CANADA

Report of the
National Advisory Board
on Science and Technology

WINNING WITH WOMEN
in Trades, Technology, Science, and Engineering

Presented to the
Prime Minister of Canada

HUMAN RESOURCES COMMITTEE

REPORT ON WOMEN IN TRADES, TECHNOLOGY, SCIENCE, AND ENGINEERING

JANUARY 1993

CANADA

National Advisory Board on Science and Technology

Conseil consultatif national des sciences et de la technologie

The Right Honourable Brian Mulroney
Prime Minister of Canada
House of Commons
Room 309-S
Ottawa, Ontario
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Dear Prime Minister:

On behalf of the Human Resources Committee of the National Advisory Board on Science and Technology, I am pleased to submit for your consideration this Report entitled, Winning With Women in Trades, Technology, Science and Engineering.

Social and cultural barriers still exist which negatively affect the attraction of women to, and the retention of women in, trades, technology, science and engineering. Given that these areas are key to Canada's ability to thrive in a global context, we need to remove any barriers which make the full participation in these fields unnecessarily difficult for half the population. Recognising this, the Committee identified a need for comprehensive recommendations designed to remove the barriers which exist at all levels of women's education and employment.

National figures show that women are significantly under-represented in all scientific and technological fields. In the disciplines of physical sciences and engineering, the enrolment and graduation figures for women at all levels are particularly low. Consequently, women's representation in these areas in the workplace is correspondingly low.

The 1992 report of the Canadian Committee on Women in Engineering, More Than Just Numbers, presented recommendations specific to the removal of barriers to women in engineering. Building upon this excellent work, NABST presents recommendations and strategies for their implementation which have been adapted and expanded to embrace the needs of women in the technical, technological, scientific and trades fields. In addition, the Board presents some general recommendations designed not only to assist in the inspiration of commitment to change but also to ensure that positive movement towards change is maintained and is making a difference.

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While the primary focus of the report is on women, many of the issues relate also to men. The Board feels strongly that the actions proposed to remove barriers to women's participation in science and technology fields, will also increase the attractiveness of these key competitive areas to men.

The long term goal is a broad and inclusive attitude change which will not only recognise women as full participants in all sectors of society, but which will also contribute greatly to the overall preparedness of the Canadian workforce to meet the needs of a demanding future.

Respectively submitted,

Stella Thompson

Stella Thompson
Chair
Human Resources Committee

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FOREWORD TO "WINNING WITH WOMEN"

It was an encouraging sign of the times when the talking "Barbie doll" who said "math class is tough" was hastily whisked off the market amidst howls of protest from parents and educators. Clearly, the marketing wizards—likely all men—had somehow completely missed a growing change in attitude.

This anecdote is significant on many levels. Obviously, it reflects society's deepening aversion to gender stereotypes of any kind. But it also reveals a keen new awareness of the need for at least a basic education in mathematics and science to equip any young person today—girl or boy—for a decent job in a knowledge-based economy.

The deeply ingrained aversion towards science and mathematics of too many young women in Canada has consequences that are no longer tolerable—first, because an inadequate education in theses subjects will continue to confine women to the poorer jobs; and second, because Canada cannot afford to draw its technical skills so overwhelmingly from less than half the population—the 48% that is male.

This message is finally starting to sink in. For example, the percentage of bachelor's degrees in engineering and applied science earned by women reached 15% in 1991, still unacceptably low but double the percentage a decade earlier. Fully one-quarter of the master's degrees in mathematics and physical sciences were awarded to women in 1991, again double the proportion 10 years earlier. As more women acquire these advanced degrees, there will be more teachers and other role models to inspire new generations of young women to follow in their footsteps.

So progress is being made. The numbers are unequivocal. But more important, there is progress in attitude, as the rejection of the math-averse Barbie proves so convincingly. There is, nevertheless, still a very long way to go and the challenge to increase opportunities for women in science and technology is urgent. Basic skills in mathematics and the natural sciences must be learned in the grade school years since they are not easily acquired later in life. We must remember that today's young woman who fails to carry mathematics at least through high school is severely limiting her employment prospects in an increasingly technological economy, not just for a few years, but through a working life that will extend to the middle of the next *century*.

The National Advisory Board on Science and Technology from its inception, has therefore emphasized the need to encourage young women to equip themselves for careers in engineering, science and technology and to ensure that those who are so equipped do not have to face the additional obstacle of gender bias in the workplace. Our first report on the subject was published five years ago in February, 1988. Entitled, "Participation of Women in Science and Technology," that report was prepared under the direction of Jeannine David-McNeil, and outlined the dimensions of the challenge. The federal government responded in part with the Canada Scholarships Program that reserved 50% of the awards for women.

Still, there is much more to be done. This latest report—Winning with Women in Trades, Technology, Science and Engineering—building on the 1992 Canadian Committee on Women in Engineering Report, provides an ambitious but practical strategy to carry forward this vital work on a broad front. The prejudices and stereotypes that have combined to discourage so many women from even considering careers in the traditionally male-dominated technical fields must be overcome *now*—not five or ten years from now. The basic tenets of equal opportunity, and the skills required by our knowledge-based society demand nothing less.

P. J. Nicholson

Executive Summary

In a climate of significant national and global economic restructuring, it is difficult to predict accurately our future human resource requirements. It is therefore critically important that the nation's work-force attain and maintain a state of technological and scientific readiness that will enable Canadians to thrive in a global context.

To ensure this readiness, it is essential that the potential resources in all sectors of the population are fully utilized. The potential contribution of women has been and still is undervalued and underutilized. Recognizing this fact, and in particular that barriers still exist to women's full participation in the scientific and technical fields, the National Advisory Board on Science and Technology (NABST) believes that strategies to remove these barriers are required at all stages of women's educational and employment development. These strategies are presented with the firm conviction that the removal of barriers to women in technology, science, engineering and the trades, together with a fundamental change in cultural and social norms, will result in major benefits for the Canadian economy and Canadian society.

A detailed look at enrolment and graduation figures in both community colleges and universities shows that women are still largely clustered in the traditionally female fields of health, social sciences and education, with the smallest representation in the fields of applied sciences and engineering. The higher the degree of qualification, the lower is the percentage of women. Similar patterns of representation are evident in the number of women faculty members at both community colleges and universities. In the labour force, women are still significantly concentrated in the clerical, sales and service occupations and at the lower and middle ranks. Their lowest representation is in the fields of manufacturing, transportation/utilities, trade/finance, the physical sciences and engineering.

Some issues identified by NABST as relevant to the long-term goal of a broad attitude change with respect to women's contribution in the scientific and technical fields include an understanding that:

- A **quality work-force** will only be achieved when the **potential** of the population is **maximized** by encouraging students of both genders to pursue studies and careers which will not only respond to their best ability but which will take them to the highest possible level of education and career attainment.

- Every sector of the population must be fully utilized and valued for the **diversity** it contributes. Innovation thrives in a climate which nurtures diversity.

- The methods of instruction in educational institutions must respond to the range of **learning styles** of students.

- A negative **cultural/educational bias** exists between the various educational and career options. This bias grants greatest status to the attainment of a university education, less to technical and technological qualifications and minimal status to the trades and apprenticeship programs.

The achievement of widespread awareness of these issues and of committed and effective action towards implementation of the recommendations and strategies, presented in the report, will require a number of key components. These include commitment from the top, gender sensitivity and awareness, women involved in the process of change, cooperation from educators, employers, technicians, technologists, scientists and engineers, challenging goals within realistic time frames, and mechanisms to measure and report on progress.

Building upon the recommendations of the 1992 Canadian Committee on Women in Engineering (CCWE) Report, NABST presents comprehensive recommendations expanded and adapted to include women in technological and scientific fields and in the trades. In order to underline the complementarity of the issues and disciplines and to facilitate use by implementors, the format of the recommendations and strategies is, by design, compatible with that of the CCWE Report. The recommendations are grouped into four sections which reflect the developmental stages in women's learning and career paths. These groupings enable the reader and the implementors to focus on the recommendations and strategies which specifically pertain to their environment. Appendix III contains a series of nine tables for quick reference to, and ease of use of, the recommendations.

Periodic measurement of progress is essential in order that commitment to change is not only inspired but also maintained. NABST has chosen four key indicators to measure progress in achieving the desired changes. These are women's level of enrolment in the scientific and technological fields, number of women science and technology graduates, number of women faculty members in these fields, and women's participation rate in scientific and technical occupations. NABST recommends that an objective, non-governmental responsibility centre be identified to maintain an ongoing national focus and to undertake a measurement of change function. Other general recommendations are designed to inspire change and to ensure that positive movement towards change is maintained and is making a difference. One recommendation is that the Social Sciences and Humanities Research Council (SSHRC), (soon to become the Canada Council for the Arts and for Research in the Social Sciences and Humanities), respond positively to funding requests for research on learning styles. NABST also recommends a detailed, exclusive study of the trades sector which has changed significantly due to the increased science and technology component in recent years.

If Canada is to be a leading nation in the world, it must possess a first-class technologically and scientifically skilled work-force. The achievement of this will depend on a coordinated and committed effort to change cultural and social attitudes so that both women and men can win through their contributions in technology, science, engineering and the trades.

INTRODUCTION

Recent dramatic economic, political and social changes around the world have resulted in a greatly altered international climate. Western countries no longer boast growth economies. As the old order disappears, rapid and inevitable changes are impacting on all sectors of society. How Canadians respond to these changes will determine the future of Canada and its place in the world economic order.

Future human resources requirements are difficult to predict accurately during this time of global restructuring. Because of this uncertain climate, Canadian educators and employers must equip both the young and the current work-force with the knowledge and flexibility they will require to meet a wide variety of challenges in the future.

A well prepared and skilled work-force will, of necessity, require a strong technological and scientific literacy. One of the challenges presented by The Steering Group on Prosperity in its recent report *Inventing Our Future* was **"To improve the capability of managers and the work-force to recognise, acquire and use effectively best-practice and leading-edge technologies, and ensure a strong engineering, science and technology skills base."** An action necessary to the accomplishment of this challenge is to **"increase the number and quality of engineers, scientists and technologists."** In order to achieve this increase in both number and quality, it will be necessary to widen the net and make these professions attractive to a much larger proportion of the population.

In the past, the potential contribution of women in the work-force has been undervalued. Barriers to women seeking an education, or a career, in unconventional spheres were formidable. There is room for encouragement, however, that change has begun, as evidenced by the decrease in educational barriers and indications that barriers to women in the work-force are beginning to be identified and challenged. But there is a long way yet to go if the talents of fifty percent of the population are to be fully developed and utilized in the future growth of the country.

In this report, the Human Resources Committee of the National Advisory Board of Science and Technology is calling for a fundamental change in the cultural norms which reflect directly on the learning and working environments for women at all levels, in all scientific and technological sectors. The implications of such a change are extensive and involve every aspect of our social structure, from parents who exert the earliest influence and establish the first learning patterns, through all of the stages of education and training, to include finally all employment practices and environments. The long-term goal is a broad attitude change in Canada which will recognize the value of an education and subsequent work experience which includes a substantive knowledge of mathematics, science and technology for both women and men.

The Report of the Canadian Committee on Women in Engineering (CCWE), *More Than Just Numbers*, has been hailed as a major achievement in identifying the obstacles to women entering the field of engineering and in making specific recommendations aimed at the removal of these barriers. NABST believes that there is an equal need to focus attention on the removal of barriers to women in the other scientific fields, in technology and the trades, and has used the CCWE Report as the basis on which to build a blueprint for action in these other areas. This adaptation and expansion of the CCWE recommendations will permit coordinated, comprehensive actions across all technological, scientific and engineering disciplines.

BACKGROUND

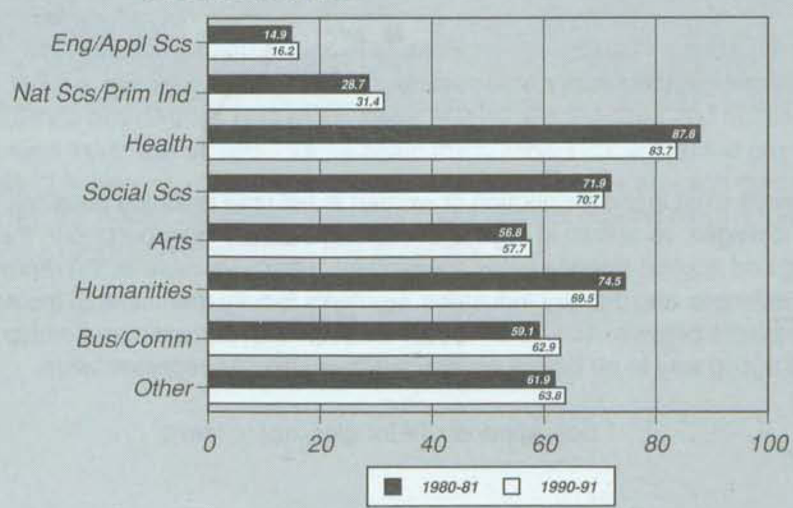
Girls and young women are capable of doing excellent mathematics and science. Yet many drop these subjects even before completing secondary school. By doing so, they shut the door on potential careers in technology, science and engineering.

