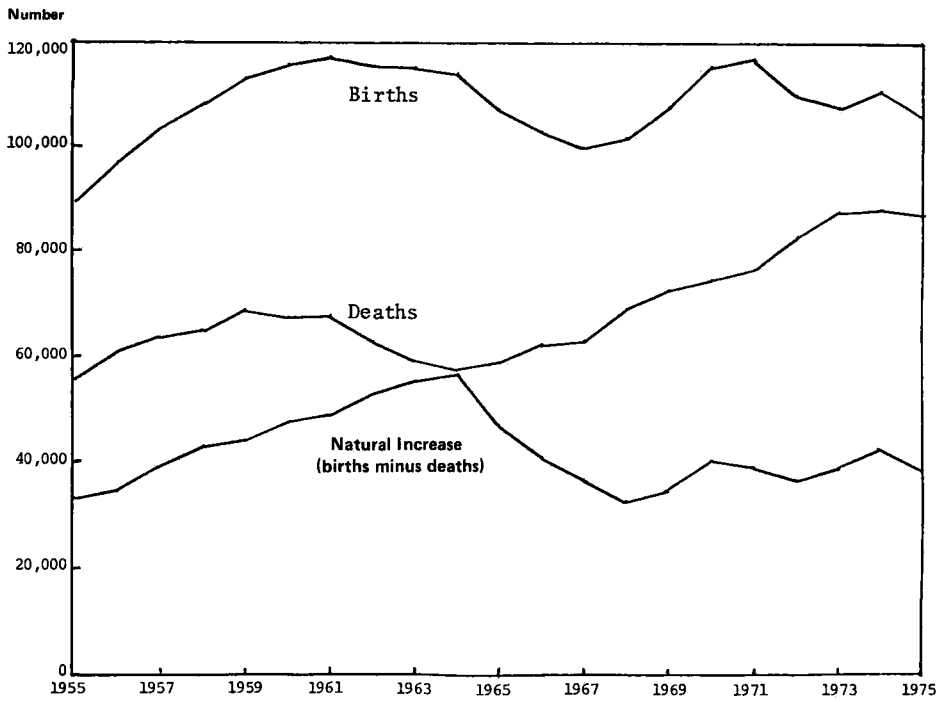
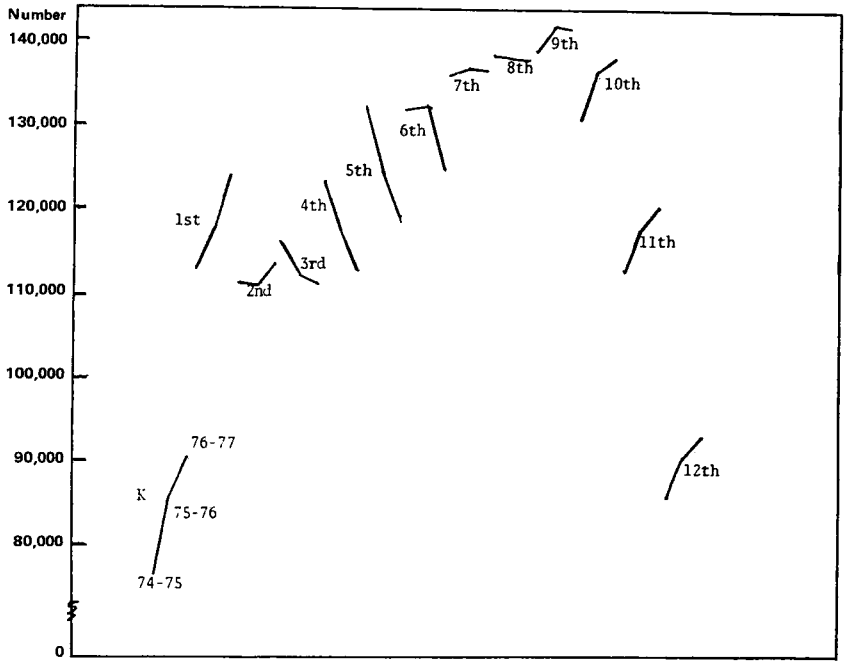


Figure 5 FLORIDA, FULL–TIME-EQUIVALENT ENROLLMENT BY GRADE, 1974-75, 1975-76, 1976-77*



*1976-77 based on three counts and an estimate of the fourth.

Figure 6 FLORIDA, THREE YEARS OF AGE COHORTS, 1974-75, 1975-76, 1976-77

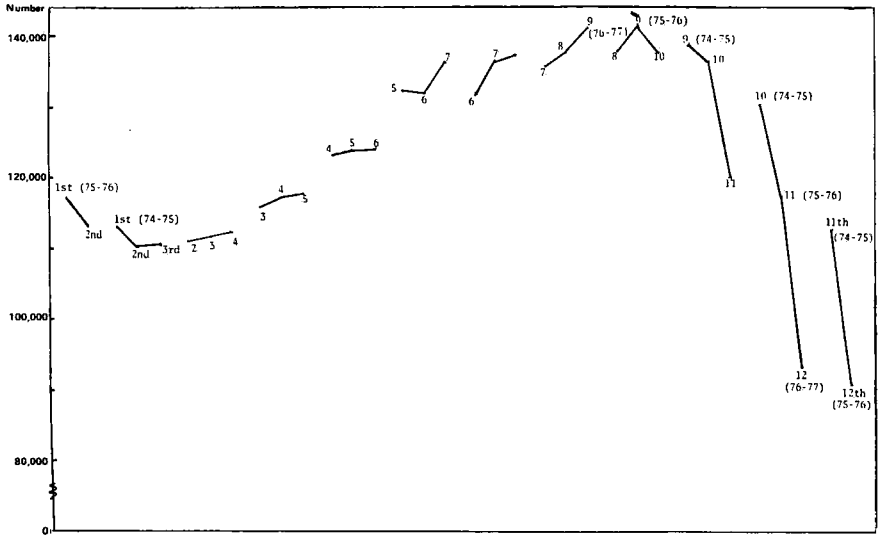
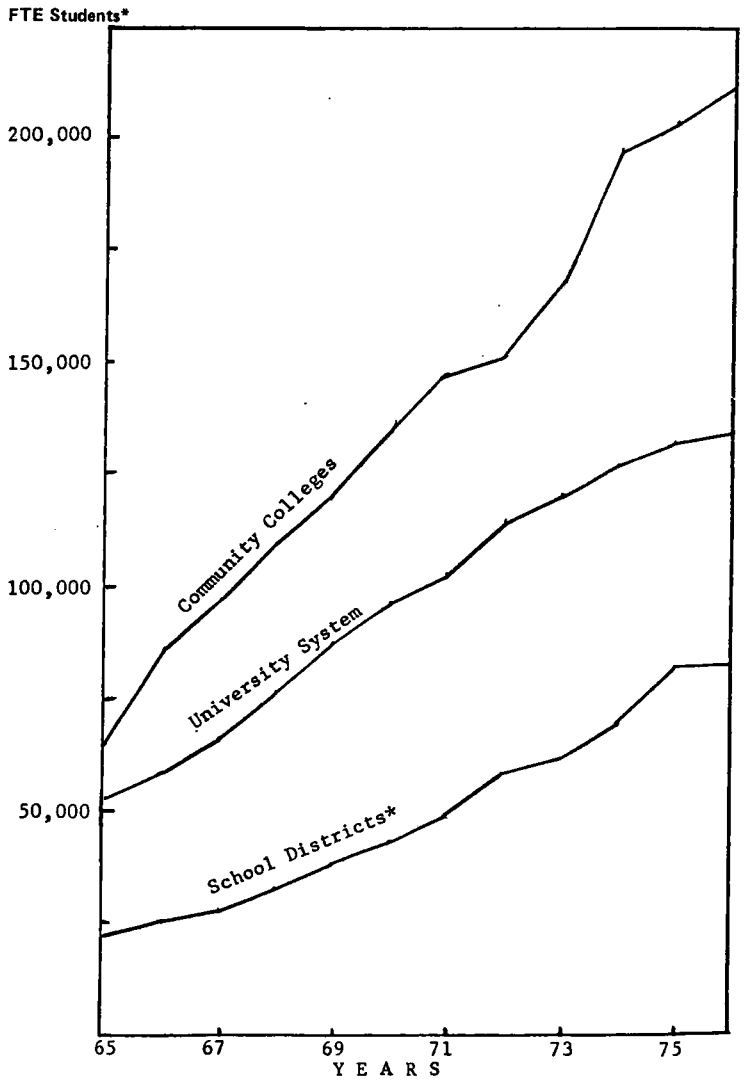
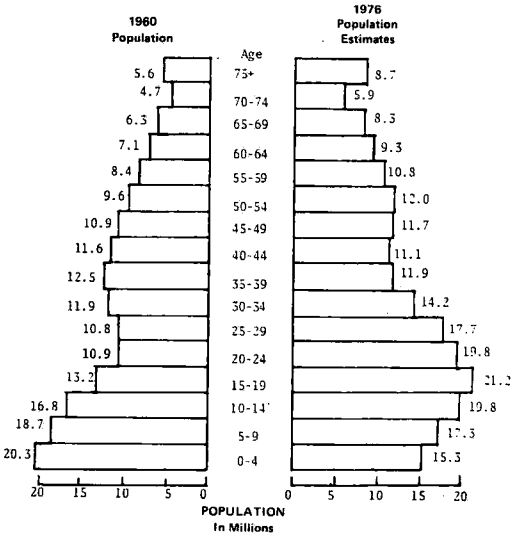


Figure 7 FLORIDA, FULL-TIME EQUIVALENT ENROLLMENT IN PUBLIC POST-SECONDARY INSTITUTIONS, 1965-76



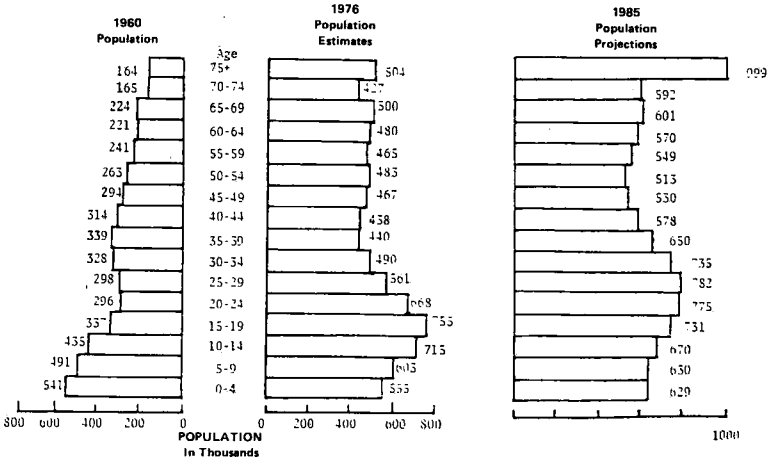
*Includes adult education and adult vocational programs offered by the districts.

Figure 8 UNITED STATES POPULATION PROFILE, 1960-75



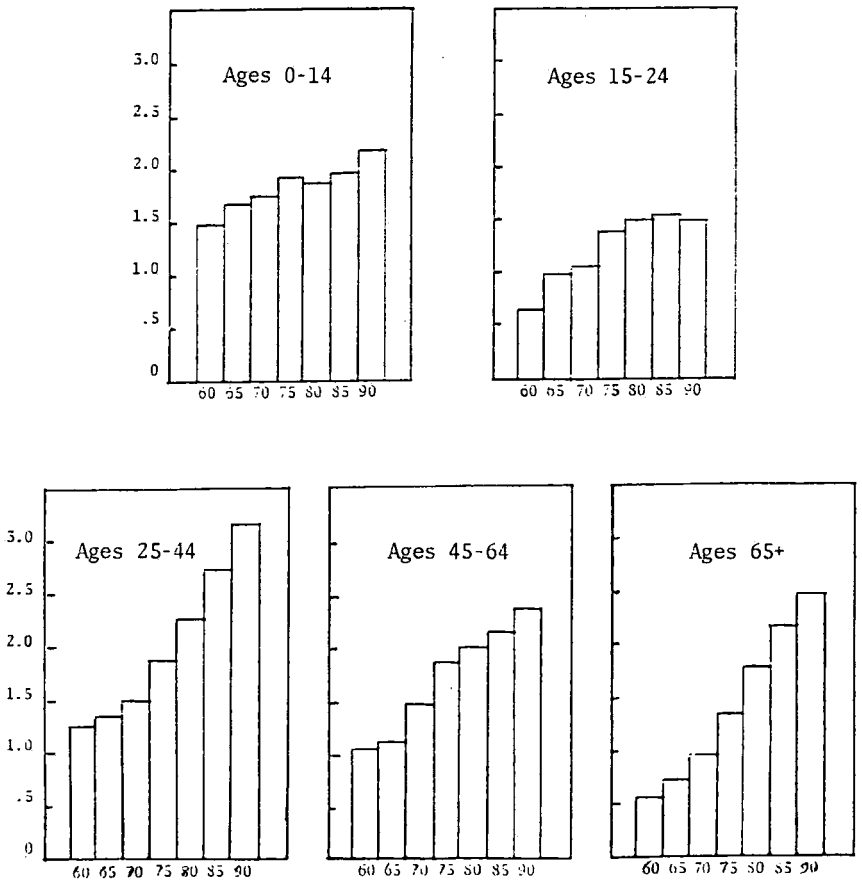
Source: 1960 population: U.S. Bureau of the Census, *Census of Population: 1970, General Population Characteristics*, U.S. Summary, Table 53, p. 276. 1976 population: U.S. Bureau of the Census, *Current Population Report*, Series P-25, No. 643, January 1977, "Population Estimates and Projections, Table 2, p. 10.

Figure 9 FLORIDA POPULATION PROFILE, 1960-1985



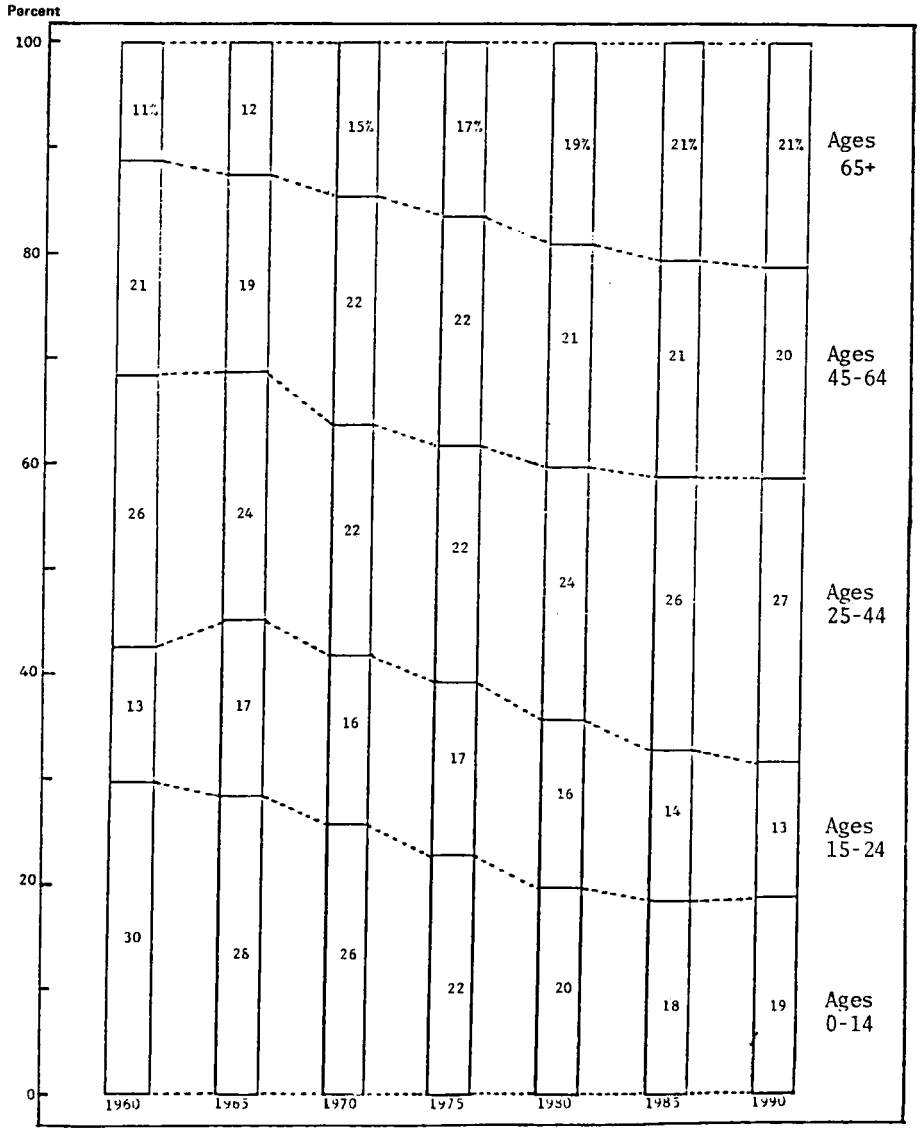
Source: 1960 population: U.S. Bureau of the Census, Census Population: 1960, Vol. I, *Characteristics of the Population*, Part II, Florida, Table 16, p. 33. 1976 and 1985 population: Bureau of Economic and Business Research, University of Florida, unpublished computer printout, June 1977.

Figure 10 FLORIDA POPULATION BY AGE GROUPS



Source: 1960 population: Based on U.S. Bureau of the Census, *Statistical Abstract of the United States, 1963*, Table 19, p. 27. 1965 Population: Estimated from U.S. Bureau of the Census, *Statistical Abstract of the United States, 1967*, Table 20, p. 25. 1970 Population: U.S. Bureau of the Census, *Census Population: 1970, General Population Characteristics*, U.S. Summary, Table 62, p. 299. Estimates and Projections: Unpublished computer printouts, Bureau of Economic and Business Research, University of Florida.

Figure 11 FLORIDA, PROPORTIONAL DISTRIBUTION OF AGE GROUPS



Source: Computed from data used in Figure 10.

