

**ABORIGINAL  
EDUCATION, TRAINING  
AND  
EMPLOYMENT**

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## INTRODUCTION

The correlation between training and educational attainment and employment opportunities, economic well-being and health has been well established and recognized by many, including the Royal Commission on Aboriginal Peoples. It is also recognized that over the past two decades, effective programs such as the Post Secondary Student Support Program, have been developed to encourage Aboriginal students to take advanced education and training. However, one result is that enrollments have grown steadily in certain programs while participation in others are invisible. This has caused an under representation in certain occupations and an overabundance in others, questioning whether we are providing the proper training to prepare Aboriginal students for the future.

We all find ourselves in a rapidly changing world in which competition has assumed a greater role than ever before. Aboriginal peoples of Canada are caught in a bind. They are not competing effectively within the Canadian economy as it is presently structured. How can they compete in a perhaps radically altered new economy which is responsive to global markets, and is being buffeted by winds of technological change unlike anything ever encountered by humankind. Aboriginal people will find themselves on the same roller coaster as other Canadians. New strategies for learning and working must be adopted if we are all to compete globally and maintain our standards of living. Within all of this is the recognition that there must be fundamental rethinking of the education and training system; rethinking the role of the State; and an appreciation of the importance of the education system supporting Aboriginal people and their participation in the economy.

The Royal Commission on Aboriginal Peoples commissioned Del C. Anaquod to prepare a paper on alternative strategies and recommendations to meeting the education and training needs of the Aboriginal work force in this ever changing environment.

## **Past Policies**

Training in Canada is an industry which has become largely dependent upon publicly-funded training strategies. As each successive government goes through a predictable cycle of reconnaissance, strategy and action, the Canadian labour force is massaged in a particular direction. Funding for training is subsequently directed to specific initiatives identified as having strategic importance to the Canadian labour force and its employment and educational development.

A review of policy and practice over the last three decades shows that government training strategies have been evolving from a "we do it for you" approach to a "we'll let you do it for yourself" approach. The gradual transformation to this style of programming has allowed the users of such a system to initiate and direct their own training.

Flexibility, in approach and in policy, and at the same time meeting the needs of general labour market requirements is a sensitive balancing act for any government training initiative. The range of individual skills, education levels and occupational types is varied, and training initiatives must be responsive enough to accommodate this variation. The success of such an approach is also dependent upon the flexibility of the system when new or alternative approaches are proposed.

One such approach proposed in this paper, is the establishment of equivalent Tribal Colleges presently thriving in the United States. By reviewing the Tribal College movement in the U.S., we can evaluate their effectiveness in providing training and educational programming for their people and their potential application in Canada

## **Tribal Colleges**

The first tribal colleges were founded in the late 1960s and early 1970s, amidst the national ferment of activism for civil rights and Indian self-determination. Leaders in many Indian communities had come to recognize both the value and the vulnerability of their own tribal ways of life. Governmental agencies and centralized programs did not seem to offer promising solutions to serious Indian issues. Self-governance and the building of local institutions appeared, to some

visionaries, as the course which their communities must take if they were to survive.

Higher education, and access to the abilities which it develops, proved a special problem to Indian people. Elected tribal officials and elders on several reservations saw that federal policies towards higher education were not serving Indian students or Indian communities. Repeatedly, young people would leave their reservations to enroll in post-secondary institutions, and repeatedly, the students would return within a semester or two. The distances which students had to travel - cultural, social, economic, emotional, as well as geographic - often proved too large, and the reception they received at their new institutions often proved insufficiently sustaining. Students, even very bright and determined students, responded by going home.

Community leaders on several reservations recognized that discouragement and dropouts served neither the needs of individual students, nor of the tribal communities themselves. These leaders began to discuss the possibility of founding their own local colleges. Among the early advocates were several traditional elders who had not received much formal education themselves, but who recognized clearly the values of education for their tribes. These early leaders, from the outset, envisioned local institutions the colleges, locally-controlled and locally-focused. Ideas for a single, national college or university to serve all tribes had been circulated in the United States since at least 1911, but nothing substantive ever came of these ideas. Tribal colleges came into existence only as individual tribes began, one by one, to address their own needs for post-secondary education. Today, there are over two dozen Tribal Colleges operating throughout the United States.

No single approach or features accounts for the success of the colleges. Among the defining characteristics of the colleges, however, their location on reservations, and their governance by local boards, are key. As institutional members of the communities -- and the cultures -- they serve, the colleges are able to identify and solve problems in their own ways, with their own skills and resources. The persistence and dedication of faculty, administrators, and board members are crucial; many participants have stayed with their institutions, despite low salaries and

gruelling working conditions, since the colleges opened. These individuals have developed - and shared - essential, long-term experience. This sharing, in fact, constitutes a third vital ingredient for the success of the colleges. From the outset, the colleges have served as each others' best sources of advice, support, and technical assistance. Fourth, frugal and prudent management of material resources has been a hallmark of the colleges' administrative styles. Finally, and most essentially, each college acknowledges traditional Indian spiritual values, based in its own tribe's living culture, as central in defining its role in the community. Traditional spiritual leaders were prominent among the founders of several tribal colleges. Their ways of looking at the world have shaped the character, not only of their particular institutions, but of the tribal college movement as a whole. From these experiences, one can conclude that similar institutions in Canada could have the same beneficial impacts for Aboriginal communities.

### **Impact of Science and Technology**

The second argument of this paper is the need for Aboriginal people and governments to recognize the impact of accelerating technology on Aboriginal society. The world is undergoing evolutionary and relentless change due to technological innovation. Aboriginal cultures and societies in the past have proven persistent through extremely dynamic and cataclysmic times. The revolutionary information era that is sweeping the globe, clearly presents challenges for all societies and nations. Aboriginal Nations are no exceptions, but they will unquestionably retain the fundamental precepts of their cultures and societies. However, they must embrace the technology or risk future prosperity.

There is nothing un-Indian about technology. There is nothing wrong with Aboriginal people employing technology to their advantage. Insulating Aboriginal people from technological change has proven disastrous<sup>1</sup> and would be especially disastrous now. In the long run, failure to foster access to technology for parsimonious reasons is debilitating and costly for all. It can and should be done in an efficient and cost effective manner. But it can't be avoided. Aboriginal populations are young and rapidly growing. Embracing technology through appropriate

curriculum will give young Aboriginal workers the skills they and their communities need.

### **Preparing for the Future**

The third issue addressed in this paper is the acknowledgment that Aboriginal people are severely under-represented in the science-based professions and occupations, such as those related to agriculture, engineering, the health sciences and related technologies. For example, as far as is known, there are currently 34 Canadian physicians of Aboriginal ancestry, approximately 2% of the 1480 required for proportional representation in this profession; Aboriginal representation in other science-based professions and occupations is of the same order. Enrollments in these programs are very low and retention rates are discouraging. This means that if action is not taken, Aboriginal people will continue to be under represented in the science-based occupations and professions well into the 21st century; a century in which science and technology promises to play an even more important role.

The choice is clear: to invest more now in creative solutions to increase the educational attainment of Aboriginal people, particularly in the science-based areas, or to accept higher expenditures for the consequences of inaction later. The population of the Aboriginal people will increase significantly in the next two decades. Furthermore, it is also projected that most of the new jobs created in the 21st century will require even higher levels of education than those of today. Maintaining the status quo will inevitably result in higher unemployment for Aboriginal people in the future. As a result, Aboriginal people will be even more marginalized, continuing to face the health, social and economic problems which beset them today, but on a far greater scale. This inevitably translates into increased expenditures for social assistance, health programs and more penal institutions, to say nothing of the cost in human terms.

Alternatively, a great investment could be made now in well-designed, new initiatives to increase the number and success rate of Aboriginal people in science-based degree and diploma programs. This would, in turn, increase employment opportunities for Aboriginal people, enable

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<sup>1</sup> At the turn of the century, Indian agents prevented First Nations people from using labour-saving machinery, such



them to participate more fully in economic development, empower them to improve their own health care systems and thus would return monetary and social dividends. This development of human resources would enable Aboriginal people to have greater control over their own destiny, to maintain their own culture and to become a leading force in the economic, cultural, political, and scientific future of Canada. Enlightened self-interest, if not the moral suasion of social justice demanding equal opportunity for all, should ensure that this investment be made.

The fact that Aboriginal people are so under represented in science-based vocations is evidence that existing education institutions at all levels have not been effective in addressing this problem. A new approach must be taken - one which builds upon the experience gained in many successful initiatives undertaken in Canada and the United States to improve the participation, retention, and success rates of culturally diverse minorities in educational programs; and one in which Aboriginal people themselves have ownership and responsibility for its success. An investment and a commitment must be made to support a comprehensive, multi-faceted, strategic plan designed to realize cumulative improvements in the interest and education attainment of Aboriginal people in mathematics- and science-related fields over the long term. This paper outlines a strategic plan to achieve this goal.

Lastly, the report concludes with a number of observations including the skills required by Aboriginal peoples to survive in the new millenium. In addition to the major recommendations embodied in the body of this report, a number of specific conclusions are provided.

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as thrashers, since they felt that it encouraged laziness.

## **BACKGROUND**

### **Traditional Aboriginal Education and Adaptation**

Over millennia, Aboriginal peoples of this continent evolved unique ways of adapting to their environment. This was not a static interaction. Rather, Aboriginal peoples changed their social organizations, their patterns of subsistence activities and other material aspects of their cultures as necessary to survive, and thrive, in an often harsh and unforgiving environment.

Unlike western societies of today, the Aboriginal peoples employed a system of education and economic exploitation of available resources which were inextricably intertwined. One did not go to school to become a hunter, an artisan, a gatherer or fisherman. Nor, after attaining the requisite "paper" credentials did one then go off to practise one's speciality. Labour force training was an integral part of every day living. The training which was obtained was immediately useful in real life situations, and the utilization of that training paid immediate dividends in the socio-economic systems of Aboriginal peoples. Aboriginal modes of learning were very similar to Aboriginal spirituality. Spirituality was a daily practise, utilized as necessary. It was not regimented, nor was it relegated to a particular day or a particular time.

From the "Clovis culture" mammoth hunters of 12,000 years ago, to the horsemen who dominated the Great Plains in historic times, Aboriginal Peoples underwent radical changes as, and when, it was necessary for them to do so. Radical changes, successfully undertaken, imply the ability to impart relevant knowledge of past practices and customs on a societal basis, and the ability to consciously engage in decisions to change past practices when required in order to secure a future for the People.

It is common knowledge, of course, that there were a great number of cultures existing in Canada from the earliest days until historic times. Each of these cultures, be they First Nations, Inuit or the Métis Nation, have had different experiences in relation to first contact with European settlers. Some have had a longer period of time to adapt to western cultural contact than others.

Some have only recently come into frequent contact with the larger society of Canada.

Aboriginal societies, until historical times, had their own systems of education and training which involved the entire community and imparted needed information to youth to enable them to function appropriately within society and to cope with their environment. Education in Aboriginal societies, although not formalized in the sense we think of education today, was a lifelong process. It was a process in which knowledge was handed down from generation to generation. The world of work, and the world of learning, did not have artificial bounds and determinants such as we have today. An Aboriginal person learned while working, and worked while learning every day of his/her life. There were no institutions of learning. Rather, an individual learned from all those around him/her, and it was the task of all to impart knowledge as necessary.

The first contacts between Aboriginal peoples and Europeans were, primarily, trade oriented. Europeans wanted furs. Aboriginal peoples desired trade goods. Both sides thought that they profited as a result of the relationship which was established. However, the interaction eventually created a fundamental change in the ability of Aboriginal peoples to be self-sustaining. The increased dependence on trade goods saw skills acquired over generations discarded very quickly. The skills of potters, for example, were no longer needed in a society which now had access to copper and iron pots. Flint knappers were redundant in a society which had easy access to metal arrow heads and spear points and, eventually, rifles and shotguns. Trapping activities assumed greater importance in the Aboriginal economy as a result of the consonant opportunity of acquiring trade goods.

From the days of first contact to the eventual settlement of First Nations, Inuit and Métis peoples on reserves, or in communities, nomadic, or semi-nomadic, ways of life were, for many Aboriginal cultures, replaced with sedentary ones. The old skills of the past were no longer necessary, or effective, in sustaining the people. Sufficient time had not elapsed, as it had in the past, to enable the people to adapt to the new circumstances in which they found themselves.

## **Transition To Modernization**

A transition process began which could lead Aboriginal peoples down one path, and one path only: a switch from the traditional hunting and gathering economy which relied upon a sharing of wealth and services to one in which a wage economy and competition was necessary in order to create, retain and accumulate more wealth. It is fair to state that Aboriginal peoples have found this transition extremely difficult, and will continue to find it difficult for some time to come. The high rates of dependency on social welfare programs, high rates of unemployment, addictions, incarceration, suicide, violent deaths stand as living testimonials to the inability of Aboriginal cultures to come to terms with the new ways of life in which they find themselves and in a world they no longer control.

However, one can ask whether modernization necessarily implies the wearing of a mantle of westernization as we know it in Canada. Other cultures, such as the Japanese, have very successfully modernized their economy, but they have done so on their own terms, and in ways which do not violate the cultural norms which they hold dear. The Japanese, for example, have an economy which is based on harmony, discipline and the collective. The Canadian economy is more licentious and anarchistic.

For Aboriginal peoples, the route to modernization may well be a combination of their own cultural traditions with technologies of the present and the future. If the Japanese could recover from the devastation experienced by their nation during, and at the close of the second world war, with their culture, language and traditions intact, then why is a similar chrysalis not possible for the Aboriginal peoples of Canada?

The values of caring and sharing were necessary for Aboriginal peoples to survive in a climate, and environment, as harsh as Canada's. Indeed, without such an ethic, neither the Aboriginal peoples, nor the first European settlers, could have gained, and maintained, a foothold in this country. Caring and sharing are endemic to the way in which Aboriginal peoples think about themselves and each other. There is not the same focus on the creation and retention of individual

wealth that one finds elsewhere in our society since a person who will not share is a person who is rejecting his/her own family, his/her own people. It was necessary, in the past, that all of the skills and wealth of Aboriginal communities be dispersed widely in order to survive. While such a sharing might not be as necessary today, the values and ethics remain. Aboriginal peoples find themselves, today, immersed in a competitive, contemporary environment within which traditional values, philosophies and ethics find some difficulty. The transition has not been easy, and the system of education and work ethic which exist in society at large are often at odds with Aboriginal thought and ways of doing things.

An Indian elder was once asked to deliver a keynote address at a world symposium of chronologists (keepers of the world's atomic clocks) and physicists which was held in Saskatoon. He appeared at the appointed hour and said, "About 490 years ago, Christopher Columbus stumbled on to our shores. We have been late ever since." He said nothing more.

It is interesting how concepts of time can differ so materially from one culture to another. In western thought, timeliness is next to godliness. As a result of the industrial revolution, time is the measure by which cogs in the machinery of production are assessed in relation to their productivity. Mass production of goods "on time and on (or under) budget" is necessary to meet commitments and, more importantly, maximize profits. The hunter had no production quotas to meet at a particular hour. Activities were undertaken as they were needed. The concept of profit existed, but did not occupy the dominant position in society that we have given it. A hundred and fifty years later, after generations of Aboriginal people have been left out of the mainstream of society it is, perhaps, not altogether surprising that it is difficult for them to make the transition and become the same as their non-Aboriginal neighbours.

Western society has created artificial barriers, on a philosophical level, between education and employment. One attends school or post-secondary institutions for a number of years, and then one is expected to shed the mantle of being a "student" and assume the role of being a "worker". This concept was foreign to the Aboriginal way of thinking 150 years ago. Learning and living

were, at that time, intertwined and one could not easily separate the two. Perhaps it is time that western society had a cold, hard look at its concepts of education, labour training and employment.

Aboriginal cultures learned very long ago that learning does not stop at any particular age or upon the attainment of any particular distinction - it goes on. Western societies have begun to rethink the concept that education ends upon graduation and, thereafter, work begins. While some western societies are adopting the principle of life long learning, much work needs to be done to change existing attitudes. Individuals harbour the attitude that it is sufficient, in order to find work, to attain a certain level of educational achievement - be it high school, a diploma or a university degree. This attitude needs significant fine tuning. People must begin to think that a certain level of educational achievement is not the means to an end but, rather, a means to a beginning.

### **New Global Economy**

We all find ourselves in a rapidly changing world in which competition has assumed a greater role than ever before. This competition has come about, in part, because of the ability of certain nations to focus their economic policies in ways which allow them to maximize production, maintain strict quality control, and sell at lower costs (with resultant higher profits). This has had an impact upon the affluent West where we have sheltered our manufacturers from the global marketplace by introducing tariffs against imports and artificially keeping domestic prices high in order that those manufacturers can realize profits.

The economic safety bubble which we have created is, however, about ready to burst. The creation of larger and larger free trade zones, such as the North American Free Trade Agreement (NAFTA) or the European Economic Community (EEC), has the inevitable result of increasing competition and lowering costs globally. These, combined with the General Agreement on Tariffs and Trade (GATT) has added to the competitive playing field. As developing nations acquire technologies, they will have the opportunity to export their goods and services at even lower prices than those made possible within trading blocks such as NAFTA. This will create pressure upon countries like Canada to restructure their economies in order to make their products and services

more competitive.

The Aboriginal peoples of Canada are caught in a bind. They are not competing effectively within the Canadian economy as it is presently structured. How can they compete in a perhaps radically altered new economy which is responsive to global markets, and is being buffeted by winds of technological change unlike anything ever encountered by humankind. Aboriginal people will find themselves on the same roller coaster as other Canadians. New strategies for learning and working must be adopted if we are all to compete globally and maintain our standards of living.

In many ways, traditional Aboriginal practices may provide some measure of stability for Aboriginal people in the new global economy. The Japanese concept of harmonious, disciplined and collective economic activity is not far removed from Aboriginal traits of sharing and caring. Aboriginal people have, perhaps, an opportunity to reinforce their culture while, at the same time, becoming active players in the Canadian, and world economy. The circle may be coming around.

Developing nations can produce their goods and services in a cost effective manner because their standards of living are very low. Often, there are no environmental laws and regulations governing industry, no human rights legislation, no minimum wage laws. Very few of the rules by which we live interfere in the production and manufacture of a developing country's goods and services. Developing nations have virtually no social safety net. Government spending is, by our standards, very low. Wages are cheap, often less than one dollar per day.

### **Public Debt and Government Restructuring**

The response of Canadian manufacturer's to global competition has been to restructure and slash overheads. In many instances this has meant reducing work forces, increasing automation and production. This response has created, for the last decade, double digit unemployment rates.

At the same time, Canadian governments have struggled to maintain our social safety net in order that individuals are not ravaged by the deleterious effects of joblessness, ill health and

despair. In the course of maintaining that safety net, Canadian governments have exceeded their incomes and massive deficits and a burgeoning national debt is the result.

The annual interest on the Federal debt of \$511 billion is now \$41 billion. Next year, it will be \$42 billion on a debt that will have risen to \$551 billion. With a projected Federal deficit this year of \$40 billion, just about everything Canada is borrowing is needed to pay interest on the money we have borrowed before. Ottawa's budgetary revenue will, in 1994, be \$124 billion. Interest payments now account for one-third of federal revenue, and constitute by far the largest single federal spending program. The largest share of the accumulated debt is attributable to income maintenance and job creation programs - all of which will have to be cut back now to make room for even higher interest payments.

Governments, like individuals, have limited choices when dealing with their debts. They can reduce their expenditures or they can increase their incomes. Sometimes reduction of expenditures is not as simple as spending less money. Outside factors, such as rising interest rates, can have alarming consequences upon existing cash flows. This inevitably results in compounded debt. Similarly, raising incomes is not always an easy proposition. While the government has the power to raise taxes, if the people being taxed reach a point where they are unable to pay any more without, themselves, beginning to avail themselves of the social safety net in great numbers, then earning additional revenue becomes problematic for government.

Canadian taxpayers are generally feeling at the end of their rope insofar as their ability to pay additional taxes is concerned. This has resulted in actions by federal and provincial governments to off-load their responsibilities for providing programs and services wherever possible. However, if those programs and services must still be provided by some level of government, then the off-loading has no beneficial effect for the taxpayer - who simply pays the taxes to another level of government. The net effect of off-loading has, so far, remained the same as far as taxpayers are concerned. The political choice, and responsibility, of cutting back on programs and services merely falls on the shoulders of a subordinate level of government - who



must either face the consequences of discontinuing the program or service, or raise taxes in order to meet the costs.

The conundrum which Canada, and other western countries face, has resulted in calls for greater fiscal responsibility on the part of government. Ultimately, this will result in governments cutting back on spending at unprecedented levels. Universality of certain programs has already been affected. Means tests are employed in areas, such as the child tax benefit, which would have been anathema just a few short years ago. The Unemployment Insurance Plan, the Canada Pension Plan, the National Medicare Plan are all potential victims of government cutbacks and restraint programs. It may well be that some of these programs could cease to exist altogether. For example, it was recently reported in February, 1994, that the Canada Pension Plan, for the first time, took in less premiums than it paid out in benefits. If such a trend were to continue on a sustained basis for some period of time, it would not be long before the Canada Pension Plan would be unable to meet its obligations as they became due. Similar scenarios can be painted for other programs which make up the social safety net.

### **Need For Aboriginal People to Adapt**

Aboriginal people are not immune from global pressures on the Canadian economy. Nor are they immune from pressures created within the economy itself. As Canada begins to restructure its affairs to effectively compete in a global economy, it will be necessary for all persons living in Canada, including Aboriginal persons, to become more self-reliant in many ways.

Prior to the creation of our social safety nets, people were more self reliant than they are today. This is not to advocate a return to the dirty thirties, or to propound a theory that each person is responsible for his/her own affairs and destiny. However, it is the researcher's opinion that many people could benefit from a return to some of the values of yesteryear. In the future, churches and charitable organizations will assume a greater role in providing for people who fall through the cracks of the social safety net as it will then exist. These same charitable groups will also have to become more self reliant, doing more with much less.

Prior to the introduction of welfare in Aboriginal communities, people grew their own gardens, cut their own firewood, repaired their own houses, hauled water and did odd jobs to raise a little cash for needs which had to be fulfilled by buying goods or services. It is rare, nowadays, to see Aboriginal people tending their own gardens or, in other ways, providing for themselves as in days past. The prevailing attitude, after several generations of complete dependence upon government, has become one in which welfare payments instead of self-sustenance are, for many people, the norm. Potatoes do not grow in the ground any more, they are obtained at the local confectionary in precut, packaged form.

**A government policy which has the effect of taking away people's incentive has little to commend it.** While it may fulfil a perceived need to ensure that the nation's poor and unemployed are cared for, it has taken away hope from a great number of people. A child growing up in a home dependent upon welfare knows nothing else. If the child comes from a broken home, or has an alcoholic or abusive parent, if no one in the child's acquaintance has a job or vocation or profession, what are that child's chances of breaking the bonds of its lifestyle and acquiring the incentive to "be somebody" or "accomplish something"?

For the foreseeable future, the Canadian economy will react to global competition through inventiveness and technological advancement. For a person to be secure in the Canada of 2000 and beyond, he/she must have the ability to adapt rapidly to changing environments, to dodge and parry the inevitable thrusts of recessions, inflation, cutbacks, rollbacks and other external circumstances which have the capacity to require further adaptability, further change.

Aboriginal peoples must make the transition, and they can only do so through educational systems which have the capacity to provide them with tools that never become antiquated or obsolete. Aboriginal peoples, in this sense, will have to return to their roots, to the ability of their ancestors to adapt to changing environments, and to learn every day of their lives.

## **Fundamental Rethinking Of The Education and Training System is Required**

Like most Canadians, Aboriginal people value highly a good education system. Education is highly correlated with a better life, more choices and opportunities for employment, better health and higher income. Both formal and informal education is increasingly seen as a life-long process and seeking more years of formal education is part of that trend. It is not surprising then that the median level of education for all Canadians has risen by almost one year for each of the last two decades - 10.6 years in 1971 to 12.2 years in 1991. The various levels of governments have responded to the public's high regard for education. On a per student basis, Canada spends considerably more on publicly funded education than does the United States, Japan, Germany, France or the United Kingdom.

Although few in Canada would question the need for education, many are questioning the value for the dollars spent on education at all levels - from elementary through to university. There is a general perception that the quality of education at all levels is not as high as it should be; that drop-out rates are too high; that there is a mismatch between what is required by a changing economic environment and what is being offered by the education system. Whether these perceptions reflect reality or are exaggerated views stimulated by a general uncertainty about the future, is not clear. However, members of Aboriginal communities and other Canadians who have had a long history of poverty and structural discrimination, and who are not among those in that sector of Canadian society which the present education system seems designed to serve best, feel even dissatisfied and with just cause.

## **The Importance of Education and Training In Determining The Strength Of The Economy**

Publicly funded social programs, like education, can only be sustained, and wealth and income can only be distributed more fairly, if wealth and income is first created. In this regard, it must be noted that the factors which determine the strength of a region's economy are changing in importance. An abundance of natural resources and arable land no longer ensures a strong economy. The domestic capital of a rich nation can flow just as easily to finance plants and equipment in less developed nations such as Mexico, South Korea or Thailand. A nation like

Japan, can exploit another country's new knowledge, superior technology and capacity to invent new products for its own gain. It appears that another factor - superior human resources at all levels and throughout a large part of a region's work force: in scientific research, in development, in production processes, in customer service, in management, in education, in Government - is going to be the most important factor in determining the competitive advantage to any economy in the 21st century.

It seems that education and training, more than ever before, helps to create the wealth that finances it. Thus, if Canada (and Aboriginal people) are to compete effectively in world markets to protect the standard of living most of its people now enjoy, it must nurture and develop its scarce human resources.

### **The Importance Of The Education System Supporting The Economy**

Equally important, educational institutions charged with the responsibility of developing our human resources must focus more attention to the implicit and direct role they can and must play in developing a strong economy. Education institutions at all levels must accept the fact that a great majority of parents who encourage their children to "get an education" do so to ensure that they may earn a living and thereby enjoy a higher quality of life than those who have not had that privilege. It is plain nonsense to suggest that more than a small proportion of students want to attend university for the sheer love of learning, or that their parents, even though they may be alumni, want them to attend for that reason. We, within the educational system, should accept the fact that for nearly everyone, the reason they seek an education, including university education at the PhD. level, is because of a belief that this is the great gateway to a profession and a good job. Even if we do not, the majority of our clients -- the students and the public -- evaluate how well our schools, colleges and universities are performing by how successful graduates are in finding employment and in earning a living.