Statistics show that law and medicine are now attracting almost equal numbers of women and men students. In 1988–1989, 48.4% of graduates in law and 45.1% of graduates in medicine were women. However, the number of women within technical and scientific fields varies considerably, but remains generally low.

Community College Participation Rates

In programs leading to careers in engineering and applied science within the technical or technological fields, women currently make up only 16% of the enrolment, as shown in **Figure 1.** This enrolment figure represents a decline from the high of 18% it reached in 1983. Equally alarming is the fact that the dropout rate for all students in technical programs is one out of every three.

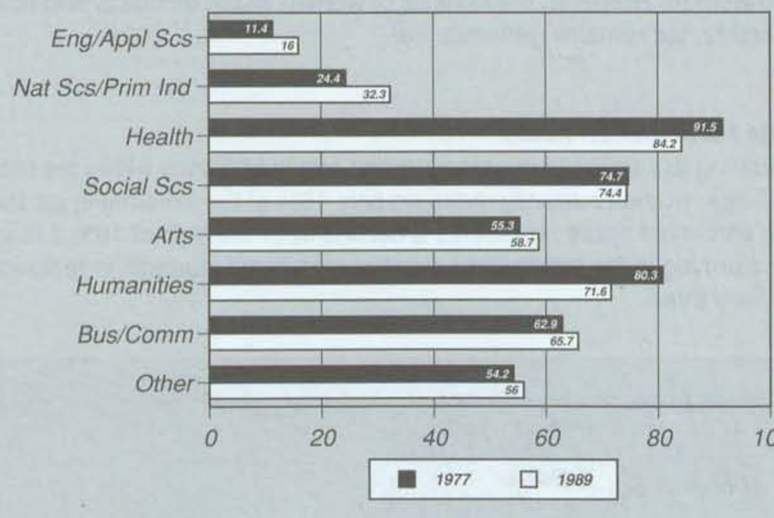
Figure 1. Women as a percentage of full-time community college enrolements by field



Source: *Statistics Canada, Education, Culture and Tourism*

The representation of women career program graduates in community colleges is highest in the health, social sciences and services and the humanities fields, as shown in **Figure 2.** It is predictably lowest in engineering, applied sciences, natural sciences and primary industries*.

Figure 2. Women as a percentage of community college career program graduates by field

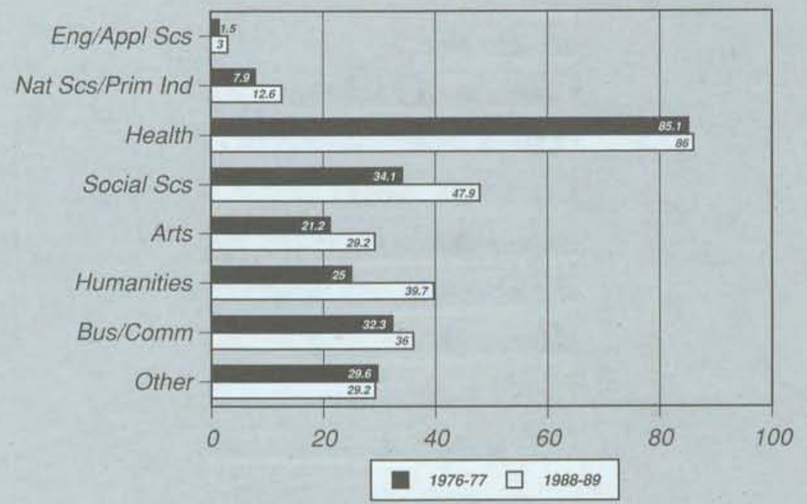


Source: *Statistics Canada; Education, Culture and Tourism*

Similar patterns exist in the distribution of women in full-time teaching positions in community colleges, as shown in **Figure 3**. Women's faculty membership in the engineering and applied science fields are currently nearly invisible at 3% representation. In the natural sciences and primary industries, women's faculty membership increased by 5 percentage points between 1977 and 1989. However, with current membership at 13%, there is still a long way to go before women achieve effective representation.

* See Appendix IV for glossary of terms

Figure 3. Women as a percentage of full-time community college faculty by field



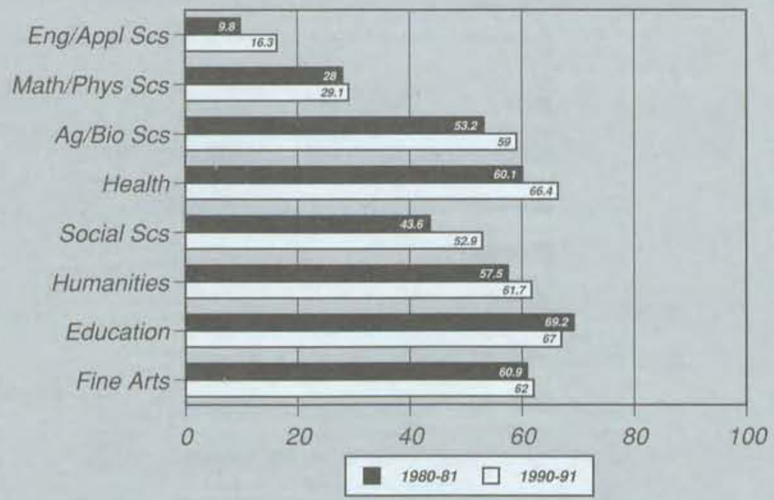
Source: *Statistics Canada; Education, Culture and Tourism*

University Participation Rates

At the university bachelor's degree level, **Figure 4** shows that women's enrolment in agriculture and biological science in 1990–1991 was 59% while enrolment in mathematics, computer science and physics was much lower at 29%. Engineering and applied science registrants were lower still at 16%.* Once again the numbers show that the greatest number of women enrol in the non scientific fields such as education, fine arts and humanities. The exceptions are the health disciplines with their caring aspect making them a "better fit" with the traditional expectation of women's role in society.

* See Appendix IV for glossary of terms

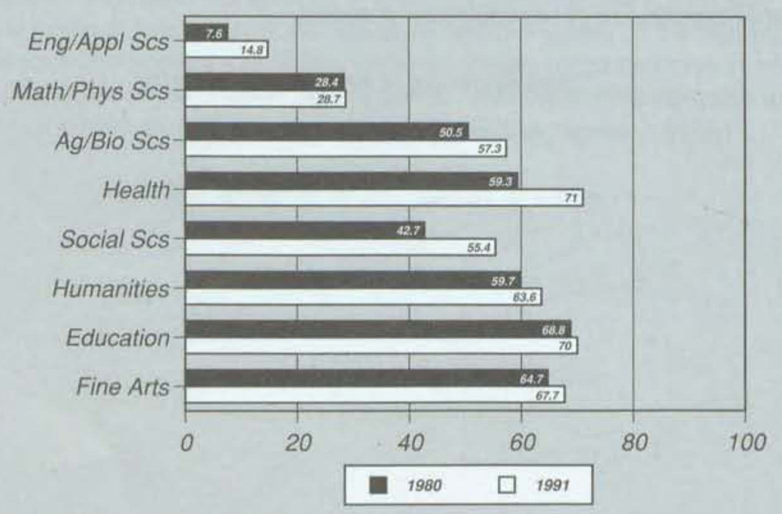
Figure 4. Women as a percentage of university bachelor level enrolments by field



Source: *Statistics Canada; Education, Culture and Tourism*

Figure 5 shows that the number of bachelor's degree graduates in the fields of science and engineering has also been slowly rising with 1991 graduates in engineering and applied science reaching 15%, up six percentage points in nine years. There is improvement, but further efforts to increase these numbers must be encouraged.

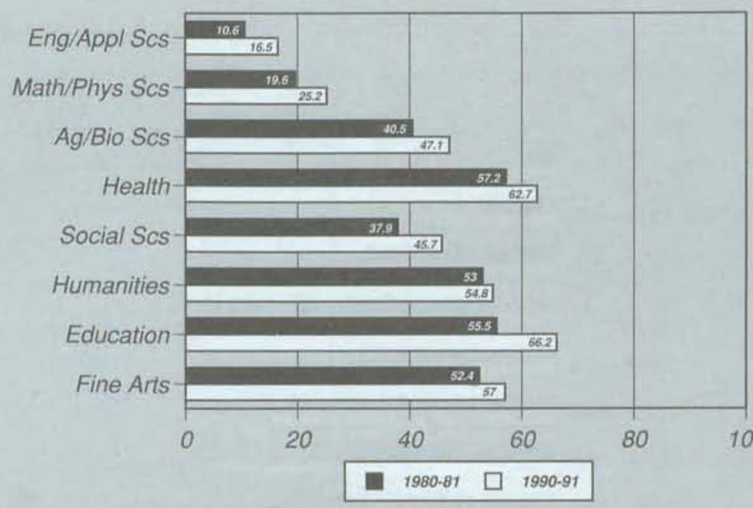
Figure 5. Women as a percentage of bachelor's degree recipients by field



Source: *Statistics Canada; Education, Culture and Tourism*

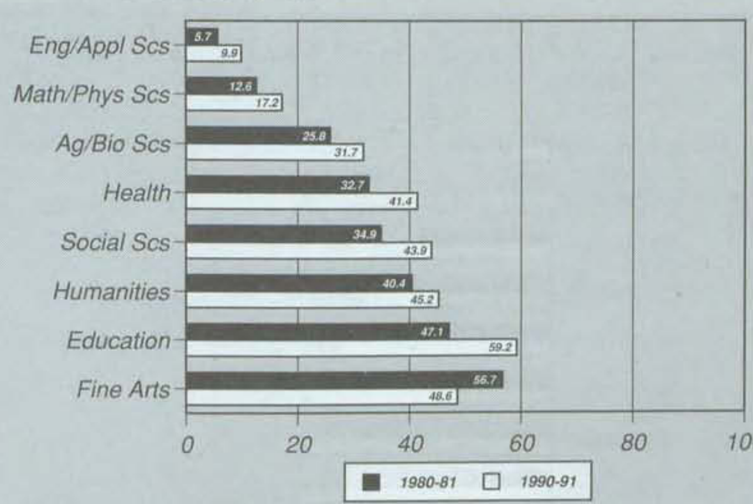
At the master's and doctoral levels, **Figures 6 and 7** indicate that the patterns of distribution by discipline are similar, with the smallest enrolment of women in the areas of mathematics, engineering and applied sciences. **The higher the degree, the lower the percentage of women.**

Figure 6. Women as a percentage of university master's level enrolments by field



Source: *Statistics Canada; Education, Culture and Tourism*

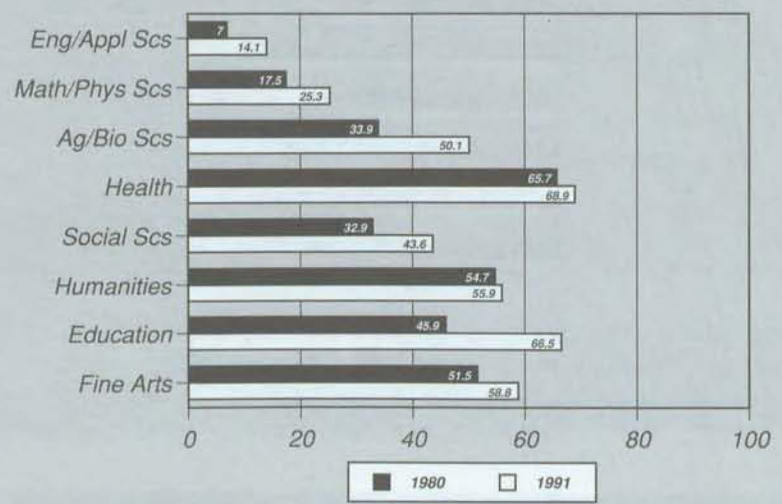
Figure 7. Women as a percentage of university doctoral level enrolments by field



Source: *Statistics Canada; Education, Culture and Tourism*

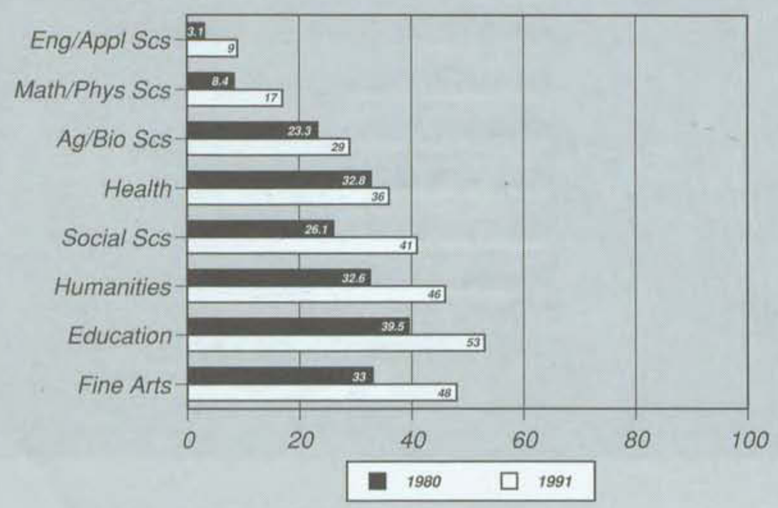
The correspondingly low representation of women receiving graduate degrees at the master's and, in particular, at the doctoral levels, as shown in **Figures 8 and 9**, raises concerns about the effects these numbers may have on the availability of highly qualified women to fill senior positions in both the industrial and academic sectors. Where the barriers are gender oriented, they can be addressed by the recommendations and strategies put forth in this report. Where the disincentives are of a financial nature, then an examination of the grants, fellowships, industrial sponsorship and support programs in general is in order.