Figure 12 FLORIDA, PROJECTIONS FOR SELECTED AGE GROUPS

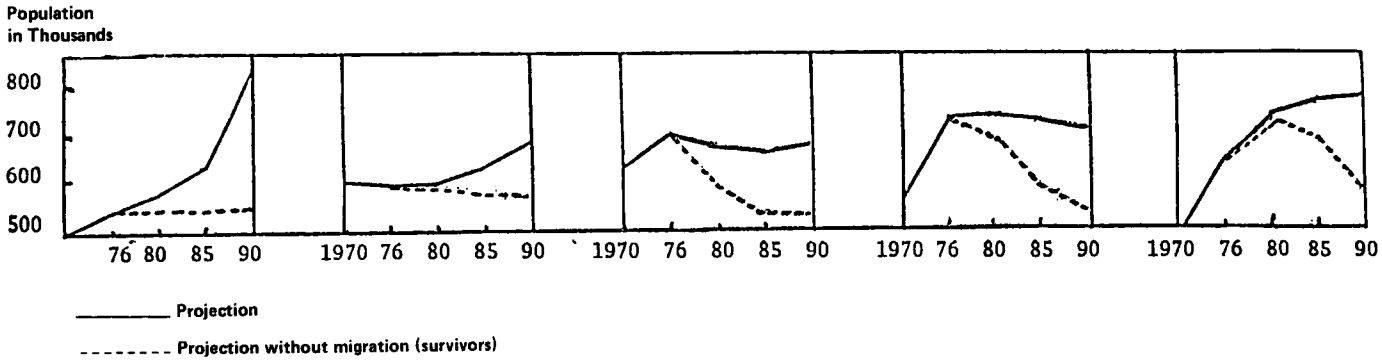
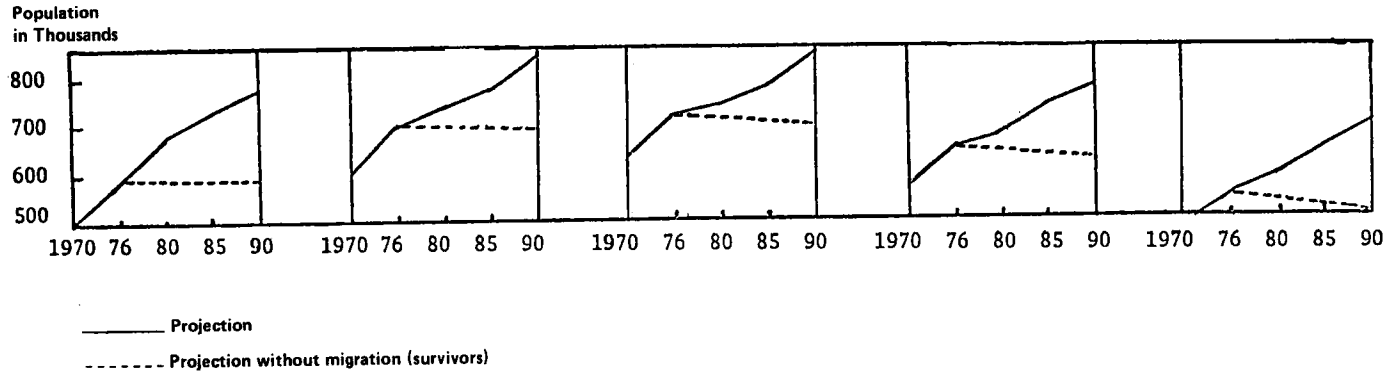


Figure 13 FLORIDA, PROJECTED SIZE OF SELECTED COHORT AGE GROUPS



Source: Tables 1 and 2

Table 1 FLORIDA POPULATION AND PROJECTIONS, 1970-1990

Age	1970	1975	1980	1985	1990
0-4	501,325	547,652	574,957	628,985	829,370
5-9	605,891	594,551	599,618	629,771	674,989
10-14	643,202	704,891	678,316	669,931	681,811
15-19	576,943	744,703	748,486	731,148	720,639
20-24	496,661	659,365	746,790	775,829	779,383
25-29	403,213	553,044	680,412	782,564	845,034
30-34	358,769	483,338	596,085	735,028	851,307
35-39	355,515	433,699	517,657	650,356	788,110
40-44	391,569	432,270	479,167	578,429	700,887
45-49	394,555	461,079	477,569	530,898	611,508
50-54	367,654	476,225	489,198	513,886	558,606
55-59	347,438	459,090	516,727	549,606	583,811
60-64	359,029	473,809	522,656	570,009	607,012
65-69	357,647	493,647	548,427	600,588	665,771
70-74	289,222	421,024	520,952	591,553	673,058
75-79	188,273	271,220	371,715	461,472	540,507
80+	154,512	225,623	362,800	538,010	610,662
TOTAL	6,791,418	8,435,230	9,431,532	10,538,063	11,722,476

Table 2 FLORIDA PROJECTIONS BY AGE GROUPS WITHOUT MIGRATION (SURVIVORS), 1980-1990

Ages	1980	1985	1990
0-4	550,584	548,101	555,275
5-9	553,167	548,547	546,073
10-14	601,321	551,839	547,230
15-19	711,632	598,795	549,521
20-24	749,636	706,579	594,544
25-29	663,264	743,789	701,068
30-34	555,922	657,626	737,467
35-39	484,432	549,584	650,129
40-44	432,262	476,245	540,296
45-49	427,156	421,326	464,196
50-54	449,829	411,052	405,442
55-59	455,866	424,729	388,115
60-64	430,155	421,311	392,535
65-69	432,706	387,484	379,517
70-74	432,907	374,291	335,174
75-79	341,944	346,802	299,845
80+	157,090	195,353	198,128
TOTAL	8,429,873	8,363,453	8,284,555

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1. 95th Congress, 1st sess., H. Doc. 15, Part 1: *General Issues in Elementary and Secondary Education*, May 1977, p. 94.
2. U.S. Congress Office of Technology Assessment, "A Preliminary Analysis of Demographic Trends Influencing the Elementary and Secondary School System," Appendix 1, *Part 1: General Issues in Elementary and Secondary Education*, p. 11.
3. A list of the reports which resulted from these projects is given below.
4. U.S. Congress Office of Technology Assessment, *loc. cit.*, p. 14.

RELATED REPORTS

Thomas J. Espenshade, Charles B. Nam, Kathleen A. Ockay, Louis G. Pol, and Nt. Wa Magango Sekimonyo, "Preliminary Forecasts for 1977-78 of FTE's at K-12 in the Public Schools: State of Florida", September, 1976.

Kathleen A. Ockay, and Thomas J. Espenshade, "An Evaluation of Educational Enrollment Projection Methodologies Currently Being Used in Florida", December, 1976.

Nt. Wa Magango Sekimonyo and Kathleen A. Ockay, "A Summary of the Data and Methodologies Used in Preparing School Enrollment Projections", December, 1976.

Thomas J. Espenshade and Kathleen A. Ockay, "Alternative Population Projections in School-Age Categories for the State of Florida: 1975-1990", March, 1977.

Charles B. Nam, Louis G. Pol and Dwight Bolling, "Methodology for Making Enrollment Projections, for Public Schools by Districts and Program and for Public Institutions of Higher Education by Program and Level, in Florida", March, 1977.

Department of Education, "Preliminary Analysis: Enrollment Trends in Florida School Districts", April, 1977.

Robert P. Hagemann and Thomas J. Espenshade, "A New Methodology for Projecting K-12 FTE's in Florida's Public Schools", June, 1977.

Charles B. Nam, Louis G. Pol, and Dwight Bolling, "Evaluation of Enrollment Projections and Recommended Methodology, for Public Schools by District and Program and for Public Institutions of Higher Education by Program and Level, in Florida", June, 1977.

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Charles B. Nam, Dwight Bolling, Kathleen A. Ockay and Louis G. Pol, "Illustrative Projections of Enrollments in Public Schools by District and Program and in Public Institutions of Higher Education by Program and Level, in Florida: 1978-79, 1979-80, and 1980-81", August, 1977.

Edward H. Humphreys*

THE USE OF THE CUMULATIVE STUDENT RECORD AS A SOURCE: THE PLANNER AND STUDENT PRIVACY

Planners rely on a wide range of information in order to carry out the many studies that are relevant to decision-makers in regional or local systems of education. However, certain data, particularly for longitudinal studies, are not usually available, or are in a form that does not lend itself to the manipulations of the planner. This leads to unnecessarily costly processes of collection, transformation or retrieval. Unfortunately, when data for planning are collected *ex poste facto* much that would be of use to the planner is no longer available, the donors have moved on to other pursuits, have forgotten the specific information or are unwilling to provide it. One data source rarely employed by planners is the student cumulative file that exists, albeit in questionable condition, in virtually every school in North America. This paper examines the student cumulative record as a possible source of valuable planning data – one which is largely unexploited at present.

There is little doubt that a number of recent trends support the need for more adequate planning in Canadian school systems. Critical enrollment trends, demands for system accountability and the continuing emphasis on (and redefinition of) equality of opportunity all lend support for more astute information management, program evaluation and resource allocation by school systems.

Broadly Based Student Data Needed

In Canada, the need for accurate historical records of attendance and program was highlighted on Aug. 26, 1977 when the Quebec National Assembly passed Bill 101, The French Language Charter. Article 69 of that law restricts "... access to the English school system to these children with one or both parents who were educated in English in Quebec."[1] Regulations under the Act permit temporary residents to attend an English language school if "... at least one of the parents would have received his or her primary or secondary instruction in the English language or one of the children in the family would have begun studies in English."[2] The planning implications of such an act are obvious. Accurate estimation of student enrollment in the English schools, even in the short term, becomes nearly impossible if no student records with parental education background are held by the school system.

The recent trend towards accountability which has swept the U.S. and Canada also makes serious demands on the planner through the requirement for program evaluation. As responsible planners we should feel obliged to approach accountability in more than a perfunctory way. Cox[3] refers to Harry S. Broudy's crucial limitations for accountability which include – outcomes being within the control of the accountable, the body of knowledge, skills and values being commonly agreed to, and the standards of quality being clear. He goes on to point out that it would be unfair to hold school or system personnel accountable when "... the most powerful variables in schooling are probably never under the control of the managing teachers, administrators or school boards...".

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From our viewpoint it would be impossible to take into account "the most powerful variables" unless the schools maintain an adequate record of the student's background and history. Hence, if one is interested in accountability, it would appear to be necessary to develop a thorough, broadly-based student information system.

Recent developments in the debate over equality of opportunity have also drawn our attention to the need for continuing records of both inputs and outputs of school systems. As the emphasis has shifted from the definitions of equality based on inputs to more sophisticated definitions based on output measures which relate achievement to student background and ability,[4] the need for sophisticated historical data becomes apparent. Cumulative records of students should provide a reliable source of such data.

Information development has always played a major role in effective educational planning. Its lack has always been recognized as a serious impediment. Whether dealing with undeveloped or developed nations, planning requires data on a wide range of topics from the number of children "... cross classified by grade, sex and age"[5] to "... ideas concerning new ways of generating desired outcomes".[6] The development and maintenance of data of appropriate types always has been a major concern of planners. Banghart[7] classified the data required to produce long range plans for a school district as those related to people, place, movement, economics and education; and he suggested sources and means of economizing on collection. In an information system analysis of the Peel Board of Education, Padro found that a major task of the Planning Dept. of that system was to develop "... an accurate, responsive information system ..." by which "... organized, relevant, timely and meaningful information" would be provided in "... transportation/bussing, accommodation planning, enrollment projecting, program planning, personnel, building, etc."[8] The task then is to determine what data are necessary and develop economical data sources in which we can have confidence.

Student Data Relevant to Educational Planning

There are a number of types of data presently being collected that are relevant to the educational planner. In this paper we are particularly interested in the information which relates specifically to students and their program of studies, which might be classified under the following categories.

(i) Identification: These data would be sufficient to identify the specific students and his/her parents and would include:

:Student – Name
– Sex
– Birthdate
– Unique code e.g., Social Insurance Number

Parent – Name(s)

(ii) Location: These data would locate the student both in the present and past and would include:

– Address (present)
– Home location (present – some geographically relevant code)
– Home location by date of residence
– School (present)
– Schools by date of attendance and grade level

(iii) Background: These data define the background of the student in relation to other variables

:Personal characteristics
- Health data: particularly health problems relevant to education
- Intelligence test scores
- Aptitude test scores

:Personal experiences
- Academic history – progress through grades
- Work history – part-time and summer employment
- Extra curricular history

:Socio-economic characteristics
- Language of home
- Ethnicity
- Religion
- Occupation – mother
  – father
- Socio-economic status
- Family status – single parent
  – siblings

(iv) Academic: These data would include all scores, grades, and classifications which identify the progress of the student in his formal studies. They include both objective and subjective assessments of the student's progress along with program descriptions.

:Program
- grade
- level
- type

:Subjects
- description
- achievement
- credits

:Special treatments
- type
- duration

:Professional Comments
- attitudes
- work habits
- attendance
- discipline

While there is room for debate over the inclusion of some of these items, it should be noted that each data type listed above is presently retained in the school records of a large number of jurisdictions in Canada (and probably in the U.S.). Our purpose in listing these is not to say they all should be collected but to show that data of potential value to planners presently are being collected and in some jurisdictions are being employed for planning purposes.

In a recent survey of practice in Canadian systems of education it was noted that: (a) Location data, maintained in a computerized student file, is presently used by the Province of Prince Edward Island to establish school boundaries, to locate needed school accommodation and to allocate teachers to schools. (b) The Vancouver School Board has employed student background data on work experience to examine program implications of such experience. The Alberni School District employed records of student extracurricular activities to investigate the effect of participation in hockey on achievement. The Edmonton Public School Board used student data on personal characteristics and achievement to locate students with learning problems and to provide special programs. New foundland's North Avalon Integrated School Board has used student information on background and academic progress to assess the "dropout" problem. (c) Boards of Education in Edmonton, Vancouver, Calgary and Regina have employed student academic data to evaluate the effectiveness of their programs and in some cases have used these records to evaluate schools and allocate resources. Clearly, student data are valuable in studies of students, school systems and the effectiveness of their programs. Furthermore, a large number of administrative personnel, many involved in planning of school and system programs, view the student cumulative file as a useful source of data for a wide variety of planning and administrative activities.

The Cumulative File as a Data Source

From interviews with officials, principals and teachers in over twenty-five Canadian cities it is clear that the cumulative records maintained on individual students contain potentially valuable planning data. Unfortunately the record's effectiveness as a source suffers from a lack of clear understanding as to its potential. Eight uses, significant to planners, were perceived when information was gathered from 62 documents and interviews covering 8 provinces in Canada. (see Table 1).

Table 1 USES OF STUDENT CUMULATIVE RECORDS

Use Being Made of Present Records[a]	No. of Responses
Provide background on individual students to teachers, administrators etc.	44
Placement of individual students in programs, levels or classes	27
Conduct evaluation of schools, areas or programs	10
Plan for new programs	19
Assist in the development of the system, (program development)	7
Allocation of funds in keeping with budget or program effectiveness	3
Track student movement within the system for bussing, boundaries-teacher allocation	2
Conduct research on program effectiveness, system and schools needs etc.	24

a. a large number of other uses are also being made of student records but these are more relevant to individual student and teacher needs.

The findings of this Canadian survey supported earlier findings from an Ontario study.[9] Educators view cumulative student records as a valuable source of planning information but they are not able to employ them fully for planning and research purposes because of problems in reliability, accuracy and format. We identified 43 specific types of student information employed by more than half the Ontario school and district administrators surveyed, but found that generally they were not obtained from the Ontario School Record (OSR which is the cumulative record held by schools on every student in Ontario). Instead, these data were obtained from a large number of sources because (i) the OSR did not contain the data required, (ii) their location or format in the OSR was inappropriate, or (iii) they were "... simply inadequate and therefore useless."[10] Our studies show that information needed by administrators, planners and researchers is simply not available in what should be the most comprehensive record of the schools. Moreover, legislation may further affect the record's usefulness as a source of planning data. The Human Rights Act of Nova Scotia, 1969, like many other similar Canadian provincial statutes, specifies that the individual has the right "... to obtain admission to and enjoyment of accommodations, services and facilities customarily provided to members of the public; ... regardless of race, religion, creed, colour, or ethnic or national origin of the individual or class of individuals".[11] From our interviews it is apparent that this section of the act has been used to suggest deleting from school records items which might be used to identify students on the basis of "... race religion creed, colour, or ethnic or national origin...". While the intent of this provision cannot be criticized its constraint on a planner who wishes to determine the relationship between such social indicators and student effectiveness are serious. Without similar indicators little research can be based on student records; it will require the specific collection of data, a very costly process.

In 1973, the Ontario Ministry of Education, significantly changed the Education Act and its regulations in order to provide parental control over the distribution of information from school records, by indicating that such a record "... is not available to any other person ... without the written permission of the parent or guardian of the pupil or, where the pupil is an adult, the written permission of the pupil".[12]

This act certainly limits the unauthorized user from obtaining information from student records, but as currently interpreted in Ontario it also seriously limits the usefulness of the individual student record for planners engaged in examination of student progress in relation to a wide range of student background factors. To obtain written permission from the individual parents/students in a large study renders the cost of the study beyond the means of most boards.

Another implication of changes in this act (and in similar changes to Acts in Canada and the United States[13]) is the effect that parental access to records will have on the contributors to records. One would agree that many items in school records are, to say the least, inappropriate and unnecessary and that "if anything, the calibre of recommendations submitted by these school personnel has improved substantially,"[14] since the new regulations. However there is evidence that contributors are tending to "... contribute fewer and more carefully worded comments (especially comments based on professional opinion) primarily as a result of the Ministry's emphasis on positive, academic content and the introduction of parent/student access provisions".[15] While greater care is commendable, it would be unfortunate if fewer comments and only innocuous statements result. What the planners need are clear, trenchant and accurate professional assessments of student performance in order to assess the effectiveness of

programs in meeting the needs of students. Planners who wish to employ cumulative student records for program evaluation must be concerned if these records do not contain the kind of information which will reveal the strengths and inadequacies of programs.

Recent legislative changes tend to cause donors to become careful in their comments for fear of contravening the rights of students and/or parents, and fear of resulting litigation. The dissemination of student data has also become more controlled. If the result of both tendencies is to increase the effectiveness of student data the planner should welcome them. However, our evidence, gathered across Canada, shows that a profound change is needed in the regulation of student information. A wide variety of practices were uncovered which (charitably) would be characterized as chaotic. The author found: schools with few records; systems where there is no authorization to collect or store information; systems where virtually everyone has access to a student's record, except the student or his parents; schools which have in the record a multitude of forms, undated comments, and irrelevant data; systems which have no policy on student records, no regulations and no guidelines for principals or teachers; and many other questionable practices. On the other hand there are systems with excellent data management guidelines, provinces with well thought out control legislation, and schools which show an excellent understanding of the implications of sloppy record management and have devised procedures to prevent it. Variety is the condition in Canada – as I am sure it was in the U.S., prior to the Buckley amendment; and it may even still be the case in some districts. The question we must ask, therefore, is whether planners really wish to employ what is potentially their most comprehensive source of data. If they do, is it necessary to be concerned about the present state of student record keeping? We think it certainly is.