The traditional distinction between "schooling" and "work" is no longer valid. Educational institutions must become more flexible and form a coherent system among themselves and with

elements of the work place so that the concept of "life-long learning" can become a practical reality enabling people at a must earlier age, and frequently throughout their life-time, to make the transition between work and learning institutions and back again. These pathways between "schooling" and "work" and back again, must be made clear and not discovered only by the most resourceful by a process of trial and error. Currently, as Judith Maxwell, former chairman of the Economic Council of Canada points out:

Large numbers of young Canadians do not value education. They cannot see clear pathways from school to work and therefore follow a process of trial and error that is in stark contrast to the clear pathways laid out in other industrial countries, particularly Japan and Germany.<sup>2</sup>

### **Rethinking The Role Of The State**

During the period from 1945 to 1980, the trend in almost all countries was to increase state industries, welfare programs and public service programs. Beginning in the 1980's, the tax burden, growing public debt and a concern about efficiency, has slowed and then reversed this trend; witness the privatization of public services, the transfer of state industries and monopolies to privatized companies or employee ownership, the questioning of universal welfare programs in favour of providing assistance only to those in need, the introduction of "workfare" programs and the decrease in government regulations with a greater reliance on market mechanisms throughout the world.

This rethinking about the appropriate role of the state will likely have a significant affect on education and training systems around the world. Also, as welfare strategies begin to focus more on responding to individual needs as opposed to the general needs of groups or categories of people (the poor, the unemployed, etc.), there will be a greater onus on the individual to give something in return for the assistance received - perhaps some work on public or charitable projects or their best effort in retraining or education upgrading. Finally, given the current unease about the state of our

education and training system, this rethinking of the role of the state will inevitably bring into question the desirability of maintaining the monopoly public universities and schools have enjoyed in the past.

### **Serving Better A "New" Clientele**

The unemployment rate in Canada has been above 10% for the past decade and there are suggestions that this may be the minimum rate achievable. With the increased participation of women in the workforce and the continuing productivity gains achieved through technology, there may not be enough jobs created in the future to achieve lower levels of unemployment. In recent years, most of the new jobs created have been in the service sector requiring relatively little training beyond high school. There has also been a dramatic increase in the number of people who have never held a full-time, permanent job and who have had to rely on part-time or short-term "contract" work to earn a living.

Also, by the year 2011, it is projected that the Aboriginal population in the 15-54 age group will increase dramatically. Thus, a very significant proportion of the potential work force could be Aboriginal. Action must be taken now to ensure that this work force has the education and training necessary to meet the demands of the 21st century.

As a result, the characteristics and distribution of the population requiring or seeking education and training is changing. Existing education and training institutions must recognize that they have a host of "new" constituents whom they have not served well in the past, or new institutions must be created to serve them. These "new" constituents<sup>3</sup> include displaced workers, the unemployed, the under employed, those who lack the skills to compete in today's labour market, and part-time and mid-career workers who recognize that they must continually educate and

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<sup>2</sup> Canada Communications Group, (1992). Education and Training in Canada, Minister of Supply and Services Canada, Ottawa, Ont., 1992. Forward by Judith Maxwell

<sup>3</sup> These constituents are not "new" in the sense that they have always existed but their education and training needs were considered peripheral to those of the "mainstream" traditional student population. However, their growing number and impact on the economy makes it imperative that a greater emphasis be placed on meeting the particular education and training needs of this segment of the population.

upgrade themselves to meet the challenges of a changing world. They also include Aboriginal students.

Many of these "new" constituents come from a different socio-economic and cultural background than most "traditional" students. Many left school early or have been out of school for a long time and as a result are generally older when they seek education and training. Many have special education and training needs; for Aboriginal people in particular, maintaining our language and culture is very important.

The development of the human resources these "new" constituents represent must be considered a sound investment holding tremendous economic potential. However, existing education and training institutions have not met, and are not meeting their special needs. The question is, is it reasonable to expect "traditional" educational institutions to re-adjust their long-standing priorities, priorities that are imbedded in their institutional culture, to better serve these "new" constituents? Existing education and training institutions are under the "tyranny of the majority" and therefore can be expected to continue to focus on the needs of the "traditional" student. New institutions will likely be required, if we are to realize the full potential of this huge, virtually untapped, natural resource of human capital and meet the needs of these "new" constituents as well as support the economy of the future.

### **Equal Education and Training Opportunity and Employment Equity**

In today's society, knowledge and skills are a potential source of individual wealth. Any deprivation of access to higher education or to the acquisition of marketable skills is a form of bondage; a form of bondage for the individual as well for the economy of the country. For this reason, as well as the need to develop scarce human resources to sustain a strong economy, a review of the education and training system in Canada must include an in-depth examination of how well the system provides for equity in education and training opportunities and in employment.

Present affirmative action programs do not appear to be working. Indeed, it is alarming the extent to which slogans like "the need to become more competitive", "the need to strive for excellence",

"the need to maintain the quality of our education system" are currently being used as rationalization, and code words, for denial of access and opportunities for minorities and for the economic and socially disadvantaged.

Equal access to traditional education and training programs is only a small part of ensuring equity. First, achieving equity involves early identification of an individual's potential and encouraging and nurturing its development -- creating on the part of the individual "a desire to be" and instilling the confidence necessary to realize their full potential. This is in part the responsibility of the family and community, but it is also the responsibility of the school and other educational institutions.

Second, equity involves creating a diversity of institutions and programs that match both the individual's interest and abilities and society's needs. Diversity in this sense relates to approaches, processes, objectives, and cultural and learning environments. Striving for homogeneity in this regard, as a matter of public policy or implicitly through the maintenance of educational monopolies in a pluralistic society inevitably discriminates against the socially and economically disadvantaged and minority cultural groups who have different education and training needs.

Finally, to provide real equity, long-range, quality programs are required. There are no cheap and quick fixes. Making available poor or second-rate programs that do not meet stated objectives or that compromise the substance of achievement not only does not lead to equity, but generates cynicism and discouragement. Equity clearly involves providing the amount and kind of financial resources and effort from Federal, Provincial, institutional, and private sources that changes access to education and employment at all levels and in all sectors from an empty gesture to real opportunity.

### **The Education And Training System Must Be More Diversified, Responsive And Adaptable**

Beginning in the 1920s, many industries became successful by adopting the assembly line technique for mass production pioneered by the Ford Motor Company. These assembly line



techniques were very efficient at producing standard products in large numbers. The organizational structures within these large companies were hierarchical and bureaucratic, and machine-like behaviour on the part of employees, was expected. Faced with international competition that emphasized quality, service, diversity of products and client satisfaction, successful Canadian and American industries have undergone a major restructuring, down-sizing their bureaucracies and adopting new characteristics. The old and new characteristics might be contrasted as follows:

<b><u>Old Characteristics</u></b>	<b><u>New Characteristics</u></b>
Hierarchical/Monolithic	Networking/Semi-autonomous units
Control/Command	Commitment/Responsibility
Managers/Workers/Jobs	Leaders/Professionals <sup>4</sup>
Systems/Efficiency	Values/Attitudes/Adaptability
Functional/Procedural/Bureaucratic	Integrative/Flexibility/Responsive
Regulate/Rules Bound/Sanctions	Collaborate/Self-Correcting/Incentives
Traditional/Uniformity	Innovative/Creativity
Quantity/Economies of Scale	Quality/Client Satisfaction/Service

After World War II many of our educational/training institutions assumed a mass teaching function and in doing so, adopted many of the old characteristics of industry. For the most part, the educational system still remains factory-like -- serial, incremental, lock step, regulation bound, synchronized by class hours, and fixed academic terms. At each level, the raw materials (students admitted) are screened to provide some uniformity of input and then processed in a uniform way to produce a uniform product of one description or another.

Just as many industries have had to restructure themselves so that they could respond more

quickly to satisfy client demand - and these demands are diverse and ever changing - so must educational institutions be restructured to be more responsive to the diverse education and training needs of its clients - various types of students and many different groups and sectors of society. Educational institutions must be induced to place a greater emphasis on service, diversity of processes, and client satisfaction. Given this, structural and organizational barriers within the publicly supported education and training system that inhibit flexibility and adaptability, must be eliminated.

It is not possible to identify all of these barriers but the following quotations suggest that "overwhelming" bureaucracies are major inhibitors to change. A major restructuring will be necessary to down-size their influence and control. A report, sponsored by the Economic Council of Canada states:

Bureaucratic controls have been used to shape and regulate the tasks and performance of teachers. Promotion within the ranks occurs in a fairly lock-step manner with annual increases tied to and dependent upon educational background and years of experience. By returning to school to earn an advanced degree, a teacher may progress to a higher professional category or earning scale, or may transfer into administrative ranks. Otherwise, personal initiative and motivation have little to do with advancement.<sup>5</sup>

Canadian teachers are caught between two overwhelming bureaucracies: the large administrative system of school boards and provincial ministries of education and the network of teacher's unions. Although for different reasons, both bureaucracies have worked to ensure that all teachers are treated alike -- regardless of their performance. Motivated by the need to provide more or less standard education programs to millions of pupils, the educational bureaucracy has placed its faith in standardized curricula, statements

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<sup>4</sup> Michael Hammer, U.S. consultant and expert on the re-engineering of organizations suggests that the term professional refer to someone who cares about a result not just a task which is the concern of a "worker". Being a "professional" is a question of personal character and attitude, not education. (Globe and Mail, August 10, 1993, pg. B20)

<sup>5</sup> Canada Communications Group, (1992). pg. 75

of teachers qualifications, and other common procedures rather than in individual teacher performance. Teachers' unions, in pursuing fair and equitable treatment of their members have, in the end, ensured that "all teachers are equal".<sup>6</sup>

### **Recognition of the Future Impacts of Technology on Educational Delivery Methods**

Advances in many different fields of science and technology are pressing on the structure and nature of society. The enterprise has been revolutionized by information technology. There are promising signs that governmental bureaucracy will be positively effected by this technology. The nature of education cannot help but be effected by the changes encompassing society. It is recommended that there be a recognition of the impact of technology on the nature of education. To ignore the significance of these trends for education and training would cause great harm to all of society. Quite simply, the students of today would not be able to function as the workers of tomorrow.

First and foremost, students will have to be trained to be computer literate. Most professions of the future will have significant reliance on information technology. Even to function at all in the future will require basic computer literary, just as it will require the basic ability to read and write.

The technology employed has to be current. Children are gaining insight into technology through video games, television, and other mechanisms. They appreciate that multimedia technology can enhance the delivery and acquisition of knowledge. This technology is compelling and future generations are going to be expecting nothing less. These expectations can only be met by the full implementation of multimedia technology.

Certainly there are costs associated with the adoption of this technology to the classroom. But these costs are dropping. The costs of basic multimedia technology is declining rapidly in price. That trend will continue for the foreseeable future. Furthermore, it is arguable that

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<sup>6</sup> Ibid, pg. 82-83

multimedia technology can in fact pay for itself. For example, the technology may cause some students to stay in school. Obviously, society would not then incur the costs of an under-educated citizen. More practically, from the school board's point of view, there would be another student for whom it would receive funding.

There is an entire industry springing up to provide multimedia courseware to schools. Currently, it does require relatively scarce expertise to develop multimedia courseware. As a result, the costs for this software are still fairly high. But because the potential market is so huge, many companies are eager to enter this field. The competition will inevitably drive down the costs of multimedia courseware. This phenomenon has occurred with other types of software, such as video editing software. As well, the size of this market does allow economies of scale.

These trends are combining to make the adoption of multimedia methods imperative. Certainly, there will be many doubts about introducing this technology. However, the employment of this technology can be of tremendous benefit to the teaching profession. The technology can deliver basic instruction, leaving the teacher free to concentrate on students having difficulty. In many traditional classroom settings, those students might well be overlooked. A significant point about multimedia technology is that it allows for very realistic training. Advanced multimedia systems exist that are used to train emergency room surgeons. The potential is there to allow for extremely authentic training.

Other technologies will also impact heavily on the classroom. In particular, advances in telecommunications have the potential to make the walls of the classroom transparent. With telecommunications, the classroom can become the universe. This is one of the major promises of the information superhighway. Students will be able to interact with the world. For example, marine biology can be taught to a class in Canada by a scientist in the south Pacific. The evolving telecommunications systems allow this possibility because of the capacity to deliver digitized real-time video, voice, and data transmissions.

As well, students can directly interact with other students across the country or across the world. With electronic mail students will be able to directly communicate with each other. This would be of tremendous benefit to Aboriginal students. They could experience first hand the strength, diversity, and extent of their own cultures.

Many of these technologies will engender alternate philosophies of education. Multimedia workstations combined with Computer Managed Instruction software free students and teachers from the regimented classroom. Students will be able to proceed at their own pace. This would be tremendously empowering for students with learning abilities above and below the average. As importantly, students would be able to have individualized curriculum.

The idea of such a highly individualized approach is radical given the current context. Many educators firmly believe that a collective approach is essential. Some school boards insist on mixing students of varying learning abilities together in the same classes. In these cases, there wouldn't be separate remedial or accelerated classes. Certainly students could gain valuable societal skills as a consequence of studying side-by-side with those of different abilities.

But to reject the philosophy of highly individualized learning as too impersonal is unfair. First of all, the regimented approach is for many students hardly a model of warmth. It is certainly not the case that a highly individualized approach necessarily precludes a high degree of socialization. Of course it depends on how an institution implements this approach. But generally, there is as much possibility for students to interact in library settings, study centers, and joint projects, as in a traditional approach.

A compelling reason for the individualized approach is that it prepares students for their careers in the future workplace. That workplace will focus on information. The workers will primarily be processors and managers of information. The tasks required of workers will be highly individualized and unstructured. Accomplishing these tasks will require the worker to navigate vast quantities of information. The regimented approach was great for preparing students for

factories and large conglomerates, but is likely to fail at preparing them for the future workplace.

Furthermore, through such a fluid, dynamic approach students would be prepared for an important aspect of the future: change. Industries are rising and falling. Entire professions blossom into being, while others vanish. The methods employed by organizations evolve. This requires a paradigm shift for all of society. Workers can no longer count on being employed by the same company for an entire career. Typical workers can expect to work with a number of organizations in their life. Even a worker who remains with the same company in the same profession can expect significant change. Auto mechanics already have to spend significant amounts of time being trained to employ new technologies and methods.

But change can be extremely disconcerting. One only has to consider the plight of entire classes of managers and industrial workers displaced by the upheavals of the day. Their old jobs are quite simply gone. So many of these people when faced with the challenges of retraining for new careers are completely disoriented. The experience is alien to them. They expected to continue doing the same thing for their whole career.

Students have to be prepared for these dislocations. The ability to survive and succeed in such dynamic realities will have to be fostered. In particular, students will have develop the capacity for life-long learning. As well, a range of general skills will be essential, especially management ability. With such dynamic futures, students will have to be trained to be managers of their own careers. Of course, in a typical information oriented workplace, the workers will be functioning to a large extent as managers of information. Again, emphasizing the need for managerial ability.

Finally, because of technological evolution, students will have to have a sense of values engendered in them. There are a host of bio-medical issues society will have to deal with. For example, the right-to-die issue: Should medicine be allowed to sustain a life that has become unbearable? This and many other issues are arising because of advancing technology.

Individuals and society of the future have to be prepared to debate and resolve these issues. But the debate has to rest on some foundation. In particular, for First Nations society there has to be a respect for traditional culture and the environment. Blind adoption of technology can be tremendously harmful. For example, the absurd employment of nuclear technology or the destructive and uneconomical clear-cutting of forests.

## **TRAINING IN CANADA**

Training in Canada is an industry which has become largely dependent upon publicly-funded training strategies. As each successive government goes through a predictable cycle of reconnaissance, strategy and action, the Canadian labour force is massaged in a particular direction. Funding for training is subsequently directed to specific initiatives identified as having strategic importance to the Canadian labour force and its employment and educational development.

A review of policy and practice over the last three decades shows that government training strategies have been evolving from a "we do it for you" approach to a "we'll let you do it for yourself" approach. The gradual transformation to this style of programming has allowed the users of such a system to initiate and direct their own training.

Flexibility, in approach and in policy, and at the same time meeting the needs of general labour market requirements is a sensitive balancing act for any government training initiative. The range of individual skills, education levels and occupational types is varied, and training initiatives must be responsive enough to accommodate this variation. The success of such an approach is also dependent upon the flexibility of the system when new or alternative approaches are proposed.

### **Training and Occupations**

Training is typically differentiated from education in that education deals with the acquisition of knowledge while training deals with the application of skills. Most learning systems have elements of both. Both education and training are generally guided by systematic instruction.

Training, however, is concerned with people learning to perform tasks which are fairly specific. Training occurs in the education system and in the workplace. Essentially training is an occupational and career based activity and is linked directly to employment. In turn, employment as a commodity is based on occupations.



Any discussion of training essentially deals with ways of matching people with jobs which result in minimal labour market imbalance. There are many reasons for imbalance such as geographic mismatches, skill mismatches or an overabundance of individuals trained in a specific occupation. The necessity of intervening in the labour market is generally accepted. The ability to intervene in all cases is, however, not there.

It has therefore been necessary for government to establish policy that prioritizes those needs that will be met with public funds. These priorities are typically established on a national basis according to overall labour market conditions and global public policy objectives. The impact of nationally-designed interventions in local labour markets is variable. The impact of interventions on specific labour market sub-groups is dependent on the specific attributes of each intervention.

### **Overview of Federal Training Strategies**

The Government of Canada has labour market responsibilities which represents a mandate to facilitate adjustment of the market. An overview of the federal labour market presence illustrates the process labour market initiatives have been transformed over the last thirty years.

Up to 1965 the National Employment Service was the principal agency responsible for Canada's labour market. As part of the Unemployment Insurance Commission, its primary role was information dissemination -- to provide workers with information about jobs and employers with information about workers. Significant emphasis was also placed on the mobility of workers and in finding jobs for professional and disadvantaged workers.

Created in 1966, the Department of Manpower and Immigration changed emphasis from information and job placement services to training and retraining. Information and job placement, however, remained as priorities. The design of the department was intended to deal with frictional and structural unemployment due to job search and manpower imbalances. The **Adult Occupational Training Act of 1967** gave additional authority to Manpower and Immigration to

purchase training courses from public and private schools, and to pay for training undertaken by employers. Thus government became financially involved in supporting training institutions through the purchase of courses and training seats. A later emphasis was given to job creation programs, many with combined social, political and economic objectives such as Opportunities for Youth, Canada Works, and Young Canada Works.

The Department of Manpower & Immigration merged with the Unemployment Insurance Commission in 1977 to create an overall responsibility for insurance, employment, training and immigration. Some argue that this move resulted in a change of emphasis from training and job creation to control and policing of insurance claimants.

The report of the Parliamentary Task Force on Employment Opportunities for the '80s was a comprehensive examination of the circumstances and issues in the Canadian labour market. This assessment identified shortages of skilled workers in certain occupations, high unemployment in parts of the country, and an under representation of female, Aboriginal and handicapped workers in skilled trades and professions. The report also noted a growing movement to part-time work, shared work and flexible retirement. It was determined that little was done to train local people at new larger employment projects.

In looking at the future, the Task Force saw labour force growth due to female, Aboriginal and older worker participation. While the unemployment rate was estimated to stay at approximately seven percent, it was believed that there was to be employment opportunities for the properly trained. Other findings identified inadequacies in employment, training and industrial policies. These included a lack of coordination between governments, apprenticeship rules were too inflexible, and there were too many barriers to interprovincial mobility. There was also significant deficiencies in instructional and physical training resources for skilled trades and inadequate allowance/support for workers in training. The Task Force also saw the need for continuing education systems for training, retraining and upgrading, and special literacy initiatives. The specific recommendations of the Task Force report were exhaustive and covered all aspects of

the labour market.

The establishment of the **Skills Growth Fund in 1982** was an ambitious initiative to significantly expand the training output in key occupations. The primary purpose of the fund was to rapidly increase training capacity by providing capital for the establishment, conversion, expansion or modernization of facilities to provide training in national occupations. As well, the policy allowed similar assistance for the cost of training centres for members of certain target groups.

In 1985 the Federal Government embarked on a new labour market strategy which encompassed changes in objectives and principles as well as program activities. The five basic principles of the new federal strategy included:

1. Training and job creation were to be economic in orientation with emphasis on small business and support of entrepreneurship;
2. Innovative and flexible programming which was responsive to regional and local needs;
3. Responsibility for training and employment development had to be shared between governments and the private sector;
4. Commitment to equality of access to training and employment development programs; and
5. Programs were to be simple, understandable and avoid wasteful duplication.

These principles were translated into six activities. They included skill development which would enable workers to obtain new skills in response to changing technology; job entry to assist young people and women to enter the labour market; job development which would provide the long-term unemployed with new opportunities in the labour market, with private sector support whenever possible; skill shortages to encourage training in areas of critical occupational shortages; community futures to extend new opportunities to workers in declining communities through community action, training and mobility; and innovation which would stimulate innovation, pilot programs, and experimentation by the private sector, the provinces and educational institutions.

Special approaches for the needs of Canada's Aboriginal peoples were part of the new strategy. Regional needs were to be met by designing the mix of activities in consultation with individual provinces and through equitable funding allocations. This was sold as a "major shift from the rigid program structures and centrally-controlled decision-making that characterized the approaches of the past". The new strategy was sold as cooperation rather than competition. These fundamental changes were incorporated under the umbrella of the **Canadian Jobs Strategy (CJS)** which was introduced in September 1985. The CJS was intended to provide Federal support for labour market adjustment focussed on individuals, employers and communities most in need of employment-related assistance. The strategy was intended to support activities that met employment-related needs with an emphasis on decision-making based at the local level.

### **Labour Force Development Strategy**

In another report (1989) entitled "Success in the Works", the Federal Government examined the future profile of labour demand and supply. The diagnosis was a developing gulf between the jobs created by the economy and the flexibility and skills of workers. This study recognized the need for a national strategy to increase the level of training and skills development. This new strategy became known as the **Labour Force Development Strategy**. Introduced in 1989, the purpose of the Labour Force Development Strategy was to ensure that the Canadian labour force of the 90's was highly skilled and adaptable to an evolving work environment. The Federal Government charged the Canadian Labour Market and Productivity Centre (CLMPC) with a national consultation process on labour market policy.

The themes that emerged from the CLMPC consultation exercise included the need to safeguard income replacement programs; promotion of Federal-Provincial cooperation; the strengthening of national standards; promotion of lifelong learning; expansion of the role of business and labour in formulating and implementing labour market policies; enhancing local input in labour market program delivery; improving human resource planning and basic skills; maximizing the effectiveness of public education resources; expansion of counselling support services; enhancing access to training and skills upgrading programs; improving the dissemination

of labour market information; strengthening the quality of labour market data; and the further development of ongoing monitoring of labour market programs.

As a result of the realignment of the Unemployment Insurance Program towards active training and re-employment assistance, a new operational framework was introduced. This framework was built on the basis of the CLMPC recommendations, incorporating the success of the former Canadian Jobs Strategy programs, and included the National Employment Services. The new program took 50 program and service elements and compressed them into 19 elements organized into four basic programs.

The first program emphasis was on Employability Improvement which was a client-centred program for those needing assistance finding employment or upgrading their employment skills. There were eight elements to the employability improvement which included; employment counselling; project-based training; job opportunities; purchase of training and income support; employment assistance and outreach; youth initiatives; mobility assistance; and delivery assistance.

A second program had a set of six elements captured under the program entitled Labour Market Adjustment and which focussed on helping employers identify and meet their workplace skill needs. These six elements were human resource planning, workplace-based training, work sharing, industrial adjustment service, employment equity and labour market adjustment assistance.

The third program called Community Development program encompassed community futures, self-employment assistance, and local projects. The intent here was to help communities facing serious employment problems. The last program collapsed the old Canada Employment Centre (CEC) Services, as well as, labour market research and innovation projects into a new thrust called Information and Special Initiatives.

It is significant that the new program structure incorporated the previous elements of the CJS programs resulting in no new types of intervention. There was, however, a significant

movement in the players who invoked the interventions and those who were eligible to receive the benefit of these activities. The Canadian Labour Force Development Board was established, and national and developmental efforts were put into place to have provincial/territorial boards assume responsibility for skills training decisions in their respective jurisdictions. Two significant points about these boards are evident. Firstly, they are essentially advisory in nature. Secondly, they are to focus on the allocation of the UI program funds. In a companion move, the Government entered into a co-management process with Aboriginal interests under the Pathways to Success strategy. This partnership initiative was described as community driven.

Resources for training are allotted to the regions of Canada on a formula basis which includes three components; UI funds are allocated based on UI clients, CJS Program funds are allocated based on a regular component and an Aboriginal component which has to date been based on the working age population. A significant change of this new programming was to move towards UI program funds as the backbone of national training strategies. There has been a corresponding downsizing in funding from general government revenues. As a result a growing proportion of trainees are in the system by virtue of their eligibility as UI clients. Such a move for Aboriginal people has been devastating, since the vast majority do not qualify as UI eligible.

A recent move by the Federal Government was to bring together related government programs and activities. The Employment and Immigration components were combined with elements of Labour Canada, and Health and Welfare Canada under the Department of Human Resources Development and Labour Canada. This new department is currently undertaking the development of proposals to reform the federal social security system. It has also announced a youth employment and learning strategy. At the time of this report, it is too early to make any observations or recommendations.

### **Aboriginal Peoples Training and Education**

As the Federal Government's labour market programming has evolved during the past few decades, the employment, training and labour market situation of Aboriginal peoples has also been

examined and evaluated. In the Federal Government Task Force on Employment Opportunities for the '80s eleven recommendations were made specifically focussing on First Nations people.

It is instructive to list the initiatives proposed by the Federal Government on the ways to improve First Nations education, training and employment opportunities.

1. Where requested, the Federal Government should work with Indian Bands, Regional and Tribal Councils and Indian Associations to place more schools on Indian Reserves. Then Indian people of all ages can be taught in their own language, as well as English or French, by Indian teachers of their own choosing. This is extremely important to reduce the high drop-out rate among Indian people and to encourage their continuing education for skilled trades and professions.
2. The Federal Government should introduce adult and basic literacy education programs for Indian Bands on Reserves and for other Native people in remote areas. This should be done in consultation with Bands and communities and should be geared to meet the ongoing employment and training needs of Native people, as well as the needs of the surrounding region.
3. The Federal Government should cooperate with Indian Bands in providing high schools and vocational schools for a number of Bands in a given area, especially where there are regional or Tribal Councils. This is necessary because many individual Bands are not large enough to support a high school or technical school.
4. With regards to community colleges, technical institutions and universities, the Federal Government should negotiate with the Bands and Associations to make sure there are sufficient places in the local educational institutions for Indians and other Native people, that there are sufficient Native counsellors in the institutions, and that there are a number of courses which meet the needs and demands of the Native people in the area.
5. With respect to Indians, Metis and Inuit who move to cities, the Federal Government should take steps to consult with their organizations in setting up programs within the local education system which meet their needs for course, counsellors, teachers and support

services.