Figure 8. Women as a percentage of master's degree recipients by field



Source: *Statistics Canada; Education, Culture and Tourism*

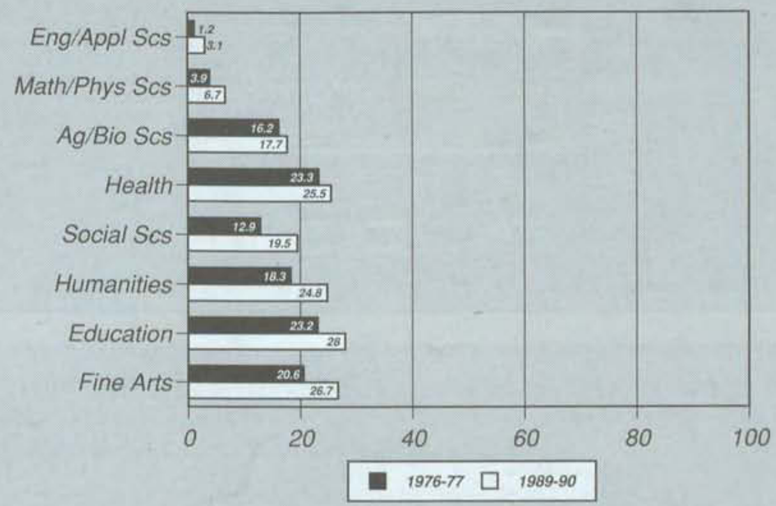
Figure 9. Women as a percentage of doctoral degree recipients by field



Source: *Statistics Canada; Education, Culture and Tourism*

Figure 10 shows that in all fields of study women faculty members are in short supply, with women's representation lowest again in the areas of engineering, applied science, mathematics and the physical sciences. As future faculty shortages are expected to be greatest in these very areas, this presents women students with an opportunity and a challenge to pursue graduate studies and an academic career in these fields.

Figure 10. Women as a percentage of full-time university members by field



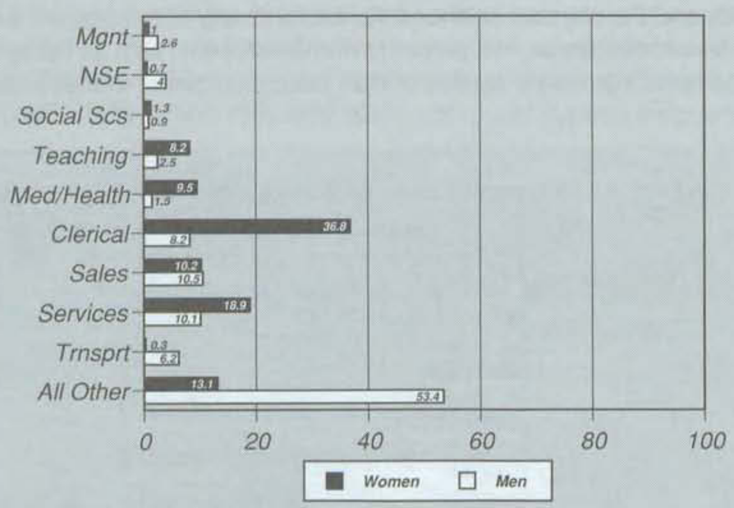
Source: *Statistics Canada; Education, Culture and Tourism*

Participation Rates in the Work Force

Women's participation in the labour force has increased steadily over the last 20 years, from 40.3% in 1971 to 58.2% in 1991, while the participation of men has remained fairly constant at 71.1% in 1971 and 77.6% in 1991. However, despite this increase, the percentage of women working in the Natural Science and Engineering (NSE)* occupations has changed very little. **Figures 11 and 12** show that in 1991, 56% of the women in the labour force were still concentrated in the clerical, sales and service occupations, down only 10% from 66% in 1971.

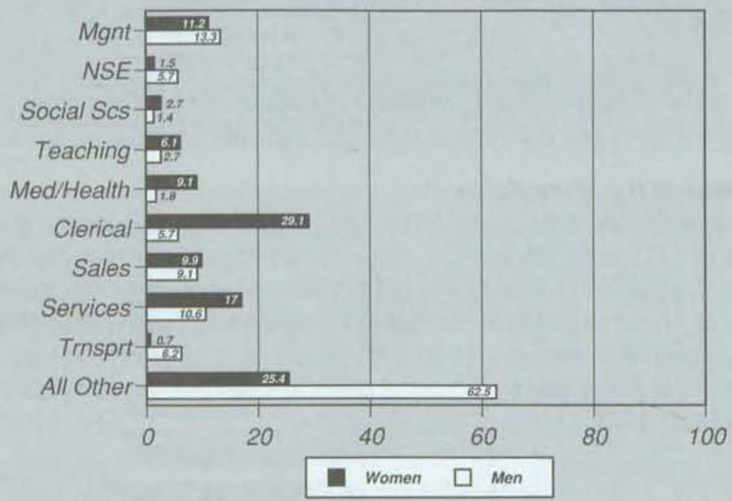
* See Appendix IV for glossary of terms

Figure 11. NSE workers as a percentage of overall labour force,1971



Source: *Census of Canada*

Figure 12. NSE workers as a percentage of overall labour force,1991



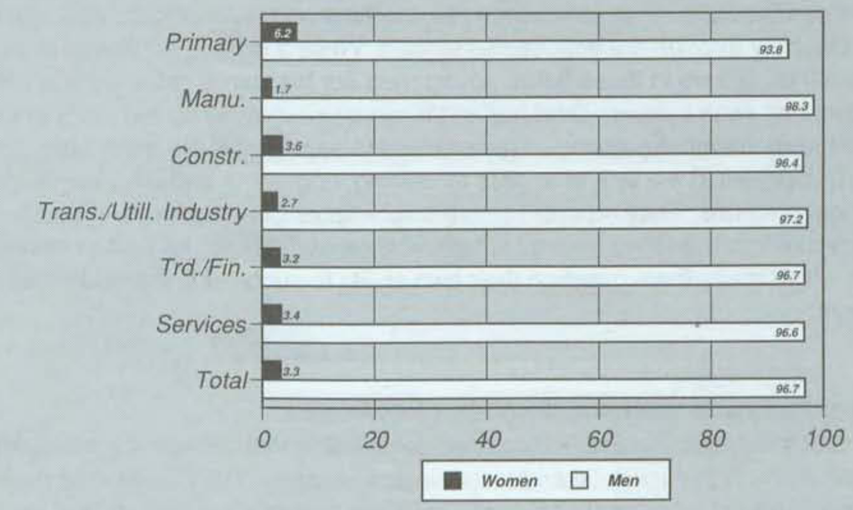
Source: *Statistics Canada; The Harbour Force Cat. 71-001*

Participation of Women in Technical and Technological Occupations

The Canadian Council of Technicians and Technologists (CCTT) 1990 membership survey revealed that women make up only 3.3% of the certified technicians and technologists across the country. Their overall low representation in the principal industry sectors*, as shown in **Figure 13**, is lowest in the areas of manufacturing, transportation/utilities and trade/finance.

* See Appendix IV for glossary of terms

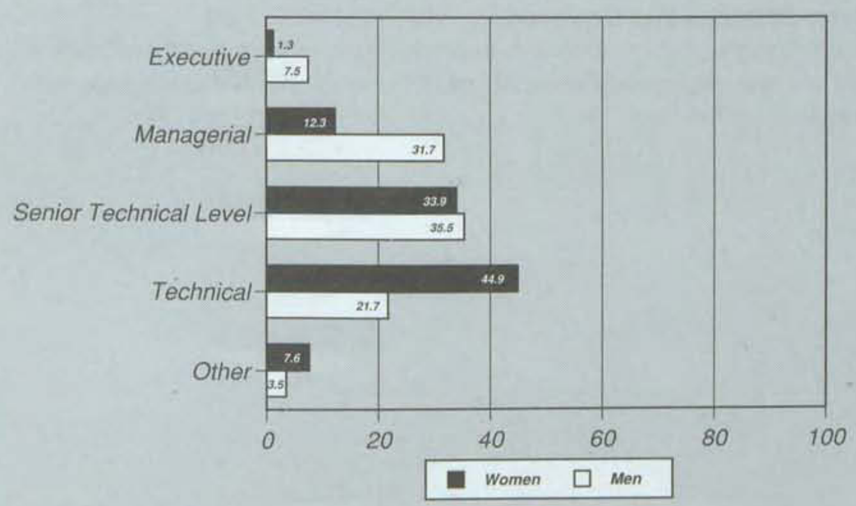
Figure 13. Industry sector by gender, CCTT national membership



Source: *CCTT. National Report #18. March 4, 1992. p. 1.*

A look at the levels of responsibility assumed by women in these fields in comparison with men, as shown in **Figure 14**, reveals that only 1% of women technicians and technologists have executive responsibilities. Only 12% are in the managerial or supervisory categories. Forty-five percent are in the bottom technical entry positions.

Figure 14. Level of responsibility, CCTT national membership



Source: *CCTT. National Report #17. March 4, 1992. p. 1.*

Barriers to Technical Occupations

The Qualitative Survey of Industry Attitudes, conducted by the Canadian Labour Market and Productivity Centre for The Study Group on Technicians and Technologists, reported that for women the route to employment as technicians and technologists appears to be almost exclusively through the educational system. While a college education is the most common path to careers in these fields, young men are frequently recruited and trained in the workplace for such careers. Over half of the women surveyed by the study group reported difficulty handling patterns of gender bias in society and the workplace, some of which were apparent in the lack of access to training, upgrading and advancement to management positions. They reported also the reluctance of educators and career counsellors to encourage their interest in technical career options, as well as social pressures which made them question their own ability to succeed in a predominately male environment.

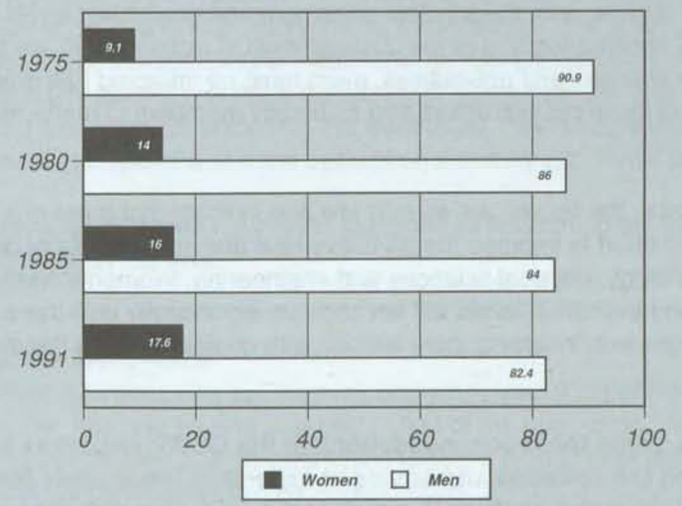
Needed: A Technically and Scientifically Skilled Work-force

Predictions of shortages in some engineering fields within this decade are paralleled by similar predictions in the scientific and technological sectors. The Conference Board of Canada anticipates shortages of engineers, software specialists, chemists and environment specialists. In addition, it is strongly maintained in some quarters that for every engineer, four or five technicians are required. Predictions at best are problematical. What is of critical importance is the degree of scientific and technological readiness that exists in a nation's work-force. This requires that a significant percentage of workers be trained as skilled technicians, scientists and engineers. The country which adapts new technology with alacrity and inspiration will gain the markets. Technical and scientific know-how must exist at every level, from the boardrooms to the shop floor.