Cumulative Student Records, Privacy and Confidentiality

If planners decide to use the student dossier as a source of planning data, they join a large cohort of bureaucrats seeking information on individuals in order to further the objectives of the collectivity. They thereby enter the debate of whether "the need to know" surpasses "the right to privacy". This debate has been extensive but unresolved, with authorities recognizing the case for availability of information while being concerned that privacy is not invaded unnecessarily and suggesting controls over invasion.[16] The issue is crucial in that "... privacy is an irreducibly critical element in the operations of individuals, groups and government – in a democratic society with a liberal culture."[17] If planners use student information, in addition to considering their own needs they must consider the privacy of students and their families, and the confidentiality of donors. They must make every effort to plan for, and bring about, effective processes for data collection, maintenance and dissemination which will protect both the subject and the donor of information. Westin[18] presents five criteria that apply to the conflict of interest between the need to know and the privacy of individuals. These can be paraphrased as follows: (i) What is the degree of seriousness of the problem in relation to the need for data? (ii) Are there alternative means to obtain the data? Is this the best source? (iii) What reliability is needed and is this instrument appropriate? (iv) Has the consent of the subject been obtained – freely – with this use in mind? (v) Do you have the capacity to limit and control these data once they have been collected? Let us briefly address each question.

(i) *Are planning questions of sufficient import to justify accumulating data on students?* The first part of this paper deals with this question. At a time when resources are limited,

it is essential that the available resources be employed effectively. Accountability is not irrelevant. But accountability must deal with real variables not only with those that are easily measured at one point in time. Surely student data of the types outlined earlier are necessary to plan for the provision of meaningful educational experiences for students whose background, intellect, attitudes and interests vary widely. To evaluate programs without an adequate range of data which reflect these influences on program effectiveness is to live in a world of illusion.

(ii) *Are there alternative means to obtain the necessary data?*

It is possible to collect specific data for a specific study at one point in time. Unfortunately, as well as requiring sampling procedures, this requires multiple contacts with students i.e., one for each study. This amount is a significantly greater investment of student time, and also requires the student to recall past events leading to unreliability of the data. Furthermore, many of the data required are recorded for administrative purposes in any event; the cost of collating them with new data would be much less than the special survey. A more serious problem relates to the kind of background information that individuals do not recall (or do not wish to recall) and that cannot be collected since the individual donors able to supply the data are no longer available. If certain data are not recorded at the time of an event, e.g., entry into school, then they are not available at a later date. Their only reasonable source is the cumulative record.

(iii) *What reliability is needed for planning studies and is this instrument appropriate?*

Both reliability and validity are critical data questions. It would appear to be axiomatic that both reliability and validity would be increased by collecting data current at the time of collection. The further the donor is from the event, the less accurate the recall. Reliability would be enhanced by recording the event or condition at one point in time and using that specific depiction as a benchmark for all future studies of the event. But one should note that useful data still depend on the acuity of the observer and the accuracy with which data were recorded and transcribed. Access of parents and students should improve the accuracy of student records. They lend a critical eye to the assessment of the data. Whether or not that critical eye sees the data objectively, it causes a donor to think carefully about what should be included and how it should be expressed. It also enables periodic corrections to be made of erroneous data. A good computerized mark record system builds in feedback which relies upon such examination and correction.

(iv) *Has the consent of the subject been obtained – freely – with the use of educational planning in mind?*

Very few individuals would be concerned with the collection of accurate professionally sound student information, if the information is seen to assist the development of good educational experiences for their children. "An individual is principally concerned if he suffers damage, inconvenience or embarrassment by reason of erroneous, incomplete or out of date information stored in a data bank, or if information provided for one purpose is used, without prior authority, for some other purpose."[19] In our experience, few parents or students object to schools collecting a wide range of information for educational needs but many object strongly to extensions of that use to other agenices or private individuals. However, it should be noted that it is not only in the parents' and students' interest to see that data are accurate, complete and up-to-date. Planners who wish to use student evaluation files for planning purposes must also ensure that data are maintained effectively and that the appropriate authorizations are obtained as data are

collected. All forms on which data about students or their families are collected should identify the uses to which the data will be put. Furthermore, consent forms should be specific. A parent is more inclined to approve specific than general statements of purpose, and is more likely to trust that the use will be reasonable if consent is freely given after an adequate understanding of the intention. The planner is then committed, of course, to protect the data from unauthorized uses.

(v) *Do you have the capacity to limit and control data once it is collected?*

This is one of the most difficult concerns to deal with. Student records generally are collected and maintained in schools, frequently by individuals who have little understanding of the proper maintenance of a student data bank and the implications of the misuse. This may lead to sloppy data management. To ensure control often requires extensive training of teachers and principals. When computerization occurs better control procedures are generally implemented but other more far reaching implications must also be considered. Reduction in cost of large computer systems make viable such applications "... as on-line banking and credit, and new medical and educational systems".[20] Integration of various data banks makes it possible to construct individual dossiers with a history from birth to death. "Many people are worried that progressively comprehensive dossiers will deprive them of an essential weapon in any struggle against the organizational bureaucracy – that of voluntary anonymity.[21] The use of such information by educational system planners obliges them to lead their colleagues to establish comprehensive regulations and guidelines for all users, guidelines which will protect individuals against the sloppy practices now widely found in schools. The planners' use of student records should not lead to the development of dossiers on individuals which begin with their life at age five (or even with the lives of their parents before that).

Conclusion

In this paper we have argued for the usefulness of the cumulative student record as a planning source providing a wide range of data on students. Types of data have been given to show the variety of information which records contain and to illustrate that this source not only contains valuable data but, frequently, data otherwise unavailable. The problems of collecting student data have been discussed including those related to recent legislation in the human rights field and changes in education acts and regulations. These problems and those related to the chaotic data maintenance procedures of schools led to a brief reference to the debate between supporters of "the need to know" and individual "right to privacy". Finally, there was some discussion of Westin's five criteria applying to conflicting interests.

The systematic use of student data in cumulative records would require planners to work for the development of more appropriate collection, maintenance, dissemination and control procedures in school systems. It would require the development of school system and state or provincial policies to govern student data. Planners must help develop awareness of the implications of sloppy data management and of education programs designed to prevent it. And, finally, planners must govern their own use of data to protect the privacy of students and their families, and to ensure that donors' confidentiality is not breached.

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POLITICS OF EVALUATION: SOME THEORETICAL ISSUES

Introduction and Definition

The necessity for examining an emerging and promising problem-solving methodology of evaluation in terms of its political implications may be disappointing and depressing to some. For in the scientist's, or the objective enquirer's mind there is an eternal hope that logic and scientific enquiry can illuminate truths which will over-ride the parochial and special interests of persons at any given point in time. However, as McLaughlin observed after her study of the evaluations conducted for Title I of the Elementary and Secondary Education Act of 1965:

> A recurring theme in this study is the extent to which these two components (logic of inquiry and the complex system of social and political relations) interact and shape each other. An important lesson of the Title I experience is that logic of enquiry should be perceived as relative, not absolute, and that a realistic and useful evaluation policy should acknowledge the constraints of the policy system and the behavior of bureaucracies.[1]

Banner, *et al.* refer to political processes as the interactions of various actors within bureaucracies as they relate to each other from differing positions of power, influence and authority. They go on to define the politics of evaluation as a phenomenon of major power and influence centers that manipulate research to their own advantage.[2] Anderson suggests that the politics of evaluation involves partisan activities directed at influencing the conduct of evaluation in line with partisan preferences.[3] Or, as House says, "Evaluation is not the final arbiter, delivered from pure objectivity and accepted as the final judgment".[4]

In contrast, evaluation in organizational settings is perceived as a set of strategies for identifying and determining the merit of something and/or providing information for decision-makers. In other words, evaluation procedures should surface a range of data for any phenomenon or program around which either a judgment or decision must be rendered. Thus it appears, in the minds of some persons, that evaluation processes and results are not without their problems, one of which is: How does one ensure a high degree of unbiased research and subsequent utilization, in environmental contexts that often are described as competitive, self-serving and survival-oriented? This paper will examine this problem in some detail discussing its probable causes, the dimensions of the causes, and strategies for minimizing these factors.

Probable Causes

As Bloom states, "It is possible to measure the length of a bar of metal in such a way that the measurement process does not appreciably alter the shape or size of the bar".[5] However, to measure or observe human behaviour within various social milieu, considerable attention must be given both to what is being observed and what needs further

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attention namely: How will the information, brought to light by the evaluation study, be used?

A classic case of this question was reported recently. A school district decided to use standardized test data for promotion and retention decisions. The results were predictable; test performance scores of students increased significantly.[6] As soon as the teachers, administrators, parents and, most importantly, students perceived the importance and significance of what was previously considered a matter-of-fact-testing program, the motivation to perform was altered appreciably. Thus, the gestalt surrounding evaluation procedures needs to be carefully examined in order to anticipate reactions to those methods and their concomitant results.

It seems plausible, in order to understand reactions surrounding evaluation studies in organizations, that a closer review be made of the major actors involved and related organizational influences upon them. There appear to be three major parties involved in evaluation studies of any magnitude. They are: the administrator, the evaluator, and the policy-maker. Others are also involved, such as the staff and clients of the system, but their demands or points-of-view are usually synthesized into decisions by any or all the major actors. A theoretical examination of each of these roles in evaluation studies offers some perspective on behaviour which might be described as political and which might well compromise the potential impact of the evaluation study.

Administrators are often placed in the position of being advocates for their programs or units. It is difficult to recruit people and resources for a given set of activities if the administrator in charge isn't enthusiastic about, or at least interested in, seeing certain goals achieved. The advocacy role generally cannot achieve the level of objectivity which Campbell suggests is desirable. Campbell urges administrators to be heavily committed to resolving the problem that a particular program is addressing, but flexible and open about the ways in which this is to be done.[7] Unfortunately, those who judge the administrator's performance – supervisors, staff and clients – often have expectations of what the goals should be, as well as how the goals should be achieved. Public school administrators know from first-hand experience that their critics seem to be unlimited and criticism seems to have no bounds. Such external pressures on administrators who may be experiencing varying degrees of discomfort about their ability, combine in the worst circumstances to give an individual the feeling of being trapped and of needing to defend to the death his own particular approach or brand of change.[8]

Bureaucratic organizations often foster a context consisting of administrators strongly in favour of (or committed to) their "thing" but subjected to cross currents as to what and how it should be done. Then the competition for resources, status, and recognition makes it understandable if the good intentions surrounding the evaluation of a particular project go astray. What is not known, in regard to this paradigm, is the varying degree to which each of these factors needs to be present in order to increase or decrease the political behaviour of the administrator.

Suchman suggests that administrators adopt the following political techniques to influence evaluation research (that is, to manipulate the study for their own ends):

eye wash – justify a weak or bad program by selecting only those aspects that look good;

white-wash – cover up a program failure by soliciting testimonials which divert attention from the failure;

submarine – torpedo or destroy a program (regardless of worth) in order to get rid of it;

posture – use evaluation as a gesture of objectivity for public relations purposes;

postponement – delay or prolong the evaluation so concerns will dissipate;

substitution – disguise failure by shifting attention from an essential part to a minor part of the program.[9]

Paralleling very closely the advocacy mode of the administrator is the role of the policy-maker. Often the strivings of special interest groups and the competition for support and resources, encourage policy-makers to advocate programs and procedures which will fulfil their expectations. Policy-makers are not neutral parties, nor can they be since their positions are legitimized by constituent groups who have elected them to a particular position on a board, advisory group, governmental commission or legislative committee. Frequently, their survival is dependent upon the delivery of certain "goods" such as jobs, economic opportunities, or manifestations of particular ideological positions.

However, the dictates of politics prevent real purposes or goals from being made explicit; only overt purposes are stated. As Cohen observed concerning the passage of the Elementary and Secondary Education Act of 1965, the overt reason given was the raising of educational opportunities for low-income children, whereas the covert purpose (perceived by some legislators) was obtaining additional federal dollars for their district.[10]

Another interesting dilemma for policy-makers is their dependence upon administrators for information concerning the progress and results of programs. Often policy-makers can only learn how well a program is doing by asking the persons who direct them. Thus, their opportunity for garnering unbiased information is sharply curtailed, and their own biases make them vulnerable. A shrewd administrator can shape his or her report about programs so that it will reinforce the general inclinations of selected policy-makers and maintain their support – so the administrator neither gives up the reins of control, nor passes on potentially embarrassing information. It is understandable why Banner, *et al.*, in their research, found support for the proposition that, "Evaluation research is most often supported by those policy-makers whose job is to allocate resources among competing programs".[11]

The remaining major actor in the evaluation process is the evaluator. Obviously he can play a major role in heightening or minimizing political reactions to an evaluation study. Certain dimensions of the evaluator's role include his/her level of knowledge of research methodology appropriate to a given set of evaluation questions and his proclivities to certain program purposes which reflect his own value system. As Sjoberg suggests, the evaluator needs to be considered as a variable in any research or evaluation design.[12]

Sjoberg's review of Orne and Rosenthal's research on the impact of experimenters' beliefs and values upon the outcome of controlled research enabled him to conclude that although, "The impact of the researcher may be reduced through ingenious experiments, the control of ethical and political contingencies through carefully designed experiments is unfeasible in most research situations".[13]

A doctoral study by Whitehead further illustrates the impact of the evaluator's personal value orientation. He found that evaluators who accept the value orientation of a program tend to evaluate it more favourably than those who were non-committal or rejected its value orientation.[14] In making choices on research design, types of questions, persons to

be interviewed, etc., the evaluator, consciously or unconsciously, can favour a particular point-of-view and reinforce perspectives which are not completely representational of the particular program.

In sum, and drawing upon Banner *et al.*, there seem to be the following political barriers to conducting evaluation studies:

- Conflict in purposes of administrators, policy-makers and evaluators;
- Concern for wasting money and staff time on evaluations which have little or negative payoff;
- Minimally funded evaluations;
- Threats to the survival of program administrators, staff members, policy-makers, and evaluators;
- Lack of clarity and agreement on program goals;
- Variations in program inputs, expectations, and the social-political milieu;
- Program changes which force shifts in activities, objectives and/or strategies of programs;
- Political or ethical reasons which prevent any randomization of subjects.[15]

In addition to these barriers to conducting evaluation studies, Banner *et al.* gleaned the following propositions from the literature on the politics of evaluation. In their own study of an Office of Economic Opportunity agency, they found support for the starred propositions (*), qualified support for double starred propositions (**), and no support for tripled starred propositions (***).[16]

**Historically, evaluation results have not been used in agency policy formulations and/or change.

*Evaluation research is a political tool, depending upon both the perspective and values held by the viewer and whether or not the results are (or are anticipated to be) positive or negative toward the program in question.

The principal protagonists in the politics of evaluation are the administrator (whose job it is to support and implement the program) and the evaluator (whose job it is to be critical of the program).

The evaluators themselves often have political motives – they can "evaluate" a program in order to effectively kill it, or, conversely, by choosing a design biased toward a successful outcome, they can support a program of their choosing. The political structure uses evaluation as a political tool. For example, those in power use positive evaluations to authenticate programs that they support; they selectively ignore those findings that are incongruent with their beliefs; and they purposely suppress positive evaluations of programs they oppose.

*Vague or diffuse goal formulation can be a direct result of the politics of evaluation. In the presence of vague or diffuse goals, perceptions of different actors at different bureaucratic levels concerning the role of a given social agency colour their orientation toward the evaluation function itself.

*Evaluation research is most often supported by those policy-makers who are assigned to allocate resources among competing programs.

*Many agency administrators (and/or program designers) assume that their programs work and do not see the need for evaluating a principle that they already know to be true.

***Because of the politics of evaluation research, often it is naive to assume that proper research leads to policy improvement.

***Social action programs often are designed with little thought as to how they can be most effective or how the most can be learned from them through quality evaluation research.

**Evaluation and operation are mutually exclusive orientations in a practical sense. It would be difficult to find an aggressive, effective administrator who places a high priority on quality evaluation.

*Typically many levels of bureaucracy are involved in the politics of evaluation research, each with a somewhat different perspective on the proper role of evaluation.

*Evaluation research can degenerate into intense role playing with no serious commitment to research by any of the parties involved.

Potential Solutions

This review seems to be depicting a dismal and paradoxical situation. There appears to be a great hue and cry for data-based decision-making. But attempts to provide objective information are fraught with methodological and political barriers which often render them ineffectual. However, before submitting to overwhelming odds, it may be possible to take steps which will reduce the political uses of evaluation studies and offer hope for users of evaluative data. Solutions are to be found in the notions of specification, design, and interpersonal behaviour of evaluators, administrators and policy-makers. First, nothing is more powerful than a truly measurable objective – the notion being that clear specification of outcomes and processes can transcend an evaluator, administrator or policy-maker. There are many reasons why program goals are not expressed in measurable language, including the abstract nature of outcomes, and ambiguous goals which postpone or minimize conflict as to what should be pursued in a particular program. Language can incite riots. Specified, clear outcomes tend to illuminate differences of opinion, creating polarization of the values of a given program. A pluralistic political milieu necessitates vague goal statements. Yet, if consensus can be generated as to the specified outcomes of a program, a goal-based evaluation is facilitated. Often one is presented with the dilemma: confront differences early in a project, through specified goal statements, or disguise ticklish disagreements within the fuzzy language of vague goal statements?

Cook and Campbell[17] present a set of suggestions for improving cause and effect inferences in experiments conducted within field settings, which have implications for the design of evaluation studies. For typical problems which threaten internal and external validity in field-based studies (such as access to data sources, withholding of treatments, faulty randomization procedures, sampling variability, treatment-related refusals, treatment-related attrition) they offer such strategies as non-equivalent control group designs, cohort, regression-discontinuity, time-series, and correlational designs. The problem of political manipulation of evaluation data is minimized by increasing the evaluator armament in the arsenal of analysis. This, of course, will not prevent the total suppression of accurate, scientifically derived data which proves embarrassing to various individuals, but it may make it rather more difficult. Strangely enough, according to a study reported at the recent annual meeting of the American Sociological Association, the more sophisticated and methodologically sound the research, the less likely it is to be used by policy-makers.[18]

Finally, the evaluator should be encouraged to climb down from his/her ivory tower of jargonese and meet administrators and policy-makers in a political arena in which each must establish their worth and/or power. Aloofness or jargon are no longer sufficient to persuade the uninformed of the intrinsic value of evaluation research. Rather, there is a need to come in touch with the practical realities of decision-making and policy development. Figure 1 suggests behaviour which each of the major parties concerned with evaluation studies consider before, during, and after an evaluation study. The message for evaluators is to adapt to the organizational circumstances in order to survive and gain legitimacy in a political-social milieu. It may be difficult to argue against such wisdom, but there does not seem to be much knowledge about the appropriate methods for discerning the elements of the evaluation context which will facilitate or impede "good" studies. The evaluator needs to be sensitive, flexible, shrewd and knowledgeable, but most of all be determined to do an honest and thorough job. Evaluation studies can be criticized for methodological and design weaknesses in the applied settings, as well as for political naivété, *but* there continues to be a pressing need for their information, for knowledge about how well specific programs are working. Even when their research methodology and related statistical methods improve, evaluators will still need to develop methods of persuading the policy-makers and program managers to *use* the information being provided.