6. Where the reserves or homes of Indian and other Native people are at a distance from their secondary schools, vocational institutes, community colleges or high schools, the Federal Government should provide adequate transportation, housing, and other support services, so that the Indian and other Native people can attend and participate, and complete their education and training programs.
7. The Federal Government should improve its teaching services on Reserves, especially the more remote ones, through the use of videotape, audiovisual techniques, itinerant instructors, teacher aides and materials.
8. There should be an Indian economic and employment strategy as well as an Indian education and training strategy developed principally by the Indian people themselves and in consultation with government departments concerned.. This must also be done for the Metis and non-status Indians in their communities and for the Inuit in the North.
9. With respect to Indian employment, it is extremely important that there be a revised employment strategy and an Indian development fund. It is recommended that the government establish, with appropriate funding, an Indian economic development fund for a period of five years. This fund should be set up in full consultation with the national and regional Indian associations and it should be administered by the Indian people through their Bands and regional governments.
10. There should be a concerted effort to training more Native teachers, Native counsellors and teacher aides for the high schools and community colleges where there is a high Native enrollment.
11. Programs to train Native teachers could be duplicated elsewhere and expanded to include other fields such as social work, health and the environment: all related to Indian and other Natives needs.

Although the Task Force report identified important issues in First Nations' education, training and employment, the overriding theme of the recommendations illustrated the Federal Government's assumption that its bureaucracy would serve the needs First Nations people and their communities. The general attitude was that the Government would consult, then act. Indications



of this attitude were reflected in the new Skills Growth Fund policy.

*"As regards specifically adapted occupational training for certain target groups, there is no requirement to link this to occupations of national importance. However, it must be skill training and linked to employment opportunities which are realistic for the intended target groups."* (Employment and Immigration, 1982:11-12)

The intended target groups, which included First Nations people, indicates that the basic posture for First Nations people was to focus on achieving basic labour market participation with no requirements to link the targeted groups "to occupations of national importance".

Success in the Works (1989) covered a broad range of issues such as the aging workforce, women, Aboriginal peoples, visible minorities, families, basic skills and private sector training. Discussion of First Nations people was in regard to labour supply in the year 2000.

*Aboriginal peoples have a relatively low labour force participation rate. Those who do seek work face substantial barriers and subsequently suffer extremely high levels of unemployment. In 1986,, the unemployment rate for Aboriginal peoples of all ages was 23 per cent; for Aboriginal youth, the rate was 31.6 per cent. At the same time, with a relatively high birth rate, the Aboriginal population is, on average, young and represents an important human resource that has been largely undeveloped and underutilised.* (Employment and Immigration Canada, 1989:19)

Thus, First Nations had become an undeveloped human resource.

### **Pathways To Success**

The Aboriginal employment and training strategy called "Pathways to Success" was established in 1990 with the objective of developing an effective Aboriginal/Human Resource Development (HRD) partnership. This partnership was intended to invest in and develop a trained Aboriginal labour force and to facilitate broader Aboriginal participation in the unique

Aboriginal labour markets and the broader Canadian labour market. It was based on five partnership principles between Aboriginal peoples and HRD.

The first principle identified the need for a consultation process and local control of decision-making through the establishment of national, regional and local Aboriginal consultation/management boards (AMBs). Each of the management boards had specific mandates which reflected their level in the Pathways structure. The National Aboriginal Management Board (NAMB) was to consider policy and program developments as it applied to Aboriginal people on a national level. Part of its' mandate was to assist in determining regional budget allocations; monitor and evaluate programs and training developments from a national perspective; and assess programs and training initiatives with potential national implications. The Regional Aboriginal Management Boards (RAMB) were to support and adapt regional training and employment policy and its application to the local boards; provide a regional forum for discussion/adaptation of policy impacting program effectiveness and services; assist in determining regional budget allocations to the local boards; and monitor and/or evaluate regional training and employment initiatives. At the Local Aboriginal Management Board (LAMB) level, responsibilities included the establishment of training and employment priorities; determining the application of program and service objectives for local labour force development and labour market needs; and decision making responsibilities encompassing the approval of local Aboriginal groups' training, employment and service proposals. The establishment of the management boards was intended to ensure that the needs and priorities of Aboriginal communities were addressed and reflected in the design, development and implementation of HRD policies that affected them.

The second principle addressed the need for employment, training programs and services to be managed, operated, conducted and arranged through Aboriginal infrastructures. This recognized the need to establish locally controlled delivery mechanisms. Under this principle, the LAMBs could either use the Canada Employment Centres (CEC) to deliver a full range of services, to establishing coordinating groups with the CECs, or they would set up their Aboriginal Employment and Training Service Centres (AETSCs), or work with Aboriginal coordinating groups to deliver some range of employment and training services.

Thirdly, that a funding mechanism be developed which recognized the planning and operational needs of Aboriginal delivery machinery, and develop a capacity reflecting the level of need in Aboriginal communities.

The fourth principle asserted that HRD undertake proactive employment equity measures to improve recruitment, training and employment of Aboriginal people, both internally and externally, to HRD. This principle outlined varied approaches for achieving employment equity goals and included such initiatives as holding an annual Aboriginal Employment Equity Conference and to develop an employer based Aboriginal human resource development program offering incentives to establish Aboriginal human resource plans.

The final principle recognized the need for autonomy of the Aboriginal delivery mechanism whereby it would be given the discretion to determine eligibility for programs and services, and that there be a reliance on counselling for determining eligibility rather than the strict criteria in the past. This would accommodate greater flexibility in the program allowing for increased participation of clientele that would not normally meet specific program criteria thus allowing for greater local control and flexibility.

Pathways committed a \$20 million dollar annual expenditure for five years which was initially seen as a commitment to increased Aboriginal training. Pre-Pathways estimates for the value of Aboriginal expenditures were \$145 million. Subsequent events saw Aboriginal expectations of new Consolidated Revenue Fund (CFR) resources evaporate as unemployment insurance funds were put into the mix. Intensive lobbying and discussion resulted in a Pathways strategy based on a target of \$180 million CFR and a minimum of \$20 million UI by the second year.

The use of the work target for CFR expenditures is indicative of the way the budget was derived. Pathways is not a national budget that is sub-allocated but is a sum of regional budgets. Each region commits resources to the Pathways process based on regional circumstances. These

commitments may or may not match the Aboriginal component of their funding and regions have demonstrated a significant variation in their support for Pathways.

### **Aboriginal Concerns of Pathways Strategy**

The implementation of Pathways to Success as an Aboriginal-driven process can be considered a success given the gradual change in attitude toward the Aboriginal labour force. It is viewed as an improvement over past relationships which were basically top-down policy initiatives.

An interim evaluation of Pathways has highlighted findings based on perceptions of "those involved in the program". Generally, the report prepared by Universalia, show that Pathways has established a process which allows for greater Aboriginal participation and control in training and labour market development. It is the opinion of the researchers that a full evaluation must still be conducted to show success or failure of the "Pathways" strategy.

Since its initial launching in 1990, Pathways to Success has led to a greater understanding of Aboriginal issues by Human Resources Development and of HRD issues by Aboriginal interests. There has been an increase in the quantity of training, greater Aboriginal participation in decision-making and an appreciation of Pathways as a mechanism to maximize funding. However, much work is still required in such areas as strategic planning, program management and control, employment equity promotion by HRD, and financial and client tracking which can gauge the impact of Pathways on Aboriginal participation in the labour market.

Although the partnership between the Aboriginal communities and HRD is an integral part of Pathways, there is no systematic way to determine, evaluate and establish strategic goals for the future of this relationship. Generally, the program is still viewed as being controlled by Human Resources Development. Therefore, the policies and structure of HRD must be prepared to address and integrate the objectives of its Aboriginal partners and the communities which they represent.

In order to facilitate more effective training activities for Pathways, other partnerships and

linkages must be established with Federal and Provincial Government departments, the private sector and other Aboriginal partners. This would allow for the optimal leverage of Pathways and other funds, and a coordinated effort with these partners in determining strategic initiatives directed toward the Aboriginal labour market.

There remains inflexibility of eligibility and program criteria which limits Aboriginal groups from designing policies to meet their needs. What has been lacking are effective mechanisms allowing for local level, "bottom-up" processes in initiating policy development. Therefore, there is a need to create policies that allow for greater program flexibility. The ability of HRD to accommodate Aboriginal designed approaches will go a long way in promoting and developing greater local control of Pathways -- one of the basic principles of the program.

The administration and allocation of funding is also viewed as requiring significant change to accommodate new and alternative initiatives. Currently, HRD is viewed as not devolving financial control but merely administrative responsibilities related to control. Concerns arise regarding the complexity of the funding allocation system, the perpetuation of historical expenditure patterns, inadequate operation and maintenance support, the fairness and equitability of allocation amounts, and that HRD controls and administers the money.

**New or alternative financial and budgetary processes must be established which would make Pathways easier to administer and to determine funding allocations.** There is a need for greater community decision-maker representation on the Aboriginal management boards which would allow community input into directing resources to high priority areas -- historical inequities in resource allocation has inhibited communities from this process.

Support for Aboriginal training delivery institutions has primarily been in the form of training dollars for specific projects rather than in helping to develop strategies to build and develop their overall capacity. Pathways has had minimal or no impact on the planning and operational needs of these institutions. Thus far, non-Aboriginal training delivery institutions have been the most likely vehicle for delivering Aboriginal employment and training programs and services.

A number of barriers have been identified which prevent Aboriginal training delivery institutions from offering the type of programs required to meet Aboriginal training needs. These include; economies of scale for small populations making development costs for Aboriginal delivery institutions prohibitive; the lack of cooperative funding arrangements between Aboriginal management boards where the areas served by Aboriginal training institutions cut across board areas; the relationship between the Aboriginal training institutions and community decision-makers are not well-defined; and the lack of long-term, stable funding sources for the Aboriginal training institutions.

As well, a significant number of Aboriginal groups, such as the Metis, off-reserve status Indians, and Aboriginal women's groups, feel excluded from participation in the Pathways structure. Accommodation on the management boards must be provided in order to allow for an input and participation from those groups which feel marginalized since they represent a significant population within the Aboriginal community.

Greater local control and local accountability to the Aboriginal community is seen as a major issue facing the future development of Pathways. There is significant movement in evolving Pathways towards greater Aboriginal control through the establishment of One Agreement Models or other models of this type. In particular, it will be critical to address the future vision of the program in the context of Aboriginal self-government. **Pathways is perceived as a "step" or a "stage" toward achieving greater Aboriginal control of training and employment programs and a small step in the direction of self-government.**

## **Literacy**

Education is a lifelong process which has come to include many non-traditional types of learning systems. One aspect of the learning cycle which addresses an issue concerning a large proportion of the Aboriginal population is literacy programming.

Illiteracy affects a person's self-esteem, employability, training potential and limits their

ability to function effectively on a daily basis. Currently, the Aboriginal illiteracy rate is over two times the national average. The grade 12 completion rate for Aboriginal people is half the rate of non-Aboriginal people and leaving school early results in a high illiteracy. If literacy and language skills are the cornerstones for building a strong and lasting education, the high illiteracy rate among Aboriginal people must be reversed in order for this population to begin participating and accessing educational and employment opportunities and to become full contributing members in their communities.

In order to be effective, literacy programming must be relevant to community needs and reflect community goals. Current literacy programming is provided through the National Literacy Secretariat of the Department of Multiculturalism and Citizenship and has been based on non-Aboriginal standards. **What is required is the establishment of a new relationship with the National Literacy Secretariat and the Federal Government that would enable Aboriginal communities to develop, direct and manage their own literacy programs.**

Most literacy programs provide training in either English or French. However, Aboriginal literacy programs must reflect the unique cultural and educational requirements of the community.

The report, Breaking the Chains, First Nations Literacy and Self-Determination, a study conducted by the Language and Literacy Secretariat of the Assembly of First Nations, identified two primary motives behind a community-based literacy program -- that of improving the personal circumstances of the participants and secondly, improving the social and economic conditions of the community.

Aboriginal controlled and community-based literacy programming would be used both to promote training in either of the two "official languages" (English or French), and to develop Aboriginal language literacy. This two-pronged approach would meet the language development needs in Aboriginal communities.

*"Community-controlled programs are better able to respond to the needs and personal*

*circumstances of individuals, and can be used to transmit Aboriginal culture and knowledge through the medium of Aboriginal literacy. The ultimate form of First Nations literacy programs is a bilingual bicultural or "two way" system of basic and lifelong education, in which Aboriginal language and knowledge play as significant a role as the languages and knowledge of the surrounding society. In this way First Nations can gain some control over the process of change which threatens the whole social fabric of some communities." (Assembly of First Nations, 1994:7)*

A number of general recommendations resulted from this report. First, Aboriginal languages must be recognized as literacy teaching languages. First Nations languages must be respected as literate languages and that funds be made available to develop literacy resources and materials in the Aboriginal languages. Currently, there is limited funding available for the research, development, publication and distribution of Aboriginal literacy resources and materials. This situation inhibits the ability of communities to provide effective literacy programs in both the traditional education systems, such as elementary and secondary schools and to the community as a whole.

The federal government must support mother-tongue literacy as central to community development and the exercise of self-government, and not strictly as a step towards employment and economic development. Mother-tongue literacy provides the foundation for an individual's cultural, social and spiritual development and First Nations values, traditions and community spirit are expressed through languages, both collectively and in each individuals' sense of identity and self worth. Thus, Aboriginal language literacy is the basis for developing well- rounded, confident individuals who, in turn, contribute to building stronger, healthier communities

Further research be undertaken on ways to solve problems in the area of child care, financial assistance, location of suitable facilities, and possible funding models for decentralizing literacy funds to Aboriginal communities. There are many communities that have the necessary infrastructure, such as schools and community halls which could house literacy programs. However, what is required is the funding to support such initiatives.



With the decentralization of funding to Aboriginal communities, the financial and support needs of the targeted population would be utilized more effectively. Such issues as the establishment of child care facilities for parents participating in the literacy programs would be addressed, as well as the development of instructional tools specific to the community could be developed and utilized in conjunction with other available materials and resources.

An Aboriginal Literacy Program must be established through the National Literacy Secretariat and be made available to all Aboriginal communities. This would provide for the current needs of Aboriginal communities to establish literacy programs until such time as a process which would allow for community control and administration of literacy funding

Input from the community will better meet needs in basic education literacy programs. This would provide for programs that are community based, controlled and adequately funded and supported and that they be student centred, suitable and effective programs which recognize the needs and backgrounds of the individual learners. Since each individual's background is unique, programming designed to provide general instruction and learning opportunities may not be suitable in all circumstances. Communities are better prepared to design literacy programs which can address the particular needs of the participants.

Effective leadership is required in the development, promotion and maintenance of community-based literacy initiatives. The growth and well-being of communities are dependent upon the social, cultural, educational and economic status of individuals. Community-based programs would provide the essential tools to assist members who are hindered through illiteracy from achieving fuller participation within and outside of their communities. Community leadership which includes the political, educational and community members must provide the support required to build a comprehensive Aboriginal literacy campaign which would sustain its ongoing development.

## **Post-Secondary Education**

Community-based literacy programming is one aspect of the educational development of Aboriginal people and communities. A second, and equally significant issue is the control and funding of Aboriginal post secondary education programs and institutions.

Several presentations to the Royal Commission on Aboriginal Peoples reported several concerns regarding post-secondary education. Generally, the concerns indicated the limitations in access related to inadequate policy, insufficient resources and unresponsive institutions. The inadequacy in policy is related to policy that does not treat all Aboriginal peoples the same. This situation is reflective of the historical relationship between the Federal Government and the various Aboriginal peoples.

Currently the Federal Government provides post-secondary funding to Status Indian people through the Department of Indian Affairs under the Post Secondary Student Support Program (PSSSP). Other post secondary funding sources which are available include both Federal and Provincial student financial assistance programs or Student Loans, and depending on the program, there are special incentives for Metis and Non-Status Indians under these programs. However, no other national post secondary funding program exists for Metis and Non-Status Indians.

Resource limitations were identified as arbitrary overall funding limitations, limited individual benefits, and inadequate provisions for special needs of mature students. Under the PSSSP and the Student Loan programs, resource limitations persist which reflect the inability of students to access adequate benefits and levels of funding to address the special needs of mature students and to promote increased Aboriginal participation at the post-secondary level.

Under the PSSSP, program funding is determined on a formula basis which neither reflects the actual student funding needs nor provides the necessary support to promote much broader post-secondary educational development. Such issues as the need for child care support, the higher costs associated with northern residents who attend post secondary institutions, special needs students such as the hearing impaired, program incentives directed at strategic studies, and the costs associated with post-graduate work are not considered in the determination of funding levels.

Such issues are also relevant to Metis and Non-Status Indian students who will be or are currently in the education system.

The issue of adequate funding to assist Aboriginal students to attend post-secondary institutions will continue to be an ongoing concern. Limited resources have resulted in increasingly larger numbers of Aboriginal students being unable to pursue their academic goals. As a growing proportion of the Aboriginal population is limited in achieving educational success, it will be reflected in their inability to pursue meaningful employment opportunities.

Post-secondary institutions were also reported to be unresponsive and not providing value for money. A number of post-secondary institutions have established Aboriginal access programs through funding designed to promote Aboriginal educational development. However, these programs have come under criticism for not providing Aboriginal input into continuing program development and administration. If post secondary institutions are to access program funding on behalf of Aboriginal people, greater accountability to the Aboriginal community they seek to serve is required.

Although most post-secondary institutions have recognized the need to establish access programming, they do not address all the needs of Aboriginal people. A number of post-secondary institutions have been established by Aboriginal communities and organizations across Canada to provide educational services and programs. These include such Aboriginal controlled institutions as cultural centres, technical institutions and colleges affiliated with universities. With an increasing population base, increasing expectations from the Aboriginal community to provide and expand their services and programs. This is placing great pressure on these institutions' human and financial resources which they often cannot meet. There is a lack of long-term core funding which would meet the ongoing developmental and operational needs of these institutions.

Currently, the Federal Government does not have a policy which deals with funding of Aboriginal educational institutions. Funding is often piecemeal or social in nature, which does not contribute to maintaining a stable environment for these institutions. **In order to promote and**

**assist in the development of Aboriginal communities and individuals, a policy dealing specifically with Aboriginal institutional funding is required.** Such a policy would provide the necessary resources for these institutions to provide the much needed services and programs to their Aboriginal clientele. The success of the U.S. Tribal College experience, as the next section shows, provides us an opportunity to establish our own College/University infrastructure.

## **THE UNITED STATES EXPERIENCE IN INDIAN POST-SECONDARY EDUCATION AND TRAINING**

### **Evolution of Indian Post-Secondary Education**

The policies and expectations which have shaped Indian education in general, and post-secondary education and training in particular, have remained remarkably consistent for at least three centuries, both in their applications and, until recently, in their results. Education in the United States falls under the jurisdiction of states and local governments -- but, almost as an afterthought. The U.S. constitution enumerates clearly those powers which may be exercised by the federal government, and then indicates that all powers which are not specifically delegated to the federal government are reserved to the states. Education, not being mentioned explicitly in the Constitution as a federal power, falls among those functions reserved, by default, to the states.

States have chosen, historically, to exercise their authority over post-secondary education in very different ways. In the northeast, until the beginning of the twentieth century, state governments did very little on their own, and depended for post-secondary education on non-governmental institutions; most colleges and universities in those states were (and continue to be) private, and often denominational, institutions. Southern states had, by the end of the nineteenth century, many well-established private colleges, but fewer major research universities; state universities, therefore, chartered and supported by state governments, played a much larger role in those states after the Civil War than did state universities in the North. In the Middle West and Far West, public systems of colleges and universities were, from the outset of Euro-American settlement, the predominant institutions of higher education within their states, and often became (and remain) focal points as well for local pride and competitiveness on a variety of dimensions.

Indian education fit nowhere comfortably in this framework. Part of the explanation for this lack of fit is simply structural. Indian policy is a matter specifically reserved for the federal government, but the federal government had very little experience, or interest, in managing education at any level, most particularly -- except for the military academies -- the post-secondary. Throughout the nineteenth and early twentieth centuries, therefore, the federal government left the job of providing post-secondary education to Indian people up to whomever seemed to want it.

Not many schools did. Several universities in the Northeast, notably Harvard and Dartmouth, had been founded with the explicit intention of providing education to Indian people. But as the local Indian populations around those institutions died, migrated, or were pushed out, the universities' attentions to their original goals lapsed. In the nineteenth century, other private colleges and universities in the Northeast occasionally recruited Indian students, usually from mission or boarding schools run on western reservations by the institution's controlling denomination. Outside the Northeast, opportunities for Indian college students were scarce. In most state universities in the Mid-West and Far West, Indian people were clearly but tacitly unwelcome for social and racial reasons; the first Nebraska Indian student, for example, graduated from the University of Nebraska only in 1976. Until well past the Second World War, the participation rates of Indian people in colleges and universities throughout the nation were negligible, and the federal government took no actions to remedy the situation.

Instead, federal policy, from the late eighteenth century, sought as a matter of deliberate choice to steer Indian students away from colleges and universities into vocational training. George Washington, during his presidency, expressed a strong preference that education for Indian people be directed away from academic pursuits (the focus of many church and mission schools), and emphasize instead "husbandry, and consequently civilization"<sup>7</sup>. In 1870, the Congress appropriated \$100,000 for the establishment of industrial schools for Indians, the first of which was located at Carlisle, Pennsylvania. Thereafter for the next century, federally-sponsored education

for Indian People was, by design, vocationally-oriented. This policy was clearly intended to speed the acculturation of Indian people by replacing indigenous economic systems with structures based on Euro-American agriculture and industrial practices. By implication, this policy also placed the skills appropriate for leadership in the American national community -- law, finance, engineering, the natural sciences -- beyond the reach of most Indian students.

By mid-1950s, the federal government had begun to increase its involvement in national education policy in ways which affected the opportunities available to Indian students. The education benefits available under the GI. Bill of Rights brought colleges and universities within reach of hundreds of thousands of returning veterans; this expanded participation laid to rest a national stereotype of higher education as only accessible to, or deserved by, an elite. In 1954, the decision of the United States Supreme Court, *in Brown vs. The Board of Education of Topeka*, brought the federal government squarely into a long-term campaign (still unfinished) to change educational policies throughout the nation to insure equality of access to all citizens regardless of race.

Potential benefits of these changes in federal policy did not, however, reach Indian country to any significant degree for another twenty years. The Bureau of Indian Affairs remained, for the most part, uninvolved in post-secondary education. The BIA consistently took the position that, while the federal government was obligated, as part of the nation's trust responsibility to provide elementary and secondary education to Indian people on reservations, post-secondary education did not fall within this trust responsibility. (Only in 1983 did the U.S. Congress formally go on record as defining the trust responsibility as extending to cover post-secondary education.) The BIA, therefore, moved cautiously throughout the 1950s and 60s, providing only limited scholarship support to the small numbers of Indian students who were enrolled in colleges and universities.

Other branches of the federal government were no more supportive of higher education for Indian students. While the U.S. Department of Justice regularly intervened in school systems and

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<sup>7</sup> Wright, Bobby. (1992) American Indian and Alaska Native Higher Education: Towards a New Century of Academic Achievement and Cultural Integrity, Indian Nations at Risk, Commissioned Paper: Indian Nations at Risk Task Force,

universities throughout the South to end racial segregation, equally segregated institutions in the West and Northern Plains went unchallenged. The federal Department of Health, Education and Welfare likewise provided little financial or technical assistance for Indian education at any level.

Other jurisdictions were likewise unwilling to deal with Indian education. State governments continued to argue that the federal government should bear all responsibilities and costs of Indian education, even when Indian students lived in urban communities away from reservations. The argument that state governments should remain uninvolved with Indian education received strong support from another quarter -- tribal governments themselves. During the early 1950s, national policies with respect to reservations and their governments had shifted markedly. Federal efforts to build and strengthen elected tribal governments on each reservation, as distinct political jurisdictions not subject to state authority, were replaced by laws which encouraged the absorption of reservations by the states which surrounded them -- effectively terminating the existence of tribes as separate political entities, and bringing to a logical conclusion the assimilationist presumptions of one strand of federal Indian policies. Tribal governments responded to this threat to their existence by rejecting the legitimacy and involvement of state-controlled institutions on reservations. Schools which operated under state rules, therefore, became, in this view, another instrument for the weakening of tribal identity and sovereignty. The control of Indian educational institutions -- from the preschool to the post-secondary level -- needed, from this perspective, to be held by tribal people and tribal governments, in order to prevent further erosion of tribal rights and tribal cultures. Tribes also used qualitative evidence to support their claims, evidence provided by the state-regulated schools themselves, which proved in the main to be disastrously ineffective in dealing with the educational needs of Indian students at every level.

After 1970, therefore, educational policy at every jurisdictional level -- federal, tribal, and state -- had to deal with two quite different requirements: first, a need to make off-reservation, predominantly non-Indian educational institutions more accessible and responsive to increasing number of Indian students; and second, a need to address the increasingly forceful demands of tribal

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U.S. Department of Education; ERIC Clearinghouse on Rural Education and Small Schools, Washington, D.C. (P.1)

communities for control over their own Tribal Colleges and futures. Each of the major policy initiatives of the next twenty years in Indian education was formulated in a context defined by these two issues.

### **Federal Government Financial Support**

While tribal colleges in the United States are developing in ways which meet a variety of educational needs of reservation communities, vocational education programs have proven less satisfactory for Indian populations.

The federal government funds vocational education directly; most of these funds are distributed annually to state governments, which in turn disburse them to local vocational institutions. These institutions in many states also customarily receive funds from the state government, and from local property taxes. The combination of federal, state, and local resources has permitted the development, over time, of a national base of stable, reasonably well-supported vocational institutions, offering programs which can evolve to deal with technological change and economic innovation within their regions. Stability of financial support is particularly important for vocational curricula, which are among the most capital intensive of all educational programs; relative security of funding allows expenditures for equipment to be spread over a number of years, and permits periodic updating and renovation.

The Carl D. Perkins Vocational and Applied Technology Act, the congressional legislation (most recently reauthorized in 1990) which established the funding mechanisms for vocational education, mandates that a certain percentage of total federal expenditures for these purposes be set aside for Indian vocational education programs. These moneys, however, are distributed on a competitive basis; tribal governments, tribal colleges, and all other Indian secondary, post-secondary, and adult education programs are forced to compete against each other for vocational funds. Competitive grants made under this Indian set-aside, last only three years. This relatively short period limits the kinds of training which can be provided to Indian students, and creates for Indian institutions a bias against capital intensive programs which require elaborate or expensive equipment.