Women in Natural Sciences and Engineering

Although women have increased their number from 9% in 1975 to 18% in 1991 in the natural science and engineering occupations, **Figure 15** shows that they are still underrepresented in the field.

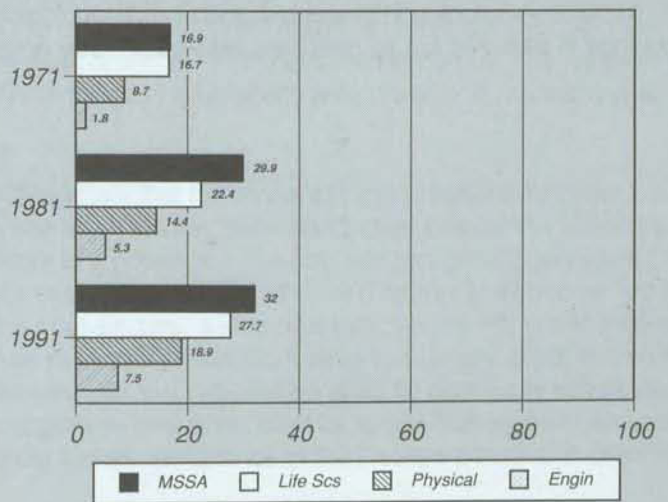
Figure 15. Women as a percentage of NSE employed 1975-1991



Source: *Labour Force Survey, Statistics Canada*

In growing, but still relatively small numbers, women have tended towards the mathematics, statistics and systems analysis (MSSA) occupations with an emphasis on the informatics area. Representation in the life sciences, while still not large, has shown encouraging increase, while the numbers in the physical sciences and engineering occupations are dismal, as shown in **Figure 16**.

Figure 16. Women as a percentage of the professional NSE labour force 1971-1991



Source: *Census of Canada - 1991 data estimated by projecting 1986 data on 1991.*

In Summary

The numbers indicate clearly that women are still significantly underrepresented in all technical, scientific and engineering fields. Enrolment figures decrease steadily as the education levels rise, with the smallest enrolment and graduation levels in the physical sciences and engineering and at the doctoral level. If more women are to be visible role models in the colleges and universities, more must be attracted into graduate programs and into careers as technical instructors and as faculty members in mathematics, science and engineering.

In the workplace, the figures are equally low and indicate that there is a need for serious and concerted effort to improve the attractiveness and accessibility of occupations in the fields of technology, physical sciences and engineering. Women's representation at the managerial and executive levels will not improve significantly until there is an overall increase in numbers, including more women with qualifications at the master's and doctoral levels.

Accordingly, using the recommendations of the CCWE Report as a base, and drawing upon the opinions and advice of experts in these other fields, the Committee presents in this report additional, expanded, comprehensive recommendations, strategies and identified change agents which have been adapted to embrace the needs of women in the technical, technological, scientific and trades fields.

Many of the recommendations in the CCWE Report which deal with social and cultural barriers occurring for women at various age, educational and employment levels have a common basis for women technicians, technologists, mathematicians and scientists. Appropriate strategies and specific agents for change have been identified and added where they applied uniquely to these other fields.

For quick reference and ease of use, a series of tables has been compiled which summarizes the recommendations and strategies, and also chronologically orders the strategies. Groupings in all cases are by developmental stage. See Appendix III.

Issues

Many of the issues identified in the Canadian Committee on Women in Engineering (CCWE) Report apply equally to women technicians, technologists and scientists, and to women in the trades. These include cultural influences, gender stereotyping in the elementary and secondary school system, a deficiency of women as role models, shortages in some scientific and technological sectors of the work-force, misconceptions of the true nature of many of these occupations and the perception that they are "male" pursuits.

In addition, a number of other issues have been identified as relevant to the long-term goal of a broad attitude change in Canada.

Improving the Quality of the Work-force

Until there is commitment to maximize the learning and employment capabilities of women, the work-force will suffer from the wasted potential of half of the population. When women are encouraged to pursue studies and careers which respond to their best abilities, and become confident and full participants in their chosen fields, the result will be an overall improvement in the **quality** of the **work-force** as it benefits from the opportunity to choose the best from a much larger base.

A top **quality work-force** also requires a ready supply of highly qualified professionals with master's and doctoral degrees. Yet, Canadian women and men are seriously underrepresented in graduate studies programs in this country. This underrepresentation of Canadian students, as opposed to foreign students, is in part due to a lack of recognition by the average Canadian business of the advantages which would accrue from hiring and/or supporting postgraduate personnel. Another possible reason is the scarcity of adequate financial resources available to assist the graduate student at a level which is compatible with the level of alternative opportunities in the work-force. The result is that many Canadian students are not achieving their maximum potential and Canadian companies either lack—or must seek offshore—highly qualified expertise. The waste of talent and subsequent loss of technological adaptability puts Canada at risk in the global economy.

Gaining from Diversity

There is a general consensus that the winners in this global marketplace will be those with innovative, state-of-the-art products. Innovation thrives in a climate which nurtures **diversity**. Every sector of a population must be fully recognised and valued for the diversity it contributes to the social and economic fabric of a nation. Until women are fully integrated as equal contributors in all sectors, and at all levels, society will suffer the loss of unique and significant female skills and attributes. A striking example exists in the strong communication, interpersonal and cooperative skills so commonly manifested by women. These skills are among those frequently cited by senior management as essential. With the acceptance of diversity comes acceptance of the creative potential in differing perspectives and experience. From this creative potential comes the innovative economic development required to regain a competitive edge in the market-place which is essential to the achievement of a prosperous life-style. Thus, by recognizing the richness inherent in the diversity women bring to the classroom and to the workplace, all Canadians will gain.

Recognizing Differences in Learning Styles

There is a growing awareness that **learning styles** can vary significantly from person to person. The instructional approach presented within a discipline may well determine the attractiveness of that discipline to different types of students, quite independently of the substance.

Research in this area indicates that although many variations exist, two very distinct learning styles are readily identifiable. While gender differences have been discerned in these variances, research also indicates that a large percentage of men generally display the learning style preference which is favoured by the majority of women.

Generalized findings of differences between the two groups indicate that the style preferred by the majority of the population is characterized by a greater concern with the relationships, or connections, to be found between theory, or concepts,and application. Cooperative learning situations which include individual contributions, experiential learning, open communication and feedback are teaching tools which respond to this learning style. A greater response and care orientation is another characteristic of the group together with the need to be able to relate the academic material to a social and human context.

Characteristics of the style favoured by the minority group include a tendency to be individually competitive. A greater hierarchal, impersonal style and an orientation to logic, justice and rights are also common traits. Surprisingly, most teaching styles are directed, particularly in the fields of mathematics, science and technology, to the learning style of the smaller group.

There are obviously aspects of these different characteristics to be found in both broad groups, in both sexes. NABST believes that this issue of learning styles is another key to solving the problem of avoidance, of transfers and of dropouts by both women and men in the trades, the technical, technological, scientific and engineering fields. If the methods of instruction are not responding to the learning styles of the majority of students, this could be, for many women and men, a significant disincentive to the pursuit of studies, graduate studies, and ultimately of a career in technology, science, engineering or the trades.

There is a need to raise the level of understanding of the impact of rigid teaching styles, a need to humanize the teaching approach and to increase awareness of the relevance and practical application aspects of technological and scientific theory.

Included as Appendix I is a bibliography of some of the work which has been done in this area, with brief content descriptions in some instances. Further study of this issue is urgently required. Clear indications are needed of optimal teaching approaches which respond to the learning styles manifested by significant sections of student populations in all disciplines. **NABST recommends that the Social Sciences and Humanities Research Council (soon to become the Canada Council for the Arts and for Research in the Social Sciences and Humanities) respond positively to funding requests for research on learning styles and their implications on the achievement of maximum learning potential by all students, including women.**

Removing Bias Against Non-university Based Technical Professions

Possibly the most elusive factor to grapple with is the negative **cultural or educational bias** which exists among the various educational and career options. This **bias** conveys greatest status to the attainment of a university education, less to technical and technological professions, and minimal status to the trades and apprenticeship programs. The existence of this bias affects the attraction not only of women but also of men into technical and technological occupations. Non-elitist attitudes must be fostered in all sectors in order to overcome the destructive stereotypes which exist in the "Technical vs Professional" attitude. These **unbiased** attitudes must not only recognize the equal value of each sector, but acknowledge and enhance the complementarity between them. Until such a change in attitude is effected, there will still be a dearth of excellent apprenticeship programs and a short supply of skilled craftspersons and technicians.

Convinced that the elimination of this **cultural bias** is critical to the economic growth and prosperity of the country, NABST has included reference to the trades sector in this report. Without this inclusion of the trades, the work-force picture would be seriously truncated. The total picture of women's representation in the work-force must be perceived and clearly understood before comprehensive change can occur. Nevertheless, NABST is fully aware that this report's treatment of issues relevant to the trades is far from comprehensive. **A detailed, exclusive study of this sector is recommended by NABST, inclusive of the apprenticeship and employer-training issues, the role of unions, "trades" funding and the existence of significant barriers to women**. An additional imperative for the inclusion of the trades is the reality of how significantly technology has changed the nature of many of the trades. There is now, of necessity, a much greater science and technology component in trades training which once more underlines the need for students at all levels to have a strong mathematics and science base. Shortages of highly skilled tradespersons will not easily be filled through immigration channels as has happened in the past. These skilled workers must be readily available in the Canadian work-force. Before this can happen with any degree of success, **a sense of pride of place, of confident equality, of acknowledged status in society must be fostered and maintained.**

In Summary

There are some significant gains to be made by including women as full participants in all the technical and scientific sectors. To accomplish this goal, a number of current attitudes must undergo change: There must be

- a clear understanding and acceptance of the value in quality and in diversity that women bring to the classroom and to the work-force,
- a greater recognition of and assistance for the pursuit of graduate studies must be given, and
- greater attention given to matching methods of instruction to varied learning styles.
- a recognition of the complementarity between the trades and technical occupations and the scientific and engineering occupations must replace the cultural/educational bias which currently exists.

KEYS TO SUCCESS

The achievement of widespread awareness of the issues, and of committed and effective action towards implementation of the recommendations and strategies, will require a number of key components. The keys to success identified by CCWE as essential to effecting attitude change and to the creation of women-friendly environments for women in engineering are of equal significance to women technicians, technologists and scientists. These keys are:

1. **Commitment from the top**
   Elementary and secondary school administrators, community college and university presidents, deans and employers must commit themselves in principle and practice to attracting women into technical, technological and scientific occupations and to creating women-friendly environments. Both men and women in top positions must demonstrate commitment to change.

2. **Gender sensitivity and awareness**
   A greatly increased awareness of, and sensitivity to, the unequal and discouraging struggles encountered by women is integral to any real progress towards full equality and respect for women in all fields, including those technical and scientific. Serious attention must be given to heightening awareness of these gender equality issues through pertinent and timely education and awareness programs.

3. **Women involved in the process of change**
   At the elementary and secondary school level, more women must be encouraged to teach mathematics and science, to be involved in the revision of mathematics and science curricula and to apply for administrative positions. In community colleges and technical institutes, tradeswomen, and women technicians and technologists must be present at both the instructor and senior administrator levels. In the universities more women must hold top management positions, have full professor status in faculties of mathematics and science, and lead research teams. In the workplace, women must have greater representation on boards of directors and in senior management. In professional associations women must sit on councils and committees at all levels and there must be active equity committees with both women and men represented. To facilitate change at all levels, the commitment and leadership of all qualified women is required.

4. **Cooperation from educators, employers, technicians, technologists, scientists and engineers**
   Cooperation is essential between all those involved in the education and motivation required to attract women into the technological and scientific fields: parents, other caregivers, teachers and guidance counsellors, deans of mathematics, science, trades, technology and engineering, faculty and students, and employers and professional associations. Such cooperation will bring positive change to the image of technical and

scientific fields; will improve the learning and working environments; will provide the necessary bridging programs; and will enable women to view technology, trades and science as challenging and rewarding careers.

5. **Challenging goals within realistic time frames**
   To assist those involved in the attraction and advancement of women in these fields, as with the CCWE Report, time frames have been suggested as guidelines for implementing the recommendations. Organizations must set realistic and challenging goals and should set their own pace for change based on their own situations. The proposed strategies address critical paths within a five-year planning horizon, from laying an educational foundation, through to the workplace. Successful programs incorporating these should include comprehensive strategies and be sustained for more than five years.