Summary

Evaluation is not a value free process. By its very nature it is potentially controversial. The issues reviewed in this paper illustrate some of the dimensions of the politics surrounding evaluation studies, but there are notable voids and this topics would justify systematic study.

First, there is a need for empirical data to show which behaviours/methodologies of the evaluator will ensure an effective and efficient evaluation study. An attempt has been made to determine empirically what competencies are needed to conduct "good" evaluation studies by asking experienced evaluators, but there has been no validation by the *users* of evaluation studies.[19]

Second there are plausible data on the causes of politics of evaluation studies, but there appears to be a dearth of data on how the evaluator can be effective in dealing with these dimensions.

Thirdly, there is a proliferation of research approaches and models each with a different focus or strategy,[20] but no empirical data as to which ones work best, when and where.

Finally, it is evident that the evaluator needs to know a great deal more than scientific research methodology. There are several related fields that have relevance to understanding the complexities surrounding evaluation processes – political systems theory notwithstanding. They include the study and the nature of values,[21] the ethics of conducting evaluation studies,[22] influencing change,[23,24] power and persuasion[25] and decision-making as viewed by a participant observer.[26]

Figure 1 POTENTIAL BEHAVIOURS FOR MINIMIZING THE POLITICS IN EVALUATION STUDIES

	ADMINISTRATOR	EVALUATOR	POLICY MAKER
BEFORE	— Specify program goals, design and activities — Specify program goals, design and activities — Spell out questions which are desirable for evaluator to answer — Establish specific dates for receiving formative & summative reports — Commit self to resolving problem the program is designed to ameliorate, be open to alternative methods — Approve indices of program change	— Assist administrator in defining goals, design & activities — Ascertain chief concerns of administrator & policy makers — Identify powerful decision-makers — Request conflict reducing mechanism to use during evaluation — Clarify evaluation approach to be followed, rationale & evaluative criteria — Request adequate funds to conduct evaluation study — Identify indices of program change — Discern real goals from ideal goals of program — Be willing to compromise and/or negotiate evaluation design	— Require a reasonable approximation of program goals — State general intent and direction for program — Direct evaluator to report results periodically directly to policy maker — Confirm administration questions and suggest any needed additional questions — Hire a well-qualified evaluator — Provide funds from outside program budget — Request comparative data
DURING	— Push evaluator to probe in greater depth and justify findings around major controversies — Provide forum for internal review of evaluation report — Advise evaluator on best ways for handling controversial situations — Retain control of project by directing questions needing answers — Establish program priorities — Judge appropriateness of data provided and provide feedback to evaluator	— Couch criticism or minimal successes in helpful/supportive language — Adapt evaluation procedures to fit any program revisions — Report any deviations from original evaluation design to administrators and policy maker — Offer suggestions for improvement but remain a safe distance from directing implementation — Make operationally relevant suggestions — Reports must be timely & intelligible — Attempt to get as balanced and representative samples of data as possible — Anticipate controversial issues and keep administrator posted of procedures and results — Focus on programs not people per se — Maintain open & face-to-face communications with policy makers and administrator — See evaluation as a learning process for those involved — Attempt to minimize disruption of program activities	— Read periodic reports and concur with program revisions — Request elaborations of more controversial aspects of program — Request program outcomes be realistic — Help establish program priorities Reinforce autonomy of evaluator but urge cooperation with administrator

Figure 1 Continued

		— Seek feedback to minimize disruption of program impact — Deal with feelings as well as ideas surrounding program — Be sensitive to the political environment — Ferret out the subtle norms operating around a program — Be sensitive to program & evaluation side effects	
AFTER	— Review and answer point by point recommendations as to feasibility, etc. — Testify to the credibility of the evaluation study — Recommend appropriate program revisions	— Mention extenuating circumstances for possible failures — Offer feasible recommendations — Buttress sensitive areas with supplemental data — Portray results differently for different audiences — Focus on the welfare of the client of the program — Don't be overly defensive concerning attacks on evaluation methodology	— Review and request clarification of summative report — Review evaluation criteria with evaluator — Ascertain program impact on targeted client group — If necessary, request a third party review of evaluator's report

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A COST-EFFECTIVENESS ANALYSIS MODEL FOR EVALUATING AND PLANNING SECONDARY VOCATIONAL PROGRAMS

Introduction

Cost-effectiveness analysis is a technique which evaluates program effectiveness against program costs; it is used by vocational administrators as the basis for decisions on the allocation and use of resources. Because of increasing demand for vocational programs, there is need for such systematic analysis of their effectiveness and cost efficiency. In an effort to meet this need, a cost-effectiveness model and administrator's manual were developed to analyse secondary programs at Indiana University-Bloomington.[1] This paper presents the conceptual model used for analyzing the cost-effectiveness of secondary vocational programs in terms of program effectiveness, cost efficiency, and management performance. After defining the concepts and identifying the elements of the analysis, a deliberate effort is made to specify each component and measure involved in the model.

Definition and elements

Cost-effectiveness analysis is defined in different ways from different perspectives. Quade defines it broadly as an "analytical study designed to assist a decision-maker in identifying a preferred choice among possible alternatives," and narrowly, as a "comparison of alternative courses of action in terms of their costs and their effectiveness in attaining some specific objectives".[2] He indicates five elements of analysis: objectives; alternatives by which it is hoped the objectives can be attained; costs, a model or simplified representation of the real world for abstracting the features of the situation relevant to the question being studied, and a criterion or standard for ranking alternatives in order of desirability and choosing the most promising one. In other words, this is a technique for assessing the costs of alternative means of achieving a stated objective; or conversely, the effectiveness of alternative means of achieving an objective within a given cost is compared in a series of numerical indices.[3] For an instructional cost-effectiveness analysis, the technique is defined as "the process of solving problems of choice requiring the definition of measurable objectives, identification of alternative ways of achieving the objectives, identification of the anticipated cost and effectiveness for each alternative, and identification of the optimum alternative which potentially achieves the desired objectives for the educational activities of a school".[4] Knezevich defines a cost-effectiveness analysis as the "systematic examination of an alternative in terms of its advantages as measured by a fixed level and quality of an outcome, and disadvantages as measured by the economic cost".[5] He also translates the analysis into a series of activities: specifying objectives, identifying alternative means, generating a model for the problem under study, computing the costs (disadvantages) for each alternative means to an objective, determining the

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effectiveness (advantages) for each alternative, computing the ratios between the cost and the effectiveness of each alternative, adopting a criterion (a rule or standard) to be used for ranking and selecting alternative means to an objective, and recognizing the importance of iterative processes for confirming the analysis.

Most definitions infer that the potential cost-effectiveness of several alternative programs will be measured in terms of their predetermined objectives. However, the analysis can be used not only for comparing and evaluating alternative programs, but also for assessing the effectiveness of existing programs in relation to their actual costs.

Cost-effectiveness analysis must be distinguished from cost-benefit analysis. Both concepts are used for assessing outputs over the common denominator of costs, but there are differences in that the measure of effectiveness is not the same as the measure of costs, whereas the measure of benefits is the same as the measure of costs. Effectiveness is measured by the degree of achieved program objectives; benefit is measured in a monetary unit. Cost-effectiveness analysis concentrates on the measure of specified goal attainments of the program against the associated costs. It measures a program for its effectiveness in achieving goals, rather than for its monetary values, against the program costs.[6] The analysis generates three kinds of measures: effectiveness, efficiency, and cost-effectiveness and/or performance ratio. The concept includes the following elements and activities:

- *The existing program or alternatives.* Define the existing program and alternative programs which might be adopted.
- *Program objective(s).* Specify program objectives in terms of certain target goals the program should reach.
- *The costs.* Identify the amounts expended for the purpose of achieving program objectives.
- *The outputs.* Define the outputs, products, or expected results from the program. These indicate the actual attainment of program objectives.
- *A model.* Create a simplified representation of the relationships among the elements mentioned above. The purpose of the model is to produce critical measures to be used in the decision-making process.
- *The effectiveness.* Compute effectiveness as a measure of the extent to which the objective is achieved.
- *The efficiency.* Compute efficiency as a measure of the relationship between the output and the cost.
- *A ratio.* Compute a ratio as a precise criterion by means of which the desirability of a program is indicated.

Cost-Effectiveness Models

There have been a number of attempts to conceptualize cost-effectiveness models as input-output or procedural frameworks. A few examples are briefly reviewed here.

Input-output models. Abt and associates developed an education system cost-effectiveness model designed to evaluate the relative school, student, and community effects and associated costs of alternative 1965 Title I programs for the disadvantaged.[7] Since such programs are directed toward increasing learning, the model focuses on the changes in student achievement, the attitudes, and the environmental factors influencing achievement in the target population. The overall model consists of five sub-models:

(1) school, (2) instructional process, (3) community interactions, (4) costs, and (5) cost-effectiveness. Title I programs, user judgements, and school and community data bases are considered as inputs. The outputs include earning potential and equality of educational opportunity for community, graduates and dropouts from school and achievements and attitudes of students, and specific efficiency measures such as effects per cost and effects per resources.

Alkin[8] proposed a model for evaluating the cost-effectiveness of instructional programs with prime consideration given to financial variables in education, specifically where a single school or school district is the unit of analysis. The model includes five components: student inputs or the nature and characteristics of the students entering the program, financial inputs or the financial resources made available for carrying on the program, manipulative characteristics or the way in which financial inputs are used in combination with student inputs within the program, outputs or the cognitive and non-cognitive changes and the impact of the program upon systems external to it, and external systems or the social, political, legal, economic, and other systems outside the school. He illustrated three examples of the model's application: evaluating the cost-effectiveness of alternative instructional programs in terms of the financial resource and student outcome relationship; evaluating the cost-effectiveness of individual school programs in the light of outcomes relating to external systems and financial and student inputs; and evaluating cost-effectiveness of input use options which relate manipulative characteristics with outcomes.

In addition to these two models, a conceptual framework for the economic analysis of education is being developed at the Wisconsin R & D Center for Cognitive Learning. The framework includes resource inputs to the educational system from the external environment, components of the educational system which consist of system inputs and resource input mix(es), the system outputs (monetary and non-monetary), and feedback as the self-correcting mechanism for the system.[9] The framework indicates the relationships among the educational system's parts and between the system and its environment.

These models would be useful for research studies on the input and output relationships among the components of the educational system, but they are far from being practical for analyzing the cost-effectiveness relationship in educational programs. They do not specify program objectives and do not use effectiveness as a measure of the relationship between objectives and program output.

Procedure models. Several dissertations have developed procedural models for instructional cost-effectiveness analysis. Burgett[10] developed a procedural model for evaluating the cost-effectiveness of occupational education, which consists of six steps:

- determination of program objectives,
- identification of pertinent behaviours,
- development of effectiveness and cost measures,
- data collection,
- analysis, and
- appraisals

Lovell developed a conceptual design for a methodological guide to the cost-effectiveness evaluation of instructional programs (K-12) at the school center level. The design includes various input models, a process model, and several output (effectiveness) models. Using

the basic components of an administrative system as his conceptual framework, Cary[12] developed an operational cost-effectiveness model for instructional activities. The model is in the form of a systems manual employing narrative and graphic modes to describe the decision-making system related to instructional cost-effectiveness analysis. It includes policy statements that provide guidelines for operating the decision-making system, an illustrative organizational chart, a flow chart indicating the sequence and relationship of activities, flowscript procedures, job outlines for unique personnel procedures, and supplementary narrative and appendix materials.

All these efforts are limited in their conceptualization of analytical procedures or in their use of cost-effectiveness evaluation for instructional activities. There is need for a comprehensive, technically useful model which is based on cost-effectiveness analysis and which explains cost and effectiveness relationships and their use in evaluating vocational programs.

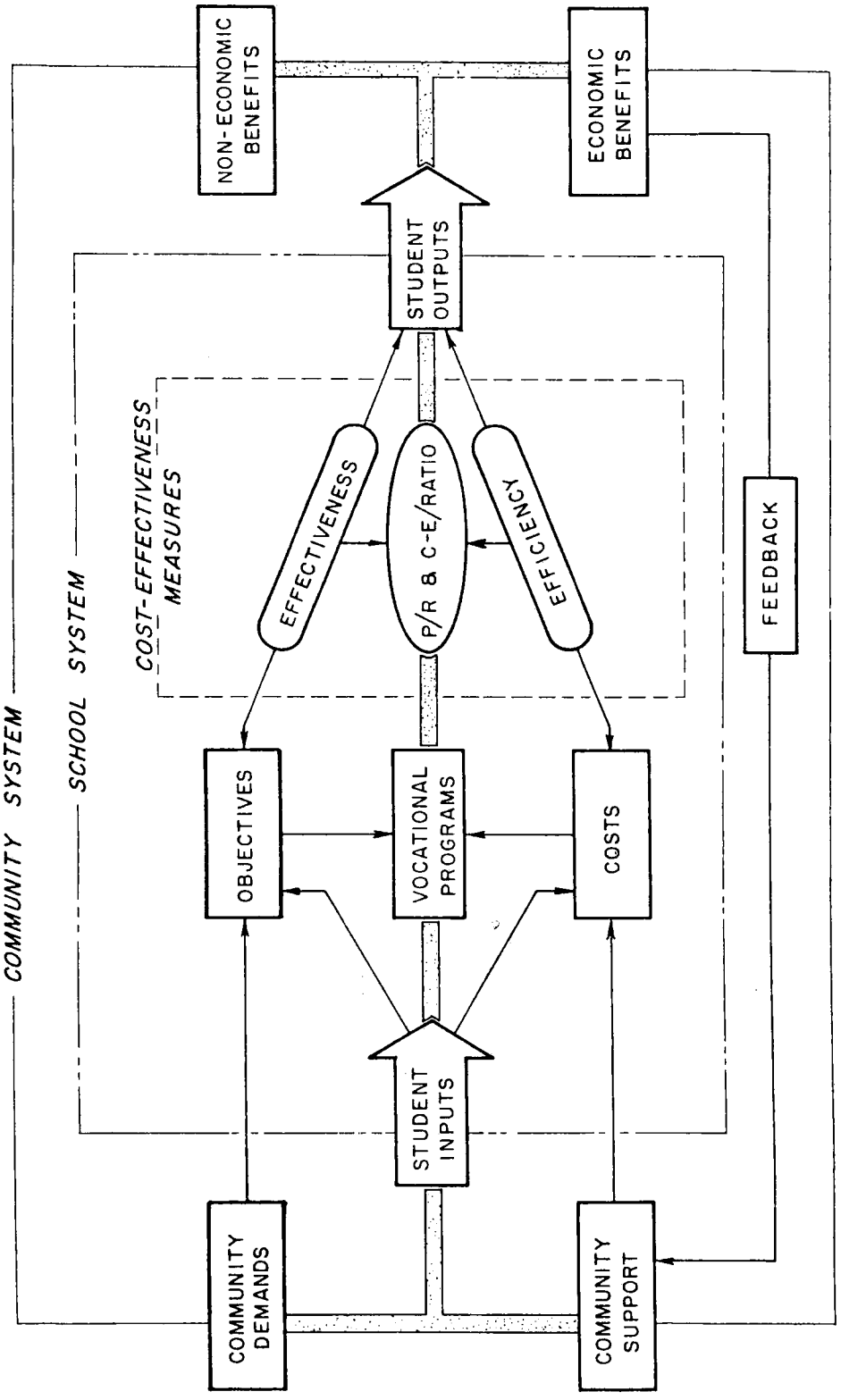
A Cost-Effectiveness Analysis Model for Secondary Vocational Programs

A conceptual model for analyzing the cost-effectiveness of secondary vocational programs is proposed here. The model represents, in a simplified way, the relationships among these major components: vocational program classification, measurably stated program objectives, program outputs, and program costs. Its primary task is to generate three kinds of cost-effectiveness measures: program effectiveness, or the degree to which objectives are being attained; cost-efficiency, or the degree to which actual costs are consistent with budgeted costs; and a cost-effectiveness and/or a performance ratio, or the ratio of effectiveness to efficiency. The proposed model designates student characteristics and community demand and support as inputs to the school system. Economic and non-economic benefits for the community constitute the long-term effects of the school system (see Figure 1). Specifications for each of the components and measures follow.

Vocational programs. The model is designed to analyze the cost-effectiveness of secondary vocational programs and not their academic counterparts at the senior high school level. According to the curriculum classification as developed by the U.S. Office of Education[13] vocational programs include seven program areas: agriculture, distributive education, health occupations, home economics, office occupations, technical education, and trade and industrial occupations. Each area is classified into sub-programs or courses. Within the model, the vocational courses are called instructional programs and serve as the basic units of analysis. In other words, the proposed model is concerned with cost-effectiveness analyses of such vocational instructional programs as agricultural production or agricultural mechanics, within the agriculture program area.

Program objectives. Program objectives are defined as specified goals to be attained from the instructional programs being offered at comprehensive high schools or area vocational schools. The model requires that a set of program objectives be formulated in terms of operating thrusts. It is also required that objectives be product-oriented, performance-based and related to the outcomes anticipated by the local district. Using these requirements, a set of program objectives was identified for the model. Six related documents (Burgett[10]; Starr and others[14]; Coe[15]; Swanson[16]; the Multi-State project[17]; the Indiana State Plan[18] provided sources for a summary of seven objectives of the secondary voational instructional program. They are stated as follows:

Figure 1 A COST–EFFECTIVENESS ANALYSIS MODEL FOR SECONDARY VOCATIONAL EDUCATION PROGRAMS



- Aid students enrolled in vocational education to successfully complete a secondary occupational program.
- Assist special student groups to successfully achieve in a secondary vocational program.
- Provide vocational education for secondary school youth in accordance with their occupational preparation.
- Provide leadership development activities for students enrolled in vocational programs through a youth organization functioning as an integral part of the vocational instruction.
- Provide guidance and counseling services (career development) information appropriate to continued education or employment for students enrolled in vocational programs.
- Provide vocational programs to fulfill the requirement of the labour markets and the employment/community manpower needs.
- Encourage vocational graduates to continue their education after completion of their secondary program.

Each program objective should be specified in measurable terms as to the degrees of its attainment. For example, objective one includes a number of target goals indicating what percentage of students enrolled in the program will complete it and the degree of satisfaction with the program. In determining target goals for the program, student and community characteristics data should be fully considered and administrators, teachers and other concerned persons should participate in the decision-making process.

Program outputs. According to the National Center for Educational.Statistics,[19] fifty-eight different educational outcomes are classified into a series of three phases: primary effects (product consumption and investment), secondary (investment and consumption feedback), and tertiary (intergenerational impacts). Clemmer, *et al.*[20] identified performance indicators including student test results and number of students completing graduation requirements as well as societal indicators including the employment rate of recent graduates.