State vocational education authorities have consistently resisted sharing their funds with tribal colleges or vocational programs within state borders. At the same time, completion rates of Indian students attending state-sponsored off-reservation programs are low. Tribal colleges are unable, for financial reasons, to provide stable, well-funded vocational programs in environments in which Indian students have a strong likelihood of success. State institutions, with adequate financial support, are unable or unwilling to offer the kinds of support to Indian students which would increase their chances of success. The resulting gap in services to Indian communities creates problems both for Indian students seeking skills and for the American economy which needs skilled workers.

The Congress, in May 1994, passed the School-To-Work Opportunities Act, P.L. 103-239, which used the Indian set-aside approach to fund another method of vocational training. School-to-work programs, similar in intent to apprenticeships, may result in a high school diploma, skills certificate, or a post-secondary credential. The legislation requires that all such programs must have three components. The school-based learning component must include career counselling, a program of study designed to meet new federal general education standards, a program which integrates academic and vocational learning and regular evaluations of student progress. The work based learning component must include work experience, workplace mentoring, and instruction in positive work attitudes. The connecting activities component must match students with work opportunities, provide counselling, provide a school mentor to act as liaison among the student, employer, school officials and other community partners, and provide training of teachers and others involved in the school-to-work programs.

The legislation permits tribes and tribal organizations (including colleges) to participate in school-to-work programs. The Congress appropriated \$100 million for the first year of these programs; of this amount, the legislation reserves one-half of one percent for programs involving Bureau of Indian Affairs schools.

Federal funds for Indian post-secondary education are spread between the Bureau of Indian

Affairs (part of the Department of the Interior) and the Department of Education. In 1994, tribal colleges received \$26.9 million, of which \$25.8 were operating funds, \$970,000 went to endowment matching funds, and \$114,000 went for technical assistance. Higher education scholarships, now administered primarily by tribes, received \$31.1 million. Graduate fellowships received \$2.7 million, and \$200,000 was appropriated for the American Indian law program at the University of New Mexico. The Department of Education received \$1.7 million for graduate fellowships in Indian education. Special programs in Indian adult education received \$4.9 million. The Bureau of Indian Affairs likewise received \$3.6 million for adult education; these funds, however, might legally be reallocated by tribes to other priorities. The Indian set-aside portion of federal vocational education funds amounted to 1.25 percent of \$972.75 million (the total amount distributed to states) or \$12.4 million. Two tribally-controlled vocational institutions Crownpoint Institute and United Tribes Technical College, received a total of \$2.9 million. Three current or former Bureau of Indian Affairs post-secondary institutions, Southwest Indian Polytechnic Institute, Haskell Indian Nations University, and the Institute of American Indian Arts, received a total of \$28 million.

### **Indian Post-Secondary Participation**

During the 1970s, many off-reservation colleges and universities dealt with issues of inclusion of Indian students and Indian issues through the establishment of Indian studies programs; by 1984, there were 107 programs (half of which were full academic departments) in two- and four-year institutions<sup>8</sup>. These programs, at their inception, usually focused on the study of Indian histories, languages, and cultures, using conceptual tools and intellectual structures drawn from standard academic disciplines in the social sciences and humanities; Indian subject matter was thereby incorporated into post-secondary institutions which remain, otherwise, substantially unchanged. Many of these programs and departments, however, evolved to provide other services of considerable value. Several Indian studies departments have become focal points for research and publication of Indian issues; the nature of the departments often facilitates interdisciplinary collaborations in these efforts. The programs provide increased visibility and an organized,

continuing presence for scholars at their respective institutions. And perhaps most importantly for Indian students, many of these programs have become the focal points on their campuses for Indian community life, providing information, advice, peer support, companionship and caring in environments which may otherwise prove forbidding.

Several of the most successful Indian education programs at state and private universities place special emphasis on this latter function, the providing of support outside the classroom for Indian students. Formal research has verified repeatedly the anecdotal observations of students themselves -- that a hostile or unsupportive climate in educational institutions is a formidable obstacle to the satisfactory adjustment of Indian students. Critical factors which improve the chances for academic performance for Indian post-secondary students include a critical mass or significant number of other Indian students on campus, peer support; parental support; support from such outside agencies as tribal education departments; expressed concern for Indian students on the part of faculty and staff; good academic preparation in high school; strong personal motivation; and adequate financial aid.<sup>9</sup>

Montana State University has worked since the early 1980s to become an exemplary center for Indian education within its region. The university's Center for Native American Studies, an academic department within the College of Arts and Letters, provides academic course work at the undergraduate and graduate levels, houses the office of the university's American Indian Club, offers faculty development programs for instructors at tribal colleges in Montana, and through the Office of Tribal Service, works with tribal governments and educational institutions throughout the state. The Center has five faculty, including two with administrative duties, and a full-time student advisor. Further, the university also delivers other services for Indian students elsewhere in the institution: targeted scholarship and fellowship programs for undergraduate and graduate study; a program to provide research experience in the health professions and biomedical research; and

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<sup>8</sup> Wright, Bobby. (1992) American Indian and Alaska Native Higher Education: Towards a New Century of Academic Achievement and Cultural Integrity, Indian Nations at Risk, Commissioned Paper: Indian Nations at Risk Task Force, U.S. Department of Education; ERIC Clearinghouse on Rural Education and Small Schools, Washington, D.C. (P.10)

<sup>9</sup> Wright, Bobby. (1992) American Indian and Alaska Native Higher Education: Towards a New Century of Academic Achievement and Cultural Integrity, Indian Nations at Risk, Commissioned Paper: Indian Nations at Risk Task Force, U.S. Department of Education; ERIC Clearinghouse on Rural Education and Small Schools, Washington, D.C. (P.10)

Advance By Choice, a federally-funded program to provide tutoring, counselling, and developmental courseware to disadvantaged students.

Clarkson University, a private institution in Potsdam, New York, has taken a different approach in its efforts to increase accessibility and likelihood of success for Indian students. Clarkson has concentrated its attention on building a strong Indian program in its College of Engineering. The institution has worked to attract corporate sponsorship of scholarships and grants, which the university matches; total institutional financial aid disbursements to Indian students (of whom there are between fifteen and twenty each year) average \$75,000 to \$100,000 annually.

Clarkson is highly selective in its admissions policies, and maintains this selectivity in its recruitment of Indian students. The institution has, over twenty years, built durable working relationships with high school counsellors, who frequently refer promising students to university programs. University administrators follow closely the progress of these students after they are admitted, providing them with mentoring and significant amounts of personal contact.

In addition, the university works closely with the American Indian Science and Engineering Society (AISES), a private non-profit organization which founded its first student chapter at Clarkson in the early 1980s. AISES, which in 1994 has more than sixty chapters, uses a variety of approaches to encourage and support Indian students of science and engineering. The society sponsors summer camps in science and mathematics for hundreds of Indian junior high and high school students. The organization raises funds for scholarships in science and mathematics, and distributes more than \$200,000 annually to Indian students. At a number of universities throughout the country, including Clarkson, AISES offers Indian students a structured progression of activities over four years, activities designed to provide academic enrichment, peer support, and mentorships. Student participants meet regularly with other AISES members nation-wide, and have frequent contact with Indian scientists and engineers. After AISES participants complete their bachelors degree, they may participate in year-long internships. AISES members complete their degrees with a high rate of success, in academic fields which have been noted for the

conspicuous absence of Indian professionals. When the benefits of this national organization are combined with strong institutional commitment at a university such as Clarkson, completion rates for Indian students appear to be very high.

Even the most successful of college and university programs, however, attract only a minority of Indian students. In 1991, fifteen percent of Indian students attended universities; thirty-one percent attended four-year institutions. Fifty-four percent attended two-year institutions, compared to thirty-seven percent of all students in the United States. A relatively high percentage -- forty - attended rural institutions. Over eighty-five percent applied for some form of financial aid<sup>10</sup>. Reliable data on completion rates have been particularly difficult to obtain; anecdotal information on attrition of Indian students, however, indicates that rates still appear to exceed eighty percent in many four-year institutions.

### **Tribal Colleges**

The first tribal colleges were founded in the late 1960s and early 1970s, amidst the national ferment of activism for civil rights and Indian self-determination. Leaders in many Indian communities had come to recognize both the value and the vulnerability of their own tribal ways of life. The credibility of the federal government as the protector of tribes and tribal cultures had been eroded seriously through responses to such challenges to established policies as the Trail of Broken Treaties. Governmental agencies and centralized programs did not seem to offer promising solutions to serious Indian issues. Self-governance and the building of local institutions appeared, to some visionaries, as the course which their communities must take if they were to survive.

Higher education, and access to the abilities which it develops, proved a special problem to Indian people. Elected tribal officials and elders on several reservations saw that federal policies towards higher education were not serving Indian students or Indian communities. Repeatedly, young people would leave their reservations to enroll in post-secondary institutions, and repeatedly,

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<sup>10</sup> Wright, Bobby. (1992) American Indian and Alaska Native Higher Education: Towards a New Century of Academic Achievement and Cultural Integrity, Indian Nations at Risk, Commissioned Paper: Indian Nations at Risk Task Force, U.S. Department of Education; ERIC Clearinghouse on Rural Education and Small Schools, Washington, D.C. (pp. 4-5)

the students would return within a semester or two. The distances which students had to travel - cultural, social, economic, emotional, as well as geographic - often proved too large, and the reception they received at their new institutions often proved insufficiently sustaining. Students, even very bright and determined students, responded by going home.

Community leaders on several reservations recognized that discouragement and dropouts served neither the needs of individual students, nor of the tribal communities themselves. These leaders began to discuss the possibility of founding their own local colleges. Among the early advocates were several traditional elders who had not received much formal education themselves, but who recognized clearly the values of education for their tribes. These early leaders, from the outset, envisioned local institutions the colleges, locally-controlled and locally-focused. Ideas for a single, national college or university to serve all tribes had been circulated in the United States since at least 1911, but nothing substantive ever came of these ideas. Tribal colleges came into existence only as individual tribes began, one by one, to address their own needs for post-secondary education.

In 1968, the Navajo Nation became the first tribe to establish its own college, by granting a charter to Navajo Community College. Three years later, the Oglala Sioux Tribe of the Pine Ridge Reservation created Oglala Sioux Community College, and later in the same year, the Rosebud Sioux Tribe chartered Sinte Gleska College. By 1972, tribally-controlled colleges had also been established on the turtle Mountain Chippewa Reservation, the Standing Rock Sioux Reservation, and the Hoopa Tribe had sanctioned D-Q University at Davis, California.

Although these first institutions each possessed a distinct tribal and institutional identity, they also shared several family resemblances. Many of these common features were taken as models by tribal colleges which developed subsequently. **Each was established by a charter granted by a tribal council; from the first, tribal colleges were set up as independent, free-standing institutions, not as programs administered directly by Indian governments.** Each college had its own governing board, composed of members of the chartering tribe. Each board had an arms-length relationship, at closest, to the local tribal council, to insulate the college

from undue political influence. The charter of each institution defined, as one purpose of the college, the serving of the post-secondary educational needs of its own tribal community. Each charter explicitly recognized that the college should have a special relationship to the culture and values of the tribe served.

Local control, therefore, has been a basic premise of the tribal college movement since its beginning, and each of the colleges regards it as an essential requirement for the building of a successful organization. The responsibilities which accompany local control provide important safeguards for each college. A tribe which wants its own college must make explicit commitments, by granting legal authority through a charter, and often by providing financial resources, facilities, and organizational support for the start-up. In fact, many Indian governments have continued to provide resources to their colleges. Although uncommitted money is scarce for most tribes, buildings, land, and services have all been provided, as well as political support in dealing with federal -- and occasionally state - governmental agencies.

Local control, over the long term, is shaping individual colleges to meet the specific educational needs of their communities. The institutions are diverse, and become more so as they mature; each has its own history, educational philosophy, limitations, and resources. Curricula, both academic and vocational, reflect the social, economic, and cultural situations of individual reservations. Local needs and preferences set the pacing of college development and innovation. Styles of management and human relationships within the organizations are grounded in the cultural values of the communities they serve. Local control insures that the colleges do not stand apart from their communities. Instead, the institutions focus community energies and activities on a wide range of issues.

No single approach or features accounts for the success of the colleges. Among the defining characteristics of the colleges, however, their location on reservations, and their governance by local boards, are key. As institutional members of the communities -- and the cultures -- they serve, the colleges are able to identify and solve problems in their own ways, with their own skills and resources. The persistence and dedication of faculty, administrators, and board

members are crucial; many participants have stayed with their institutions, despite low salaries and gruelling working conditions, since the colleges opened. These individuals have developed - and shared - essential, long-term experience. This sharing, in fact, constitutes a third vital ingredient for the success of the colleges. From the outset, the colleges have served as each others' best sources of advice, support, and technical assistance. Fourth, frugal and prudent management of material resources has been a hallmark of the colleges' administrative styles. Finally, and most essentially, each college acknowledges traditional Indian spiritual values, based in its own tribe's living culture, as central in defining its role in the community. Traditional spiritual leaders were prominent among the founders of several tribal colleges. Their ways of looking at the world have shaped the character, not only of their particular institutions, but of the tribal college movement as a whole.

Non-traditional students are the norm at tribal colleges. Women predominate; at most institutions, between two-thirds and three-quarters of all students are female. The median age for students is between 29 and 30 years. At some of the more established colleges, however, younger students are enrolling in increasing numbers. As the colleges build track records in their own communities, students and high school counsellors come to see the schools as their institutions of first preference. Large numbers of students do not have high school diplomas. Up to half of the student body at some colleges has earned a General Education Diploma (GED), in many cases through their college's adult basic education program<sup>11</sup>. Most tribal college students are family-responsible, with children (and often older dependents) living in their households. Significantly, many students describe the close presence of their families as a primary source of support for their academic efforts, not as a source of conflicting obligations. Most students attend full-time. Most are unemployed, and have been unemployed for a significant period prior to enrolling in college. The overwhelming majority of tribal college students are the first members of their families to attend college; again, this percentage is declining as several generations of families, or whole groups of cousins, begin to enroll virtually simultaneously.

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<sup>11</sup> Carnegie Foundation for the Advancement of Teaching (1989). *Tribal Colleges: Shaping the Future of Native America*, Princeton University Press, Lawrenceville, N.J. (p.41)



The communities in which tribal college students live are, economically, the poorest in the United States. Seventeen of the colleges are located in chronically distressed agricultural areas of the northern Great Plains. The magnitude of reservation economic problems was revealed in a national study<sup>12</sup>, conducted by the General Board of Global Ministries of the United Methodist Church, which identified the 25 poorest counties in the United States. Of these counties, seven are located in South Dakota on reservations served by tribal colleges. Per capital income in these seven counties in 1986 ranged from \$4,580 on the Cheyenne River Reservation, to \$3,244 in Shannon County on the Pine Ridge Reservation. Economic conditions are similar throughout other reservations in the northern plains, where most of the tribal colleges are located. Unemployment rates in these communities have consistently exceeded 70 percent for the past decade. Little private-sector employment exists. On the Rosebud Reservation, for example, in 1986 only one job in five was in a for-profit business; the remainder were in education, health care, social services, government or other public agencies. Although Indian communities typically have mainly micro-enterprises, which operated in private homes, the formally-organized portions of reservation economies tend to produce few jobs and little wealth. About 98 percent of tribal college students, in consequence, qualify for need-based federal financial aid.

Economic hardship in reservation communities are compounded by the hardships of geographic and cultural isolation, and by extreme climatic conditions. Many students must regularly drive 120 miles or more for each day of classes. Snow, ice, and cold, from December through April, are normal and severe obstacles to travel in rural and remote areas. Both cars and telephones are scarce resources in many Indian communities, and if students can afford automobiles, the cars are liable to be old, inefficient and vulnerable to breakdowns. Colleges have dealt with transportation issues in several ways: by developing their own bus services; by decentralizing and moving classes to the students; by collaborating with other local agencies to develop comprehensive rural transportation systems. Similarly, several colleges have dealt with the absence of daycare facilities in their communities by developing their own systems, or by supporting other local agencies to fill the needs.

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<sup>12</sup> Johnson, Douglas. (1987) *A study of the Twenty-Five Poorest Counties in the Continental U.S.A. in 1986*, National Program Division, General Board of Global Ministries, The United Methodist Church, New York, N.Y.

The tribal colleges serve communities which extend beyond the boundaries of individual reservations, and beyond the memberships of individual tribes. Each tribal college enrolls a significant percent of non-Indian students. For Sinte Gleska, this group regularly comprises about one-fourth of the total student body. Non-Indians living on or near reservations face many of the same obstacles to higher education as do Indian students: geographic isolation; extreme distances to post-secondary institutions; declining rural economies; limited personal financial resources; family and job obligations. Both personal stories and continuing enrollment patterns indicate that most non-Indians who enroll find tribal colleges to be accessible and satisfying. These students, in discussing their college experiences, often suggest that their new-found minority status provides them with useful and unanticipated opportunities to explore and re-value Indian communities and ways of life. Around several reservations, non-Indian alumni of tribal colleges are beginning to help to erode the encrusted barriers of racism, political inequity, and economic exclusion which still divide their regions.

The founders of tribal colleges recognized from the outset that, if Indian students were to be well served, colleges needed to be integral parts of their communities - geographically, culturally, socially, economically, and organizationally. Simply being close to students geographically is, however, a necessary, but not an sufficient condition for success. Each of the colleges is open to, and intertwined with, its community on many levels. For example, rather than creating separate and exclusive organizations for student extra-curricular activities, many colleges contribute to community softball leagues, pow-wows, rodeos, sobriety dances, and other functions which serve entire populations. Members of college boards of directors frequently serve their communities as leaders in other respects as well, and college faculty and staff often have visible, positive roles in other local organizations, and college facilities, expertise and resources are regularly used or shared by other groups.

Thus news about the colleges can, and does, travel through many channels. The institutions are open, transparent, and accountable, and these qualities reinforce the sense of local ownership provided by local control. Together, this ownership and control build identification and

comfort with the colleges in Indian communities. Formal educational institutions, in these same communities, have sometimes been regarded, with ample justification, as irrelevant at best, and at worst, alien, condescending, and predatory. But within tribal colleges, decision-making processes are consistently open to community observation; what college administrators occasionally lose in tranquillity they more than regain, over the long term, in credibility, acceptance, and acknowledgement.

Openness and accessibility likewise aid recruitment and retention. As the tribal colleges grow with their communities, the normal processes of academic life - registration, graduation, applying for financial aid, selecting courses of study - become incorporated as regular parts of local life. Students at non-Indian colleges have long been able to find out about college life from relatives and friends, through informal processes of information transfer and mentoring. Now these resources are available to tribal college students, and potential students, as well.

For more formal communications, tribal colleges have used whatever opportunities have been available locally. Conventional media strategies, devised for urban areas, are difficult to apply on reservations. Isolated geographically; most tribal colleges are far removed from even minor media markets. The closest television stations and daily newspapers are frequently located in cities hundreds of miles away. Local weekly newspapers, however, have often been generous and supportive in their coverage of college news and events. Local radio stations - particularly low-power FM stations targeted specifically at Indian audiences - have likewise been helpful. In addition to promotional announcements, several colleges broadcast their own regular programs on topics of general interest to their communities. In addition, many colleges make splendid posters and visual materials, using local artists and incorporating exuberant and flourishing local artistic traditions.

Tribal colleges maintain close contacts, not simply with individual students, but with whole families and communities. These contacts shape recruitment and retention activities. One recruiter at Little Big Horn College, for example, recognizing that extended families form natural support groups for their students, works with whole cohorts of cousins at once. Despite the fact

that many colleges are less than 15 years old, second and third generations of students from the same families are enrolling frequently. Most colleges combine an understanding of family-oriented recruitment patterns with more conventional efforts: sending representatives to local high college awareness programs; providing academic scholarship awards to promising high school graduates; familiarizing high school counsellors with college programs and services.

Since, however, a very high percentage of tribal college enrollers have high school equivalency certificates rather than diplomas, the institutions have also developed ways to deal with the particular needs of these students. Many colleges operate adult basic education programs for their communities; high proportions of GED graduates continue on to enroll in degree programs. By that point, college staff members have, in most cases, already become familiar with individual educational needs and learning patterns.

Students who have not been involved in formal education for some time - and many recent high school graduates - need opportunities to build skills, both academic and personal, to enable them to succeed. Most tribal colleges, therefore, evaluate each student's needs and academic situation at the beginning of his or her college career. This assessment, which usually combines conversations with diagnostic testing, frequently leads to the requirements that the student take one or more development courses (numbered below basic freshman level) to strengthen basic mathematics or language skills. Occasionally, students themselves will request to enter these classes, as a way of building confidence before they proceed. Many colleges also provide individual tutors, or study skills centers, which students may use at any time during their course work. These centers frequently stress the development of writing and communications skills as crucial to academic success.

In addition to academic reinforcement, tribal colleges work to strengthen student attitudes towards academic and personal responsibility. At Turtle Mountain Community College, if a student misses three classes, he or she is contacted immediately by a college staff member, and efforts are made to resolve any difficulties. At Sisseton-Wahpeton Community College (SWCC), distribution of financial aid is pro-rated for first year students, who may choose to receive portions

of their living stipends monthly or semi-monthly. Disbursement is made only on condition that the student has been attending regularly. Again, support is available, both from SWCC staff and from other organizations within the community, to work through problems. The approaches used by Turtle Mountain, Sisseton, and other colleges require careful monitoring of student attendance, performance, and morale. These techniques entail moderate investments in record-keeping, and detailed knowledge of community life.

The colleges work to make sure that students understand, at each step of the enrollment and assessment process, what is happening, and why. The colleges also try to communicate to students that the purpose of the developmental courses is supportive and preventive, not punitive. The colleges work to identify problems early, and to encourage students to develop constructive ways of addressing them - through tutoring, counselling, developing new study habits, rearranging study areas, whatever it takes to get on with the business of acquiring an education. Fundamental to this approach is an appreciation, on the part of faculty and staff, of the intense motivation of most tribal college students, coupled with a recognition of the legitimacy of the colleges' standards of performance. Weakening requirements for students, by bending standards or making unwarranted exceptions, weakens the institution as well. Instead, tribal colleges work to help students acquire whatever skills they need to succeed. If the colleges allowed students to continue with impaired skills or diluted educations, those students would only continue to face the limited choices - in employment, careers, further education - with which they are already familiar.

Student support services at tribal colleges generally attempt to make effective use of scarce resources. The small size of most institutions, coupled with their strong focus on students, facilitate communication among faculty, registrars, support staff, and financial aid personnel. Academic advising, financial aid counselling, and career-planning assistance can often be interwoven for each student by faculty and staff who are familiar both with the individual and with the institution's process. Fort Berthold Community College has formalized a mentoring process for its students, making available to them contact with several graduates. Colleges also work closely with other agencies in their communities - social services, alcoholism and drug abuse prevention programs, vocational rehabilitation, etc. Since the budgets of tribal colleges often do not permit

the institutions to have their own comprehensive student support services, most institutions establish close relationships with, and make referrals to, local organizations which can provide assistance to students.

Tribal colleges likewise encourage students who have not succeeded to try again. As many as one-third of the students at most of the institutions have been enrolled previously at some other college. The simple accessibility of a tribal college frequently provides an incentive to resume efforts at higher education. Federal financial aid policies place sharp limits on the number of times an adult learner without independent means can afford to try for an education, but within those constraints, tribal colleges work to provide opportunities and support for repeated efforts. Thus, in any academic term, as many as 10 to 20 percent of tribal college students may have used up their federal financial aid eligibility, but still need assistance in order to complete their educational programs. Few resources are available to provide this support, but the colleges continue to recognize an obligation to these students.

The social climate at tribal colleges also contributes significantly to student retention. Students and staff repeatedly describe their colleges as functioning "like an extended family", with warmth, humour, and discipline provided in culturally appropriate ways. The colleges are inclusive; parents, children, relatives, friends and community members regularly turn up at college events, and may pass through campus areas daily. Special efforts are made at graduations and other ceremonial occasions to honour the families of students, and to recognize the values and contributions of elders. For faculty and staff, personal and social relationships with students continue as a matter of course after they graduate or leave the institution, since they remain within their communities. Interestingly, most tribal colleges also have an informal support network, primarily composed of former faculty and staff, who have left the institutions and the reservations, but who return for visits, and keep up with the news.

The contexts in which tribal colleges began their work were disheartening. In the early 1970s, mainstream post-secondary institutions regularly experienced attrition rates among Native students in excess of 90 percent. Native students from reservation communities who became

discouraged, or were unable to continue, often appeared to give up, not only on higher education, but on their own futures. Simultaneously, however, educational patterns among non-Native students began to shift, especially after the Viet Nam War. Older students enrolled in greater numbers; students took longer to complete their degrees. Increasing numbers began their academic careers at two year-institutions. More students remained involved in formal education after they had completed an initial degree. These changes altered the tempos of American higher education. By the end of the 1980s, for example, few than one-third of the entering students at a major state university in the north central states, graduated within five years with bachelor degrees. In 1990, the median time taken for the attainment of a bachelors degree, nation-wide, was six years.

### **Success Of Tribal Colleges**

Tribal colleges came fairly early to recognize that their own successes, and those of their students, ought not to be evaluated solely by yardsticks appropriate to other communities. Nor should those evaluations be based on assumptions that tribal college students could, or should, progress in lock-step towards degrees. Many tribal college students have families, and therefore must proceed towards degrees at a pace which is realistic for them. Tribal colleges also serve other constituencies: people taking one or two courses to improve job skills; individuals who enroll in a single course out of general interest; staff of public-sector programs who take workshops or special courses developed for them. The communities served by the colleges are geographically and socially isolated; the tribal colleges are often the sole providers in their areas for educational services - adult and community education, skills upgrading, professional development or recertification - which, in more popular areas, would be provided by a whole range of institutions, public and private.

In order to assess the effectiveness of tribal colleges in educating their students, AIHEC, in the spring of 1990, gathered data from six of the accredited institutions, those with large enough enrollments, and long enough track records, to generate statistically significant data: Oglala Lakota; Sinte Gleska; Standing Rock; Turtle Mountain; Salish Kootenai; and Blackfeet. Information was collected for the period 1983-89. During these years, the six colleges graduated 1575 Indian people. Of these graduates, 210 earned one-year vocational certificates, 1198 earned

associate degrees, 158 earned bachelor's degrees, and 9 earned master's degrees in education.