6. **Mechanisms to measure and report on progress**
   Organizations that represent the key stakeholders in the elementary and secondary school system, community colleges and technical institutes, universities, workplaces and professional associations must be responsible for monitoring the implementation of these recommendations and strategies. Such monitoring must include regular and public reports on progress.

KEY INDICATORS

In order that commitment to change is not only inspired but also maintained, a periodic measuring of progress is essential. Additionally, it will provide a good indication of where strategies are working and where more concentrated effort is required. The Committee has identified four areas as key indicators to be used in the measurement of progress.

The four particular areas in which women's representation has been examined in this report are:

1. Women's **enrolment** levels in technical, technological, scientific and engineering fields at technical institutes, community colleges and universities.

2. The number of women **graduates** in technical, technological, scientific and engineering fields from technical institutes, community colleges and universities.

3. Women's representation on the **faculties** of technical, technological, scientific and engineering departments at technical institutes, community colleges and universities.

4. Women's representation in the **labour force** in the areas of trades, technical and technological occupations, and in scientific and engineering professions.

Appendix II contains the latest available data on each of the four areas, for each Canadian province and territory.

This data should be updated and published every three years to enable each part of the country to measure progress and make required adjustments to effort, emphasis or strategies. The first update, showing measures of change, could be presented at the Follow-up Conference on the CCWE Report *More Than Just Numbers* to be held in Fredericton, on May 16 to 18, 1995.

The Committee recommends that **an objective, non-governmental responsibility centre be identified to maintain an ongoing, national focus and to undertake a measurement of change function as recommended, using the key indicators as a measurement base. The Conference Board of Canada might undertake such a function, or a Canadian Education Council, as recommended by the Prosperity Initiative Task Force on Challenges in Science, Technology and Related Skills.**

General Recommendations

1. That the Prime Minister accept and endorse the Report of the Canadian Committee on Women in Engineering, *More Than Just Numbers*;

2. that the Prime Minister accept and endorse the adapted, expanded recommendations of the CCWE Report to include women in trades, technology and science as presented in this report;

3. that a detailed, exclusive study be undertaken of the trades sector, inclusive of the apprenticeship and employer training issues, the role of unions, "trades" funding and the existence of significant barriers to women;

4. that the Federal Government act as a role model for industry, by not only endorsing but also implementing the recommendations in its own sphere;

5. that the Minister for Science obtain commitments for action from all Federal Ministers of science-based departments;

6. that these reports and their recommendations be included on the agendas of Federal/Provincial Ministerial Conferences along with action reports from Provincial Ministers;

7. that Federal Ministers report back to the Prime Minister, as Chairman of the National Advisory Board on Science and Technology, on what they are doing, in 12 to 18 months;

8. that an objective, non-governmental responsibility centre be identified to maintain an ongoing national focus and to undertake a measurement of change function as recommended, using the key indicators as a measurement base. The Conference Board of Canada might undertake such a function, or a Canadian Education Council, as recommended by the Prosperity Initiative Task Force on Challenges in Science, Technology and Related Skills if such a council is established; and

9. that the Social Sciences and Humanities Research Council (SSHRC), (soon to become the Canada Council for the Arts and for Research in the Social Sciences and Humanities), respond positively to funding requests for research on learning styles and their implications on the achievement of maximum learning potential by all students, including women.

COMPREHENSIVE RECOMMENDATIONS AND STRATEGIES

The following recommendations, based on the work of the Canadian Committee on Women in Engineering (CCWE), have been adapted and expanded to include women in technical, technological and scientific fields and in the trades.

The format of the recommendations and strategies is, by design, compatible with that of *More Than Just Numbers* in order to underline the complementarity of the issues and the disciplines and to facilitate simultaneous use by implementers.

Each recommendation is followed by a number of practical, doable strategies designed to activate effectively the implementation of the recommendations. For each strategy, there is a suggested time frame for action, within the five year planning horizon.

The recommendations are grouped into four sections which reflect the developmental stages in women's learning and career paths:

- **Laying the Foundation,** which covers early childhood through secondary school;
- **Education By and For Women Technicians, Technologists, Tradesworkers, Scientists and Engineers,** which covers post-secondary educational institutions;
- **Workplaces for Women Technicians, Technologists, Scientists, Engineers and Tradesworkers,** which covers the workplace; and
- **Support by Association,** which covers professional associations and societies.

These groupings enable the reader and the implementers to focus on the recommendations and strategies which specifically pertain to their environment. At the end of each of the four sections is a listing of change agents. In the same manner recommended by the CCWE in its report, the organizations listed in each of the expanded change agents groupings should be responsible for implementing the recommendations. The lead organizations should cooperate to collect and analyze the data and qualitative information needed to measure progress against the goals, publish this information in summary form in their annual reports, and discuss it at least once a year at the board of directors level. Organizations in supporting roles should provide advice, information, support and forums for discussion.

Appendix III includes a series of nine tables for quick reference to, and ease of use of, the recommendations:

LAYING THE FOUNDATION

addresses the socialization and education of girls and young women up to the end of secondary level education. Parents, educators and counsellors are responsible for developing interests and maintaining high expectations of girls and young women in doing the science and mathematics which they will need as essentials for future careers.

1. That the active role of women in trades, technology, science, mathematics and engineering be portrayed in television, radio and print media so that parents and the public will encourage young women to pursue careers in technical fields, science, mathematics and engineering.

STRATEGIES:

- Canadian Radio-television and Telecommunication Commission's (CRTC) policy and promotion of women action plan in place. By year 2
- New drama/entertainment series for national television depicting the joys, difficulties and contributions of women working in a variety of trades and in technical, scientific and engineering jobs. By year 3
- Promotion for women in particular during "National Science and Technology Week" and the "Festival of Engineering", and throughout each year. By year 1
- Women committed to leadership as role models, mentors and effective communicators to increase visibility of women in technology, science and engineering. By year 1
- Programs to inform parents of technical, scientific and engineering career options, and gender stereotyping. By year 1

2. That educators empower young women to develop high self-esteem through significant and appropriate learning experiences in mathematics, science and technical skills, in elementary and secondary school.

STRATEGIES:

- Include the hands-on development of tool skills in a variety of technical and applied science disciplines. By year 3

3. That faculties of education include the study of equity issues, educational/professional bias, gender stereotyping, gender differences and different learning styles in teacher education programs so that all students have equal opportunities for learning, participating and contributing in the classroom.

STRATEGIES:

- Courses in equity and gender-related issues for all education students. By year 4
- Educational curriculum to include courses on teaching methods to appeal to various learning styles, classroom management styles, and empowerment of students. By year 4

4. That educators enhance the mathematics, science and technical learning experiences of women students in elementary and secondary schools so that they develop interests and abilities in these subjects and acquire the academic prerequisites for mathematics, technical studies, science and engineering.

STRATEGIES:

- Revamp the teaching of elementary mathematics, science and environment to imbed applied science topics in the curriculum so that students can see the relevance and value of mathematics and applied technology to their everyday lives and how the use of scientific and technical knowledge can be used to satisfy human needs. This would ensure a more balanced view of women's and men's contributions to science and technology. By year 3
- Increase technical education, science and mathematics courses required for secondary school graduation. By year 4
- Enhance science and mathematics courses in all teacher education programs, especially at the elementary level. By year 3
- Review of qualifications and standards of science and mathematics for teachers. By year 3
- Ensure that all teachers of elementary and high school subjects other than mathematics and science have, at the very minimum, completed high school mathematics and science. By year 4
- Develop and implement mechanisms to monitor the participation and success of young women in secondary school mathematics, science, environmental and industrial education courses. By year 2
- Grant a Toy of the Year Award to the toy which best fosters development of non-violent technical and science oriented skills. By year 2

5. That teachers and guidance counsellors provide career information and guidance free of gender-bias and educational/cultural bias about technology and applied technical fields, trades, mathematics, science and engineering, to all students, so that women's interests in, and aptitudes for, science and technology are informed, encouraged and supported.

STRATEGIES:

- Forums/seminars/workshops to increase the awareness of guidance counsellors and teachers regarding equity issues, cultural bias, changing gender roles and career markets. By year 2
- Guidance counselling system for women students strengthened through increased numbers and professional training throughout the entire school system. By year 4
- Active use of career exploration and career decision-making initiatives being developed by Canadian Guidance and Counselling Foundation and their partners. By year 3
- Industry, labour groups, government and educators will develop partnerships between high schools and industry to make students aware of careers in the trades, technologies and sciences, with particular emphasis on breaking down gender stereotyping. By year 3

6. That educators introduce girls and young women to role models in the fields of trades, technology, mathematics, science and engineering so that they realize women have career options and bring unique talents to science, to the trades and to technical and engineering professions.

STRATEGIES:

- Regular visits to elementary and secondary schools by role models. Employers and institutions supporting role modelling projects should receive recognition. By year 2
- Development and distribution of a role model resource package, including audio-visual aids, to assist guidance counsellors and teachers. By year 2
- Initiatives to encourage women with backgrounds in technology, mathematics and science to study education and become teachers. By year 2
- Training of women teachers as science and mathematics specialists for elementary schools. By year 1

7. That educators and employers develop extra-curricular programs to ensure that girls and women develop self-confidence and competence in technology, mathematics, science and engineering in a collaborative environment.

<u>STRATEGIES:</u>

- Job shadowing, enrichment programs and work-experience programs for junior and senior high school students. By year 3
- Presentations of technology, science, engineering and related careers showing their contributions to society, the environment, to policy and decision-making, and their applications in non-scientific and non-technical fields. By year 3
- Mathematics crisis teams developed to work with students who are considering dropping mathematics. By year 2
- Expansion of extra-curricular science and computer clubs, field visits, and mathematics/science conferences and workshops for elementary school children. By year 4
- Innovative science and technology fairs in which all students are encouraged to submit projects and where social relevance, interdisciplinary approaches and teamwork is encouraged. By year 2
- Proliferation of "Girls Exploring Technology" camp/workshop and "Girls in Science" workshops during summers and school year (weekends) for elementary and secondary students. By year 2

Change Agents

THE ELEMENTARY AND SECONDARY SCHOOL SYSTEM

Lead responsibility:

- Council of Ministers of Education of Canada
- Canadian Education Association
- Canadian Teachers' Federation
- Council of Science and Technology Ministers
- Canadian Radio-television and Telecommunication Commission

Supporting role:

- Federal-provincial-territorial Ministers responsible for the status of women
- Canadian Guidance Counsellors' Association
- Canadian Guidance Counselling Foundation/CAMCRY
- Industry, Science and Technology Canada
- Status of Women Canada
- Statistics Canada
- Conference Board of Canada (Education Council)
- Association of Community Colleges of Canada
- Canadian Congress on Learning Opportunities for Women
- Canadian Association of School Administrators
- Canadian School Boards Association
- Canadian Association of Deans of Education
- Provincial Ministries for Science and Technology
- Provincial Ministries of Education
- Science Teachers Associations
- Canadian Council of Technicians and Technologists (CCTT) and affiliates
- Canadian Council of Professional Engineers
- Association of Consulting Engineers of Canada
- The Canadian Manufacturer's Association and all industry organizations listed under THE WORKPLACE
- Private industries
- Canadian Coalition of Women in Engineering, Science, Trades and Technology (CCWEST)
- Women in trades and technology, science and engineering associations, including the Society of Canadian Women in Science and Technology (SCWIST); Women in Science and Engineering (WISE); Women in Trades and Technology (WITT) National Network; Women in Scholarship, Engineering, Science and Technology (WISEST); Association of Women in Engineering and Science (AWES); Canadian Association of Women in Science (CAWIS)
- Deans of Engineering and Applied Science
- Deans of Technology and Trades in community colleges
- Northern Telecom – NSERC Women in Engineering Chair

EDUCATION BY AND FOR WOMEN TECHNICIANS, TECHNOLOGISTS, TRADESWORKERS, SCIENTISTS AND ENGINEERS

addresses the changes in climate required within the technical institutes, community colleges and universities, which must occur to attract and retain more women in post-secondary and graduate programs in technology, science, engineering and the trades. Educators and administrators are responsible for making curriculum changes relative to issues of concern to women and society. Deans of science and engineering and department chairs are responsible for increasing and promoting more women in their faculties as role models for women students and as full participants in academic life.

8. That technical institutes, community colleges and universities create attractive environments for women and commit—in principle and practice—to the recruitment and retention of women faculty and students, especially in trades, technical and technological programs and in faculties of engineering, science and applied science.