However, in the model program outputs are defined as the attainment of predetermined target goals which result from vocational instructional programs. Accordingly, the scope and contents of the program outputs are determined by a set of program objectives, and long-range effects such as community economic or non-economic benefits are viewed as output indicators of the school system. Program output indicators can be identified upon the completion of annual requirements by immediate follow-up data after graduation, depending on the predetermined program objectives.

Program costs. Program costs are defined as annual expenditures for operating the vocational instructional program at the local school level. Since the model is basically concerned with the school corporation's expenditures for the operation of the vocational instructional program, foregone income (the students' time while they are in the program) is not included in the model. Expenditures are analyzed on a one-year basis without consideration of the present value of a multi-year cost. Program costs may be analyzed into direct and indirect costs as recommended by the U.S. Office of Education.[21]

Direct costs of a vocational instructional program are defined as expenditures directly related to it. The model includes the following items as direct costs:

- Annual salaries of teaching staff within the vocational instructional program.
- Fringe benefits paid by the school corporation on behalf of the teaching staff within the program.
- Travel costs for instruction related to the program.
- Costs of instructional supplies and materials used by the program.
- Costs of classroom and laboratory facilities and equipment used by the program.
- Building use cost assigned to the program.

Prorated expenditures for supporting services are considered as indirect costs of the instructional program. The supporting services include:

1. *Student support services:* Activities which are designed to assess and improve the well-being of students and supplement the teaching process.
2. *Instructional staff services:* Activities associated with assisting the instructive staff in the teaching process.
3. *General administration services:* Activities concerned with establishing and administering policy in connection with operating the school corporation (district).
4. *School administration services:* Activities concerned with overall administrative responsibility for school operation.
5. *Business services:* Activities concerned with purchasing, paying, transporting, exchanging, and maintaining goods and services for the school corporation.
6. *Central support services:* Activities, other than general administration and business services, which support each of the other instructional and supporting services.

Expenditures for support services should be prorated to each instructional program. The Handbook II illustrates applicable prorating bases: time, average daily membership or pupils enrolled, space, time consumption, number of pupils, mileage, units consumed, employees, number of transactions, or dollars. The selection of one basis over another depends upon the types of supporting services.

For analytical purposes, a simplified method would be employed to prorate expenditures between instructional programs. For instance, expenditures for student services can be prorated on the basis of average daily membership (ADM) or average daily attendance (ADA), and instructional staff services expenditures by portion of full-time equivalent teachers. Expenditures for general administration and school administration can be prorated by full-time equivalent teachers or average daily membership. Both instruction hours and square feet of space can be used in prorating expenditures for plant operation and maintenance, ADM for pupil transportation and food service expenditures, and full-time equivalent teachers for fiscal and internal business service expenditures. Central services expenditures can be prorated by average daily membership or full-time equivalent teachers. After these prorating procedures are completed, the prorated expenditures of all supporting services are added to the supporting indirect costs of the instructional program. The sum of direct and indirect costs represents a total cost of the vocational instructional program. Based upon the annual budget, total costs of vocational programs can be made by repeating the same procedures as mentioned above. These costs may be called budgeted total costs of vocational programs.

From these four major components, the model generates three kinds of cost-effectiveness measures. The measures provide the evidence to evaluate and compare the degrees of effectiveness, efficiency, and management performance of vocational instructional programs. For this purpose, an analytical scheme has been developed (see Figure 2).

Program effectiveness. Effectiveness is defined as "a measure of the achievement of program objectives".[22] Accordingly, program effectiveness is measured by the degree of target goal attainment, the extent to which the program goal is achieved. Effectiveness scores are percentages determined by dividing an actual output by a predetermined target goal. The score can be weighted on the basis of policy preferences or the importance of the program objective; then the score is adjusted to a weighted value. Furthermore, two or more effectiveness scores can be combined into a composite effectiveness index. Dividing the composite effectiveness index by number of scores will produce an average effectiveness index. If the effectiveness scores were weighted, then a weighted composite effectiveness index and average weighted effectiveness index can be computed in the same way.

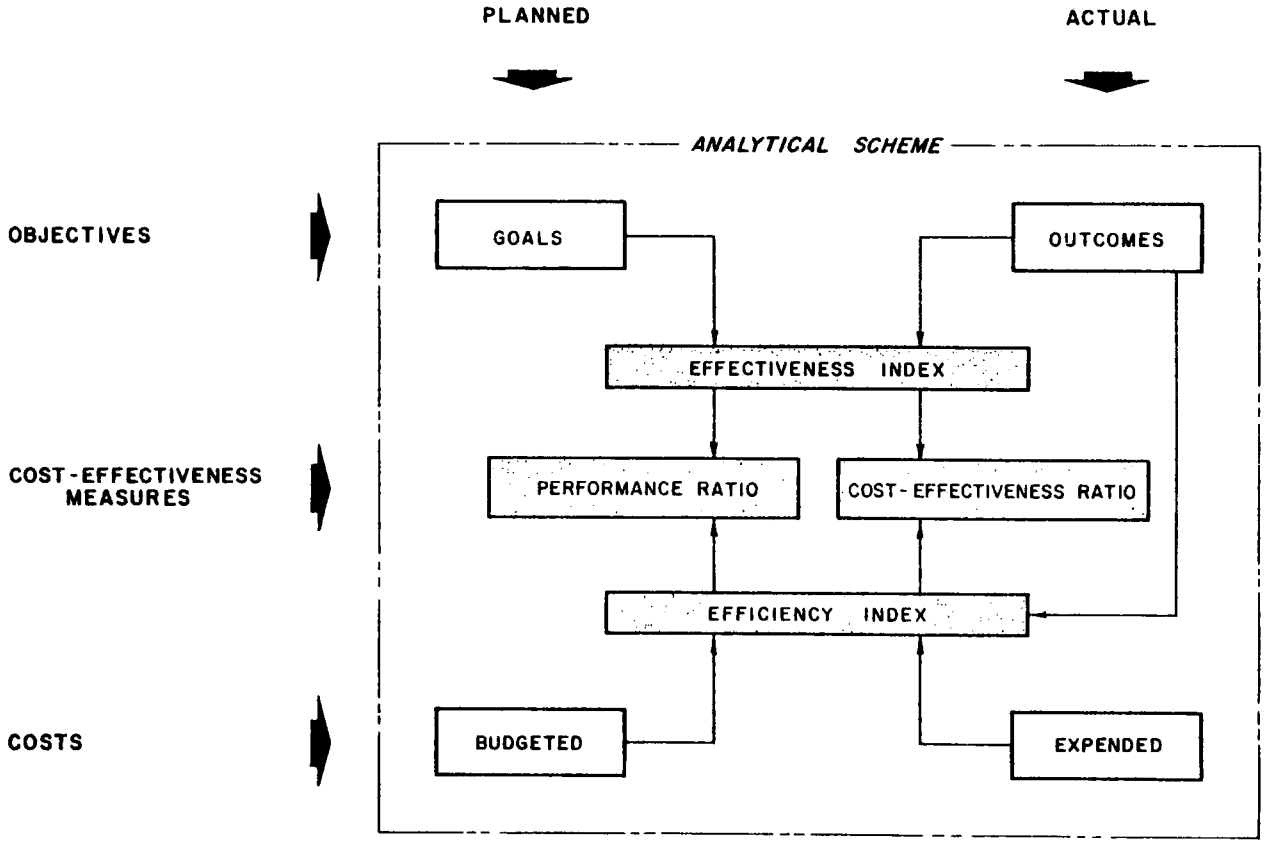
Cost efficiency. Efficiency is defined as a measure of the unit cost. In general, unit cost is computed to indicate "resources consumed for a unit of output" [23] The model computes unit costs as efficiency measures by dividing the total costs of the program by units of outputs – such as total number of program completions or graduates. Unit costs per student and per student contact hour can be computed by dividing annual total costs of the vocational instructional program by total number of students enrolled in the program and by total number of student contact hours with the program.[24] If budgeted costs are analyzed, budgeted cost efficiency measures can be made in the same way as actual cost efficiency measures. And also a cost efficiency index can be derived from the computation of actual unit cost over budgeted unit cost for the vocational instructional program. The cost efficiency index indicates more or less than one unit.

Cost-effectiveness ratio and performance ratio. Finally, based on the measures of program effectiveness and cost efficiency, a cost-effectiveness ratio and a performance ratio can be computed. A cost-effectiveness ratio, which indicates the degree of goal attainments per unit cost, is made by dividing program effectiveness by actual unit cost. This computation of a cost-effectiveness ratio is somewhat different from the commonly used method which divides outputs by the total or unit cost as inputs. The method is lacking effectiveness measures as in this model, therefore the result may be referred to as a cost-output ratio rather than a cost-effectiveness ratio.

A performance ratio is derived from the division of program effectiveness by cost efficiency index. This performance ratio indicates more or less than one unit using average program effectiveness indices. It may represent the degree of management performance as determined by program effectiveness against cost efficiency for the vocational instructional program.

Student and community characteristics. The model uses student and community characteristics as inputs to the school system. As the program's target population, data on student characteristics are required not only for determining program objectives, but also for interpreting the analytical results. The U.S. Office of Education suggests a classification of student characteristics into two categories: regular and special (i.e. students who are gifted and talented, mentally retarded, physically handicapped, emotionally disturbed, or culturally disadvantaged). In addition to such characteristics, the

Figure 2 ANALYTICAL SCHEME FOR COST-EFFECTIVENESS MEASURES



model suggests proxy measures of such student inputs as sex, age, and ethnic identity; individual needs for vocational education and achievement scores; and socio-economic status of a student's family (e.g. parents' education and annual income). These input data are related to the specification of program objectives and are used in interpreting student outputs and the results from the cost-effectiveness analyses.

Community demand and support for secondary vocational programs are included in the model as external factors to the school system. The sources of data on community demands for vocational education include such population characteristics as annual growth, age distribution, sex and ethnic group ratios and data about the size of the labour force, unemployment ratio, and manpower demand projections. Financial support for vocational education can be measured by the family income level and the extent of revenue along with tax rates, by changes in the level of support over a period of time with consideration of inflationary factors, and by approval of bonds issued by the school corporation for the support of vocational education programs. Both student and community characteristics data may not be considered in cost-effectiveness analysis because the technique is concerned with the cost and effectiveness aspects of the instructional program. However, it would be unwise to set forth program objectives without a student and community characteristics data base.

Economic and non-economic benefits. Because it is conceptually concerned with long-range outputs of the school system, the model examines such economic effects of schooling as earnings, employment, and occupational improvements. It also suggests that non-economic benefits of long-range outputs be measured by the degree of "participation in governmental affairs, crime rates, and number of public assistance recipients".[25]

Feedback. The final consideration of the cost-effectiveness analysis model is the feedback loop and input-output relationship in operating vocational programs. As a self-correcting mechanism, feedback relates educational effects to community demand and support for the evaluation and planning of vocational programs. Programs also can be evaluated within the input-output relationship by measuring changes in students before and after program operation at the school level, and by assessing communitywide input-output relationships for the program operation.

Conclusion

This paper conceptualizes a cost-effectiveness analysis and describes a cost-effectiveness analysis model for secondary vocational programs. The concept "cost-effectiveness analysis" encompasses a variety of features. It can be defined as an analytical tool for assessing outcomes of existing and/or alternative new programs in achieving specified objectives in relation to their costs. Our definition distinguishes the cost-effectiveness concept from the cost-benefit concept and identifies eight elements for analysis. Based upon these elements, a conceptual model was presented, which consists of four components: vocational program classification, measurably specified; program objectives; program outputs; and program costs. It generates three kinds of cost-effectiveness measures: program effectiveness, cost efficiency and cost-effectiveness and/or performance ratio. Student and community characteristics are considered as inputs to the school system and economic and non-economic benefits for community are viewed as long-term outputs of the school system.

Even though the cost-effectiveness analysis model is focused upon secondary vocational programs, its conceptual and technical procedures can be extended to the evaluation of any kind of existing or new program which has appropriately specified program objectives. As a comprehensive conceptual framework, the proposed model is expected to be used as the basis for a further step in cost-effectiveness studies. The specified program objectives, the cost analysis scheme, and the three quantified cost-effectiveness measures will provide foundations for similar studies.

The model can be used for vocational program evaluation. Three measures will provide evidence for judging the degree of effectiveness, efficiency, and management performance of programs. Program effectiveness measures will evaluate to what extent the program objectives are achieved; cost efficiency measures will indicate how efficient the program is; and the performance ratio will provide a criterion for judging if it is operating in effective and efficient ways. This will also provide decision-makers with information about the need for new program development. If a program is found to be ineffective and inefficient, a judgement can be made to either modify it or develop a new alternative.

The resulting measures will also provide a basis for a plan for the future improvement of vocational education programs. The program evaluation can lead administrators to make a short-range (one or two-year) plan to increase program effectiveness and/or cost efficiency. They can also make a long-range plan for the overall improvement of vocational programs and the development of new ones. However, careful consideration must be given to interpreting the model's results. The cost-effectiveness measures computed by it are no more than relatively inclusive criteria for evaluating programs. Although they make a reliable contribution to the decision-making process, the measures may not be used as absolutely exclusive criteria for judgements. Moreover, cost-effectiveness analyses should be made continuously. Repeated measurement, based on accumulated data, will increase the utility of the technique for evaluating programs.

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Michael Sinclair*

PUBLIC POLICY TO IMPROVE THE EMPLOYABILITY OF YOUNG PEOPLE

Introduction

This paper focuses on the public policy issue of programs designed to alleviate and prevent the problems which young people experience in their transition from the world of education to the world of employment.* In recent years not only has youth unemployment increased significantly in North America but its problems have become more complex in that school-to-work transition difficulties are recognized as becoming an increasing component of the overall problem.[1] The difficulties arise mainly from young people's lack of employment experience, job-specific skills, inadequate education, poor job search skills, inadequate preparation for career development, unsatisfactory attitudes toward work, and weak 'attachment' to the labour force. Young workers, 15 to 24 years of age, constitute almost half of the total unemployed in Ontario but only about one-quarter of the province's labour force. Youth unemployment has a number of costs, consequences, and causes. The major economic cost is the lost production of goods and services,[2] and there has recently been some evidence of racism as a growing social cost.

Unemployment among youth is caused by two types of contributing factors: (1) *system-related causes* include changes in the economy, the labour force and enrollment patterns in educational institutions, and also to some degree in certain provisions and legislation for social assistance; (2) *individual-related causes* pertain mainly to the person's school-to-work transition difficulties. These two categories are not necessarily mutually exclusive. The importance and complexity of the individual-related causes recently has been emphasized in Canada. In May 1976, for example, Canada's former Minister of Manpower and Immigration stated:

> Various research findings and the results of experimental projects in the delivery of [Canada] Manpower services to youth continually point to the school-to-work transition process as being at the core of youth employment difficulties. We have found that most school-leavers, regardless of their level of academic achievement, lack a sufficient orientation to the world of work.[3]

In support of this position some empirical data indicate that much youth unemployment is 'frictional' in nature – i.e., is due mainly to the large number of new labour force entrants, and to their ineffective job search techniques and high propensity to change jobs. One study has estimated that for Canada in the early 1970s frictional causes increased the measured rate of youth unemployment by as much as 1.25 to 4.5 percentage points above the adult unemployment rate (varying of course for different age/sex groups).[4] Applying

*An extensive discussion about conditions in the province of Ontario, Canada, and unemployment and the Ontario Career Action Program (OCAP) appears in *Ontario Career Action Program – Phase II – Evaluation Report*, Toronto: Ministry of Colleges and Universities, January 1977. This publication is obtainable from the OCAP Central Co-ordinating Unit, 880 Bay Street, 7th floor, Toronto.

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this finding to Ontario would mean that the province's 1975 youth unemployment rate which may be attributed to frictional causes would have been between 5.5 and 8.8 percentage points of the actual rate of eleven percent. Youth unemployment due to frictional causes is a significant portion of total youth unemployment in Ontario.

Recognition of the growth of youth unemployment, the discouraging job outlook for young people in 1978 and the poor prospects for the next few years suggest the need for government intervention.[5] In this paper we have assumed that government intervention in labour markets is accepted public policy designed to increase labour utilization, productivity and gross national product. At both the federal and provincial levels in Canada in recent years the interventions have mainly been to provide or support training or re-training of the unemployed, job and career information and counselling, and foster occupational mobility (on the supply side) and direct job creation (on the demand side). Other measures which have not been taken would include labour substitution and affirmative action to promote the hiring of young workers. In Canada it is the provinces which have constitutional authority for education, employment is a shared authority but it is generally agreed that the major responsibility for employment and economic growth is that of the federal government.

The individual-related causes of youth unemployment give rise to the following program needs:

- Opportunity to gain employment experience.
- Opportunity to learn job-specified skills.
- Opportunity to receive remedial education.
- Access to better career development services:
  - appropriate labour market information
  - career guidance counselling
  - training in job search techniques
  - exposure to the work world (specific occupations, industries, public services and agencies)
- Measures to change the attitudes of young people towards the world of employment
- Special services for minorities and particular individuals and groups
  - sheltered workshops
  - job-re-design
  - affirmative action in job hiring

Ontario's plans to deal with youth unemployment incorporate existing programs and services, extensive cooperation between the provincial and federal governments and additional measures to involve business and industry, private and voluntary groups and community resources.[6] In this paper I shall compare one of its programs, the Ontario Career Action Program (OCAP) which is operated by the province's Ministry of Colleges and Universities, Industrial Training Branch and cooperative education programs generally. And they are assessed as alternative policy responses and supplements to formal education and training systems, designed to improve the employability of youth. The term employability here refers to the extent to which a young person possesses the job experience, skills, education and other attributes desired by employers. Table 1 shows the rates of unemployment in Ontario from 1973-1976, by age and sex, so that the magnitude of the condition may be understood. Unfortunately final figures for 1977 are not yet available but preliminary data show that measured unemployment rates have worsened this year.

Table 1 UNEMPLOYMENT RATES BY SEX AND AGE GROUPS, ONTARIO, 1973-1976*

	Old Labour Force Survey			Revised Labour Force Survey	
Sex and Age Groups	1973	1974	1975	1975	1976
Males					
15-19 yrs.	10.2	10.3	14.4	14.5	14.9
20-24	7.3	7.0	10.9	9.2	8.9
15-24	8.5	8.3	12.3	11.5	11.4
25 and over	2.8	2.9	4.2	3.6	3.3
Total	4.0	4.0	6.0	5.4	5.1
Females					
15-19 yrs.	9.0	8.7	12.6	14.1	14.4
20-24	5.7	6.1	7.4	8.8	8.6
15-24	7.0	7.2	9.6	11.2	11.1
25 and over	2.9	3.1	4.5	6.4	6.4
Total	4.1	4.4	6.0	7.8	7.8
Both Sexes					
15-19 yrs.	9.7	9.6	13.6	14.4	14.7
20-24	6.6	6.6	9.4	9.0	8.2
15-24	7.8	7.8	11.1	11.3	11.2
25 and over	2.9	2.9	4.3	4.6	4.5
Total	4.1	4.2	6.0	6.3	6.2
Total Unemployed	141,000	151,000	226,000	244,000	242,000

Source: Derived from unpublished data from Statistics Canada's old and revised Labour Force Survey. (Compiled by Ms. Brinda Murti, Research Branch, Ontario Ministry of Labour, Toronto).