About one-third of these graduates, primarily those with vocational certificates and associate degrees, continued their education after graduation. The remainder sought employment within their communities. Additionally, an overwhelming majority of tribal college graduates who pursued advanced degrees outside their communities returned after the completion of their academic work.

Tribal college graduates have been successful in finding employment. Depending on the reservation, 83 to 86 percent of the graduates of the six colleges studied were employed. These figures contrast sharply with local unemployment rates, which range from 54 percent on the Flathead Reservation (home of Salish Kootenai College) to 85 percent on the Rosebud Reservation (home of Sinte Gleska College). Independent evidence indicates that 75 percent of tribal college graduates in Montana are employed in fields related to their degrees. Of the remaining 25 percent, approximately half indicated that they had already been working for their employer prior to entering a tribal college.

The employment rates of tribal college graduates are particularly significant because they represent gains made primarily by Native female heads of households, whose median age was about 30 years, with little previous experience in the workforce - most of these students had been receiving general assistance or Aid to Families with dependent Children (the basic federally-funded social assistance program) prior to enrolling in college. Similar gains in employability appear to be taking place at every tribal college; data from Stone Child College, on the Rocky Boy Reservation, and Sisseton-Wahpeton Community College, paralleled or exceeded those from the larger and older institutions.

Independent assessments are also beginning to confirm observations made from within the tribal colleges - that tribal college students are fundamentally pleased with their educational experiences. In a recent study of Montana tribal college graduates, 33 percent of those surveyed rated their "preparation for continuing your education" as "excellent", and 38 percent rated it



"good". Eighty-six percent of graduates surveyed rated the preparation of their instructors as "good" or "excellent". Graduates rated "the quality of educational training received" with a mean of 3.36 on a scale of four, indicating a high degree of satisfaction.

Completion rates at tribal colleges appear to bear favourable comparison with those of other post-secondary institutions. Data from three of the colleges - Salish Kootenai, Turtle Mountain, and Sisseton-Wahpeton - indicate that as many as 80 percent of students enrolled in any academic term complete their courses; it is not yet clear what percentage of students eventually completes a degree, or the range of times normally required for those completions. A study of Montana tribal college students, however, revealed that a majority of students who discontinued their education, did so for non-academic reasons. Furthermore, among the academic reasons expressed, students most frequently cited: the unavailability of desired majors and courses; uncertainty about choice of major or degree programs; and the need for a break from studies. Non-returning students cited, as reasons for not going back to college: home responsibilities (27.5 percent); personal problems (24.5 percent); insufficient money (22.5 percent); the unavailability of desired major or program (21.6 percent); and the need for a temporary break from studies (19.6 percent). Dissatisfaction with the quality of tribal colleges, or the students' experiences in them, did not emerge as significant reasons for leaving the colleges.

Tribal college students are beginning, in significant numbers, to obtain degrees at off-reservation institutions. The experience of tribal college students who transfer to off-reservation institutions, or complete graduate degrees, likewise are beginning to provide evidence of the strength of their academic preparation. By their own accounts, individual Native students who have earned graduate and professional degrees at the University of South Dakota Law School, Montana State University, the University of North Dakota, Harvard Law School, Arizona State University, the Harvard Graduate School of Education, the University of Nebraska, or South Dakota State University would not have been able to attend without their experiences at the tribal college. As of June 1990, the graduates of a single two-year institution, Turtle Mountain Community College, had earned 155 bachelor degrees, 25 masters, 3 law degrees and 3 Ph.D.s.

The tribal colleges have derived new solutions to long-standing problems in Native education. This effort has required sustained, patient, hard work; many of the presidents, administrators, and faculty have been with their colleges since the doors opened. The colleges have become institutions, with institutional continuities and institutional memories. No three-year program, or succession of them, has provided comparable results. Benefiting from two decades of continuity, the colleges have been able to learn from their own experiences and those of others. The Institutions have, over time, discarded less functional methods and approaches, and accumulated and refined those which work for them. They have shared, patiently and gradually, their experience and expertise with each other, and have built a network which provides information, support and political effectiveness.

The colleges do not form a unitary system; their network is decentralized. No single, central organization has mastered the sensitivity and local knowledge necessary to serve the diversity of cultures, languages, economies and societies which form the colleges' constituencies.

The colleges demonstrate the utility of smallness, openness, and accountability for working in their reservations. The colleges know their students, their families, and their communities. And the communities know their colleges, not only as collections of teachers, friends, and relatives, but as institutions and as resources.

Ultimately, the colleges derive strength from their accountability. They hold themselves accountable, not only to their tribes, to funding sources, and to accreditation agencies, but also to the intentions for which they were established. The founders of the first colleges insisted that the inclusive values of tribal spiritual traditions be a foundation of the institutions. They insisted as well that the ultimate moral purposes of education at the tribal colleges be acknowledge, celebrated, and shared. The wisdom of their choices is becoming increasingly clear.

It is important, however, to recognize that the tribal colleges gain strength not only because of their distinctiveness from other American educational institutions, but also because of their relationships to the wider post-secondary community. Accreditation of post-secondary institutions

in the United States is a peer-review process; members of regional associations of colleges and universities set standards for, and conduct on-site evaluations of, other institutions in their areas. There is some variation in the methodologies and language used by the accreditation associations, but all emphasize the periodic self-evaluation of institutional systems and educational outcomes at stated intervals - usually five to ten years. Each of the tribal colleges must participate in this accreditation process, as a prerequisite for being able to administer basic federal student financial aid programs. As tribal colleges participate in this review process, they are drawn into contact with other institutions to exchange ideas and techniques, and contribute to on-going national dialogues on higher education. For the colleges, successful completion of the accreditation and reaccreditation processes likewise can be useful as an affirmation of educational quality, both to local constituencies and to national audiences.

A second connection between tribal colleges and other post-secondary institutions comes through the transfer of tribal college students to other universities and colleges. In the United States, transfer from two-year to four-year institutions is relatively routine; community colleges customarily design their curricula with an eye towards facilitating this movement. Many tribal colleges also negotiate formal articulation agreements with four-year institutions; these agreements specify in advance the kinds of courses and numbers of credits which the four-year will accept from the tribal college when an individual student transfers. These articulation agreements assist students in selecting their course work at both institutions, and provide some security in planning, both for the transfer student and the four-year institution.

## **IMPACT OF TECHNOLOGY/INFORMATION ON ABORIGINAL TRAINING AND SOCIETY**

### **Aboriginal People and Technology**

Technology and humanity are inextricable. Throughout history, the ability to wield technology has driven human destiny. Indeed, there are many who hold the view that it is the ability to use tools that distinguishes human reason from other life on Earth. Throughout time, technology has not served purely as an inanimate contrivance. Technology is an intimate and essential aspect of the people employing it. To an extent, it is a function of an era and a world view.

Consider the introduction of the horse and gun to the Great Plains of North America. This technology arrived in the late 18th century, and was rapidly assimilated by the First Nations extant there. The binding of this technology and these peoples produced one of the most compelling adventures in all of human history. Admittedly the reality, as portrayed in oral history, was less than idyllic. These were, after all, hard people living in difficult times. But in terms of economic factors and quality of life, they prospered. The synthesis was eminently successful. The relationship between these peoples and this technology was organic. The technology fostered societal evolution and the engagement of the technology was a function of their culture. Obviously, the horse became a staple of their prosperous economy, and guns greatly enhanced their ability to harvest game. But they didn't use mobility and firearms to hunt the buffalo to extinction. That behaviour was precluded by their culture.

In the past, the First Nations of what is now British Columbia and the Yukon had developed fish traps to harvest salmon. This was extremely beneficial technology. They employed this technology skilfully. The fish traps were set at strategic points in the river. However, it was technology that they used wisely. With a fish trap constructed across the entire width of the river, they could have taken a bounteous harvest. But doing so would have destroyed the salmon run. As a result, there would have been no salmon for future generations. The fact there are still salmon runs in those rivers. proves the wisdom of their use of that technology. Again, culture dictated the

engagement of the technology.

Early in this century, many First Nations of the Great Plains were adapting successfully to an agrarian existence. They had survived a shocking dislocation of liberty, diet, and affluence. But taking to agriculture with a will, they were able to reverse their fortunes. At the time, a wave of automation was being introduced into agricultural methods. In many instances, Indian Affairs agents forbade the use of mechanical threshers and other automated methods by Indian farmers. These men ruled the Bands with an iron fist. The ostensible reason for their actions, was that they desired to cultivate a 'work ethic' among the Indians they ruled. The consequence was that Indian farmers couldn't compete fairly with the dominant society farmers who surrounded them.

The world is still undergoing evolutionary and relentless change due to technological innovation. Some argue that there will be a dichotomy in the dominant society. The post-industrial age will see an entirely new society emerge. Others argue that the industrial society will evolve, in a linear fashion, into a post-industrial society.

Aboriginal cultures and societies have proven persistent through extremely dynamic and cataclysmic times. The revolutionary information era that is sweeping the globe, clearly presents challenges for all societies and nations. Aboriginal Nations are no exceptions, but will unquestionably retain the fundamental precepts of their cultures and societies. However, they must embrace the technology or risk future prosperity.

There is nothing un-Indian about technology. There is nothing wrong with Aboriginal people employing technology to their advantage. Insulating Aboriginal people from technological change has proven disastrous and would be especially disastrous now. In the long run, failure to foster access to technology for parsimonious reasons is debilitating and costly for all. It can and should be done in an efficient and cost effective manner. But it can't be avoided. Aboriginal populations are young and rapidly growing. Embracing technology through appropriate curriculum will give young Aboriginal workers the skills they and Canada need.

## **The Microprocessor**

The engine driving the omnipresent change is the microprocessor. The computational power that can be generated by a single sliver of semi-conductor is immense. The Alpha microprocessor manufactured by the Digital Electronic Corporation has the computational power of the Cray I supercomputer of the early 1980's. For several years the computational power of the microprocessor has doubled every 18 to 24 months. The trend is expected to continue until the end of the century.

Just as important has been the astonishing decrease in the cost of the typical microcomputer system. History has never seen a commodity like the microcomputer or an industry like the microcomputer industry. Had the automobile industry been able to improve automobiles and reduce costs as much, everyone would be driving Rolls Royces that cost a couple of dollars and cost pennies to operate.

The microcomputer industry is intensely competitive. There is competition between the assemblers of microcomputers and the manufacturers of microprocessors. Furthermore, there is competition between the manufacturers of the components, such as the disk drives, memory chips and video systems. The consequence of this competition is that there is irresistible momentum behind the improvement and increased cost-effectiveness of the hardware. Assemblers and component manufacturers that cannot continually deliver a superior product at a lower cost are driven into the ground by companies that can. The revolution in the evolution of the microcomputer is not going to end any time soon.

The increase in computational power and the decrease in hardware cost affords everyone and every segment of society the opportunity to be empowered in fundamental ways. Certainly the economy of the microcomputer means that computational power is widespread. But it is the magnitude of the computational power that is critical for empowering the individual. After all, microcomputers with limited computational ability would have insignificant utility regardless of the cost-effectiveness.

## **User Friendly Computers**

With powerful microprocessors many computational difficult problems can be addressed. Perhaps the most significant problem that has been addressed by recent generations of microprocessors is the interaction with the user. At the present time it is the standard for the interface of the microcomputer to be graphically-oriented. In the past, the computer user interacted with the computer by typing in cryptic strings of commands. With current generations of microprocessors, the microcomputer user can interact with the system via the use of graphics. For example, when the user wishes to print a document the user selects an icon that looks like a printer.

This graphically oriented way of interacting with a microcomputer system is only the beginning of the enhancement of the interaction between humans and computers. Increasingly, the user will be able to interact with voice. There are presently systems that understand voice commands issued by the user. As well, there are dictation systems that can understand the user's speech and enter the corresponding text into a word processing system. The microcomputer with multimedia enhancements has the ability to convey information to the user through sound, pictures and even full-motion video.

The consequence of these advances is that the microcomputer is vastly easier to use. The time it takes a user to learn to utilize microcomputers effectively is greatly reduced. As well, the user can employ the most advanced features of microcomputer applications, because they are so accessible. For example, the best word processor programs allow the user to easily accomplish tasks like: spell checking documents; checking for grammar; inserting elements like graphics, bar charts, or tables; doing mail merges; and formatting the appearance of documents.

In this drive towards ease-of-use, the powerful notion of virtualization was developed. An example of virtualization is the use of a push button with the image of a printer on it to represent the print function in different applications. Another utilization of virtualization is found in Program Manager of Microsoft Corporation's Windows 3.1. In this graphical environment, most of the typical tools of the office desktop have been virtualized. There are functions that serve as the user's clock, calculator, card index, filing cabinet, notepad, and so on. Each of these functions

is realized by a reasonable graphical metaphor. For example, the notepad function is represented by an icon that looks like a notepad.

Most importantly, the user can employ powerful microprocessors to solve problems in a dynamic manner. Large scale computing has been around since the late 1950's. Until well into the 1980's, computer systems were centered around the machine. These early systems had very limited capabilities and for reasons of economy, the computational power was centralized and inaccessible to most users. The users interaction with the computer was inflexible. It was very much the case that, in most early systems, users served the computer. Solving a problem, with those early systems was often an elaborate process that involved programmers, analysts, and considerable time. Today, the user can often pursue the solution of difficult problems alone. Sophisticated software systems and powerful hardware allow the user to readily develop solutions to a vast range of problems. For example, an artist can create photo-realistic art work, a manager can generate reports on inventory, a mathematician can solve complex fractional equations.

### **Impact On The Work Environment**

The nature of the technology has had profound consequences for much of the economy of North America. Automation and global restructuring dramatically changed the fundamentals of the North American economy. The manufacturing sector has been decimated and is unlikely to recover. To an extent, the technology has suffused the philosophic foundations of organizations. The same furious competition of the microcomputer industry, has been generated, in a synergistic manner, in most other industries, and for much the same reasons. New technologies and methods create enormous potentials and perils for enterprises. Witness, for example, the introduction of automated teller machines and a raft of other technology-spawned services in the banking industry. This trend has lead whole industries to evaluate the very way business is conducted.

These influences have caused the very structure of large-scale organizations to evolve. Up to the late 1980's, the typical large company was hierarchical in structure and pyramidal in the proportional numbers of employees at each management level. The workers and clerical personnel were the most numerous. A number of low level managers and supervisors oversaw those workers



and the fundamental activities of the company. There was a smaller number of middle-level managers concerned with the tactical planning of the company. Finally, there was a small number of top-level managers concerned with the strategic direction of the organization.

Automation and the introduction of information technology initially reduced the numbers of the workers, clerical personnel, supervisors and low-level managers. By the early 1990's, in many companies, the proportional number of employees at each management level had evolved into a diamond shape. The greatest number of employees was at the middle-management level, with fewer employees at the top-level management and low-level management levels.

This evolution is continuing with a reduction in the number of middle-level managers. This evolution is possible because the technology permits the tasks of those managers to be automated, just as the tasks of workers and clerical personnel were automated. As a result, fewer managers working more productively do the work that once required more managers and the supporting infrastructure those managers required. Those remaining managers rely heavily on sophisticated information systems based on powerful microcomputers, because the complexity and volume of tasks still remains the same.

This evolution will in many cases proceed to its logical conclusion. Essentially, **a flattening of the classical hierarchical structure of the typical organization.** The workforce of many organizations will evolve into dynamic, interrelated teams. The workers may not necessarily be involved in only one project at a time.

Furthermore, the workers on particular teams may be located at different locations. There is obviously a requirement for some means to coordinate these workers. An important trend is the development of software to assist such workgroups in the performance of their tasks. The preeminent example of such software is Notes by Lotus Development Corporation.

The philosophy of workgroups goes hand-in-hand with the principle of the virtualization, as seen in the desktop tools in the Microsoft Windows Program Manager. Virtualization can be

extended to the entire enterprise. Quite simply, **the model of workers commuting daily to a central office or factory is no longer necessary.** Workers can utilize telecommunications technology to telecommute to wherever they are required. Indeed, they can interact simultaneously with workgroups whose members are all physically separate.

In fact, with a microcomputer, a modem, and telecommunications software each worker could be at their own home. There does not have to be a office building for workers to congregate in. In this model, there has to be some repositories of information and hardware. But, in principle, the office itself is virtual. The workers can still communicate and work together as readily as if they were in the same building.

### **Information As A Commodity And The Superhighway**

Information, in the old style of organization, flowed strictly in a horizontal or vertical direction. With this new model, information flows in every direction. Everyone talks to everyone. Each point is connected to every other point. Information shuttled lethargically from level-to-level and department-to-department in the old model. **In the new model, information flows dynamically and intelligently to wherever it is needed, whenever it is needed.**

The nature of information has been altered by these developments. With sophisticated means of handling and looking at information, companies were able to gain a strategic advantage. By examining information about their flights, airlines are able to plan seat sales to increase profitability and gain market share. In some industries competition is increasingly centered around providing better information services for customers and clients. By introducing on-line tracking of packages, Federal Express was able to significantly increase its share of the courier business.

**Information has evolved into a commodity.** Moreover, information is becoming the most important commodity for North America. Increasingly, it will be the job of the typical North American worker to process information in some way. The quality and extent of information infrastructure is important for that future.

This future information infrastructure or information superhighway has recently received great play in the media. However, the information superhighway is going to remain in the planning and construction phases for some years to come. There are a range of fundamental technical issues and strategic considerations that have to be resolved before this highway becomes a reality.

The highway promises to deliver a range of information and transactional services to the user. These services could include:

- on-demand entertainment services, such as videos and interactive games
- banking services such as bill payment and brokerage services
- consumer services like shopping and travel services
- communications services, including electronic mail and video telecommunications
- a range of educational services, including university-level courses
- library and general reference services
- governmental services
- employment related services, including the ability to telecommute to the workplace from home

To fully function in a global economy, many industries will require unfettered and free access to the information superhighway. For these industries, the information superhighway will become their marketplace, office, and plant. In addition it will serve as their gateway to international business.

**There is little doubt the highway is going to come about and that it will have enormous impact on all aspects of life.** The analogy between the information superhighway and real highways is appropriate. The information superhighway will connect most communities and homes, just as the streets and highways do now. The services the highway will provide, will be as universal as the services provided by the transportation system. It would be difficult to imagine life in Canada functioning without the transportation system. Even the existing

telecommunications system is an inherent and fundamental part of life. The services provided by the information superhighway will undoubtedly become a seamless and essential part of life.

One pivotal issue is whether the telephone companies or the cable companies will be the carrier for the information superhighway. Both industries are quite intent on becoming the carrier. Certainly, both have facilities that can potentially serve as the roadway for future information services. The telephone companies have nearly universal coverage. The cable companies have experience in delivering a range of entertainment services. Canadian cable companies have the advantage that their systems are fairly recent and as a result are more technologically up-to-date.

The primary technical problem in delivering the promises of the information superhighway is the capacity or bandwidth of the proposed systems. The problem is rather like pumping water through pipes. Pumping large volumes of water requires larger diameter pipe. Conveying digital information in the volumes required by the information superhighway will require telecommunications distribution systems with significantly enhanced bandwidth. In particular, full-motion interactive digital video will require significant bandwidth.

The information superhighway will generally require an investment in telecommunications infrastructure. The great distances and relatively low population densities do put Canada at a disadvantage in economically deploying telecommunications services. This can only impact negatively on Canada's ability to prosper in **a future where information processing is the main economic endeavour.**

To this point, a breakthrough technology has not emerged that can deliver the information superhighway. There are certainly a number of possibilities, but there is no standard or even a generally agreed upon approach. Clearly, this technology has to have the ability to deliver digital information in a range of formats, in an interactive manner. This is going to require a convergence of processing capability and telecommunications. One approach would be to directly combine microprocessor with cable television technology. This is the approach adopted by the UBI initiative in Quebec, which involves a set-top cable box with a PowerPC microprocessor. All the

information services are delivered through that one system. On the other hand, Microsoft Corporation and Rogers Communications Incorporated are developing a system which will keep the microcomputer and the television separate. The television will be used to deliver interactive video entertainment, while the microcomputer will be used to deliver transactional services.

A framework for the information superhighway exists in the Internet. This system is a loose collection of millions of computers located at myriad sites throughout the world. These sites are linked by a complex telecommunications system. The Internet began as a system to link scientists and military personnel in the late 1960's.

First and foremost, the Internet serves the research and academic communities. Many universities provide Internet access to their faculty and students. In addition to providing electronic mail services, Internet has vast electronic libraries of information. In addition, there are mailing lists and news groups that provide interest groups an ongoing forum. These forums covered an enormous range of topics from current events to the most arcane academic research areas.

Currently, there are some 15 million users of the Internet, with 150,000 joining every month. Increasingly, the business community is accessing the Internet. Stories abound of small retail businesses posting their catalogues on the Internet and gaining enormous increases in sales volumes. Many large businesses utilize the enormous world-wide electronic mail services of the Internet.

The Internet may well evolve into the information infrastructure of the future. Significantly, it shows the range of important global services that can be provided by an information superhighway. Often cable operators and video game distributors aim for the lowest common denominator in their proposals for the information superhighway. But the Internet show the demand exists for far more than just on-demand games and movies.

## **Educational Impacts**

Today's typical student will enter an environment restructured around information. Clearly, the education they receive should prepare them for the challenges they face. However, **education as practised in the public schools of Canada is dated**. It is largely a product of societal imperative and circumstance. In the final event, education must prepare the students for life after school. In the past, that optimally meant a career in a substantial or even monolithic organization. Those organizations were ordered in a hierarchical manner. Workers, lower and middle level managers performed their scripted duties in concert. Regimentation and collectivity in the public school system was relevant in that context. As a result, in the dominant society, the emphasis is on providing a standard education for everyone.

However the need to educate large numbers of student with limited resources in a collective fashion gives rise to substantial problems. In a typical classroom environment, the average student receives minimal individualized instruction. The teachers interaction with the students is usually diffused. It is spread throughout a class. Furthermore, the pace of lectures and exercises must be based on the abilities of typical students. There are going to be substantial numbers of students who are going to be bored because the pace will not be challenging enough. Then there will be those who will find the pace too demanding and will fall behind.

Another difficulty is the sophistication of the interaction. Most classroom discourse has not changed in a century. It consists of a teacher, standing at the head of a class and writing on a chalkboard. This has to be contrasted with the compelling forms of interaction the student can participate in outside the classroom. There are electronic forms of entertainment such as television, movies, and video games. Digital broadcast systems and intelligent video-on-demand cable television systems will offer the user the ability to individualize the delivery of video entertainment. Video game systems are often based on microprocessors and offer stunning graphics, with well thought out interactive interfaces. Then there is, of course, the growing numbers of home computers. Many parents are investing in home computers with the express purpose of improving the computer literacy of their children. Home computers are widely available through the same retail outlets that sell other consumer electronics. Microcomputers systems now outsell television sets.

Not surprisingly, traditional textbooks and classroom lectures are becoming tedious to many students. Education has to compete with those technologies for the attention of the student. Furthermore, the interactive, sophisticated and singular way of working with information is what the students are accustomed to. Most importantly, the workplaces the students are going to be entering will by and large require workers to interact with information in the same manner.

Another difficulty with the standard classroom is the issue of the productivity of the teachers. Often the time of teachers is consumed by administrative tasks. As well, teachers with specialized skills are quite often employed outside the area of their specialization. Certainly smaller class sizes would go a long way to employing specialized teachers more productively and reducing the overhead of administrative details. However, reasons of economy often preclude that as a practical solution.

Admittedly these difficulties can be overcome by dedicated and creative teachers. However, failure to evolve the current educational system ignores the trend of events outside the classroom and the fact that exceptional teachers are not universal. In any case, the current system does not always employ teachers advantageously. The concern, then, is to introduce information technology in beneficial ways into the classroom.

### **Computer -Assisted Instruction And Training**

Information technology can be employed to deliver educational material. This is known as Computer-Assisted Instruction (CAI). The most suitable platform for CAI is multimedia technology. Multimedia technology allows sophisticated interaction with users. A multimedia workstation has the capability, via a sound card, to generate stereo quality sound. With the appropriate software, voice commands and simple voice input can be interpreted. In addition, a multimedia workstation has a CD-ROM drive. CD-ROM's have the capability to store information such as pictures and full-motion video. With these facilities, the user can interact with the computer via stereo sound, still photos, and full-motion video.

Many encyclopaedias have been published in a multimedia format. A reference to

traditional pow-wow dancing can include the usual text and still photos, as well as, full-motion videos of a traditional dancer. A wide range of courseware is already available for multimedia workstations. In the near future, an extensive library of educational material will be available on every topic.

It is quite usual for a multimedia application to combine different sorts of information, in a presentation on a single topic. This concept of tying disparate forms of information together in this way, is of fundamental importance - it is known as Hypertext. The concept was pioneered by the Hypercard program that runs on the Apple Corporation's Macintosh line of microcomputers.

Hypertext systems allow related information to be linked together, regardless of the format the information is in. For example, an article on the Plains Cree might have a reference to Chief Poundmaker. By clicking on his name a biographical sketch of Chief Poundmaker would be called up. The biographical sketch could contain a reference to Saskatchewan. Clicking on that key word calls up an article on the province. That article could have links to maps and statistical information presented in a chart. Presenting information in this manner, allows the student to gain relevant knowledge quickly and precisely.

Multimedia systems utilizing hypertext principles are invaluable for training in office environments. Companies normally have a standard set of application packages the secretarial personnel work with. However, staff turnover presents difficulties. Often, in the past, trainers conversant with the software would have been retained to train new staff. An alternative would be to utilize a multimedia workstation with courseware teaching the applications. This courseware can employ a fully interactive video presentation by a trainer. The advantage over normal video tapes played on a VCR, is that the multimedia presentation is interactive. The system reacts appropriately to the user's actions.

Multimedia workstations have been employed to train professionals as diverse as mechanics and emergency room physicians. The knowledge necessary to perform in these and many other fields is changing. The workers in these different fields continually need to have their skills



upgraded because of evolving technologies and methods. It is often difficult to schedule this training. By retaining multimedia workstations these workers don't have to attend specific training courses. They can take the training at their convenience. They can leave the training at any point to attend to regular duties, then continue where they left off.

The outstanding aspect of multimedia technology is that it is compelling. It can compete with the host of distractions facing students. Moreover, it is decreasing dramatically in cost. In fact, it is very likely, that the standard microcomputer will be shipped with multimedia enhancements because the multimedia capabilities allow far more articulate interactions.