STRATEGIES:

- Equal opportunities and pay equity programs. By year 2
- Clear, strong accountability measures and incentives in place to ensure equal opportunities. By year 3
- Proactive marketing and recruitment campaign. By year 2
- Non-harassment policies and procedures. By year 2
- Comprehensive awareness programs on harassment for all students, faculty and staff. By year 2
- Gender-inclusive language policy. By year 2
- Gender-sensitivity programs and assessment, with feedback, for faculty, staff and students. By year 3
- Childcare referral system within three years and where feasible, on-site childcare facilities. By year 5

9. That faculties and schools of technology, trades, science and engineering develop programs to attract women into technical and undergraduate programs to increase the pool of well-qualified, talented technicians, technologists, tradesworkers, mathematicians, scientists and engineers.

STRATEGIES:

- Regular visits to elementary and secondary schools which include a discussion of social relevance of these fields, income prospects and their importance to the Canadian economy.
  By year 2
- Regular sponsorships of career days, science and mathematics conferences, and mathematics and science contests.
  By year 1
- Information sessions for teachers, guidance counsellors and parents.
  By year 2
- Exploratory courses for women providing academic upgrading and technological literacy, professional development skills, with hands-on technical training, as feeder courses to trades, technology and engineering programs.
  By year 2
- Accessible transfers between community colleges and university undergraduate science and mathematics programs.
  By year 2
- "Women Do Math" conferences at technical institutes and major universities.
  By year 2
- Training in alternate learning styles for professors and instructors of technical, scientific and engineering material.
  By year 3
- Income support assistance programs for technician/technology programs.
  By year 2
- Incentive programs for institutions that draw a greater number of women students in technical areas.
  By year 3
- Mechanism to monitor impact of attraction programs.
  By year 2

10. That institutes of trades and technology and faculties of engineering and science encourage mature women and minority women students to enter programs.

STRATEGIES:

- Part-time technician/technology programs. By year 3
- Part-time and flexible undergraduate science and engineering programs. By year 4
- Introductory, transitional, refresher and qualifying courses for non-traditional students. By year 3
- Increased transferability of qualifications and credit between programs and institutions. By year 3
- Adoption of flexible admission policies. By year 3
- Credit for documented work and life experience. By year 3
- Mechanisms to monitor impact of attraction programs. By year 1

11. That institutes of trades and technology and faculties of engineering and science establish academic adjustment and social support programs for undergraduate students, especially for women students.

STRATEGIES:

- Encourage and facilitate transfer of women undergraduates from other science disciplines to mathematics, physics, chemistry, computer science and engineering. By year 1
- Support services of tutoring, study teams, mathematics skills workshops and career information workshops to serve the needs of women students. By year 1
- Voluntary mentorship program. Mentor's participation should be recognized by their institution or employer. By year 2
- Support for Canada Scholars including science coaches, mentors and newsletter. By year 1
- Support for recognition/scholarship programs for trades and apprenticeship programs. By year 2
- Assertiveness training and gender-related issues built into vocational/technical training programs. By year 3
- Women's advocate at all technical institutes and community colleges. By year 2
- Advisors to deans of technology, science and engineering. By year 3
- Mechanism to monitor attrition. By year 2

12. That trades and technical institutes and faculties of science and engineering create an environment that ensures the physical, emotional and psychological security of all students and creates feelings of respect and equity.

STRATEGIES:

- Written code of behaviour for students including enforcement and accountability measures. By year 2
- Institution/Workplace Safety Audit Kit developed and utilized. By year 3
- Editorial policy and editorial board for student publications. By year 2

13. (a) That faculties of engineering and science accelerate efforts to attract women students to post-secondary and graduate studies and to ensure they continue to graduation so that the pool of candidates for senior positions in industry and faculty positions are increased.

STRATEGIES:

- Strategies to identify potential graduate students. By year 2
- Strategies to support and encourage career upgrading through higher education for women already employed in the fields of science and engineering. By year 2
- Increased flexibility in regulations for fellowships and grants to accommodate the needs of women graduate students and researchers. By year 2
- Financial and counselling assistance for encouragement of graduate training. By year 2
- Investigation of maternity/paternity needs of graduate students. By year 3
- List of and network for women graduate students and faculty. By year 2
- Assistance for professional development. By year 2

13. (b) That institutes of trade and technology accelerate efforts to attract women students into nontraditional program areas and to ensure they continue to graduation.

STRATEGIES:

- Strategies to support and encourage career upgrading through higher education for women already employed in the fields of trades and technology. By year 2
- Financial and counselling assistance for encouragement of advanced training and career advancement in these fields. By year 2
- Courses with a technology management orientation for senior technical students. By year 3
- Cooperative arrangements between institutions to improve access to degree programs in technology and technology management, applied sciences and engineering, and bridging to academic qualifications. By year 3

14. That institutes of trades and technical studies and faculties of science and engineering develop an action plan to increase the number of women faculty so that a more gender-balanced faculty results.

STRATEGIES:

- Voluntary or compliant employment equity programs with goals, timetables and methodologies, and special measures for recruitment and retention set out in action plans, in consultation with unions where applicable. The action plan will also include a communications strategy for the institution. By year 3
- Specific goals and strategies for recruitment, hiring and development of women faculty, including use of professional job placement services. By year 3
- Adjunct, part-time or term appointments of faculty with comparable worth to full-time faculty. By year 3
- Fully integrated, short-term, part-time positions for individuals desiring such appointments. By year 4
- Guest lectureships by women leaders in technology, science, mathematics/statistics and engineering. By year 1
- Provision of proactive job searches and assistance, wherever feasible, for professionally qualified spouses seeking academic positions. By year 1
- Data base of qualified women candidates for faculty positions. By year 3

15. That institutes, colleges and universities design tenure and promotion criteria and processes to allow for family responsibilities so that maternity, paternity and parental leaves do not jeopardize career progression or achievement of tenure and promotion.

STRATEGIES:

- Flexibility in requirements and time frame for tenure and promotion. By year 2
- Parental leaves without jeopardy of career progression or achievement of tenure and promotion. By year 1
- Recognition of faculty participation in programs to attract and retain women students. By year 2

16. That technology, science and engineering curricula be made relevant to current societal realities and future needs so that students are made aware of the social, political, economic and ethical contexts of technology, science and engineering, and develop an understanding of and appreciation for the humanities and social sciences.

STRATEGIES:

- Incorporation of social and environmental impact, and human values in technical, scientific and engineering courses. By year 3
- Transformation of trades, technology, science and engineering curricula to "humanize" the subjects, reflect cultural diversity and women's perspectives. By year 2
- Presentation of science and engineering as a diversity of subjects and processes thereby appealing to a broader cross-section of students. By year 1
- Faculties of technology, science and engineering to review academic courses for inclusion of a "concepts" approach as a balance to "detail". By year 3
- Incorporation of gender-related and equity issues in technology and engineering curriculum. By year 3

17. That institutes of trades and technologies and faculties of science and engineering develop and expand work-experience programs and encourage women students to participate so that they are able to validate their career choice and relate engineering and technical studies to the workplace.

STRATEGIES:

- Increase government support for cooperative education targeted to women. By year 2
- Exploratory courses and trade/technology specific courses for women with a solid work experience component. By year 2
- Orientation programs for work-experience students. By year 2
- Procedures for reviewing work experiences and follow-up of problems with employers. By year 2

CHANGE AGENTS

THE UNIVERSITIES, COMMUNITY COLLEGES AND TECHNICAL INSTITUTES

Lead responsibility:

- Association of Universities and Colleges of Canada
- Association of Canadian Community Colleges
- Canadian Association of University Teachers
- Canadian Federation of Engineering Students
- National Committee of Deans of Engineering and Applied Science
- National Committee of Deans of Arts and Sciences
- Canadian Association of Graduate Schools

Supporting role:

- Canadian Engineering Human Resources Board of CCPE
- Northern Telecom – NSERC Women in Engineering Chair
- Statistics Canada
- Industry, Science and Technology Canada
- Employment and Immigration Canada (via the Federal Contractors' Program and the Employment Equity Act)
- Canadian Association of University Continuing Education
- Conference Board of Canada (Education Council)
- Canadian Congress on Learning Opportunities for Women
- Canadian Federation of Students
- Canadian Organization for Part-Time University Students
- Deans of Engineering and Applied Science
- Deans of Technology and Trades in community colleges
- National Research Council of Canada
- Natural Sciences and Engineering Research Council of Canada
- Social Sciences and Humanities Research Council of Canada
- Canadian Federation of University Women
- Canadian Coalition of Women in Engineering, Science, Trades and Technology (CCWEST)
- Women in Trades and Technology (WITT) National Network
- Women in Scholarship, Engineering, Science and Technology (WISEST); Association of Women in Engineering and Science (AWES); Canadian Association of Women in Science (CAWIS)
- Society of Canadian Women in Science and Engineering (SCWIST)
- Women In Science and Engineering (WISE)
- Federal-provincial-territorial Ministers with advanced education responsibilities
- Canadian Labour Force Development Board
- Provincial associations representing Community Colleges' and Technical Institution Instructors

WORKPLACES FOR WOMEN TECHNICIANS, TECHNOLOGISTS, SCIENTISTS, ENGINEERS AND TRADESWORKERS

addresses how employers can change the corporate culture to ensure opportunities for career development and the promotion of women in the trades, technical, technological, engineering and scientific careers.

18. That all employers develop and implement corporate strategies and policies that demonstrate commitment to the hiring, retention, promotion and career development of women professionals, especially technologists, technicians, tradesworkers, scientists and engineers.

STRATEGIES:

- Employers work with technical institutes, colleges and universities and unions to extend cooperative education programs and to recruit female students for cooperative education and work-experience programs to facilitate their entry to the job market. By year 2
- Voluntary or compliant employment equity programs with goals, timetables and methodologies, and special measures for recruitment, retention and promotion set out in action plans, in consultation with unions where applicable. By year 2
- Gender-awareness programs for all employees. By year 4
- Diverse work-force management training for all managers. By year 3
- Exit interviews with all women technical, scientific and engineering employees. By year 3
- Identification and removal of systemic barriers such as the existence of biased or preconceived attitudes and formal and informal discriminatory procedures. By year 2
- Women's advisory councils to bring issues of significance for women to the attention of senior managers. By year 2

19. That employers of technicians, technologists, tradesworkers, scientists and engineers develop recruitment practices to attract qualified women by creating a selection process that is fair, objective and free of gender bias.

STRATEGIES:

- Realistic objectives for hiring women technicians, technologists, tradesworkers, scientists and engineers. By year 2
- Appointment of one technical/professional woman to every selection process. By year 2

- Training program for participants in selection process which includes information on language issues, job posting, recruitment and selection, human rights, and employment equity and harassment policies. By year 2
- Recognition and incentives for organizers and participants in recruitment programs. By year 2
- Attraction programs for elementary and secondary school students. By year 4

20. That employers of technicians, scientists and engineers institute career development, retention initiatives and promotion strategies to prepare women in these fields for management, and to ensure the promotion of the best-qualified and most productive employees.

STRATEGIES:

- Career development, training and promotion programs for women technicians, technologists, scientists and engineers. By year 2
- Training for mid-career technicians and technologists to update or expand their technical knowledge and management skills to be designed in conjunction with educational/technical institutions. By year 3
- Mentorship programs for recently qualified new technical employees, scientists and engineers. By year 2
- Mentorship programs for women with management potential. By year 2
- Networking opportunities within organizations with other women in technical and trades areas, science and engineering. By year 2
- Equity advisor/manager with reporting authority to President/CEO. By year 2

21. That employers of technicians, technologists, tradesworkers, scientists and engineers adopt policies that support the professional, personal and family needs of all employees and ensure employees are able to balance family responsibilities with professional responsibilities and career development.

STRATEGIES:

- Alternative work arrangements and schedules. By year 4
- Access to childcare or a childcare/eldercare referral system. By year 4
- Maternity, paternity and family issues addressed. By year 4
- Examination of employee compensation and benefits packages. By year 4

22. That employers of technicians, technologists, tradesworkers, scientists and engineers, including government, industry and post-secondary institutions initiate, update, promote and enforce policies to eradicate harassment in the workplace.