*Unemployment data exclude 14-year-olds, thus enabling comparisons of the unemployment rates of youth between the old and revised methodologies of Statistics Canada's Labour Force Survey. The concept of unemployment refers to the unutilized supply of labour offered to the labour market and is measured by a monthly sample survey of about 55,000 Canadian households. The measurement of unemployment in Canada includes students seeking full-time and part-time jobs, but does not include "discouraged workers", i.e., those who believed that they could not find work and, therefore, ceased to look for a job. For full details of the definitions used in Canada, see Statistics Canada, *The Labour Force.* Catalogue 71-001 Monthly, Vol. 32, No. 11, Nov. 1976, pages 47-62. In 1975 a slightly revised methodology was introduced but the former methodology was also used that year. A full discussion of the reasons for the changes is contained in Ian Macredie and Bruce Petrie, "The Canadian Labour Force Survey", paper presented at the 10th Annual Meeting of the Canadian Economics Association, Laval University, Quebec, June 1, 1976.

The Ontario Career Action Program

In the announcement of the Ontario Career Action Program (OCAP) the Honourable William G. Davis, Premier of Ontario, on August 27, 1975, stated that OCAP would:

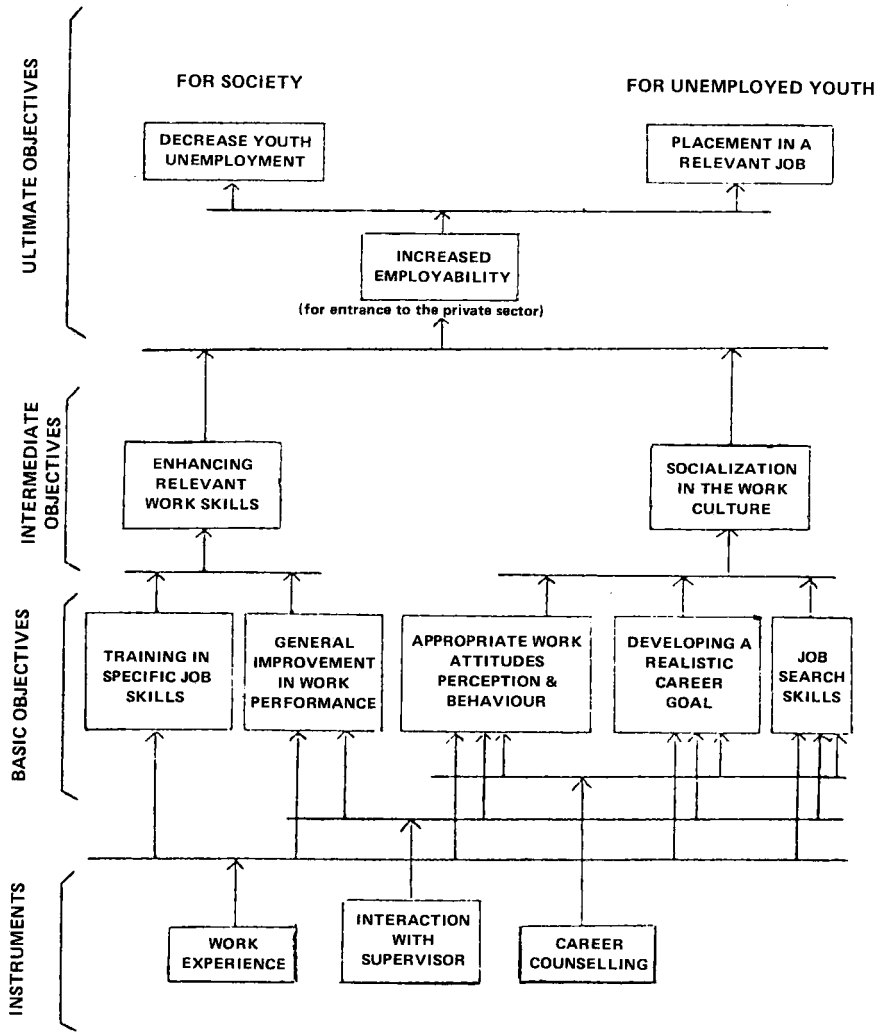
> provide a youth internship program within the Government and Government related agencies and allow a socially useful and relevant work experience to young people who emerge from our educational system.[7]

He added that the program's main goal is to ensure "opportunities for those who want to work and thereby help themselves", but that it would not provide "grants or support that would reduce the need to work." Publicity stressed that the program was "designed to help you develop marketable work experience for 'that first job'." The Ontario Ministry of Colleges and Universities has formulated objectives for the program on several levels, as may be seen by the diagram, Figure 1. The objectives can be restated slightly as follows:

- provision of employment experience (thus providing a good reference from an employer);
- training in specific job skills;
- general improvement in work (job) performance;
- acquisition of appropriate work attitudes;
- development of a realistic career goal; and
- acquisition of effective job search skills.

Training stations are located throughout the province in Ontario government ministries and agencies and applicants apply in the locality of their choice. Trainees receive some career counselling and may also take sessions of the Creative Job Search Techniques course of Employment and Immigration Canada (formerly the federal Department of Manpower and Immigration). Trainees are encouraged, as soon as they begin OCAP training, to seek regular full-time employment in the private sector. They can remain on the program for a maximum of 26 weeks and are paid a stipend of $100 per week. This is not a direct job creation program; it is essentially a training effort. Since OCAP has no formal educational pre-requisites, the potential trainees range from high school dropouts to university graduates. Preference is given to those who have not previously held full-time employment – other than on a seasonal (summer) basis, to high school dropouts (most applicants have grade 13 or less), to persons who can show a long unsuccessful search for employment. Applicants must have left the educational system and be registered for employment with their local Canada Manpower Centre. In addition to OCAP, the Ontario Government has recently launched a counterpart program in the private sector (following a successful pilot project earlier this year). It has the same objectives and is managed at the local level by the province's colleges of applied arts and technology (CAATs, which are essentially locally oriented vocational and technical training colleges, also under the jurisdiction of the Ministry of Colleges and Universities). Since OCAP has no authority over the civil servants who act as supervisors of OCAP trainees the success of the program depends upon cooperation and goodwill from the various participating ministries, agencies and CAATs. This is not a mass program. There are severe limits on the number of unemployed youth who can be accepted by OCAP – just over 1000 in 1976, from about 5,500 applicants. In 1977-78 about 3,000 are being placed in both program components, about 1,200 in the private sector portion.

Figure 1 OBJECTIVES OF OCAP



Source: Based on "Statement of Objectives – OCAP Evaluation – Phase II," prepared by the OCAP Administration, Industrial Training Branch, Ministry of Colleges and Universities, Toronto, August 30, 1976, Figure 3, p. 7. This schematic interpretation of the relationships between the various objectives of OCAP's training process was compiled on the basis of a content analysis of the following documents: the Premier's statements of August 27, 1975 announcing the creation of OCAP; the policy guidelines prepared by the OCAP Administration, December 1, 1975; and the information requirements for the Phase I of the OCAP Evaluation as approved by the OCAP Steering Committee on April 2, 1976.

Our analysis of OCAP's effectiveness and efficiency is from two points of view. First, comparisons are made between the outcomes of OCAP graduates (labour force status, experiences and perceptions) by late 1976 and a select sample of unselected applicants. Three surveys and evaluation reports have been undertaken by OCAP: "Preliminary evaluation" of 223 trainees and 130 graduates (defined as anyone who leaves or completes the program), in May 1976; the "Phase II evaluation" of 400 (other) graduates, 380 of their supervisors and 400 unselected applicants to OCAP; and the "OCAP in Industry Pilot Program Evaluation" of 186 trainees and their employers. Secondly, in the next section, data from these and other surveys are discussed to see to what extent they lend support to the essential objectives of OCAP.

Empirical Evaluation: Comparisons between outcomes of graduates and unselected applicants

Four hundred OCAP graduates and 400 unselected applicants were interviewed by telephone in November/December 1976. From their reports the following conclusions can be made about their perception of their labour force status and experiences:

(1) The graduates had left OCAP on average only two months, but already slightly more (than the unselected applicants) had secured full-time regular employment (48.4% vs 45.5%). The proportion was much larger for female graduates (64.4% vs 45.5%). Their propensity to seek secretarial and related jobs, and the generally greater availability of these jobs, suggest that overall the OCAP graduates should have done better in securing full-time employment (or should do so over a longer period). However, the period of their availability for employment (2 months) was really too short to make fair judgements.

(2) Among respondents with full-time permanent employment the graduates had a median salary of $140.00 per week, the unselected applicants only $130.00.

(3) About half the graduates obtained full-time employment in the public sector (contrary to OCAP's *explicit* aim, which is to prepare trainees in order to secure employment in the private sector), whereas 81 percent of the similarly employed unselected applicants obtained jobs in the private sector.

(4) The OCAP graduates with full-time permanent employment found their work much more challenging than did the unselected applicants who had permanent full-time jobs.

(5) The graduates with full-time permanent jobs also perceive their employment as being relevant to their career goals to a much greater degree than did the similarly employed unselected applicants.

(6) Overwhelmingly the employed OCAP graduates were in their first jobs. This was much less true of the unselected applicants. (This was to be expected since the graduates had left OCAP on average only two months earlier.)

(7) Among respondents *not* having full-time jobs, the OCAP graduates were much more likely (59% vs 35%) to have returned to formal education. More unselected applicants were receiving unemployment insurance (17% vs. 10%) and "doing nothing" (40% vs. 20%) which can be interpreted as living at home and neither formally studying nor actively looking for a job.

(8) Among those *not* employed far more unselected applicants than graduates (65% vs. 49%) reported that they were actively seeking work and were available for employment.

(9) The graduates much more than the unselected applicants perceived a job reference as being of prime importance in helping them find full-time employment.

In relation to OCAP's objectives the major conclusion from these findings are: (1) that the OCAP graduates had done 'better' than the unselected applicants in terms of employment status, income and job satisfaction. They had perception of a greater relevance of this job to their career goals, and of the usefulness of a reference in securing full-time employment; (2) that the sample of unselected applicants had done 'better' in terms of the location of their jobs and one of OCAP's specific goals, i.e. most members of this group who had secured full-time employment were working in the private sector.

Cooperative Education Programs: An Alternative Approach to Increasing the Employability of Youth

Cooperative education programs are defined in various ways. Most include work experience directly related to and integrated into a student's formal education but there are some which have unrelated or semi-related work experience or voluntary service which alternates with the academic part of the course. These programs are a direct response to the need for more effective linkage between formal education/training systems and the world of work, and their essential feature is to enable students to alternate periods of academic study, learning on-the-job and actual work. Such programs have grown rapidly in the United States in the 1960s and 1970s,[9] but they are not common in Canada either at the high school or the college level. The largest and oldest cooperative education programs are at the University of Waterloo, and more recently such programs have been added in McMaster University, Sir Wilfred Laurier University and some of the (non-degree) colleges of applied arts and technology. Some few cooperative education programs exist at the secondary school level. Those of one of the boards of education in Metropolitan Toronto (North York) are well-known and several other boards are giving the development of comparable programs high priority.

There is widespread prevailing belief in the utility of such programs. With reference to the United States, Patricia Cross concludes that "the purported advantages of cooperative education for students *seem* to be substantial and significant ones", but reports that they are neither "confirmed by objective data" nor "refuted by research". She adds:

> Anyone wishing to sell the concept of cooperative education to almost anyone can find ready made lists of advantages accruing to almost everyone – students, colleges, employers, and the community. . . The movement does not suffer from false modesty, but it must be admitted that the arguments appear sound, and some of the claims have been documented through research.[9]

She concludes that research about cooperative education is sparse, "in a primitive state," and "is descriptive rather than evaluative and testimonial rather than behavioural". Such comments would be equally valid for Canada; but there must be more programs than are commonly known because in October 1976, when announcing a new "employment strategy" the Honourable Bud Cullen, Canada's Minister of Manpower and Immigration, said he knew of more than 80 cooperative education programs in Canada and that:

> Canadian youth who have participated in them have had far fewer problems in the labour market, are far more certian of where their career interests lie, and are often hired by the very firms for which they worked as part of their training.[11]

There is substantial indirect evidence to support the need for cooperative education programs which can be gleaned from the data generated of the OCAP Phase II Evaluation, e.g., the responses of both graduates and unselected applicants as to their perception of the importance of having a job reference and work experience, the importance of acquiring or improving specific job skills. One reasonable interpretation of the evidence of recent surveys of school dropouts in Ontario[12] is that had these young people participated in cooperative programs before they dropped out of secondary school, they likely would have fared better in their entry into the labour force.

Only in the last couple of years have the employers, educators, students, and policy-makers in Ontario shown much interest in cooperative education. The Ontario Ministry of Education has now approved guidelines and funding provisions and provided academic credit for such secondary school programs. A supplement to the H.S. 1 regulations was issued for 1977/78.[13] And the province's Ministry of Colleges and Universities has contracted for a survey of cooperative education programs in the colleges of applied arts and technology.[14] Such a study should hep to assess whether cooperative programs "can be used to reduce program delivery costs while still maintaining an acceptable level of program performance." In October 1976 the then federal Minister of Manpower and Immigration announced that up to $500,000 would be available in his department's 1977-78 budget to support pilot or experimental cooperative education projects on a joint funding basis with the provinces.[15] Subsequently, Employment and Immigration Canada developed the guidelines for application (by provincial education ministries) for seed money for new programs. Two Ontario projects have been approved for funding. One is a conference–the "First Invitational Seminar on Cooperative Education" to be held in Toronto, February 23-26, 1978. It will be jointly sponsored by the Ontario Cooperative Education Association, the North York Board of Education, the Ministry of Education and the Ministry of Colleges and Universities. The seminar will enable up to 200 participants from secondary schools and colleges of applied arts and technology to learn about the potential for growth of cooperative education in Ontario, or to promote and implement programs.

In order to formulate policy to deal with youth unemployment it is still necessary to compare the OCAP and the cooperative education types of approach. Their *results* cannot really be compared in Ontario, we have not enough experience of the second approach, but some assessment can be made.

OCAP *vs.* Comparative Education Programs

Both types of program have essentially the same objective: to provide opportunities for young people to increase their employability by systematic exposure to the world of work, to offer the chance to acquire specific job skills and work experience, and also through some counselling to facilitate the youngster's awareness of the need to plan his career development. They differ in the means used to achieve the objectives. All OCAP trainees are provided with "on-the-job" experience. The only "course" they take is the Creative Job Search Techniques course. In cooperative education programs the training and opportunities for career development planning, if offered, are provided in an educational setting or a training institution. Some "practice" or application is provided in the work setting of a cooperating employer. OCAP is a *remedial* program designed to supplement a deficiency. Cooperative education is a preventive approach integrating formal skill training, education and work practice in order to make the education more effective.

Both OCAP and cooperative education programs should be funded in Ontario for a number of years. Existing programs should be improved, extended and adapted to changing circumstances. Even if OCAP were made available to all unemployed youth in Ontario who applied to become trainees it would not, of itself, solve the problem. Most of the students now in secondary schools will not be participating in cooperative education programs. It would take a number of years for programs to proliferate and there will continue to be constraints on financial resources and the organization of work stations. The programs need not be perceived as being in competition with each other. Features of both will be needed in Ontario for the foreseeable future. However, it is of importance that they be set up in such a way as to enable us really to learn of their comparative outcomes and costs. The notion of "efficiency" in public finance relates to the cost incurred by a program or service in achieving its objectives. This is the concept which is particularly appropriate for the comparison of alternative programs or services which have the same objectives. The determination of comparative efficiency requires that measurement be made both of progress in attaining a program's objectives and in estimation of all the various costs involved. This is difficult in ideal circumstances; it becomes complex when the programs have similar but not identical objectives and when the objectives are hard to measure. Since figures on the indirect costs of cooperative education programs are scarce, the estimation of comparative efficiency is virtually impossible. Nevertheless, the writer has (tentatively) estimated that the direct operating costs of OCAP and cooperative education programs in Ontario are approximately the same ($21.00 per participant per day).[16] However, much more research needs to be done on the detailed costs and (particularly) the outcomes of OCAP and cooperative programs. Longitudinal research is especially needed to follow the graduates of OCAP – especially now that the program has been extended to the placement of trainees in the private sector.

In relation to effectiveness, a few words of caution are in order about various *generalized* advantages of cooperative education. Cross emphasizes that although the advantages "are impressive. . . and logical enough to be believable", there is "little demonstration of their validity."[17] She also warns that the literature contains very little discussion of the problems, disadvantages or criticisms of cooperative education.[18] The alleged, logical advantages do not necessary occur, and there are definite problems in the adoption of cooperative education on a large scale.[19]

Variations in the type of work activity usually provided through OCAP and cooperative education programs might well be considered. In addition to aiding the employability and career development of youngsters, such programs might also help reverse their growing isolation and alienation. Walter Pitman, the President of the Ryerson Polytechnical Institute, suggested that students be involved (as part of their study and work) in social service and related projects.[20] His proposal does not necessarily relate directly to the youth's career development but it could be relevant to it. Opportunities of this type are generally known as "study-service".