Education, to varying extent, must simulate experience. Multimedia workstations, by more realistically demonstrating some skill or knowledge, can simulate experience better than any standard classroom environment. Advancing technology has the potential to simulate reality even more closely. Virtual reality or virtual environments, consists of headgear and gloves that are worn and software that translates data into images. The headgear has earphones and three dimensional stereo-scopic screens. The glove has sensors that collect data about the user's hand movements. When coupled with the software, this sensory equipment allows the user to experience and interact with alternative realities to the real world. This technology has tremendous potential for realistic training for professions such as pilots or surgeons, where the alternatives are costly or risky. It would be particularly useful in training for hazardous situations like fire fighting or nuclear clean-up.

Another way that information technology can be employed in education, is through Computer Managed Instruction (CMI). With CMI, the computer is used, primarily, to manage the progress of students through a curriculum. There may be little or no actual instruction done at the computer. A CMI system could be used to give and evaluate tests to individual students. The system would recognize where the student had deficiencies and tailor assignments to correct those deficiencies. In addition, a CMI system relieves teachers of considerable administrative work. This allows teachers to focus on teaching. The students are allowed to progress at their own speeds and to their own schedules.

CMI systems are particularly suited for situations where there are students with varying levels of education and needing different subject matters. For example, alternative schools, adult basic education, and skills upgrading. These sorts of situations aren't suitable for the standard lecture format, where all the students have equivalent prerequisites and are pursuing the same subject matter. Here an individualized approach is clearly called for. CMI software allows for this to be done in efficient manner.

CMI has potential both for education and training in the future. First of all, because it allows for an individualized approach. Worker are going to have far more transitory careers. The average worker is not going to hold the same position for life. The average worker will likely have a series of jobs, with none of the jobs necessarily being in the same profession or trade. As a consequence, there will be a stream of workers requiring diverse new skills or differing levels of basic education. These workers will have varying educations and backgrounds. This is, of course, an ideal case for CMI.

The ideal would see a convergence of CMI and CAI. There should be links between desired educational outcomes in CMI curriculum and CAI lessons that provide those outcomes. For example, there could be a series of concepts in Indian Studies determined and evaluated by CMI based curriculum, with automated links to interactive CAI courseware teaching those concepts.

## **ABORIGINAL PEOPLE AND THE SCIENCE-BASED PROFESSIONS**

### **The Need**

The correlation between training and educational attainment and employment opportunities, economic well-being and health has been well established. Over the past two decades, very effective programs have been developed to encourage more Aboriginal students to take advanced education in the social sciences- and humanities-oriented areas such as Education, Social Work, Indian Studies and Indian Languages. As a result, enrollments in these areas are growing steadily. However, Aboriginal people are severely under represented in other areas, particularly the science-based professions and occupations, such as those related to agriculture, engineering, the health sciences and related technologies. For example, as far as is known, there are currently 34 Canadian physicians of Aboriginal ancestry, approximately 2% of the 1480 required for proportional representation in this profession; Aboriginal representation in other science-based professions and occupations is of the same order. Enrollments in these programs are very low and retention rates are discouraging. This means that if action is not taken, Aboriginal people will continue to be under represented in the science-based occupations and professions well into the 21st century; a century in which science and technology promises to play an even more important role.

The choice is clear: to invest more now in creative solutions to increase the educational attainment of Aboriginal people, particularly in the science-based areas, or to accept higher expenditures for the consequences of inaction later. The population of the Aboriginal people will increase significantly in the next two decades. Furthermore, it is also projected that most of the new jobs created in the 21st century will require even higher levels of education than those of today.

Maintaining the status quo will inevitably result in higher unemployment for Aboriginal people in the future. As a result, Aboriginal people will be even more marginalized, continuing to face the health, social and economic problems which beset them today, but on a far greater scale. This inevitably translates into increased expenditures for social assistance, health programs and more penal institutions, to say nothing of the cost in human terms.

Alternatively, a great investment could be made now in well-designed, new initiatives to

increase the number and success rate of Aboriginal people in science-based degree and diploma programs.

This would, in turn, increase employment opportunities for Aboriginal people, enable them to participate more fully in economic development, empower them to improve their own health care systems and thus would return monetary and social dividends. This development of human resources would enable Aboriginal people to have greater control over their own destiny, to maintain their own culture and to become a leading force in the economic, cultural, political, and scientific future of Canada. Enlightened self-interest, if not the moral suasion of social justice demanding equal opportunity for all, should ensure that this investment be made.

The fact that Aboriginal people are so under represented in science-based vocation is evidence that existing education institutions at all levels have not been effective in addressing this problem. A new approach must be taken - one which builds upon the experience gained in many successful initiatives undertaken in Canada and the United States to improve the participation, retention, and success rates of culturally diverse minorities in educational programs; and one in which Aboriginal people themselves have ownership and responsibility for its success. An investment and a commitment must be made to support a comprehensive, multi-faceted, strategic plan designed to realize cumulative improvements in the interest and education attainment of Aboriginal people in mathematics- and science-related fields over the long term. The following pages outline a strategic plan to achieve this goal.

### **Under representation of Aboriginal People In The Science-based Professions**

A positive step that should be taken toward improving the economic well-being and general health of Aboriginal people, while at the same time placing them in a better position to manage their own affairs, is to make a concerted effort to increase the number of Aboriginal people in the science-based professions.

Reliable data on the number of Aboriginal people currently engaged in science-based occupations is not available. However, the approximate number of Aboriginal people who have

the necessary education background to enter these professions is available from the 1986 Census Data and can be used as a relative measure. Based upon 1986 census data, Table 1 shows the estimated number of First Nations people over 15 years of age in Canada with post-secondary degrees, certificates and diplomas in the following areas:

1. Agriculture and Biosciences or Related Technologies;
2. Engineering and Applied Sciences;
3. Engineering and Applied Science Technology and Trade;
4. Health Professional Sciences and Technology; and
5. Mathematics and Physical Sciences.

In 1986, only 10,005 Aboriginal people in Canada held post-secondary degrees, certificates or diplomas in these professional science and technology areas. This number was only 21% of the 46,365 who would hold these credentials if the Aboriginal people were represented in these certification categories in proportion to their population. This suggests that First Nations people would have opportunity to compete for roughly 36,000 more jobs in these areas if they had the necessary education qualifications to do so. In Saskatchewan, there were 1065 who held post-secondary degrees, certificates or diplomas in these areas, or only 17% of the 6,320 required in this province for proportional representation.

Aboriginal people are much more severely under represented in those science and technology areas requiring university degrees, certificates and diplomas. The number of Aboriginal people holding this level of certification in the five areas listed above in 1986 in Canada was only 410; about 4% of the 11,570 that would have been required for proportional representation.

Table 2 shows the number of people holding non-university certificates and diplomas in 1986 in Canada, in certain science- and technology-based fields. It also provides an estimate of the number of Aboriginal people that will be required to hold these credentials in the year 2006 if proportional representation were to be the goal based on a 1990 Statistics Canada population

projection. This estimate suggests that for proportional representation, the number of Aboriginal people holding these credentials in these fields in Canada would have to increase from an estimated 9,595 in 1986 to approximately 58,000 in 2006; roughly a six-fold increase.

Table 3 provides the same information for university certificates, diplomas and degrees for certain science-based fields. For proportional representation, the number of Aboriginal people holding these credentials in these fields in Canada would have to increase from an estimated 410 in 1986 to approximately 19,160 in 2006, nearly a 50-fold increase.

The 1986 census data is now outdated but the 1991 census data relating to the number of Aboriginal people holding post-secondary degrees, certificates and diplomas will not be available until the third quarter of 1993. Also, population projections are subject to change. Furthermore, while proportional representation in certain science- and technology-based fields has been used in these tables as a basis for comparison, this may not be the specific goal Aboriginal people wish to achieve. Nonetheless, these figures indicate that a massive, all-out effort is required to increase the number of Aboriginal people graduating in these five professional science and technology areas, particularly at the university level. This effort will require the cooperation and involvement of many organizations and institutions within the public and private sector, and the enthusiastic support within the Aboriginal communities, as well as within industry, government and academia.

**Table 1**  
**Number of Aboriginal People with Post-Secondary Degrees, Certificates & Diplomas**  
**In Five Professional Science and Technology Areas<sup>13</sup>**  
**In Canada**

	<b>Total Population</b>	<b>Number of Aboriginal People</b>	<b>Number of Aboriginal People as a % of Proportional Representation</b>
Trade Certificate or Diploma	1,266,495	6,965	35%
Other Non-University Certificate or Diploma	<u>935,600</u>	<u>2,630</u>	<u>18%</u>
<b>Sub-Totals</b>	<b>2,202,095</b>	<b>9,595</b>	<b>28%</b>
University Certificate or Diploma Below Bachelors Degree	118,930	155	8%
Bachelor's Degree	392,640	210	3%
University Certificate or Diploma Above the Bachelor's Degree	35,640	15	3%
Degree in Medicine Dentistry or Optometry	74,235	15	1%
Master's Degree	75,410	15	1%
Doctorate	<u>35,565</u>	<u>0</u>	<u>0%</u>
<b>Sub-Totals</b>	<b>732,420</b>	<b>410</b>	<b>4%</b>
<b>GRAND TOTALS</b>	<b>2,934,515</b>	<b>10,005</b>	<b>21%</b>

<sup>13</sup> These areas are the following Statistics Canada categories: Agriculture and Biosciences or Related Technologies, Engineering and Applied Sciences, Engineering and Applied Science Technology and Trade, Health Professional Sciences and Technologies, and Mathematics and Physical Sciences.

**Table 2**  
**Number Of People with Non-University Certificates  
 And Diplomas In Certain Science-Based Fields  
 and  
 Number Of Aboriginal People Required To Hold These Credentials  
 For Proportional Representation in 2006<sup>14</sup> In Canada**

	<b>Number in General Population</b>	<b>Number of Aboriginal People for Proportional Representation</b>
Agriculture & Biological Technologies	81,180	2,135
Engineering & Applied Science Technologies	1,481,885	39,020
Household Science Technologies	103,475	2,725
Mathematics & Physical Science Technologies	44,215	1,165
Medical Laboratory & Diagnostic Technologies	25,785	680
Medical Treatment Technologies	49,825	1,310
Nursing	236,415	6,225
Nursing Assistant	133,965	3,530
Other Health Related Technologies	<u>45,365</u>	<u>1,195</u>
<b>TOTALS</b>	<b>2,202,101</b>	<b>57,985</b>

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<sup>14</sup> Medium Aboriginal population projection for the year 2006 used; Canada 671,526. From Population Projection of Registered Indians 1986-2011, Shirley Lob, Population Projections Section, Demography Division, Statistics Canada, January 1990.



**Table 3**

**Number of People With University Certificates, Diplomas And Degrees In  
Certain Science-Based Fields, And  
Number of Aboriginal People Required To Hold These Credentials  
For Proportional Representation in 2006<sup>15</sup> In Canada**

	<b>Number in General Population</b>	<b>Number of Aboriginal People for Proportional Representation</b>
Agriculture Science	31,610	830
Architecture	14,955	395
Biological Sciences	60,420	1,590
Chemistry	27,935	735
Dentistry	14,735	390
Engineering	187,080	4,925
General Science	26,680	700
Geology & Related Fields	16,955	450
Household Science	25,180	665
Mathematics	67,605	1,780
Medicine	55,215	1,455
Nursing	86,065	2,270
Other Engineering & Applied Sciences	19,245	510
Other Health Sciences	50,640	1,335
Pharmacy	20,865	550
Physics	16,185	425
Veterinary Medicine	<u>5,865</u>	<u>155</u>
<b>TOTALS</b>	<b>727,235</b>	<b>19,160</b>

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<sup>15</sup> Ibid

## **A Strategy For The Promotion of Science/Math Based Professions**

### **Objective 1 – Fostering A "Desire To Be" And Providing The Encouragement "To Become"**

*"And I remember going home that day (when I was eight year old) and telling my Mom and Dad that I now knew what I'd be when I grew up - I would be a doctor. And they just fostered that desire all the way through: my Dad said, "yup that sounds pretty good to me," and my Mom say, "yup, that sounds pretty good to me, too, you're going to be a doctor. But to be a doctor means that you are going to have to get good grades from now on. Every year, every report card, you must try to get good grades now, because you want to be a good doctor." So that was the decision which was carried out and directed my future, and it was family who encouraged me in it. I must point out that it was an unfamiliar choice for members in my family to seek a career in Western medicine. No one had ever done it -- we've never had an M.D. in our family, on either side.<sup>16</sup>"*

It is not possible to predict who or what will influence a student to select a particular career path. They may be influenced by someone in their family, in their community, by teachers, fellow students, career counsellors, or role models. This may happen when they are very young or later in life. Somehow, preferably at an early age, they must be inculcated with a sense of self-worth, a sense of confidence, so that a "desire to be" can be developed; a desire to become a head of state, a chief, a doctor, a teacher, a politician, a homemaker, a policeman, a writer, or whatever.

Not all careers are the result of deliberate choice; opportunities are also important factors. But what can be said with some certainty, is that children will not even consider certain career opportunities if they have been discouraged from doing so or have not been made aware of them. Many Aboriginal children, particularly those who live in remote areas must make choices about their education and future careers, primarily on the basis of what they can observe in their

immediate environment, often without a good understanding of the broad range of vocational possibilities which might be open to them.

A career in a science-based profession can be a very rewarding one, but the road to acquiring the necessary skills and education is a long one requiring self-sacrifice, dedication and hard work. To meet the challenges that must be faced, an individual must have a strong "desire to be" a member of that profession. The starting point, then, in encouraging more Aboriginal people into the science-based professions is to foster this "desire to be".

### **Specific Proposals To Increase The "Desire To Be"**

*Encouragement by Parents, Elders, and Aboriginal Political Leaders - "Yup, that sounds good to me".*

In many Aboriginal traditions, the greatest punishment was to be banished from the community. It has been suggested that a modern version of banishment for someone from the Aboriginal community, is the self-banishment that results in accepting a career path that may cause them to forsake the closeness of their community, to give up some of their values, and to lose part of their identity and their culture.<sup>17</sup>

But a career in a science-based profession need not result in such a sacrifice for someone from the Aboriginal community. With the involvement of the Aboriginal people and their organizations, an appropriately designed educational experience can be developed so that an individual may obtain the necessary foundational skills and knowledge to become a practising professional and develop a better understanding of Aboriginal culture, philosophies and teachings so as to nurture a sense of pride in being a member of the First Nation, Metis or Inuit sisterhood. Also, if the individual's family, community, band and tribal council, feel a sense of ownership in at

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<sup>16</sup> Annette, Kathy (1990) Experiences on Becoming An Indian Physician, From Aitken, Larry P. and Haller, Edwain, W. (1990): Two Cultures Meet: Pathways For American Indian to Medicine, University of Minnesota, Duluth Minnesota, Chapter 5, page 69.

least a portion of the educational program, the necessary support and encouragement will be provided and the sense of belonging to the Aboriginal community can be sustained as one pursues such a career.

To increase the number of Aboriginal people in the science-based professions, parents, family, Elders, and political leaders must encourage Aboriginal children to pursue these careers. Every opportunity must be taken to point out to young children that the future well-being of the Nation, like that of other nations, will require a supply of Aboriginal people highly trained in the sciences - doctors, nurses, engineers, architects, agronomists, technologists - to fill leadership positions in management, government, industry, and education. It is true that not all of these highly trained people will find positions within Aboriginal communities. However, it should be explained to children that they will be able, and indeed have an obligation, to improve the quality of life for future generations of Aboriginal people in whatever future leadership position they may hold and wherever they may live. Aboriginal children who aspire to be an astronaut, a dentist, a science or mathematics teachers, need to hear from those they love and respect, "Yup, that sounds good to me."

***Increasing The Availability Of Career And Vocational Counselling Information Specifically Oriented To Aboriginal Students.***

Much of the career information that is currently available to Aboriginal students through career day programs and vocational counselling, has been designed primarily for non-Aboriginal students. However, some Canadian Aboriginal-oriented career guidance materials are available. For example, the National Native Access Program To Nursing (NNAPN) has developed a video explaining what a career in nursing might entail and what the NNAPN is all about. In addition, the Manitoba Indian Nursing Association has produced a video entitled "Mind, Body and Spirit" designed to encourage Aboriginal children to consider professional health careers. Also, the First Nations Health Care Professions Program at the University of British Columbia, has developed a

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<sup>17</sup> Aitken, Larry P. and Haller, Edwin, W. (1990): Two Cultures Meet: Pathways For American Indians to Medicine, University of Minnesota, Duluth, Minnesota, Pgs. 93-96.

Health Care Video Series that provides an overview of the health care programs offered at U.B.C. stressing early requirements and admission criteria.

However, much more needs to be done to make available to schools, career guidance information that is oriented specifically toward Aboriginal children and their families. **A comprehensive series of audio-visual tapes on Careers For Aboriginal People should be developed.** While the series should eventually cover a much broader range of vocations, an initial project(s) could focus on the opportunities available in the science-based disciplines. This series should have the following objectives:

- make Aboriginal students aware of the broad range of vocational opportunities that are available;
- bring to a widely dispersed population a greater exposure to Aboriginal people who have succeeded in their desire to become an agronomist, an astronaut, an engineer, a doctor, a nurse, etc.;
- show that being a professional in a science-based area is not antithetical to traditional Aboriginal cultures, philosophies and teachings;
- provide practical advice and to give specific guidance with respect to how one becomes the professional of choice, where the programs are located, entrance requirements, etc. and the challenges one might face.

***Establishing a First Nations, Metis and Inuit Role Model School Visitation Program.***

To foster a "desire to be", Aboriginal children (and parents) need to have the opportunity to talk to Aboriginal people who have chosen a science-based career to obtain a better understanding of the challenges to be faced in pursuing such a career. The most effective role models are frequently senior students or recent graduates of a professional program. A visitation program using these students, would provide summer employment and would be relatively inexpensive.

There is also a need for some organizations to keep a roster of Aboriginal people in various

professions who would volunteer to visit schools and talk to Aboriginal students. Most of these individuals would be prepared to undertake to visit a number of schools each year if expenses were covered.

***Providing "Hands-On" Science-related Experiences For Aboriginal Students.***

While visitations, career days, videos and other material are essential and can provide helpful information about vocational possibilities, there is an old adage which goes: "I hear, and I forget. I see, and I remember. I do, and I understand". Much more needs to be done to provide Aboriginal children with some actual exposure to the broad range of vocational possibilities that are available to them, particularly to those vocations in which there are now very few Aboriginal people participating. By providing Aboriginal children with an opportunity to have some "hands-on" experience in various science-related fields, they will be able to see the relevance of mathematics and science, become more interested in these subjects and gain confidence that they have the ability to become involved in science-based professions.

a) *Science Workshops/Camps*

Although a number of initiatives are being taken to provide young Aboriginal students with an exposure to university and some "hands-on" experiences in science-related fields, more must be done.

An example of a program of this type that should be considered is the Med Quest Program<sup>18</sup> sponsored by the Faculty of Medicine at Memorial University. This program is designed to introduce high school students (grades 9 to 12) from rural communities to careers in the health sciences. The program consists of a one week on-campus exposure to some areas one normally studies in the professional schools of medicine, nursing and pharmacy. The program involved lectures, demonstrations, experiments, computer applications, tours and sports.

b) *Science Fairs/Clubs.*

Children are natural scientists. They have an innate sense of wonder and are always asking questions. ...Scientists too, are always asking questions. They observe the world, its interrelationships and discrepancies. Scientists investigate questions using the following cyclical process: (asking questions; observing; hypothesizing; testing results; drawing conclusions; asking questions;...). Children too can use this scientific process.... For children, the process of doing science is both more valuable and more enjoyable than any given product.<sup>19</sup>

The National Science Fair Association of Canada sponsors a National Science Fair for students in grades VII to XII to encourage them to "do and enjoy" science. With leadership provided by a science teacher, the children are encouraged to use the Library and other resources in formulating a question, develop the necessary experiment(s), do the project at home, and demonstrate this at a Regional Science Fair. The object judged to be the best, is demonstrated at a Canada-wide Science Fair held annually during the long week-end in May. While there is a certain amount of "prestige" associated with going to the Canada-wide Fair, an emphasis is placed on the "joy of doing" as the major incentive. Group participation in the Science Fair Program leads naturally to the formation of Science Clubs where students can share ideas and activities. There are eight regions in Saskatchewan with some 500 students participating in the program. Steps should be taken to encourage a higher degree of participation by Aboriginal students.

To do this, more teachers must be encouraged to assume a leadership role in what is essentially an extracurricular activity. Nonetheless, some teachers are reluctant to become involved because they are not quite sure how to go about establishing such a program in their school. A work-shop is required to help these teachers and to provide the opportunity for teachers who are now involved to share ideas and experiences. A modest amount of funding is also required to

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<sup>18</sup> Kirkby, Francis; (1990), Med Quest 1990, Faculty of Medicine, Memorial University, St. Johns, Newfoundland.

cover project materials and some travel costs.

c) *Apprenticeship, Scholarship and Summer Work Exposure Programs.*

Programs should be developed by hospitals, the Crown Corporations and major private sector firms engaged in mining, mineral exploration, manufacturing, etc., to provide Aboriginal youth with a hands-on exposure to the various professional and vocational careers that are possible within their organizations. In some instances, these might be apprentice type programs or summer work programs which have as their primary emphasis providing a simulating learning experience that builds self-confidence and encourages the young person to seek the necessary education and training to fill challenging, leadership positions they might not otherwise have considered.

Some examples of the sort of initiatives that should be undertaken by private and public sector organizations to encourage further education and enhance employment opportunities for Aboriginal people, can be found in a 1992 publication entitled *Aboriginal Employment and Community Relations, Best Case Practice Studies* prepared by the Aboriginal Employment Equity Consultation Group for the Treasury Board Secretariat of the Government of Canada. To cite one of these, the NOVA Corporation of Alberta established an Education Awards Program in 1981 to assist Aboriginal people to obtain post-secondary education relevant to the oil and gas industry, and to increase the number of Native professionals in the petroleum industry. Bursaries of approximately \$3,500 are awarded to students enrolled in relevant 2-year programs. Award recipients are offered summer employment between their first and second years of study, and every effort is made to employ graduates of the program. The overall graduation rate is currently 78%. Ten of the 27 graduates are working within the NOVA group.

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<sup>19</sup> American Indian Science & Engineering Society, (1990). *Hand On/Minds On: Science Activities for Children*, AISES, 1085, 14th Street, Suite 1506, Boulder, CO, 80302-7309, pili.



## **Objective 2 – Establishing The Foundations To Be A Professional In A Science-Based Discipline**

*"I took ninth grade algebra and that was the extent of my high school mathematics. I was accepted to a lot of colleges based on my high grade point average. But I realized that a lot of my grade point average was based in other subjects that were not going to be of much help to me in college, because they were not college prep courses at all."<sup>20</sup>*

Without a solid foundation in mathematics and the sciences, the career options a student has available are significantly reduced. For example, without credit in a mathematics 30 course, students do not meet the regular admission requirements for any program at the University of Saskatchewan. While it is possible to make up any deficiencies in these subjects while attending university, most guidance counsellors would generally discourage students from entering these programs unless they had a solid foundation and a strong interest in these subjects.

The number of Aboriginal people graduating from high school with a foundation in mathematics and the sciences, is relatively low and if more are to be encouraged to seek careers in the science-based disciplines, then steps must be taken to ensure that a larger number of Aboriginal students have the necessary preparation in these subjects.

### **Specific Proposals To Encourage More Aboriginal Students to Obtain A Solid Foundation In Mathematics and The Sciences.**

*"However, I had one teacher in high school, Mrs. Segerstein, my chemistry teacher (and I took all the sciences offered at the high school) who took a special interest in me. ...She taught me that science was just working things out logically. I don't know how much chemistry I learned, but her attitude was really influential. She would say "you can learn this". Once I got to college, I did not particularly like chemistry, but I wanted it to be my major, nevertheless. It did not make sense, but there was something that she had instilled in me: the belief that I*

*could do it.*<sup>21</sup>"

### ***Instilling The Belief That "I Can Do It"***

There was once a wide-spread belief that women could (or should) not be as good in mathematics and sciences, as men. Many parents, teachers, and guidance counsellors once held this belief so strongly that young girls were discouraged from even considering careers in science-based professions such as engineering or medicine. (Women were not even permitted to enter medical schools until the turn of the century). Consequently, at a very early age, many female students saw little relevance for mathematics and the sciences. Since they were not supposed to be good in these subjects anyway, many underachieved in, or avoided them, thus making the hypothesis self-fulfilling. In recent years, as more women have become doctors, engineers and scientists, this belief barrier to increased opportunity for women has diminished, but still exists.

Similar belief barriers have existed that have restricted the opportunities for Aboriginal people. For example, twenty year ago it was widely believed that Aboriginal people could not become good teachers, lawyers, or social workers, simply because there were so few of them in these professions and their retention rate in university programs so low. However, programs were established which provided a better learning environment including culturally relevant curriculum, necessary personal support systems and alternate access routes. Today it is hard to understand how such a belief could have existed since Aboriginal people are now graduating in increasing numbers in these fields and are very effective members of their chosen profession.

However, a significant belief barrier still exists for both male and female Aboriginal children - the false belief that Aboriginal people are not (and cannot) be good in mathematics and sciences. Again, the only basis for this belief is the observation that there are currently so few of them in mathematics- and science-based disciplines. A special effort will be required to dispel this

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<sup>20</sup> Annette, Kathy (1990), p.74.

<sup>21</sup> Ibid, p.4.

belief for as long as it is widely held, Aboriginal children will be infected by it through one source or another like a contagious disease, and come to believe this about themselves. Then just like any other child who has some doubts about their ability to do well in these subjects, the Aboriginal child will either give a minimal effort to these studies in order to provide a reasonable cause for their own expectation of failure or avoid them altogether to prevent the possible confrontation with failure. The belief barrier becomes a self-fulfilling prophecy.

How does one eliminate a belief barrier? To answer that question it may be helpful to reflect upon what diminished the once strongly held belief that females could not (or should not) be as good in mathematics- or science-related disciplines as males. There were many factors but two might be mentioned. First, there were women trailblazers; the heroic few who overcame the belief barrier and became role models for the many that followed in their footsteps. But these women by themselves would have had little effect if it had not been for other people who were determined to shake off the shackles of old beliefs, who publicly challenged the many fallacious assumptions about women, who brought public attention to how these beliefs resulted in discrimination against women and who promoted the cause of equal opportunity for women. The work of these groups sensitized professional organizations, professional colleges, teachers, guidance counsellors, and others who then began to take an active role in encouraging more women into these professions.