STRATEGIES:

- Corporate mission/ethics policies, non-harassment policies and procedures. By year 2

- Routine compulsory sensitization programs on harassment for staff and management. By year 2

- Monitoring mechanisms developed. By year 1

CHANGE AGENTS

THE WORKPLACE

Lead responsibility:

- Canadian Manufacturers' Association
- Association of Consulting Engineers of Canada
- Canadian Council of Professional Engineers (CCPE)
- Association of Consulting Engineers of Canada (ACEC)
- Provincial/territorial professional associations
- Canadian Labour Congress
- Employment and Immigration Canada (via the Federal Contractors' Program and the Employment Equity Act)
- Canadian Council of Technicians and Technologists (CCTT)

Supporting role:

- Status of Women Canada
- Provincial government departments responsible for employment equity legislation
- Canadian Council of Professional Engineers
- Canadian Labour Force Development Board
- Northern Telecom – NSERC Women in Engineering Chair
- Other employers' organizations, including Canadian Nuclear Association, Canadian Petroleum Association, Mining Association of Canada, Canadian Forestry Association, Canadian Pulp and Paper Association, Aerospace Industries Association of Canada, Electrical and Electronics Manufacturers' Association of Canada, Canadian Construction Association, The Chemical Institute of Canada, Canadian Association for Chemical Engineering, Information Technology Association of Canada, Canadian Advanced Technologies Association, Industrial Biotechnology Association of Canada, Canadian Steel Producers Association
- Canadian Coalition of Women in Engineering, Science, Trades and Technology
- Women in trades and technology, science and engineering associations, including the Society of Canadian Women in Science and Technology (SCWIST); Women in Science and Engineering (WISE); Women in Trades and Technology (WITT) National Network; Women in Scholarship, Engineering, Science and Technology (WISEST); Association of Women in Engineering and Science (AWES); Canadian Association of Women in Science (CAWIS)

SUPPORT BY ASSOCIATION

addresses the roles of professional associations and societies in endorsing and promoting the trades and technological fields, science and engineering as viable careers for women. Institutional linkages are important because of common concerns in increasing the number of women in these career paths.

23. That professional associations/societies, in collaboration with advocacy groups for women in trades and technology, science and engineering, institute and develop programs for all members and trainees to ensure full acceptance of women in their professions/vocations and to eradicate harassment and discrimination against women members.

STRATEGIES:

- Initiatives to increase membership of women. By year 1
- Appointment of at least one woman to each committee such as awards and honours, nominations, editorial review and conference committees. By year 2
- Nominations of women for election to national, provincial and territorial councils. By year 2
- Committees to address issues of concern to women members. By year 2
- Invitations to women as speakers and guests at meetings and ceremonies, and as representatives of their profession. By year 1
- Development of a code of ethics and guidelines for application in instances of personal harassment and discrimination. By year 3
- Gender-inclusive documents and ceremonies. By year 2
- Special events for women members. By year 2
- Programs and workshops on gender sensitivity. By year 3

24. That professional associations working in conjunction with advocacy groups, Employment and Immigration Canada and educational institutions improve the information base on equity and human resource distribution, particularly as it pertains to women technicians, technologists, tradesworkers, scientists and engineers.

STRATEGIES:

- Track the increase and/or decline of women in various disciplines; the attrition levels in technician and technologist careers and in community college programs; the alternate career destinations; the impact of cooperative versus regular programs in influencing women to enter/remain in technology programs; the effect/importance of mentors, role models and other factors in schools, colleges and the workplace. By year 2

- Establish and maintain a national data bank inventory of women trades and technical workers scientists and engineers for use by employers, school systems and association role modelling programs, and interested others. By year 3

- Expand member surveys to measure level of responsibility, salary, etc. By year 2

- Distribute survey results to members, educators and employers. By year 3

25. That professional associations of technicians and technologists, scientists and engineers design and launch a public awareness campaign across Canada to promote trades and technology, applied science and engineering, especially as careers for women.

STRATEGIES:

- Development of a national participaction-like campaign to promote the use and value of technical, scientific and engineering occupations showing women as positive role models. By year 2

- Distribution of information about technical, scientific and engineering careers to all elementary and secondary educators. By year 2

- Support for "National S&T Week" and "Festival of Engineers". Ongoing

- Appointment of at least one woman on awards committees. By year 2

26. That professional associations establish or expand comprehensive attraction programs at elementary and secondary schools in cooperation with other organizations concerned with encouraging women to study technology and trades, applied science and engineering.

STRATEGIES:

- School visit strategy and plan, including science and technology fairs, mentoring programs, career days, role models in the classroom and girls exploring technology workshops. By year 2
- Registries, resources packages and gender-sensitive training program for role models. By year 2
- Coordinated visits with established monitoring. By year 2
- Industry and professional associations to support "adopt-a-school" projects to raise profile of science and technology careers in small and remote communities. By year 3

27. That professional associations support the development of voluntary career advisory programs to provide support and guidance to young people who are just beginning careers in technology, science or engineering.

STRATEGIES:

- Voluntary career advisory programs for students delivered at the local level. By year 2
- Training program for advisors. By year 2

28. That professional associations develop close working relationships with institutes of trades and technology and faculties of science and engineering to ensure students are aware of common commitments to fairness, respect and equity in the workplace.

STRATEGIES:

- Regular presentations on ethics at technical schools and science and engineering faculties. By year 2
- Communication channels with technology/trades/science/engineering deans, student leaders and newspaper editors. By year 2

29. That professional associations of technicians, technologists, scientists, engineers, women's groups and educators make employers aware of the different perspectives, qualities and values that women can contribute to applied technical work and engineering science.

CHANGE AGENTS

THE TECHNOLOGY, SCIENTIFIC AND ENGINEERING PROFESSIONS

Lead responsibility:

- Canadian Council of Professional Engineers
- Canadian Council of Technicians and Technologists and affiliates
- Association of Consulting Engineers of Canada
- Provincial/territorial professional associations
- Canadian Academy of Engineering
- Engineering Institute of Canada
- Biological Council of Canada
- Royal Society of Canada
- Chemical Institute of Canada
- Organizations for women in trades, technology, science and engineering including those belonging to the Canadian Coalition of Women in Engineering, Science, Trades and Technology

Supporting role:

- Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers (CCPE)
- Canadian Engineering Human Resources Board of CCPE
- Canadian Engineering Qualifications Board of CCPE
- Canadian Federation of Engineering Students
- National Committee of Deans of Engineering and Applied Science
- Northern Telecom – NSERC Women in Engineering Chair
- Employment and Immigration Canada
- Association of Canadian Community Colleges
- Employer associations
- CBC, CTV, CRTC, The Newspaper Guild, etc.
- Canadian Astronomical Society
- Canadian Association of Computer Science
- Canadian Association of Physicists
- Canadian Biochemical Society
- Canadian Mathematical Society
- Canadian Applied Mathematics Society
- Canadian Federation of Biological Societies
- Canadian Botanical Association
- Canadian Forestry Association
- Canadian Information Processing Society
- Canadian Society of Agronomy
- Canadian Society of Animal Science
- Canadian Society of Cell Biology
- Canadian Society of Environmental Biologists
- Canadian Society of Microbiologists
- Canadian Society of Zoologists
- Statistical Society of Canada

THE MEDIA (A change agent relevant to every stage)

Lead responsibility:

- Industry, Science and Technology Canada
- Canadian Radio-television and Telecommunications Commission
- Canadian Broadcasting Corporation (CBC)
- The Canada Council

Supporting role:

- Canadian Coalition of Women in Engineering, Science, Trades and Technology
- Women in trades and technology, science and engineering associations, including the Society of Canadian Women in Science and Technology (SCWIST); Women in Science and Engineering (WISE); Women in Trades and Technology (WITT) National Network; Women in Scholarship, Engineering, Science and Technology (WISEST); Association of Women in Engineering and Science (AWES); Canadian Association of Women in Science (CAWIS)
- Status of Women Canada
- Canadian Council of Technicians and Technologists (CCTT) and affiliates
- Canadian Council of Professional Engineers
- Association of Consulting Engineers of Canada

CONCLUSION

The long-term goal is a broad and inclusive attitude change, one which will recognize women as full and equal participants in all sectors of society, but particularly in areas of scientific and technological endeavour. The Committee believes that success in achieving this goal will affect both the education and the labour force environments in a way which will benefit all participants. It will also help to eliminate the destructive existence of a cultural/educational bias.

To achieve this long-term goal, action will be required on many fronts beginning with widespread senior level commitment. Action must include measuring and reporting on progress in the implementation of the recommendations, as well as an ongoing media campaign to keep the issues before the public. It will be necessary to maintain the measuring, reporting and communications functions at least until the end of the decade. Cooperation among educators, academia and employers is needed, especially in establishing institutional linkages to work on common goals. Women's networks, associations and individual women can be catalysts as well as key facilitators for change.

Many industries, organizations and institutions have already begun to map and initiate programs to include more women in the scientific and technological fields. These beginnings, many initiated in response to the CCWE Report, are exciting and encouraging. For the great majority who are just becoming aware of the need and the urgency for action, this document provides suggested directions to stimulate participation. Achievement of the goal is dependent upon the active participation and commitment of all organizations, and of each individual. The overall preparedness of the Canadian work-force to meet the demands of an uncertain future is dependent upon the achievement of this goal.

> We can change laws in a matter of months. But to change attitudes, values and behaviour requires years—even generations. And it requires partnerships among governments, educational institutions, business, industry, labour, non-governmental organizations and others.
>
> *(The Honourable Mary Collins, Minister Responsible for the Status of Women, Ontario Forum).*

APPENDIX I

LEARNING STYLES

BIBLIOGRAPHY OF WORK ON LEARNING STYLES

Auger, Marion. *Different Voices Within the University: The Learning Preferences of Male and Female Students.* Thesis presented to the Faculty of Graduate Studies of the University of Guelph. April 1992.

Marion Auger notes that the traditional approach in universities has been to view women and men as homogeneous when considering their learning needs. Noting that women, however, experience university differently from men, the main point of discussion in her thesis is not the source of the differences, but the meaning and implication of the differentiated role expectations for the sexes.

Bohnen, Elizabeth, Susan Booth and Judy Klie. *Bridges to Equity Program Manual and Trainer's Guide.* City of Toronto, Management Services Department.

European Cultural Foundation. *Learning Styles.* Edited by Richard Duda and Philip Riley. Nancy: Presses Universitaires de Nancy, 1987.

Gilbert, Sid and Alan Pomfret. *Gender Tracking in University Programs: An Analysis of Gender Patterns in CSP Disciplines and Non-CSP University Disciplines.* Prepared for ISTC. February 28, 1991.

Sid Gilbert and Alan Pomfret conducted an empirical study to determine why women choose arts and humanities over natural sciences and engineering, and to investigate the relationship between psychological/motivational factors and academic achievement in the retention of women in natural science and engineering. The study suggests that innovative teaching methods, may be part of the solution to the perceived disillusionment with science and technology related disciplines.

The study revealed significant gender differences in basic attitudes, values motivations, social support and perceptions of self and science that affect recruitment or discipline choice, experiences, achievement, retention or career directions. The authors conclude that women in general demonstrate a "response and care" orientation. On the other hand, men have a "justice and rights" orientation. This means that the impersonal, logical and objective nature of science- and technology-related disciplines will appeal more to men than to women.

The general departure of high school women high achievers from science is related to their expectations concerning science and their career plans. Women in science may require additional time to construct an appropriate response to various unanticipated and unsatisfying environmental aspects.

The study found that many women take science programs, not to pursue a career in the field, but as prerequisites for programs leading to other careers that are oriented towards helping others. Science itself is seen as impersonal.

Among the number of recommendations presented, is the call for more research on the relationship between the characteristics of the teaching environment in science and student experiences and achievements.

Gilligan, Carol. *In a Different Voice: Psychological Theory and Women's Development.* Cambridge: Harvard University Press, 1982.

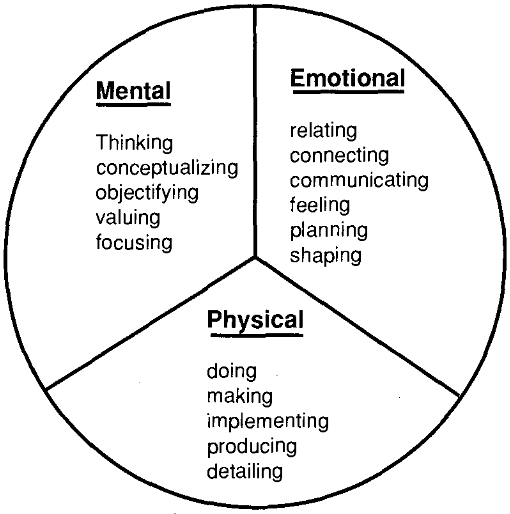
Minty, Mildred. *Human Resources in Science and Technology: Rethinking the Problem.* Presentation to NABST Human Resources Committee. April 15, 1992.

Ontario. Ministry of Skills and Development. *Adult Learning Strategies: An Instructors Toolkit by Ontario Adult Educators.* Edited by Susan Booth and Carol Brooks.

Ontario. Ministry of Skills and Development. *Instructor's Handbook: Working with Female Relational Learners in Technology and Trades Training.* Edited by Carol Brooks. Sponsored by Fanshawe College, London, Ontario.