Study-service has been defined for UNESCO as "a period of community service [which] is made part of the curriculum in an educational institution".[21] A 1973 conference at the University of Western Ontario defined the concept as

> practical participation in activities which directly help meet other people's basic needs (e.g., agricultural extension, health care and education, social welfare), for a limited period, in other than a conventional employment situation, [and which

> are] organized by educational institutions with the clear intention of this service providing an educational experience for those who serve.[22]

For several years study-service programs have operated in some developing nations of Asia and Africa and, more recently, interest has been expressed in this concept in England,[23] the United States and Canada. It is being recognized as a useful adjunct to school curricula which help young people bridge the gap between school and work. The Community Improvement Program of Peterborough (CIP), which seeks "to develop commitment to the solution of social problems and to teach the kind of skills" required for examining alternative solutions to social problems, embodies the aims of study service.[24] In October 1975 the Toronto Board of Education and the Ontario Institute for Studies in Education sponsored a one day "Community as Classroom" conference featuring the internationally recognized authority on study-service, Dr. Alex Dickson, Director of Community Service Volunteers in England. This is also some indication that the essential features of study-service are receiving consideration as a means of dealing with youth unemployment. Anderson's paper for the Universal Youth Service Conference in 1976 observed that:

> A universal youth service represents a creative public policy response to the critical problem of youth in the labour market, and among its many benefits, would ease the transition from school to work. The opportunity for useful and rewarding service, combined with education, can conserve much of the wasted energy and effort currently associated with youth entry into the world of work.[25]

The Ontario Ministry of Colleges and Universities is looking into a "Pre-payment Through Service" scheme as a means to fund students who undertake post-secondary education. And Canada's Defense Minister caused quite a stir recently by suggesting that there should be public debate on the idea of some form of compulsory national youth service.[26] Some days after the speech the Social Affairs Minister of Quebec, with their problems of youth unemployment in mind, announced that some form of compulsory public service would be established for youth in that province.[27]

The receding job prospects for youth suggest the need for programs that will develop in youth the realization that their educational experiences enable them to earn a living but are also for personal development and to help serve the community as a whole. Study-service as one form of cooperative education could at the same time (1) improve the transition from school to work; (2) broaden the range of career knowledge and goals held by young people; and (3) supplement essential public services. The challenge for policy to deal effectively with problems of youth unemployment and employability should be of interest to planners in the future. All the program types reviewed in this paper can contribute. The planner, however, must advise on the elements of the overall policy, the role each program type will play and the allocation of funds necessary for each.

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Cicely Watson and Mohindra Gill*

AN EVALUATION OF THE GRADE 13 MARKS WHICH ARE THE MAJOR CRITERION OF ADMISSIONS INTO ONTARIO UNIVERSITIES: WITH SPECIAL REFERENCE TO CHOICE PREFERENCE OF UNIVERSITY AND PROGRAM

Introduction

In Ontario, with the abolition of the Grade 13 departmental examinations and system-wide standardized aptitude and achievement tests, the selection for entry to universities has come to depend heavily upon the students' Grade 13 marks. "Strict" marking has the effect of unduly limiting the student's ability to choose among the universities; "permissive" marking leads to criticisms of the local school system. A poor evaluation of the student by the teacher(s) leads either to an unduly optimistic expectation of the student's ability to perform or an unduly pessimistic one. This paper reports some of the findings of a study designed to investigate the impact which the marks appear to have had on (a) student's choice of university and (b) his choice of program. The applicant's university acceptance and the program he is registered in are compared with the rank orders of that institution and program as specified in the choices on the initial application. This paper is the second in a series dealing with evaluation of the Grade 13 marks. The first dealt with the stability of the marks.**

The data to be analyzed are drawn from the reported Grade 13 teacher-assigned marks of a sample of 1975/76 students (N = 1902) from the 26 secondary schools of the six school boards of Metropolitan Toronto. The total group comprises those students who applied for admission to the first year of a program in an Ontario university (i.e., to enter in the Fall term 1976). The sample used was limited to those students for whom a preliminary and a final mark was available for at least six matched credits. This limitation was chosen because the most common entry requirement for Ontario universities is a given percentage (or higher) derived from the weighted average of the six "best" Grade 13 subjects. In 1976 the total number of applicants from the schools in question exceeded 4000. Our sample includes all types of secondary schools which offer programs leading to the Secondary School Honour Graduation Diploma.

Variables

The following variables are used in the analysis:

1. The final weighted averages of the students based upon their six "best" credits.
2. The student's final marks in selected subjects and programs which include at least two credits from the following areas of study:

Languages:	English 1 and English 2
Social Sciences:	History (Canadian)
	Geography (Canada)

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Mathematics:	Functions and Relations, Calculus, Algebra
Sciences:	Biology, Physics, Chemistry

3. The student's preference, as indicated on the application, is compared with his eventual registration by:
   a. university
   b. program

Definitions

For purposes of this study the term "subject combination" is used to denote groupings of Grade 13 subjects which provided the program nucleus of the applicant. These represent concentrations in one or more subject areas e.g., maths, maths and physics, social sciences, languages, etc. We identified 14 groupings defined in terms of subject combinations and listed them in a hypothetical "pecking order" according to some views as to their likely difficulty and their rank order of average marks. The groups defined by subject and their pecking order are listed in Table 1. Such groupings represent concentrations or specializations by subject area. One cannot compare the weighted averages of these grouped marks, with consistency, unless the groups are defined by at least 3 subjects of concentration – otherwise the components of the best 6 credit average shift, depending on the student's performance in the various subjects.

Where admission to an institution of higher education is based on a final average mark derived from different groups of subjects, the assumption is that the selection is "fair" because all subject marks have equal probability of representing comparable achievement. Thus a mark of 80% in mathematics is held to represent the same level of achievement in that subject as an 80% does in history. If this were not the case an average based on, say 3 mathematics marks out of 6 could not be compared, for selection purposes, with one based on 3 history marks out of 6. By defining subject combinations and postulating a pecking order we can check whether certain specified subject combinations consistently produce higher final averages. The combinations which emphasize languages (#11, 12 and 13) were grouped together for most of the analyses presented here. The groups showing average marks by subject combination provide the basis for qualitative comparisons between applicants according to their major program components.

The Study

Data

The data required for this exercise were obtained from the Ontario Universities Applications Centre at Guelph and the authors wish to acknowledge their assistance in supplying the statistics and, particularly, the work of R.B. Riley, their systems analyst. The authors would also like to acknowledge the helpful comments and suggestions of their colleague Don Burrill.* Weighted averages of the 6 "best" credits and the marks for each of the 14 selected subject combinations were analyzed by means of numerical and percentage distributions, means, standard deviations and medians. To determine the relationships between subject combinations and university preference and program preference, percentage distributions were computed for each of the sub-groups defined. Most of the analyses were done by sex. Appropriate tests of significance were applied to determine the significance of the observed differences.

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Final weighted average marks by subject combination and sex

Hypothesis 1:

1.a Groups defined by combination of subjects would differ significantly with respect to the means of their final weighted average marks.

1.b Students whose program emphasized math and/or physical sciences would obtain higher averages than students whose programs emphasized languages and social sciences.

The distribution of the means, standard deviations and medians of final weighted average marks by sex and subject combination is given in Table 1. As can be seen, the average marks for subject combinations with emphasis on languages (predominantly female students) were highest and those with three or more social sciences (with one math, group #7; and with no math, group #9; taken together) were lowest. Subject combination groups (#1, 2 and 3) emphasizing maths and 1 or more physical sciences fall somewhere in between. This condition, except for languages, is in the predicted direction. Subject combination groups which emphasize social sciences and languages seem to be more homogeneous. That is, they show lower standard deviations than those which emphasize mathematics and/or physical sciences. Two-way ANOVA technique was applied to determine the significance of the variation introduced by sex and subject combination. The three groups with emphasis on languages were combined into one for this analysis. As can be seen from Table 2, F ratios for both sources of variation were found to be significant (sex: $p < .05$; subject combination: $p < .001$). Therefore, hypothesis 2.a was accepted. However, the direction of the mean differences was contrary to the prediction made under hypothesis 1.b.

University admission in relation to subject combination

Since, in Ontario secondary schools, students choose their subjects of study and their resulting program concentrations vary widely, we were interested to determine the variance by reference to their marks. In an earlier paper we demonstrated that there is greater stability of evaluation (as represented by marks) in some subjects than in others; and that this instability varies by sex and by achievement range. By judicious choice of subject grouping, therefore, a student might well improve his resultant weighted average of the six "best" marks. If this is so, there should be a consistent relationship between the subject combination group and admission status, as indicated by the student being registered or not registered in a university.

We classified students by subject combination, sex and admission status to determine the interrelationship of these variables (see Table 3). Although the proportions of registrants and non-registrants differed by sex for the various groups as determined by subject combination, the differences were not large enough to produce a significant relationship between sex and admission status for any combination except the last, "other". However, the relationship between subject combination and admission status was found to be significant beyong the .001 level for both the males ($x^2 = 38.30, df = 11$) and the total group ($x^2 = 48.58, df = 11$).

Relationship between subject combination and university choice preference

Not all students who enter university are admitted to the institution of their prime choice. The system used in Ontario permits the student to rank order three preferences and then, as refusals are received, to substitute other choices. A student may receive more

than one offer of admission and he may actually accept his second, third or a quite different choice in preference to his initial first choice (for a variety of reasons). But, given a real opportunity for choice, the first preference usually represents precisely what it defines. Therefore we were interested to observe the relationship between the subject combination groupings and what had been the original choice of students who did eventually register in one of Ontario's universities.

Hypothesis 2:

2.a Choice preference of university of registration is significantly related to program grouping defined in terms of subject combinations.

2.b Students whose programs emphasized mathematics and/or the physical sciences stand a better chance of being registered in the institution of their first choice than those whose programs are concentrated in languages and the social sciences.

In order to test hypotheses 2.a and 2.b, the students registered in Ontario universities were classified by the subject combination and choice of university of registration. This was done separately for each sex and the total group. As can be seen from Table 4, a considerable amount of variation was observed in the distribution patterns determined by the two modes of classification. Contrary to the predicted direction, students whose programs showed emphasis in languages were over-represented among those registered in institutions of their first choice. Students in subject groupings #4, 6 and 7 (physical or social sciences with only one or no math) ranked lowest in obtaining their first choice of university. The observed relationship between the two modes of classification, i.e. choice preference of university and program grouping defined by subject combination, was significant beyond the .05 level. Hypothesis 2.a, therefore, was accepted. However, hypothesis 2.b predicting predominance of students with emphasis in mathematics and/or physical sciences among those registered in the institution of first choice was rejected.

In general, more females than males were registered at their first university choice, but this was not true for subject groupings #2, 7, 9, 10 and 11. However, the difference between the male and female proportions achieving first choice was not significant. That is, achieving one's choice of university was not significantly related to sex for any of the subject combinations. (The second and third choices were grouped together for computing the chi square values.)

University choice preference in relation to the final weighted average of Grade 13 marks

Hypothesis 3:

> Choice preference of university of registration is significantly related to the level of achievement as indicated by the final weighted average of Grade 13 marks.

In order to test the foregoing hypothesis, students were classified by achievement level and choice of university, and percentage distributions were obtained for the various subgroups thus formed (see Table 5). Students with higher average marks (70% and above) were more likely to be registered in the university of their first choice than those attaining a lower (less than 70%) level of performance. The apparent relationship between the two modes of classification was significant beyond the .001 level ($x^2 = 123.25, df = 3$). Therefore, hypothesis 3 was accepted. (The second and third choice categories were combined into one for obtaining chi square values.)

The data analysis continued to determine the means and standard deviations of the final weighted average marks of various sub-groups obtained by classifying the students by their choice of university and sex. As can be seen from Table 6, the students registered in the institution of first choice had higher means scores than those registered in their second or third choices, but there was not as much difference in the latter two as might be expected. Taking the group as a whole, the mean scores of the females (72.52) were higher than the mean scores of the males (70.00). However, there seems to be no difference in the mean scores of males and females who were registered in the institutions of their first choice. Two-way ANOVA technique was applied to determine the significance of the variance introduced by sex and choice of university. As indicated in Table 7, F ratios for both sources of variation were significant beyond the .001 level. Therefore hypothesis 3 was accepted.

Program choice in relation to subject combination

Not all students who are admitted to the university of their prime choice enter their first choice of program. And some students will sacrifice their institution choice for their program choice (and *vice versa*). Therefore we were interested to determine the relationship between subject combination grouping and program of registration at university (*note* not application but registration, i.e., program achieved).

Hypothesis 4:

4.a Choice of program (registered) is significantly related to program grouping defined in terms of subject combination.

4.b Students with a program emphasis in mathematics and/or the physical sciences stand a better chance of being admitted to (as attested by being registered in) their prime choice, than those in languages or the social sciences.

In order to test hypotheses 4.a and 4.b, the students registered in Ontario universities were classified by subject combinations and choice of (registered) program. This was done separately for each sex and the total group. As can be seen from Table 8, a considerable amount of variation was observed in the distribution patterns of sub-groups determined by these two modes of classification.

On the whole more females than males obtained their first choice of program (81.7% *v.* 78.5%). However, this was not true of subject combinations #1, 2, 4, 5 and 6 (groups with emphasis on maths and/or physical sciences), although the girls invariably obtained higher mean scores in their final evaluations of all the subjects in these two areas.* There may well be some sex bias in the program selection procedures used in Ontario universities. Or the explanation may be that females are relinquishing their first choice of program in order to achieve their first choice of university. In any case, the findings are sufficiently intriguing to warrant some further study. Achievement of choice of program was found to be significantly related to sex for subject combination #1, which includes the largest number of students.

Generally speaking students whose programs emphasize languages and the social sciences seem to have a better chance of obtaining their first program choice; subject combinations #11, 10 and 9 ranked highest; #6, 5 and 2 ranked lowest. The competition for entry seems to be more severe for certain programs in mathematics and/or

*See Watson, Gill paper referred to above.

physical sciences. There may be more clustering of program choice in these subjects, with just a few favoured institutions to which all candidates are seeking admission. Whatever the explanation, choice of program obtained (registered) was significantly related to subject combination grouping ($x^2 = 65.89, df = 33, p < .001$). Hypothesis 4.a, therefore, was accepted. However, the relationship was contrary to the direction predicted; hence, hypothesis 4.b was rejected.

Program choice in relation to the final weighted average of Grade 13 marks

Hypothesis 5:

> Choice of program of registration is significantly related to the level of achievement as indicated by the final weighted average of Grade 13 marks.

In order to test the foregoing hypothesis, students were classified by choice of program (registered) and achievement level, and percentage distributions were obtained for the various sub-groups (see Table 9). From the 1975/76 sample, about 80% of those registered in Ontario universities had obtained their first choice of program. Students with average marks above 70% had a better chance of being registered in their first program choice than those with average marks below 70%. The apparent relationship between the two modes of classification was tested for its significance by applying the chi square technique. With 6 degrees of freedom, the computed value of chi square ($x^2 = 15.54$) is significant beyond the .05 level. Hypothesis 5, therefore, was accepted.

The data analysis continued to ascertain the means and standard deviations of the final weighted average marks of the various sub-groups obtained by classifying students by their choice of program of registration and sex. As indicated in Table 10, the means of the final weighted averages were highest for those registered in their first program choice (74.53) – which was to be expected – followed by those obtaining their second choice (72.18) and then third (70.22). The means of the final weighted average marks for the category designated "other" (74.36) was comparable to the means for the first choices. The "others" are those students found to be registered in programs which were not designated as one of their first three choices, so this is a puzzling finding. Apparently those students failing to get any of their original program choices have average marks comparable to those successfully obtaining their first program choice. Two-way ANOVA technique was applied to determine the significance of mean differences among the various sub-groups. The F ratio (3.89) for estimating significance of variance introduced by program choice is significant beyond the .01 level. However, the F ratio (1.13) testing the significance of variance introduced by sex was not significant ($p = .288, df = 1$).

Conclusion

Limitations of the study

There was no way, in a study of teacher assigned marks alone, to provide control over the variation introduced by academic aptitude or other determinants of academic achievement – interest, motivation, aspiration level, etc. And the procedure of sample selection – requiring availability of both preliminary and final marks for determining stability of Grade 13 evaluation* – imposed a further restriction. In addition, these data are limited to the marks of applicants from Metropolitan Toronto in one academic year (1975/76).

*The subject of the first paper of the series.

Metro is not comparable to the province of Ontario on many important school dimensions, so this is not a typical provincial sample. On the other hand the applicants from Metro represent a large proportion of those making the transition from Grade 13 to an Ontario university. Therefore, analysis of their marks, which was made possible as an inexpensive by-product of a large contract project, was justified. Further investigation is needed to check the validity of these findings and to determine whether they are generally valid.

Summary of Findings

- Subject combination groupings were found to be significantly different with respect to the means of their final weighted average marks ($p < .001$). Subject combinations with emphasis on languages had highest means and those with three or more social sciences (with only one or no math) had the lowest.
- Subject combination was significantly related to choice preference of university (at the .05 level). Students with emphasis on languages were over-represented among those registered in their first choice of institution, and those combining physical or social sciences with only one or no math ranked lowest in obtaining their first choice.
- Subject combination was found to be significantly related to choice of the program which was eventually obtained ($p < .001$). Students whose subject combinations emphasize languages and the social sciences seem to have a better chance of obtaining their first program choice than those with subject groupings which combine maths and physical sciences, where the competition seems to be more severe.
- Achievement of program choice was significantly related to sex ($p < .01$) in favour of the males for subject combinations consisting of three or more maths.
- Choice of university as well as choice of program were significantly related to the final weighted average marks ($p < .01$). As expected, students obtaining their first choice of university and/or program were predominantly high achievers and those obtaining their third choice were predominantly from the lower ranges of weighted average distribution, i.e. were lower achievers.

A more rigorous research design would be needed to arrive at conclusive statements and recommendations for policy change regarding the use of teacher assigned marks for admission to university. However, the findings of this small study suggest the following conclusions:

Averaging marks on different sets of non-standardized teacher-assigned marks is not an adequate criterion for selecting students for admission into universities.

The averages of marks in different groups of subjects, based upon evaluations of a large number of teachers from different schools, in different school systems, following different curricula cannot be taken as comparable. There is no way one could come up with a "fair" admission decision without having any control over the sources of variation.

The significant relationship between program choice and subject combinations suggests that there is an implicit *numerus clausus* operating in university admission. But before this postulate can be raised as a policy issue, further analysis of these and comparable data is required.