In a similar manner, as the Special Report on the Tribal Colleges published by the Carnegie Foundation for the Advancement of Teaching points out, "after years of physical hardship and cultural neglect, Indians themselves are again gaining the confidence and skills needed to lead their nations. A new mood of optimism and self-respect among native people is beginning to emerge."<sup>22</sup> More and more Aboriginal people are saying to their children, "Yes, you can be good at anything you wish".

This new wave of self-confidence needs to be re-enforced by publicizing more broadly the very significant and heroic accomplishments of Aboriginal people in all walks of life. In

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<sup>22</sup> The Carnegie Foundation for the Advancement of Teaching, (1989): Tribal Colleges: shaping the future of Native America, Princeton University Press, 3175 Princeton Pike, Lawrenceville, N.J., 08648, p. 2.

particular, Aboriginal young people need to be aware of these accomplishments. How many Aboriginal young people know about the Aboriginal trailblazers: men and women who have struggled to establish effective political organizations, better schools, and better housing; those who have earned degrees and major awards at university while caring for their children as a single parent; those who were among the first to become doctors, lawyers, judges, nurses, teachers; those who have become nationally and internationally recognized for their contribution such as Douglas Cardinal, who is one of the world's leading architects or Jean Goodwill, originally trained as a nurse, who received the Order of Canada for her work in the development of health care in Canada?

How can these accomplishments become more widely known? Again, by way of example, the significant accomplishments of women are also not well known. To ameliorate this situation, a desk calendar called *Her Story - Canadian Women's Calendar* has been published since 1972.<sup>23</sup> On each facing page to the weekly calendar, is a short biography of a woman who has made a major contribution or achievement. This publication has become a best seller in Canada. A similar publication might be produced about the many outstanding First Nations, Metis and Inuit people. Alternatively, these biographies might be produced in book form or as inserts in student's note books. A greater awareness of these accomplishments would openly challenge the many fallacious assumptions about Aboriginal people and draw to the public's attention how these erroneous beliefs result in discrimination against Aboriginal people and prevent them from having equal opportunities.

Professional organizations, professional colleges, teachers, and guidance counsellors must also play a greater role in re-enforcing this more realistic and positive view that Aboriginal children should have of themselves. Universities and technical institutes can do this by visiting Aboriginal schools, as they do other schools, to talk about the opportunities that higher education can provide, and by actively recruiting Aboriginal students. Professional organizations and industrial leaders in Canada need to speak out about the under-representation of Aboriginal people in the science-based professions and urge that corrective action be taken -- as their counterparts in the United States have

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<sup>23</sup> Saskatoon Women's Calendar Collective (1992), *Her Story - Canadian Women's Calendar*, Coteau Books, Regina, Saskatchewan.

done. For example, in 1973, J. Stanford Smith, then top General Electric executive, challenged the United States "to take bold, innovative, all-out action to increase the supply of minority engineering graduates by 10- or 15-fold, and to get it done within the decade." As a result, the National Academy of Engineering sponsored a symposium in May 1973. The ensuing dialogue among leaders of minority groups, industry, government and academia raised the general awareness of the problem and many positive steps were taken to begin to address the situation.<sup>24</sup>

### *Improving The Teaching Of Mathematics and Science In Elementary School.*

The AAAS (American Association for the Improvement of Science and Mathematics For American Indians) recommended that Native American students be actively recruited to study science and technology. This is an important goal to be encouraged. But, to accomplish it, students need to be exposed to science in a positive and meaningful way, early in elementary school. It may be too late to attract students by the time they are in high school.<sup>25</sup>

"Truly understanding and respecting the Indian child, are teaching characteristics that will surmount a multitude of other shortcomings (of teachers)."<sup>26</sup> While this is true, it does not mean that those other shortcomings teachers may have, should not be addressed. How many elementary school teachers are truly enthusiastic and excited about the elegance of mathematics and about the way science can help us appreciate and understand the beauty, complexity and mystery of our environment? If these subjects were drudgery to them when they went to school and nothing they experienced at university changed that feeling, it would be difficult for them not to transfer this negative attitude to their students.

This and other shortcomings elementary school teachers may have with respect to the teaching of science and mathematics, can and should be rectified. There is a significant body of research

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<sup>24</sup> Landis, B. Raymond (1991), p.1.

<sup>25</sup> Ovando, Carlos J. (1988). Teaching Science to the Native American Student - From Teaching the Indian Child, A Bilingual/Multicultural Approach, Edited by Dr. Jon Reyhner, 2nd Edition, Bilingual Education Program, Eastern Montana College, Billings, MT. 59101, p. 234.

<sup>26</sup> Garcia, Ricardo, L., (1988). The Need For Bilingual/Multicultural Indian Education, See reference 4, p.2.

and curriculum materials that address the education needs of Aboriginal children in this regard. For example, Hands On/Minds On: Science Activities for Children is a book prepared by forty teachers of Native American students, under the sponsorship of a grant from the National Science Foundation, to the American Indian Science and Engineering Society.<sup>27</sup> Another example is the Mathematics Their Way Program.<sup>28</sup> In both of these examples, the material is presented in more of a hands-on, visual and less abstract manner which has proved to be more successful. There are also "master" elementary school teachers of science and mathematics -- teachers who can take advantage of "the children's natural desires to make sense out of their environment (with all its beauty, complexity, and mystery) and nurture this "in the elementary grades so that the spark is not gone by the time these children are in high school."<sup>29</sup>

The point to be made is that teachers of Aboriginal children need to have the opportunity to become familiar with the latest research, with the techniques that have been used in successful programs, and to learn from "master" teachers. Many years ago, the concept of Summer School was introduced in universities to up-grade teachers who were less well prepared than they might wish to be. Those involved in Native teacher education programs, in collaboration with "master" teachers of science and mathematics, should be asked to prepare a proposal for a Summer School Program which would be designed specifically for elementary and/or secondary school teachers of Aboriginal children with a view to improving their teaching skills in mathematics and the sciences. These Summer School Programs should not be restricted to on-campus only but be made available at various sites off-campus as well.

### ***The Need To Have More Aboriginal Teachers Of Mathematics and The Sciences.***

For many of us, one or more of our teachers became one of our most significant role models. The various teacher education programs have prepared many Aboriginal elementary school teachers who serve as role models for Aboriginal children. However, there are still very few Aboriginal teachers who have specialized in the teaching of mathematics and the sciences.

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<sup>27</sup> American Indian Science & Engineering Society, (1990).

<sup>28</sup> Davison, David, M. and Schindler, Duane E. (1988). Mathematics and the Indian Student, see references 4. p. 251.

This fact probably does not go unnoticed by Aboriginal children. There is a need for more Aboriginal elementary and secondary school teachers who have a solid background in mathematics and the sciences. In particular, there is a need for secondary school teacher education program that has as one of its objectives, the training of Aboriginal mathematics and the sciences teachers. Again, those responsible for the current Native teacher education program, together with the organizations that fund the, should take steps to meet these needs.

***A Review To Determine The Accessibility To Aboriginal Students Of Adequately Equipped High Schools For The Teaching Of Mathematics and Sciences.***

Verbal reports<sup>30</sup> concerning the adequacy of facilities available for teaching science and mathematics in Band controlled high schools are mixed. It appears that some schools that were designed as high schools are relatively well equipped; others that were originally designed for grades K-9 have not been properly up-graded. Furthermore, as the general rural population declines, some communities are finding it increasingly difficult to sustain a properly equipped high school because of insufficient enrollments. This can affect Bands in the vicinity. Also, there appears to be a shift in First Nations enrollments from Provincial schools to Band/Federal schools.<sup>31</sup>

Given this, it would be desirable to have a review undertaken to determine if Aboriginal students, now and in the future, will have access to high schools that are adequately equipped for the teaching of mathematics and science.

***A Summer Enrichment Program For Aboriginal High School Students With An Interest In Science.***

The University of North Dakota's AIndians Into Medicine Program® (INMED) sponsors an Annual Summer Institute for students at the junior high and high school levels. Students participate in an intensive five-week enrichment that includes group and individualized instruction

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<sup>29</sup> Ibid, p. 234.

<sup>30</sup> Personal Communications with Tribal Council Educations Directors and Reserve high school teachers, August, 1992.

in pre-college mathematics, physics, chemistry, biology, Indian Studies, and English. A course on techniques for effective study is also offered, as well as an overview of health careers opportunities.

Field trips, tours of medical facilities and laboratory sessions are incorporated as practical teaching aids. Participants stay in a dormitory on campus, under the supervision of Indian tutor/counsellors.

The Institute is designed to help students develop the strong academic foundation and study skills vital to success in college health science courses and provides a well qualified pool of applicants for the INMED program.

A similar program should be implemented in Canada. The program could be designed for Aboriginal students from Grade IX to Grade XII, selected on the basis of their commitment and interest in science and mathematics, to help them develop the strong academic foundation and study skills that are important to eventual success in any of the science-oriented diploma and degree programs. In all other respects, the program would be patterned after the INMED Institute.

### *Upgrading Courses In Mathematics And The Sciences.*

While the number of Aboriginal students completing high school is increasing, the number who have dropped out in grade IX or X is relatively high. Many universities and technical institutes will admit mature students with less than grade XII and offer pre-college courses in mathematics and the sciences. But this route is far too difficult for students who do not have at least a grade XI foundation in mathematics and science. Upgrading programs in mathematics and the sciences are required for those students who dropped out of school early and now have a sincere interest in pursuing a science-based career. Providing upgrading programs should be the responsibility of the School System.

### **Objective 3 – Establishing A Better Learning Environment For Aboriginal Students To Successfully Make The Transition From High School Into First Or Second Year Of A Science-Based Degree Or Diploma Program.**

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<sup>31</sup> Data provided by The Office Of The Treaty Commissioner, Saskatoon, Saskatchewan, July 1992.



We must teach our children so that they will be able to compete in either society.<sup>32</sup>

Reliable data on enrollments and retention rates for Aboriginal students in science-based degree and diploma programs in Canada is not available. Nonetheless, educational institutions are well aware that students of Aboriginal ancestry are severely under represented in these programs and that retention rates are low. The largest number of university students appear to drop out in first and second year and, therefore, if the graduation rate is to improve, attention must be focused on how to increase the retention rate in these two years.

### **The Learning Environment For Aboriginal Students In Most Post-Secondary Educational Institutions.**

There are a variety of reasons why most traditional institutions in Canada have not been effective in addressing this situation. But the primary reason is that their central mission is to meet the needs of the dominant society. Consequently, there is a mismatch between the goals, objectives and learning environments which currently exists within traditional universities and those required to serve the Aboriginal community -- a minority sector of the population with a history of poverty, structural discrimination, isolation and very few second generation university students

Traditional universities are complex institutions with a broad and diverse set of goals and objectives and often included among these is an expression of their intent to ensure a greater participation of Aboriginal people. The primary goals and objectives of an institution, however, are those to which most of its members direct most of their time, energy, and discretionary resources; the achieving of these goals and objectives leads to accomplishments for which most of its members would like themselves and their institutions to be recognized. On this basis, few, if any, traditional universities can claim that serving the Aboriginal community is a high priority goal. Rather, most universities offering science-based professional programs today, aspire to be known

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<sup>32</sup> Ahenakew, Alan, Elder, Sandy Lake Reserve, age 84. Quoted in: Funk, Jack and Lobe, Gordon, Editors (1991), "...And They Told Us Their Stories", Saskatoon District Tribal Council, Saskatoon, Saskatchewan. Page xii.

as research universities. The prestige of a research university is determined by the reputation of its graduate school, the amount of funding it receives from research granting agencies, and from the recognition its faculty receive from their peers in other institutions, not from how well it serves a minority group, like the Aboriginal community.

Research universities play a very important role in a modern society. Many of the developments in a wide range of areas - medicine, electronics, food production, communications, transportation to list a few - which all of us, including Aboriginal people enjoy, have their origins in science-oriented research universities. However, some of the characteristics which enable research universities to achieve their primary goals and objectives effectively, are also those which hamper their ability to serve the Aboriginal people well.

For example, a research university requires faculty who are prepared to devote themselves to the search for new knowledge, to obtain research grants, to find support for graduate students, to teach and supervise them, to manage and undertake research projects, to publish, and to account for research funds obtained. In this kind of environment, activities related to research must receive the highest priority on a faculty members time and attention. The next most important activities are graduate student teaching and supervision, followed by the teaching of classes related to a faculty members specialty, particularly senior classes in which they may be students who will go on to graduate school. As Dr. Stuart Smith<sup>33</sup> points out, these activities are considered so important that they are often viewed and referred to by faculty as "opportunities"; the teaching of introductory first and second year undergraduate classes, on the other hand, is often viewed as a teaching "load". Over the years, the allocation of resources, programs and mode of instruction in traditional universities have evolved to carry out as effectively as possible those functions considered most important. First year and second year classes, for example, are generally very large with average enrollments in first year mathematics and science classes well in excess of 100 students. Yet, it is the type of learning experience an Aboriginal student has in these classes that often determine whether he or she will "drop-out" or graduate.

The majority of university students today come from English speaking, middle and upper income families whose parents are usually well educated. The community they come from is well aware of the relationship between education and opportunity so their "desire to be" is usually very high. They have attended well-equipped and well-staffed high schools obtaining an average of 70% or better. As might be expected, the learning environment most traditional universities have created tends to match the expectation that all students come with this level of preparation - preparation not only from their experience in a particular type of school, but from a particular type of family, community and work place. Having been selected because of their above average academic skills, students are expected to sink or swim with little individual help or time to adjust to a new social and academic way of life.

Even though the majority of university students are from a rather select group in society, relatively high first year "voluntary" drop-out and "required to discontinue" rates are considered acceptable and indeed, there is a tendency to view high failure rates as a confirmation of high academic standards.

Institutional acceptance of relatively high "voluntary" drop-out and "required to discontinue" rates are defended by arguments that tend to blame the student: "poorly prepared", "lacking ability", "unmotivated", "not willing to work", "family problems". This tendency has stifled any serious attempt to critically examine the institution's learning environment to determine if this is a possible cause. Furthermore, faculty who believe that poor academic performance is primarily the student's fault create a self-fulfilling hypothesis by having low expectations of certain students. They transmit those expectations to these students, which in turn negatively affects student performance. Instead of receiving the encouragement, "You can do it", the student only hears the subtle message, "Why do you bother trying?".

Traditional universities often pride themselves "in treating all students the same".

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<sup>33</sup> Smith, Stuart L. (1991): Commissioner, Report on the Commission of Inquiry on Canadian University Education, Publications Office, Association of Universities and Colleges of Canada, 151, Slater Street, Ottawa, Ontario. K1P 5N1,

However, Dr. Raymond Landis, Dean of Engineering and Technology, California State University,<sup>34</sup> points out that most institutions do not treat all students the same.

*"If faculty have low expectations of minority students and transmit these expectations to the students, how is this "equal treatment"? Ethnic isolation also precludes equal treatment...Is the only (Indian) in a class of 30 receiving the same treatment as one of 29 white students in that class? Not if the attitudes and behaviour of non-minority students resonate negative faculty attitudes and it appears that they do. At university after university, minority engineering students have told me that white students won't form laboratory groups with them, act surprised when they do well on tests, and intentionally leave the seats next to them vacant.*

*White students see an almost all-white faculty, a white dean, white vice-president, a white president, and for the most part, white engineers. For minority students, not having any role models is bad enough, but then they must face a faculty that has little or no understanding of, or sensitivity to the situation confronting them. Although these observations alone expose the idea of "equal treatment" as a myth, the problems do not stop here.*

*Most college freshmen must adjust to being away from home for the first time and to the rigorous academic standards of engineering study. Being thrust into a predominantly white environment for the first time, however, presents minority students with a much greater adjustment problem. For a new engineering student, the support of peers -- new friends going through the same adjustment -- and the opportunity to share information and engage in group study with other engineering students are key ingredients for success. Yet this support is not readily available to minority students.*

*The primary factors that impede the success of minority students in engineering, then, are not poor preparation, lack of ability, lack of motivation, or any of the other reasons commonly attributed to minority students. Rather, they are ethnic isolation, lack of peer support, lack of*

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p. 32.

<sup>34</sup> Landis, Raymond, B. (1991), p. 5.

*role models, and low faculty expectations. This should come as good news, however, for these are factors which are under our control.*

*...Equal treatment should mean that students of equal ability and background achieve equal results; and further, that all students feel equally valued by the institution and have a comparable regard for the educational experience they are receiving. This is certainly not the case in many of our institutions today.*

*Some studies have shown that the performance of minority engineering students is below that of white students with comparable backgrounds. Some institutions have even found inverse correlation's between the performance of minority students in college calculus, chemistry and physics courses, and their background as indicated by SAT scores, high school GPA, and level of math/science courses completed. That better prepared minority students may do worse than less prepared non-minority students is a serious indictment of the educational environment we provide those students. Our institutions are a long way from providing "equal treatment".*

### **Changing The Learning Environment In Traditional Institutions**

There is now a sufficient body of experience to develop a framework for what needs to be done to create a better environment for Aboriginal students. But to create this environment within the traditional institution would require major attitudinal and operational changes. While there are many faculty who would create this environment if they could, large well-established institutions adopt practices and procedures that are well justified for some purposes but counter-productive for others which, once widely implemented, tend to become "tyrannical machines" -- very difficult to change.<sup>35</sup>

In any event, to create a better learning environment for Aboriginal students would require resources to be directed for that purpose. As far as most post-secondary educational institutions

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<sup>35</sup> Cheney, Lynne V. (1990), *Tyrannical Machines, A Report On Educational Practices Gone Wrong and Our Best Hopes For Setting Them Right*, The National Endowment For The Humanities, Washington, D.C., pg. 1.

and provincial governments are concerned, education for people, particularly Aboriginal people, is a Federal responsibility. Thus, even though Established Program Funding (EPF)<sup>36</sup> agreement between the Federal Government and the provinces includes the Aboriginal population in the formula for determining the transfer payment to the provinces originally specified for the support of education and health (but now not so restricted) universities have not felt any responsibility to treat Aboriginal people any differently than the general population. Thus, without special funding from the Federal Government or other external sources, the only motivation most post-secondary institutions have had to introduce special programs for Aboriginal students, has been from some faculty who have felt strongly that this was "the right thing to do".

A further obstacle to change is that most universities in Canada have had as many, or more, students knocking at their doors than they felt they could handle. Indeed, quotas have been established in most science-base programs to limit the number accepted. There is no incentive for most institutions to seek any additional students, let alone seek additional students from those sectors of society that are now under represented.

Some institutions believe that they have done all they need to, or should do by establishing enhanced "student services" -- special tutoring, counselling and advising by administrative staff who are considered to be sympathetic and understanding of the needs of Aboriginal students. Faculty are generally not involved directly in these programs. These student service programs are necessary and are to be encouraged, but they are not sufficient to improve the student's academic performance. Usually these services are delivered campus-wide through an Aboriginal/Indian/Native Students' Centre and are quite separate from the academic enterprise. Dealing with administrative problems generally consumes the staff's time and even if the staff are competent in each of the subject areas that a student might enroll, the amount of tutoring time available per student is extremely limited. Also, students who need the tutoring service the most are frequently the most reluctant to seek it in this type of setting. In short, an enhanced student service does little to improve the learning environment in a predominantly white institution. The

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<sup>36</sup> Federal-Provincial Fiscal Arrangements and Federal Post-Secondary Education and Health Contributions Act. (1987), Part 1, Article 4, Queen's Printer For Canada, Ottawa, Ontario, p. 2.

barriers to academic performance resulting from ethnic isolation, lack of peer support, lack of role models and low faculty expectation still remain in the classrooms and the laboratories.

Another traditional approach to increasing the number of Aboriginal people in the science-based professions is to search out those Aboriginal students who have exceptional academic records in high school and encourage them to enroll in a regular program at their university. These programs, too, are laudable and are to be encouraged but they help only a few extraordinary individuals and do nothing to change the learning environment.

### **Non-Traditional Post-Secondary Programs and Institutions Have Been More Effective.**

Some post-secondary institutions, with the support of the Federal Government, have established very successful, non-traditional, professional development programs for Aboriginal students. In Canada, these have been primarily in the social science areas, Education, Social Work and Law, and to a lesser extent in Nursing, and Medicine. In the United States, a number of very effective Minority Engineering Programs (MEP) have been established. The Indians Into Medicine Program (INMED) has also been very successful. Two non-traditional institutions -- the Saskatchewan Indian Federated College at the University of Regina and the Tribal College System in the United States -- have also been exemplary in showing what Aboriginal-controlled institutions for Aboriginal people can accomplish by encouraging participation and building self-confidence. Much can be learned from all of these programs and institutions.

For example, a story can be told with respect to encouraging more students of Aboriginal ancestry to consider a career in Law. When the Program of Legal Studies for Native People was started in 1973 at the University of Saskatchewan, there were, as far as could be determined, only four lawyers and five law students of Aboriginal ancestry throughout Canada. It is estimated that there are now over 200 lawyers of Aboriginal ancestry in Canada. Of these, over 150 including three judges, were introduced to the study of law through the Program. Similarly, it is estimated that there are between 120 and 130 students of Aboriginal ancestry currently in law schools of which 100 gained admission through the Program. While there should be between 1500 and 1700

lawyers of Aboriginal ancestry in the country and at least 380 students of Aboriginal ancestry in Canadian law schools for equal representation, the number of Aboriginal people expressing an interest in, and entering law schools is increasing at an exponential rate.

The Saskatchewan Indian Federated College (SIFC) has been extraordinarily successful in encouraging more First Nations people to seek a university education. It is an institution under the administrative control of the Federation of Saskatchewan Indian Nations (FSIN) and federated academically with the University of Regina. From less than a dozen students in 1976, SIFC's enrollment has grown to over 1,200 students in 1994. It has graduated over 1000 students (approximately 50% with degrees, the balance with certificates) in the 17 years of its existence, 57% in Social Work, 18% in Arts, 18% in Education, 5% in Administration, and 2% in other programs. Furthermore, the College's graduation rate has increased to over 100 students last year, double the average of the last 16 years. In terms of professional development programs, its most successful program has been Indian Social Work. As far as is known, there was only one Aboriginal person engaged in professional Social Work prior to the establishment of the Indian Social Work Education Program (ISWEP) in 1974. The program had less than half a dozen students when it was transferred to the Saskatchewan Indian Federated College (SIFC) when that college was established in 1976. Today, enrollment in the program has grown to 200 full-time students and over 450 students have now graduated with degrees or certificates in Indian Social Work. The program is now accredited by the Canadian Association of Schools of Social Work.

In 1987, the SIFC established a Department of Science to offer pre-university, and first and second year math and science courses for students interested in entering one of the health science programs or the School of Business and Public Administration. The interest in these courses has been high with over 800 semester-course students enrolled in 1994.

There are also lessons to be learned from the nearly 100 Minority Engineering Programs that have been established in the United States. While not all have been successful, some were established on sound educational principles and have been very effective. In 1985, the California Post-secondary Education Commission evaluated 12 minority engineering programs under the



sponsorship of the California Mathematics, Science, Engineering Achievement (MESA) organization. The Commission determined that students participating in these programs were being retained at higher rates than all engineering students at each of the 12 institutions, and at three times the rate of minority students not in the programs. In another program, the Professional Development Program at the University of California, Berkely, participating minority students earned on average, one letter grade higher in their mathematics and science courses than non-participating minority students and exceeded the average grade achieved by white students in the same courses.<sup>37</sup>

The INMED program located at the University of North Dakota has been particularly successful in graduating health care professionals. Started in 1973, it has enrolled 352 students in pre-professional curricula and has graduated 69 physicians, 21 degree nurses, and 23 other health care professionals. It has enrolled over 715 students in its Summer Institute Program which has provided a pool of candidates for its university programs. INMED claims an overall retention rate of 70% for pre-professional students and 88.8% for professional students since 1973. It has recently (1989) introduced a Minority Medical Education Program consisting of a six week summer enrichment program for college sophomores, juniors and seniors for American Indian undergraduates planning for medical school application and admission. INMED has an all-Indian Board of Directors with members appointed by reservation tribal councils and charter members from throughout the United States, providing direction and setting policies and priorities.

### **Characteristics Of A Better Learning Environment For Aboriginal Students**

Reference could be made to other successful programs, but those referred to above are sufficient to identify some characteristics that promote success.

#### **1. Clear Sense of Purpose.**

Most traditional institutions have a diverse set of functions and goals. One of the

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<sup>37</sup> Landis, Raymond, B. (1991), p.8

characteristics that distinguishes the most effective non-traditional programs and institutions for Aboriginal people is a single-minded sense of purpose. That purpose is to increase the competence, understanding, confidence, and self-esteem of their students, and through them to improve the quality of life of future generations of Aboriginal people.

## 2. A Belief That Academic Performance Is Primarily A Function Of The Learning Environment.

The academic performance of a student is a function of many factors: the students' background, their personal life, their ability, their desire and commitment, and the learning environment to which they are subjected, to list a few. All effective programs for Aboriginal and other minority students have in common the belief that a student's academic performance is, to a very large extent, a function of his or her learning environment. This belief focuses attention of all concerned on a critical examination of the learning environment and how to improve it, rather than blaming the student for poor academic performance. For example, if the student is less well prepared than might be desired, steps are taken to remedy that situation to the extent possible. If students seem to be less motivated than is expected, the question is asked, "What is the reason for this, and what can be done about it?" If the student is a single parent, an attempt is made to provide or to help her/him find day-care services. The basis for this belief is suggested by Dr. Landis in the following:<sup>38</sup>

*"Given national academic performance and retention figures, how is it that minority students outperformed white engineering students and were retained at significantly higher rates than all engineering students? After all, myth has it that minority students are less well prepared, less motivated, and more burdened by personal and family problems. The answer is very simple. If we create an optimum learning environment for minority students, one which is equal to that which we provide all students, then minority students will perform equally well. To understand this requires a shift in our belief system -- from believing that students' academic performance is primarily a function of their background and ability to believing that students' academic performance is primarily a function of their*

*educational environment. A good educational environment produces good academic performance, and a poor educational environment produces poor academic performance."*

### 3. A Flexible Admission Policy.

The admission policies of effective programs and institutions for Aboriginal people reflect the above belief and also the reality that not many Aboriginal students meet the entrance standards of the traditional institutions. These entrance standards are usually based upon academic achievement in Grade XII and it is well known that this criteria is not a particularly good predictor of how well a student will perform; desire and commitment are equally important factors. Furthermore, it has been found that able Aboriginal students come from a broad range of academic background. The most successful programs, therefore, have very flexible admission criteria.

### 4. Matching Program And Performance Expectations With An Individual Student's Preparation

A student's preparation for a university experience cannot be adequately judged by how well he/she performed in school. It also has to do with their family, community, and work place experiences. A flexible admission policy is, therefore, a necessary but not a sufficient condition. Indeed, adopting a flexible admission policy without giving careful thought to the design of a curriculum and student support program that matches the preparation of each student admitted may be less effective than an admission policy that rigidly restricts the students admitted to those who can meet regular admission requirements.

In addition to a flexible admission policy, effective programs for Aboriginal people take considerable care to ensure that, on an individual student basis, there is the best possible match between the student's academic and personal preparation and the expectations of the program.

There are a number of ways this is done. For example, based upon the student's academic background and the results of a personal interview at the time of admission, a student may be

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<sup>38</sup> Ibid, p. 8.

required to take all, some or none of these in addition to the normal requirements for the degree.

There are also less structured ways in which a better match between student preparation and program expectation is brought about. In the most effective programs, those involved in teaching the preparation courses are also involved in the admission decision-making process, including the interviews. They are also involved in all aspects of the course-marking assignments and in instructing in laboratories or workshops. And finally, they are involved in personal counselling and in orientation. Records of attendance are often kept and absent students contacted to determine if assistance is required. At one tribal college, for example, the president even takes time to go to the homes of students who start missing classes because he knows that many of his students lack self-confidence and are easily discouraged initially.<sup>39</sup> Instructors in each of the courses frequently get together to discuss how a particular student is doing and what might be done to overcome any deficiencies. Thus, they get to know the student's strengths and weakness -- academic and personal -- almost from day one and can monitor their development, matching the presentation of the curriculum material and expectations accordingly.

##### 5. An Extended Instructional Period.

It is unrealistic to expect an Aboriginal student, who must make a major adjustment to a new environment and who may be less well prepared, to complete a program in the same time period as a student who is in a more advantageous position. Furthermore, more time is essential to complete a program if Aboriginal students are to enhance their understanding of their culture and language as well as meet the normal requirements of a degree.

The regulations governing the length of time First Nations students can receive financial support to complete a particular program need to reflect this requirement for a longer instructional period. To further support this, it might be noted for example, that while 50% of the students complete an engineering degree at the University of Saskatchewan in the nominal

four years, the average length of time is 4.75 years.<sup>40</sup>

## 6. A Committed, Competent, and Caring Staff

The most critical factor in creating a better learning environment is the quality of the staff involved. Another characteristic of all effective programs for Aboriginal people is that staff are selected not only on the basis of their competence in the subject area in which they are to teach but on how deeply they are committed to the academic and personal growth of their students. A commitment to the latter is considered particularly important because in the most effective programs, character development, including spiritual development, is a major concern.

The racial origin of the staff does not seem to be as important as other personal characteristics, although the importance of Aboriginal staff as role models should not be undervalued. Nor, does it seem important that staff meet the usual recruitment and promotion criteria of the traditional university. Many of the most effective staff in these programs have not been accepted as tenured faculty. What seems to matter most is teaching competence and the ability of all staff associated with the program to develop a close and caring relationship with the students they have. Also required is a sensitivity to the fact that students of Aboriginal ancestry come from diverse and unique cultures with distinct ways of communicating, interacting and learning.

## 7. Teaching Is Considered To Be The Most Important Function of Faculty.

As noted earlier, the central purpose for these non-traditional programs or institutions is clear. They exist to improve the quality of life of future generations of Aboriginal people by providing the present generation with a quality education. Excellence in teaching is highly valued and, as Dr. Stuart Smith has pointed out, it is understood that:

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<sup>39</sup> The Carnegie Foundation for the Advancement of Teaching, (1989), p. 3.

*"...teaching consists of more than just lecturing. The ability to hold the interest of an audience during a lecture is very valuable but it is neither necessary nor sufficient as an indicator of good teaching. What counts is learning; good teaching is whatever the teacher does that enhances learning on the part of the student. Much of this has to do with inspiration and motivation. Needless to say, not all subject matter is equally likely to inspire students, and not all students are equally easy to motivate. The ability to motivate students is the largest part of good teaching. Being genuinely available to students after class can be as important as being able to give organized lectures. Knowing how to facilitate discussion, create small group, self-directed learning, or to incorporate students' experiences into the learning materials are all crucially important. As one witness put it, the best teaching is based on a love for learning and for one's students; these qualities come across even while technical abilities are still being developed. Furthermore, the motivation students bring with them is dependent in part on the comfort and acceptance they feel at the institution, the way they are treated by the bureaucracy, and the activities, residences, counselling, and services available to them.<sup>41</sup>"*

#### 8. Ethnic Isolation Is Eliminated.

As has been argued by Dean Landis, that ethnic isolation often precludes equal treatment for a minority student within an otherwise all-white class room and as Stuart Smith has said (See quotation above), the motivation students bring with them is dependent in part on the comfort and acceptance they feel at the institution. Therefore, all effective programs for Aboriginal students, have eliminated ethnic isolation in the early transitional period of the program. As the students progress and gain confidence, they become progressively more involved in the broader student environment. The importance of this characteristic is often difficult to understand for members of the dominant society who have never experienced the many subtle forms of racial discrimination that Aboriginal students must endure. For example, few within the university would suggest that the learning experience within an all-white section of a class is

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<sup>40</sup> Personal Communications from J.M. Wigham, Assistant Dean, Undergraduate Administration, College of Engineering, University of Saskatchewan, October 1992.

somehow deficient but many would consider that to be the case within an all-Aboriginal section that has not been segregated by regulation, but by choice -- why?

9. A Strong Emphasis Is Placed On Creating A Collaborative Learning Community.

Another characteristic of effective programs for Aboriginal students, and probably the most important one, is that an emphasis is placed upon collaborative learning, cooperation and team-work instead of fostering a highly competitive environment. A serious and deliberate attempt is made to create a cooperative, supporting community of staff and students in which all students perceive themselves as sinking or swimming together as opposed to the competitive situation in which students often perceive that if one of them swims, another must sink. Students are encouraged to view each other as potential helpers rather than as competitors and to develop a sense of responsibility for, and to care about, each other.

Studies have shown that educational programs which emphasize collaborative learning, cooperation and team-work are more effective.<sup>42 43</sup> This approach takes advantage of a teaching resource that is not often used effectively, namely the students themselves and in addition, it enables faculty and tutors to integrate and coordinate the material in all classes better. Other benefits reported include: increased retention rates, students develop a better understanding of concepts, better overall academic performance, improved oral communication and inter-personal relations skills, increased student self-confidence and self-esteem, and improved student satisfaction with the program. Furthermore, it develops those skills and attributes that are necessary for students to work cooperatively with people following graduation, for example, in communities, in health care teams, on engineering projects.

Some of the strategies and techniques that have been used with considerable success by the various non-traditional programs and institutions to develop a collaborative learning community

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<sup>41</sup> Smith, Stuart L. (1991), p. 45.

<sup>42</sup> Slavin, Robert, et al, Editors (1985), *Learning To Cooperate, Cooperating To Learn*, Plenum Press, New York and London. See pages 5 to 6.

are describe below:

a) Having Aboriginal Students Take All Of Their Classes Together As a Group.

In order to promote collaborative learning and group study, students are scheduled to take all of their courses together. In this way, they see each other regularly, have the same homework, can discuss what happened in class, share information, and prepare for the same tests.

b) Creating A Community Or Group Identity Of Which They Can Be Proud.

As far as is known, none of the programs for Aboriginal people have established fraternity houses, although a common residence might be desirable. Nonetheless, effective programs have found ways to create among their students a strong sense of group cohesiveness and mutual support similar to that which exists in a fraternity house. For example, pro-active steps are taken to ensure that students get to know each other well and to identify with a group that has common goals and workloads by working together in class and on homework, socializing and having recreation together. An attempt is made to foster an attitude in which if one of the groups fails, the group as a whole feels a loss. If this can be done successfully, then group dynamics will be such as to apply pressure for each to do his/her best. When the group is studying or working, for example, the student who slacks off does so at the risk of loosing favour with the group -- the group of individuals who now have, become his/her friends. Students do not take that risk lightly because they have discovered that their group is a valued resource that can provide support when it is needed, academically, socially, and personally.

c) Establishing a Student Study Centre.

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<sup>43</sup> Cooper, James et al, (1989) Cooperative Learning and College Instruction: Effective Use of Student Learning Teams, California State University Dominquez Hills, California, U.S.A.



To promote collaborative learning, Dr. Landis argues strongly for the need for a student study centre -- a place of study that minority students identify as their own; a place where students can study individually or in groups and where tutoring can be carried out; a place where students can keep their books, where there are chalk boards and ample tables and chairs to encourage group study. While this is a place where students can meet and plan social activities, it must be first and foremost an "academic place" not a students' union. It should be of good quality, adequate size, and accessible.

d) Structured Study Groups.

Although students after they graduate will be expected to work in groups, many students have been conditioned to work alone and may be reluctant to work collaboratively. Some form of mandated collaborative learning may be necessary for students to realize the benefits of group study. Dr. Landis describes one of the most effective models for structured groups as follows:

*"Academic excellence workshops are structured group study sessions. Workshop participants -- students who are clustered in common sections of their math or science course -- meet as a group with a workshop leader for two or three, two hour sessions each week. The students are required to have attempted the assigned homework before coming to the workshop. At the workshop, the students work in small groups on sets of problems prepared by the workshop leader in consultation with the course instructor. Consistent with the stated objective of the workshop -- that all participants achieve a grade of either "A" or "B" in the course -- the problem sets are generally more challenging than the assigned homework. The workshop leader assists groups as problems arise and may give a short lecture when several groups are encountering common problems. Lecturing, however, is kept to a bare minimum, since the emphasis of the workshop is on group study."*

10. An Emphasis is Placed On Orientation

The typical orientation program for first year university students is a week-end or perhaps a week of activities and lectures at the beginning of the first term. What characterizes effective programs for Aboriginal and other minority students is that orientation is closely integrated with the academic program. In the case of the PLSNP and the NNAPN programs which are 8-9 weeks in length, orientation continues throughout the first year and the instructors are available to the student in subsequent years. In the most effective MEP programs, attendance at orientation sessions is mandatory and between 60 to 70 hours of total contact is considered necessary to meet the course objectives.

One of the objectives of the orientation course is to build a supportive academic community and to promote collaborative learning. It is also used to give instruction on academic survival skills such as how to get the most out of each class, to improve study skills, to use time more effectively, and to prepare for examinations. In addition, it is used to assist students in their personal development towards better interpersonal relations, leadership and organizational skills, as well as providing some tips on how to deal with stress, conflict resolution, goal setting, personal financial management, and other personal problems.

The orientation program can also be used effectively to give the student a better understanding of the field of study and the profession they are preparing themselves for. Students need to be prepared for the fact that the early years of a professional program are not very exciting and often the subjects studied appear to have little relevance to what the student will do in practice. They also need to be continually reminded that the rewards and opportunities of a career in their chosen profession are well-worth the hard work and personal sacrifices they will endure to reach the goal.

Finally, the orientation course can be used to familiarize the student with the university and/or college/faculty; its administrative organization, the important regulations, how to use the resources available such as the library, computing services, counselling services, etc...

11. Adequate Student Support Services, Including Access To Elders, Are Provided.

While the provision of student support services alone are not effective in overcoming some of the barriers Aboriginal and other minority students face in university, they are nonetheless a critical component of the overall program. Adequate student services such as personal counselling, advising, tutoring, job placement support, recreation programs, day-care, scholarship and financial assistance are necessary. It has also been found that the availability and active participation of Elders in the program is very important.

## 12. A Work-Study Experience Is Incorporated.

Having an exposure to the realities of one's chosen career while studying to meet the degree requirements for entry into the profession can make academic subjects more meaningful and interesting. Aboriginal students have little opportunity to find out what an engineer does, what the practice of medicine entails, or to experience the excitement of discovery in a research laboratory.

The effectiveness of maintaining interest and in improving the learning experience of students has been well demonstrated. In the science-related fields, the University of Montana has two programs - Minority Apprenticeship Program (MAP) and Minority Biomedical Research Support (MBRS) -- in which Aboriginal high school, undergraduate, and graduate students are hired to work in research laboratories. The retention rate in university of high school students who have been in the MAP program is reported to be 90%; those in the MBRS program have a retention rate of 77%.<sup>44</sup> The SIFC established a Co-op Work-Study Program for Aboriginal students in 1991. While it is too early to assess the results of this particular Program, similar programs for non-Aboriginal at the University of Regina, Waterloo and Sherbrooke have been enthusiastically endorsed by students and employers. "The experience is that co-op graduates find it easier to obtain employment, often with one of their co-op employers."<sup>45</sup>

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<sup>44</sup> Montana State University (1992), History of Funding of the Montana American Indian Research Opportunities (AIRO) Program, AIRO, 307 Culbertson Hall, Montana State University, Bozeman, MT, 59717.

### 13. A Challenging Program Producing Equally Or Better Qualified Graduates.

Another characteristic of effective non-traditional programs is that they are very challenging. A second year law student<sup>46</sup>, for example, has observed that the eight-week PLSNP program was a more intense and challenging experience than first year law. A better documented example is provided by James P. Degnan in his article, *Sympathy Vs. Standards: Teaching the Unprepared*.<sup>47</sup> In this article, Degnan points out that when San Diego State University established an Educational Opportunity Program (EOP) to make it possible for academically unqualified minority students -- blacks, Chicanos, American Indians and Others - to enter the university, most of these students (eight out of ten as opposed to one out of ten white students) failed their introductory biology course. He then describes at length how Professor Vernon Avila lowered the failure and drop out rate of EOP students to that of white students; indeed, students in Professor Avila's special course actually performed better than did students in the regular biology sections. He quotes San Diego States' coordinator of lower-division biology courses as saying:

*"And he did this, not by watering down content, not by lowering standards, but, if anything, by raising them higher than the standards that prevailed in man of the regular biology sections. He was tough, so tough that at first I thought he was going to have riots on his hands. But the students, rather than resenting his toughness, seemed to like him all the better for it."*

While non-traditional programs and institutions have a flexible admission policy, they have devised their curriculum so that upon graduation their students will be as well, or better, prepared than students graduating from traditional programs. In some programs, such as the PLSNP and NNAPN, only the first eight to nine weeks of the student's experience is different from that of mainstream students; in others, only the first and second transitional years of the

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<sup>45</sup> Smith, Stuart L. (1991) , p. 51.

<sup>46</sup> In conversation with Irma Bird, second year law student, University of Saskatchewan, August 1992.

<sup>47</sup> Degnan, James, P. (1976), *Sympathy V.s. Standards: Teaching the Unprepared*, Report on Teaching, No. 2, Change Magazine, No. 6, Vol. 8, July 1976, pages 16-19.

program have been modified. As the students progress in their program, they become more and more integrated with the broader student environment and graduate having met all of the requirements for the degree.

#### 14. An Effort Is Made To Celebrate And Help Sustain The Richer Culture Of The Aboriginal People.

This characteristic is most evident in non-traditional institutions such as the SIFC and the American Tribal Colleges. The special report on the Tribal Colleges<sup>48</sup> highlights this characteristic and stresses its importance:

But in many reservation communities, traditional cultural values remain a vital part of the social fabric. Tribal languages are still spoken, and traditional arts and crafts and spiritual beliefs are respected.

While non-Indian schools and colleges have long ignored Indian culture, tribal colleges view it as their curricular center. They argue that it is through a reconnection to these long-standing cultural skills and beliefs that Indians can build a strong self-image and participate, with confidence, in the dominant society. Each of the tribal colleges offers courses, sometimes taught by tribal elders, in native language, story-telling history, and arts.

Beyond the classroom, traditional values are also embedded in the very spirit of these institutions. Cooperation is valued, for example. Respect for elders is encouraged. Differing ideas about how time should be managed and how people should interact with each other are understood and accepted. In mainstream institutions, Indians find their own values undermined; tribal colleges reinforce the values of Indian culture.

#### 15. A Strong Identification With The Community They Serve.

To be effective, an educational institution or program must identify -- to associate in feeling, interest and action -- with the community it is intended to serve. The Aboriginal community is a minority community with: a distinct cultural background; a history of poverty and structural discrimination; and with a potential university student population that is almost entirely first generation. Effective programs and institutions interact with this community, largely ignored by traditional institutions, to increase the desire among its young to seek an education, to improve the preparation they receive, as well as provide a more comfortable social and learning environment at the post-secondary level that is dedicated to helping their students learn.

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<sup>48</sup> The Carnegie Foundation For The Advancement Of Teaching, (1989), p. 4.

## CONCLUSIONS/ RECOMMENDATIONS

In the foreseeable future, as technology becomes more complex and specialties more specialized, **business will more and more dictate the type of training required of its workers.** In many ways, business may transplant the role of universities and technical institutes by providing in house training programs for employees which are directly geared to the business' activities. Universities, and other institutions of higher learning, will have to move away from the notion that learning is an activity which can be engaged in for its own sake. Our society can no longer afford such elitist practices -- particularly if the public purse is to be the vehicle by which these practices are to continue.

As businesses begin to take on the role of educators, **it is important that Aboriginal people make strategic alliances with businesses** to ensure that there is an equitable number of jobs for Aboriginal people. This networking must begin now if there is to be a positive effect in the future.

What skills will be required in the future? **Adaptability, entrepreneurship, the ability to work and learn independently and efficiently.** In order to impart these skills, it will be necessary that students are not trained in a hierarchical, constrained manner that does not allow for independence of thought. Rote learning of spelling, for example, is like focussing upon penmanship after the advent of the typewriter, or the computer. While literary skills may be important, it is suggested that it is more important for the **worker of the future to be innovative and entrepreneurial.** It is necessary for the worker of the future to be able to learn independently without recourse to interminable retraining programs, or refresher courses. The worker of the future will be happy to keep abreast of new developments in his/her chosen field of endeavour -- not because it is required by the employer, but because it is required by the individual to remain competitive and marketable.

It is more necessary now, than ever, that **Aboriginal students and workers become computer literate** and, preferably so, in a multimedia setting. It is probably true that most of us

learn more on an ongoing basis through television, newspapers, magazines and other media. The use of computers will enhance the ability of many Aboriginal students to learn. Accordingly, it is more necessary now, than ever, that the **governments of Canada take extra steps to ensure that Aboriginal schools receive the latest in computer equipment, that the equipment be updated on a regular basis, and that properly trained teachers be available to assist students in acquiring computer skills** which, now, are indispensable in almost every profession or vocation. Access to information has completely revolutionized what we learn, how we learn and when we learn. It is necessary that Aboriginal students be some of the first persons to plug into the information superhighway of the future, and that they have the skills to use the information that is available to their best advantage.

It is specifically recommended that an emphasis be placed on **developing an information infrastructure for First Nations communities**. There are tremendous problems with the basic infrastructure of these communities. It is difficult to perceive the need for such an information infrastructure when the sewage system doesn't work. But in the long run, economic well being and the very survival of these communities depends on having such an infrastructure in place.

Economic disparity has arisen between the First Nations and the dominant society in step with a disparity in infrastructure. In the 1930's, the First Nations were relatively prosperous. Most First Nations communities didn't experience the precipitous economic decline that many other Canadian communities suffered at the time. Primarily rural and agriculturally based, these communities had an infrastructure on par with the rest of the country. Economic decline for most First Nations communities began in the years after the Second World War.

Clearly a link has to be made to the relative decline in First Nations infrastructure that began in that period. The tremendous expansion of the telephone and highway systems of that time usually missed First Nations communities. When a program of gasification was launched in rural Saskatchewan in the 1970's, again First Nations communities were by-passed. Now there are extensive fiber-optic telecommunications system being built and again First Nations communities are being missed. The result of these developments is that First Nations communities cannot



compete fairly with other communities and their superior infrastructures.

Clearly roads and other infrastructure are important, but telecommunications systems are going to be essential in an economic environment driven by information and microprocessor technology. First Nations can be prosperous, given this necessary infrastructure. It is very likely that no society or nation will be prosperous without it.

It is recommended that the federal government place a priority on the development of information infrastructure for First Nations communities, just as it has for the rest of society. The challenge will be to balance the need for other infrastructure against this very imperative need.

In the foreseeable future, jobs will become of two categories: those requiring matriculation - mostly service sector jobs such as waiting on tables, labourer occupations, etc. or those requiring high levels of sustainable skill and 17 years of education or more. There will be fewer and fewer jobs that require only an undergraduate degree or diploma. If Aboriginal persons are not to be relegated to the menial, service sector jobs of the future, then a strategy for **acquiring skills in higher technology, science, mathematics and related disciplines needs to be implemented now.**

Aboriginal peoples, and all Canadians, must become technologically literate, and remain on the leading edge for all of their working lives. Only then will they be able to fend off some of the competition which they will inevitably face from developing nations. Every resident of Canada should begin to consider the prospect that retirement may not be possible in the future if the Canada Pension Plan ceases to be. Or that Unemployment Insurance may, in the future, be restructured only to assist a person in obtaining new job skills which will assist them in returning to the work force. The day of "X" number of weeks of benefits after "Y" weeks of insurable earnings may be drawing to a close.

In time, the number of jobs in the public sector will reduce dramatically. There will need to be a corresponding increase in the creation of jobs in the private sector. If the government wishes to increase revenue without increasing taxes, one method of doing so is to ensure that there are

additional tax payers who can help to share the tax burden.

We believe, as Canadian society and the Canadian economy shifts and sways, that **there will be created a new class of entrepreneurial public/private contractor (EPPC) who will provide labour to government** , quasi-government agencies and private businesses on a contractual, cost-effective basis. The EPPC will be completely computer literate, and will ordinarily work out of his/her own home with telephone and modem access to various employers for which he/she will do business.

The overhead costs associated with an EPPC employee will be minimal. No office, no utilities, no need to provide secretarial services, no need to pay into pension plans or other benefit plans, no union affiliation. While this scenario will not be palatable to many, and will seem anathema to some, it is one which is unfolding today and one which will eventually become the norm.

We, in Canada, are too used to requiring expensive infrastructure to produce anything. We have a national case of "big projectitis". If we want to produce light bulbs, then we have to have the resources of General Electric. If we want to think about a concept, we must have a meeting and bring in scores of people to participate. In the rest of the world this is simply not so. One would be surprised at the goods and services produced in other areas of the world in the smallest of factories, in people's back yards, in spaces of no more than 8 or 10 square feet. One would be surprised at the decisions that can be taken without resort to the perennial call to order.

It is necessary for **all of us to adjust our attitudes, to train our minds**. If we are to maintain our standards of living, to reduce our dependency, how are we going to do it?

For Aboriginal peoples, **part of the answer is greatly expanded land and economic base. Another part of the answer will ultimately lie in self-government**. For example, the ability to exercise jurisdictional control (not just administrative management) over the Aboriginal educational system will, at least, give Aboriginal people the potential to make meaningful decisions

about the manner in which education and training will be delivered to Aboriginal people. It is necessary for Aboriginal people to avoid the trap of devising educational institutions which are structured in a linear, hierarchical manner. It is necessary for Aboriginal educational institutions to provide the means whereby Aboriginal people can acquire skills and abilities which will enable them to use the best aspects of their cultures and traditions in tandem with the leading edge of technological expertise. It will be necessary for Aboriginal educational institutions to provide not only a first class education, but one which will be appropriately suited to the overall labour market of today and tomorrow.

**The exercise of self-government will provide incredible challenges, and opportunities, to Aboriginal communities.** It is the view of the researchers that self-government which is restricted to the exercise of self-governing powers by an amalgam of Aboriginal towns or hamlets spread across Canada will not provide the educational opportunities necessary for Aboriginal people to reach their educational and vocational potential. It is virtually impossible for most Aboriginal communities to support the type of educational infrastructure which is required in order to be innovative, and practical, on the scale that will be necessary to make a significant difference for Aboriginal students and workers. **If Aboriginal communities do not pool their resources to create institutions with depth and ability, they will be doomed to significant failure.**

Aboriginal people, in exercising their rights to self-government, must rejuvenate the system in a manner which provides meaningful programs and services for those in need of them. Systems imposed by other levels of government through vehicles such as the *Indian Act*, have obviously not worked very well. **If Aboriginal governments simply replicate the welfare dependency system which currently exists, then not very much will have changed for the rank and file Aboriginal person.** Aboriginal governments must carefully redesign the social safety net in such a way that the dignity and worth of the individual is enhanced while, at the same time, ensuring that the recipient of services from the social safety net becomes, and remains, a valued contributor to Aboriginal society. This was, after all, how Aboriginal people conducted their affairs for thousands of years. Aboriginal governments must now find innovative ways of combining welfare, unemployment, pension, housing and other safety net dollars to maximize job creation and job market training

opportunities for Aboriginal people

It is easier to write a cheque for welfare, for example, than to break the shackles which create the need for welfare in the first place. It is easier, in the exercise of self-government, to import the systems and philosophies of INAC than it is to develop, or re-discover, one's own systems and philosophies. **However, difficult though it might be, Aboriginal leaders must rise to the occasion and make the politically hard decisions.** They must be prepared to evolve governmental systems which give tangible benefits, provide appropriate incentives to contribute to Aboriginal societies, and are sensitive to future community and individual needs, or face the prospect of continued poverty and despair for their people.

Self-government will be a meaningless exercise if Aboriginal leaders do not have a clear vision for the future of their people. If the goal is 100% meaningful employment, 100% good health, 0% alcohol and drug addictions, 0% crime, which it ought to be, then a comprehensive plan must be developed to enable Aboriginal people to get from today to tomorrow. **Lack of resources is traditionally touted as the cure-all to some of these problems. It is not.** Even if Aboriginal governments can provide all of the opportunity for their people, there must still be a focus on providing the individual with the drive and determination to exercise that opportunity. **Ultimately, it is up to each individual to reach his/her potential.** It is the opinion of the researchers that Aboriginal, and other governments, can ill afford to continue to help those people who do not wish to help themselves.

In the interim, **governments have a significant obligation to ensure that existing and new Aboriginal educational institutions are supported adequately to ensure that they can meet the challenges of the future.** Such institutions need resources to enable them to strategically plan for the delivery of significantly enhanced programs which amalgamate traditional educational perceptions of Aboriginal people with the demands of a global, competitive marketplace. If these institutions are able to facilitate such a marriage of traditional philosophy with contemporary economic reality, they will provide an invaluable service for Aboriginal people in meeting their needs for tomorrow.

**Education, properly utilized, is the key for the future for most Aboriginal Nations.** Only education, entry into the higher levels of the labour market and the ability to continue to provide meaningful and necessary services to employers, can guarantee for Aboriginal people an escape from the quagmire of despondency and despair which is currently the destiny of many. Aboriginal nation building is built on the foundation of education.

We must realign our educational system as has been suggested, and return to a cultural basis for education which ensures that **learning again becomes a lifelong activity** with practical socio-economic aims and objectives.

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