Table 1 MEANS, STANDARD DEVIATIONS AND OTHER STATISTICS OF FINAL WEIGHTED AVERAGE OF BEST SIX CREDITS BY SUBJECT COMBINATION AND SEX FOR UNIVERSITY APPLICANTS TO ONTARIO UNIVERSITIES – 1976

	Subject Combination	Sex	N	Mean	SD	Median	Range
1	Three or more Maths	M	391	73.43	12.11	74.00	34-97
		F	158	75.77	12.61	77.64	25-96
		T	549	74.10	12.29	75.13	25-97
2	Two Maths + 1 or more Physical Science(s)	M	260	69.25	10.94	69.10	23-95
		F	204	72.97	9.57	73.90	46-92
		T	464	70.89	10.51	71.24	23-95
3	Two Maths + 1 or more Social Science(s)	M	47	71.13	9.87	71.25	48-90
		F	33	73.67	8.03	73.00	52-87
		T	80	72.18	9.19	71.53	48-90
4	One Math + 2 or more Physical Sciences	M	24	64.63	10.12	63.50	48-83
		F	19	72.53	8.97	72.25	56-88
		T	43	68.12	10.31	68.01	48-88
5	One Math + 3 or more Physical Sciences	M	27	62.96	7.27	62.25	47-75
		F	53	71.42	8.19	71.58	55-88
		T	80	68.56	8.81	61.24	47-88
6	Two or more Physical Sciences with no Math	M	17	63.94	8.42	63.52	51-82
		F	18	69.17	5.85	69.48	58-80
		T	35	66.63	7.58	67.23	51-82
7	One Math + 3 or more Social Sciences	M	28	67.43	8.39	66.00	55-85
		F	17	66.65	11.50	68.00	34-84
		T	45	67.13	9.56	66.81	34-85
8	One Math + 2 Social Sciences	M	33	66.79	8.48	66.13	45-82
		F	44	69.75	8.23	70.75	50-85
		T	77	68.48	8.42	68.31	45-85
9	Three or more Social Sciences with no Math	M	78	64.28	8.54	65.17	43-78
		F	87	67.05	6.80	66.67	53-88
		T	165	65.74	7.77	66.14	43-88
10	Two Social Sciences with no Math	M	23	67.17	10.24	65.25	49-84
		F	95	70.04	7.93	70.00	42-87
		T	118	69.48	8.46	69.62	42-87
11	Three or more Langs. (Eng. or any other)	M	6	63.50	9.67	67.50	45-71
		F	49	75.44	8.40	75.25	58-92
		T	55	74.15	9.24	74.14	45-92
12	Four Languages (English or any other)	M	5	66.40	8.96	64.00	57-80
		F	40	75.20	9.17	74.17	54-93
		T	45	74.22	9.47	73.74	54-93
13	Five Languages (English or any other)	M	5	77.00	7.58	80.00	64-83
		F	24	77.88	10.32	80.50	57-93
		T	29	77.82	9.79	80.21	57-93
14	Other Combinations	M	39	68.31	9.91	67.80	46-85
		F	79	72.89	7.45	71.75	60-91
		T	118	71.37	8.58	70.14	46-91
	Total	M	983	70.00	11.32	69.55	23-97
		F	920	72.52	9.73	72.40	25-96
		T	1903	71.22	10.65	71.04	23-97

Table 2 TWO-WAY ANALYSIS OF VARIANCE OF FINAL WEIGHTED AVERAGE MARKS BY SUBJECT COMBINATION AND SEX FOR (1976) UNIVERSITY APPLICANTS TO ONTARIO UNIVERSITIES

Source of Variation	d.f.	Mean Square	F	Significance of F
Main Effects	12	1,282.18	12.39	.001
Sex	1	5.93	5.93	.014
Subject Combination	11	9.54	9.54	.001
Interaction between Sex & Subject Combination	11	118.40	1.14	.322
Explained	23	925.62	8.94	.001
Residual	1,878	103.49		
Total	1,901	113.43		

Table 3 PERCENTAGE DISTRIBUTION OF (1976) UNIVERSITY APPLICANTS BY SUBJECT COMBINATION, SEX AND ADMISSION STATUS IN ONTARIO UNIVERSITIES

Subject Combinations	Male			Female			Total			Chi Square[1] d.f.=1
	Reg. %	Not Reg. %	Total Appl. N	Reg. %	Not Reg. %	Total Appl. N	Reg. %	Not Reg. %	Total Appl. N	
Three or more Maths	76.7	23.3	391	81.6	18.4	158	78.1	21.9	549	1.59
Two Maths + 1 or more Physical Science(s)	75.4	24.6	260	79.4	20.6	204	77.2	22.8	464	1.05
Two Maths + 1 or more Social Science(s)	83.0	17.0	47	72.7	27.3	33	78.7	21.3	80	1.22
One Math + 3 or more Physical Science(s)	62.5	37.5	24	52.6	47.4	19	58.1	41.9	43	.42
One Math + 2 Physical Science(s)	44.4	55.6	27	79.2	20.8	53	67.5	32.5	80	1.25
Two or more Physical Sciences with No Math	58.8	41.2	17	72.2	27.8	18	65.7	34.3	35	.70
One Math + 3 Social Sciences	64.3	35.7	28	58.8	41.2	17	62.2	37.8	45	.13
One Math + 2 Social Science	78.8	21.2	33	81.8	18.2	44	80.5	19.5	77	.11
Three Social Sciences with No Math	56.4	43.6	78	59.8	40.2	87	58.2	41.8	165	.19
Two Social Sciences with No Math	65.2	34.8	23	74.7	25.3	95	72.9	27.1	118	.85
Three or more Langs. (Eng. or any other)	87.5	12.5	16	81.4	18.6	113	82.2	17.8	129	.35
Other Combinations	59.0	41.0	39	77.2	22.8	79	71.2	28.8	118	4.24*
Total	72.4	27.6	983	76.3	23.7	920	74.3	25.7	1903	
Chi square[2] d.f.=11		38.30**			28.69**			48.58**		

[1]Chi square values testing the significance of the relationship between admission status and sex.

[2]Chi square values testing the significance of relationship between admission status and pecking order.

*Significant beyond the .05 level.

Table 4 PERCENTAGE DISTRIBUTION OF STUDENTS REGISTERED IN ONTARIO UNIVERSITIES (1976) BY SUBJECT COMBINATION, SEX AND CHOICE OF UNIVERSITY OF REGISTRATION

	Subject Combination	Sex	Choice of University of Registration: First %	Second %	Third %	Total Number of Registrants	Chi Square[1] $df = 1$
1	Three or more Maths	M	69.7	19.0	11.3	300	.25
		F	72.1	16.3	11.6	129	
		T	70.4	18.2	11.4	429	
2	Two Maths + 1 or more Physical Science(s)	M	67.9	21.4	10.7	196	1.21
		F	51.5	24.7	10.3	162	
		T	65.4	22.9	11.7	358	
3	Two Maths + 1 or more Social Sciences	M	66.7	17.9	15.4	39	2.10
		F	83.3	16.7	--	24	
		T	73.0	17.5	9.5	63	
4	One Math + 3 or more Physical Sciences	M	46.6	26.7	26.7	15	.03
		F	50.0	30.0	20.0	10	
		T	48.0	28.0	24.0	25	
5	One Math + at least 2 Physical Sciences	M	50.0	41.7	8.3	12	.80
		F	64.3	19.0	16.7	42	
		T	61.1	24.1	14.8	54	
6	Two or more Phsyical Sciences with no Math	M	30.0	60.0	10.0	10	3.49
		F	69.2	15.4	15.4	13	
		T	52.2	34.8	13.0	23	
7	One Math + 3 or more Social Sciences	M	61.1	33.3	5.6	18	.00
		F	60.0	30.0	10.0	10	
		T	60.8	32.1	7.1	28	
8	One Math + 2 Social Sciences	M	69.3	26.9	3.8	26	.25
		F	75.0	19.4	5.6	36	
		T	72.6	22.6	4.8	62	
9	Three Social Sciences with no Math	M	65.9	31.8	2.3	44	.06
		F	63.5	26.9	9.6	52	
		T	64.6	29.2	6.2	96	
10	At least two social sciences with no Math	M	73.4	13.3	13.3	15	.21
		F	69.1	23.9	7.0	71	
		T	69.8	22.1	8.1	86	
11,12 & 13	Three or more Langs. (Eng. or any other)	M	78.6	21.4	--	14	.01
		F	77.2	19.6	3.2	92	
		T	77.4	19.8	2.8	106	
14	Other Combinations	M	65.3	30.4	4.3	23	1.53
		F	70.5	19.7	9.8	61	
		T	69.1	22.6	8.3	84	
	Total	M	67.3	22.5	10.2	712	.46 (d.f.=2)
		F	69.0	21.2	9.8	702	
		T	68.1	21.9	10.1	1414	

$\chi^2 = 33.95$ $df = 22$ Significant at the .05 level

[1] Chi square values testing the significance of the relationship between choice of university and sex.

[2] Chi square value testing the significance of the relationship between choice of university and subject combination.

Table 5 NUMERICAL AND PERCENTAGE DISTRIBUTIONS OF STUDENTS IN ONTARIO UNIVERSITIES (1976) BY FINAL WEIGHTED AVERAGE MARKS, SEX AND CHOICE PREFERENCE OF UNIVERSITY OF REGISTRATION

Final Weighted Average of best six	Sex	Choice Preference of University of Registration: First N	First %	Second N	Second %	Third N	Third %	Registered in Ontario University N	Registered in Ontario University %	Not Reg. in Ontario University N	Not Reg. in Ontario University %	Total Applicants N
50	M									40	100.0	40
	F									10	100.0	10
	T									50	100.0	50
50-59	M	9	33.4	13	48.1	5	18.5	27	20.6	104	79.4	131
	F	7	31.8	9	40.9	6	27.3	22	32.4	46	67.6	68
	T	16	32.7	22	44.9	11	22.4	49	24.6	150	75.4	199
60-69	M	120	51.3	80	34.2	34	14.5	234	73.4	85	26.6	319
	F	100	53.5	49	26.2	38	20.3	187	69.5	82	30.5	269
	T	220	52.3	129	30.6	72	17.1	421	71.6	167	28.4	588
70-79	M	173	72.7	42	17.6	23	9.7	238	88.5	31	11.5	269
	F	205	71.9	61	21.4	19	6.7	285	84.1	54	15.9	339
	T	378	72.3	103	19.7	42	8.0	523	86.0	85	14.0	608
80-89	M	143	82.2	23	13.2	8	4.6	174	95.1	9	4.9	183
	F	145	83.8	25	14.5	3	1.7	173	86.9	26	13.1	199
	T	288	83.0	48	13.8	11	3.2	347	90.8	35	9.2	382
90-100	M	33	86.8	2	5.3	3	7.9	38	95.0	2	5.0	40
	F	27	77.1	5	14.3	3	8.6	35	100.0	–	–	35
	T	60	82.2	7	9.6	6	8.2	73	97.3	2	2.7	75
Total	M	478	67.2	160	22.5	73	10.3	711	72.4	271	27.6	982
	F	484	69.0	149	21.2	69	9.8	702	76.3	218	23.7	920
	T	962	68.1	309	21.9	142	10.0	1413	74.3	489	25.7	1902

$x^2 = 123.25$

$df = 3$

$p < .001$

Table 6 MEANS AND STANDARD DEVIATIONS OF FINAL WEIGHTED AVERAGE MARKS OF STUDENTS IN ONTARIO UNIVERSITIES (1976) BY SEX AND PREFERENCE CHOICE OF UNIVERSITY OF REGISTRATION

Preference Choice of University	Male N	Male Mean	Male SD	Female N	Female Mean	Female SD	Total N	Total Mean	Total SD
First	478	76.0	8.77	484	76.07	8.08	962	71.22	8.43
Second	160	69.46	8.23	149	72.00	8.80	309	70.68	8.59
Third	73	69.40	8.75	69	68.09	8.06	142	68.76	8.42
Other[1]	271	59.87	10.10	218	66.39	10.49	489	62.78	10.77
Total Applicants	982	70.00	11.32	920	72.52	9.73	1,902	71.22	10.65

[1]Students not registered in Ontario universities

Table 7 TWO WAY ANALYSIS OF VARIANCE OF FINAL WEIGHTED AVERAGE MARKS OF STUDENTS REGISTERED IN ONTARIO UNIVERSITIES (1976) BY SEX AND PREFERENCE CHOICE OF UNIVERSITY OF REGISTRATION

Source of Variation	*df*	Mean Square	F	Significance of F
Main effects	3	2,725.00	38.19	L.001
sex	1	1.12	.02	.999
choice of university	2	3,379.41	47.36	L.001
Interaction between sex & choice of university	2	241.54	3.38	.033
Explained	5	2,366.84	33.17	.001
Residual	1,408	71.35		
Total	1,413	79.48		

Table 8 PERCENTAGE DISTRIBUTION OF STUDENTS REGISTERED IN ONTARIO UNIVERSITIES (1976) BY SUBJECT COMBINATION, SEX AND PREFERENCE CHOICE OF PROGRAM OF REGISTRATION

			Choice of Program or Registration				Total	Chi
	Subject Combination	Sex	First %	Second %	Third %	Other %	Number of Registrants	Square[1] $df = 1$
1	Three or more Maths	M	78.1	10.3	5.0	6.6	300	10.37**
		F	72.9	3.9	3.9	16.3	129	($df = 3$)
		T	76.4	7.3	4.7	9.6	429	
2	Two Maths + 1 or more Phsyical Science(s)	M	77.0	14.3	2.0	6.7	196	3.31
		F	72.2	13.6	4.9	9.3	162	($df = 3$)
		T	74.9	14.0	3.4	7.8	358	
3	Two Maths + 1 or more Social Sciences	M	82.1	10.2	2.6	5.1	39	.02
		F	83.3	16.7	-	-	24	
		T	82.5	12.7	1.6	3.2	63	
4	One Math + 3 or more Phsyical Sciences	M	86.6	6.7	6.7	-	15	1.04
		F	70.0	10.0	10.0	10.0	10	
		T	80.0	8.0	8.0	4.0	25	
5	One Math + at least 2 Physical Sciences	M	75.0	16.7	-	8.3	12	.06
		F	71.4	11.9	4.8	11.9	42	
		T	72.2	13.0	3.7	11.1	54	
6	Two or more Ph ical Sciences with no Math	M	70.0	30.0	-	-	10	.00
		F	69.2	15.4	7.7	7.7	13	
		T	69.7	21.7	4.3	4.3	23	
7	One Math + 3 or more Social Sciences	M	83.3	11.1	-	5.6	18	1.87
		F	100.0	-	-	-	10	
		T	89.3	7.1	-	3.6	28	
8	One Math + 2 Social Sciences	M	69.3	19.2	11.5	-	26	5.21*
		F	91.6	2.8	5.6	-	36	
		T	82.2	9.7	8.1	-	62	
9	Three or more Social Sciences with no Math	M	86.4	6.8	-	6.8	44	.90
		F	92.3	5.8	-	1.9	52	
		T	89.6	6.5	-	4.2	96	
10	At least 2 Social Sciences with no Math	M	86.6	-	6.7	6.7	15	.65
		F	91.6	5.6	-	2.8	71	
		T	90.7	4.6	1.2	3.5	86	
11,12 & 13	Three or more Langs. (Eng. or any other)	M	92.9	7.1	-	-	14	.00
		F	92.4	4.3	-	3.3	92	
		T	92.5	4.7	-	2.8	106	
14	Other Combinations	M	69.7	21.7	4.3	4.3	23	5.42*
		F	90.2	8.2	-	1.6	61	
		T	84.5	11.9	1.2	2.4	84	
	Total	M	78.5	11.9	3.7	5.9	712	6.20
		F	81.7	8.5	2.7	7.1	702	($df = 3$)
		T	80.0	10.2	3.2	6.5	1414	
	$\chi^2 = 65.89$***		$df = 33$		$p < .001$			

[1] Chi square values testing the significance of the relationship between choice of program and sex.

[2] Chi square value testing the significance of the relationship between choice of program and subject combination.

* Significant at the .05 level.

** Significant at or beyond the .01 level.

*** Significant or beyond the .001 level.

Table 9 NUMERICAL AND PERCENTAGE DISTRIBUTIONS OF FINAL WEIGHTED AVERAGE MARKS OF STUDENTS REGISTERED IN ONTARIO UNIVERSITIES (1976) BY SEX AND CHOICE OF PROGRAM OF REGISTRATION

Final Weighted Average of Best Six Credits	Sex	Program Choice of Those Registered in Ontario Universities								Total				
		First		Second		Third		Other		Registered in Ontario University		Not Reg. in Ontario University		Applying
		N	%	N	%	N	%	N	%	N	%	N	%	N
<50	M											40	100	40
	F											10	100	10
	T											50	100	50
50 to 59	M	17	63.0	7	25.9	2	7.4	1	3.7	27	20.6	104	79.4	131
	F	14	63.6	4	18.2	2	9.1	2	9.1	22	32.4	46	67.6	68
	T	31	63.3	11	22.4	4	8.2	3	6.1	49	24.6	150	75.4	199
60 to 69	M	178	76.1	32	13.7	12	5.1	12	5.1	234	73.4	85	26.6	319
	F	151	80.8	17	9.1	9	4.8	10	5.3	187	89.5	82	30.5	269
	T	329	78.2	49	11.6	21	5.0	22	5.2	421	71.6	167	28.4	588
70 to 79	M	184	77.4	27	11.3	7	2.9	20	8.4	238	88.5	31	11.5	269
	F	234	82.1	24	8.4	6	2.1	21	7.4	285	84.1	54	15.9	339
	T	418	79.9	51	9.8	13	2.5	41	7.8	523	86.0	85	14.0	608
80 to 89	M	146	83.9	17	9.8	4	2.3	7	4.0	174	95.1	9	4.9	183
	F	145	83.8	13	7.5	1	.6	14	8.1	173	86.9	26	13.1	199
	T	291	83.9	30	8.6	5	1.4	21	6.1	347	90.8	35	9.2	382
>90	M	33	86.8	2	5.3	1	2.6	2	5.3	38	95.0	2	5.0	40
	F	29	82.9	2	5.7	1	2.9	3	8.5	35	100.0	–	–	35
	T	62	85.0	4	5.5	2	2.7	5	6.8	73	97.3	2	–	75
Total	M	558	78.4	85	12.0	26	3.7	42	5.9	711	72.4	271	27.6	982
	F	573	81.7	60	8.5	19	2.7	50	7.1	702	76.3	218	23.7	920
	T	1131	80.0	145	10.3	45	3.2	92	6.5	1413	74.3	489	25.7	1902

$x^2 = 15.54$ $df = 6$ $p < .05$

Table 10 MEANS AND STANDARD DEVIATIONS OF FINAL WEIGHTED AVERAGE MARKS OF STUDENTS IN ONTARIO UNIVERSITIES (1976) BY SEX AND CHOICE OF PROGRAM OF REGISTRATION

Program Choice	Male N	Male Mean	Male SD	Female N	Female Mean	Female SD	Total N	Total Mean	Total SD
First	558	74.40	9.17	573	74.65	8.52	1131	74.53	8.84
Second	85	71.63	8.98	60	72.95	8.67	145	72.18	8.84
Third	26	70.35	8.91	19	70.05	9.82	45	70.22	9.20
Other	42	73.29	8.84	50	75.26	9.25	92	74.36	9.07
Total Registered in Ontario Univ.	711	73.85	9.17	702	74.42	8.64	1413	74.14	8.92

Table 11 TWO-WAY ANALYSIS OF VARIANCE OF FINAL WEIGHTED AVERAGE MARKS OF STUDENTS REGISTERED IN ONTARIO UNIVERSITIES (1976) BY SEX AND CHOICE OF PROGRAM OF REGISTRATION

Source of Variation	*df*	Mean Square	F	Significance of F
Main Effects	4	252.55	3.21	.012
Sex	1	89.10	1.13	.288
Choice of program	3	306.01	3.89	.009
Interaction between sex & choice of program	3	32.27	.41	.999
Explained	7	227.06	2.88	.006
Residual	1,406	78.74		
Total	1,413	79.48		

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