The learning style assessments in this document were based on the Human Dynamics Model, the theory of which maintains that all individuals possess three different learning faculties: mental, emotional/relational and physical as shown in **Figure 1.** However, the model postulates that in each individual, one of the three faculties predominates as a central process to the way in which an individual learns. Teaching methods commonly used respond largely to the "mental" faculty. Of the women whose learning styles were assessed for this work, 93% were found to be relational learners.

Figure 1.



Characteristics of Learning Styles

This theory also maintains that the interrelationship between the way in which a person learns, and the manner of teaching received, may affect that person's ability to learn mathematics, science or technology related material. Likewise, the same interrelationship could affect the same person's interest in higher education and/or a career in science or technology related fields. Applied to women, the assumption could be drawn that they were not being taught science or mathematics in a manner which was responsive to their learning styles.

"To enable instructors and administrative programmers to provide service for relational learners, an instructional guide, a report on the learning needs survey, a curriculum model, sample exercises and a background paper on the relational learning style have been compiled in this handbook."

Status of Women Canada and Manitoba Women's Directorate. *Participation of Girls and Women in Math, Science and Technology.* February 21, 1989.

Tobias, Sheila. *They're Not Dumb, They're Different – Stalking the Second Tier.* Tucson: Research Corporation, 1990.

Sheila Tobias addresses the dropout or transfer of students from science programs. She identifies a number of student needs which could alleviate the alienation which is often experienced by some students in science programs. Some of these needs include more individual attention and support, more meaningful and appealing introductory courses, more and better job ladders, a greater early familiarity with the language of science. She maintains that the low representation of women in science may be due in part to a too narrow vision of what kinds of attributes, behaviours and lifestyles the "true" scientist possesses.

She recounts a study conducted at Harvard–Radcliffe of students who switched out of science programs. Six main themes were identified which directly related to the students' decision to switch:

1. a rejection of "the culture of competition";
2. some difficulties in decision-making about the science concentration:
3. the fear of cheating themselves out of a "well-rounded liberal education";
4. the complex relationships among performance, motivation and interests;
5. the perceived differences between science and non-science; and
6. the anticipated conflicts between family and career which is of particular interest to women students.

Tobias, Sheila. *Revitalizing Undergraduate Science – Why Some Things Work and Most Don't.* Tucson: Research Corporation, 1992.

Revitalizing Undergraduate Science is another study which examines problems in science education, this time from the perspective of determining the reasons for success or failure in some attempted reform programs. It examines "programs (and courses) that appear successful in terms of faculty accomplishments; students graduated and entering advanced study or the professional workplace; and showing evidence of high morale among both faculty and undergraduates."

"Common elements in many of these programs are abandonment of an almost exclusive emphasis on problem solving and modification of the lecture format to permit teaching of underlying concepts. Other variations in traditional introductory physics and chemistry courses are aimed at persuading those simply fulfilling graduation requirements to major in science; at bringing minority students into the fold; or at combining physics and/or various subfields of chemistry in different ways to promote better understanding."

APPENDIX II

PROVINCIAL DATA

TECHNICAL NOTES

The national figures presented in the text have shown trends in the academic environment and the work-force. The following data presents equivalent provincial baselines for use as bench-marks for measurement of progress. Updated data at three year intervals will indicate progress achieved when measured against these bench-marks.

The data sources used to depict the natural science and engineering educational community and labour force are based on the administrative data sets of Statistics Canada's Education, Culture and Tourism Division and the survey data from the Canadian Council of Technicians and Technologists (CCTT), Census of Canada or the Labour Force Survey. National figures rely on all four sources while the provincial distributions rely on CCTT, Census and Education, Culture and Tourism Division data only.

- Administrative data are derived from the records of provincial reporting institutions. Not all institutions report regularly, therefore this data source is not always complete. The CCTT survey was a census of the membership with a one-third response rate. The Census and the Labour Force Survey are sample surveys, albeit ones with very large survey frames. However, population figures derived from these surveys are estimates and are subject to error. These errors increase as the size of weighted figures decrease.

- Community college enrolments and graduates are based on career programs of community colleges, collèges d'enseignement général et professionel (CÉGEPS) in Quebec and technical institutes. These programs lead to a technician or technologist certificate or diploma. University transfer programs are not included. In the Yukon and Northwest Territories, colleges initiated reporting relatively recently with the result that data from earlier years are not available.

- Data on college teachers are not available for the province of Quebec and the Yukon Territory. In the Yukon, the college is not surveyed. Community college teachers presented are those teaching career programs, a definition based upon the greatest number of hours spent teaching in these programs and the type of institution being a college rather than a trades school. Some college teachers teach both career programs and apprenticeship programs, these are not included in this report.

- University enrolments, graduations and faculty cover all universities. Faculty charts include all full-time teaching staff at all levels. Where numbers appear high for certain courses of study, especially in Prince Edward Island, the program may be recent with the result that the numbers are small and thus, the representation of women is higher than expected.

- Agricultural and biological sciences include household sciences, biochemistry and veterinary medicine at the university level. This classification with household science especially, leads to some inflation of women's representation in the category in Nova Scotia, New Brunswick, Quebec, Manitoba, Saskatchewan and Alberta.

- The Canadian Council of Technicians and Technologists data comes from a survey of the membership in 1990. The response rate was approximately one third of the membership. The membership survey data represents an unknown portion of the technicians and technologists in Canada, a drawback shared by other sources of information. Other sources of data have additional definitional, measurement and data classification problems associated with them which result in the representation of only a portion of the technician and technologist population. Therefore these data were not included in this report.

- Technicians and technologists from the Yukon eligible for CCTT membership can apply to any provincial association, however they are more likely to be found as members of the Alberta association. Technicians and technologists from the Northwest Territories eligible for membership in a provincial organization are directed to join the Alberta association. Thus, some portion of the figures for that province include NWT and possibly some Yukon technicians and technologists.

- Figures for 1991 have been estimated through projection based on historical trends from 1981 to 1986. Estimates of this type can lead to increases or decreases depending on the historical trend observed. Indeed growth in both women and men in an occupation can lead to a flat trendline while a disproportionate historical increase in the number of women over men can lead to large increase in the projection while the actual numbers may be quite different. Similarly historical decreases in the representation of women may be actually due to larger increase of men over women in an occupation even though women may have increased their number. Such factors can be observed in the massive expansion in the proportion of women in physical sciences in Ontario and Manitoba due to high historical growth in the number of women in these fields, in these provinces. For a variety of reasons, these trends observed between 1981 and 1986 may not have continued and only the 1991 Census will confirm or deny the projections.

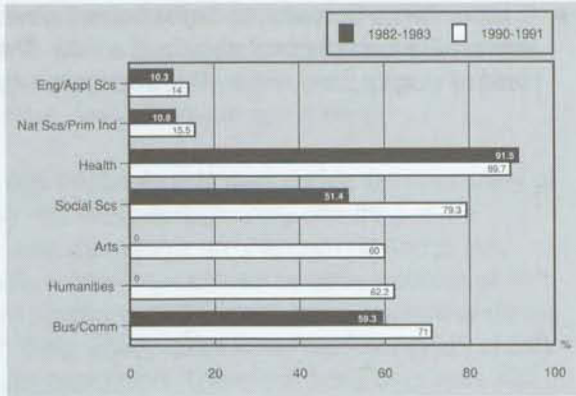
- Census figures for the Yukon and the Northwest Territories should be used with caution due to the very small sample sizes and the large error in the resulting population estimates in these areas. Population estimates for occupations with typically small numbers will lead to very high variances and thus unreliable data. Numbers in occupations in natural sciences and engineering (NSE) are scanty in the smaller provinces and therefore the estimates of the number of women in a particular group such as engineers may be subject to high error of the estimate.

- Labour Force Survey, although large as a sample survey, was used only to provide some NSE occupational data for Canada. The sample size precludes using this source for any occupations within NSE and for the majority of provincial distributions.

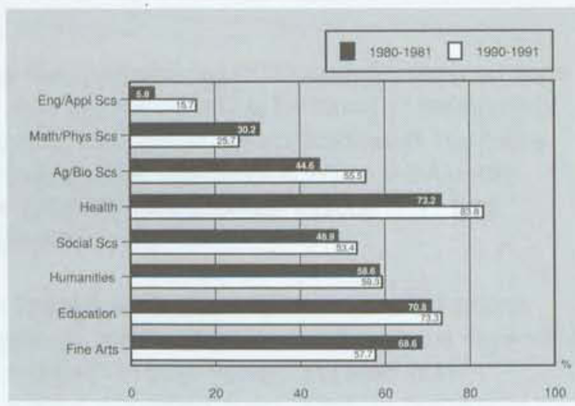
NEWFOUNDLAND

Full-time Enrolments

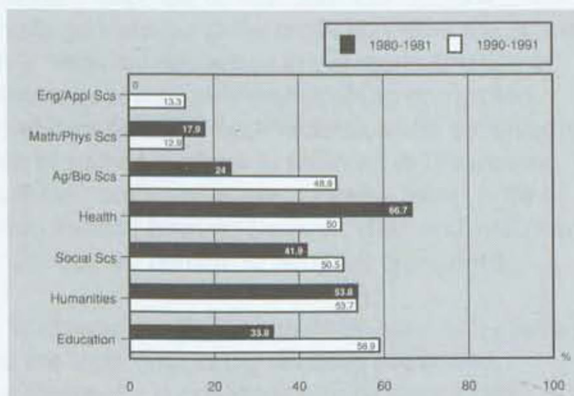
Women as a Percentage of Community College Enrolments by Field



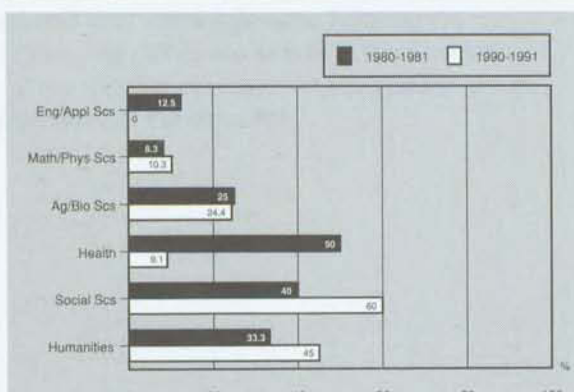
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

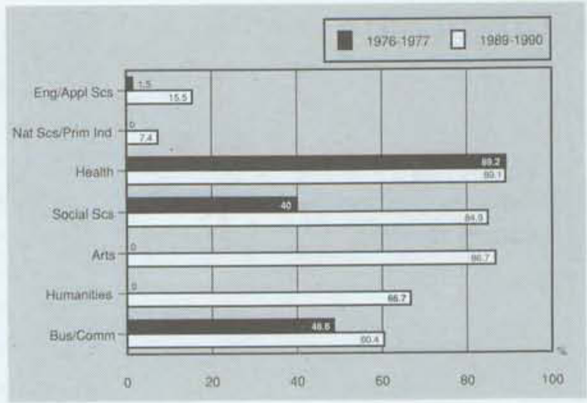


Source: *Statistics Canada; Education, Culture and Tourism.*

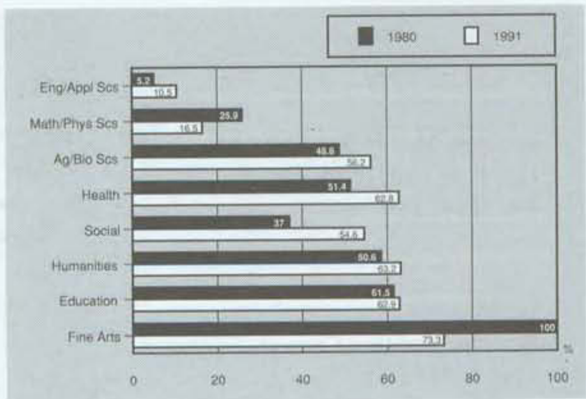
NEWFOUNDLAND

Graduates

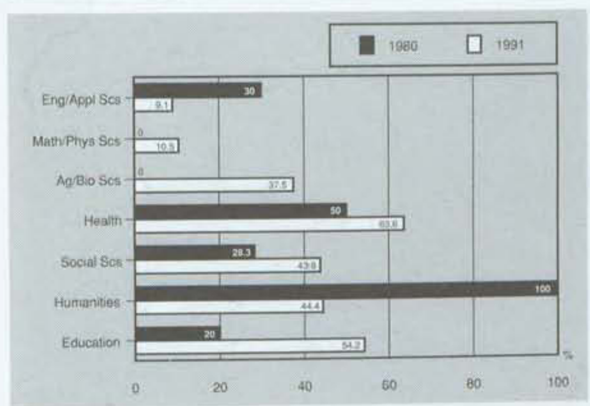
Women as a Percentage of Community College Career Program Graduates by Field



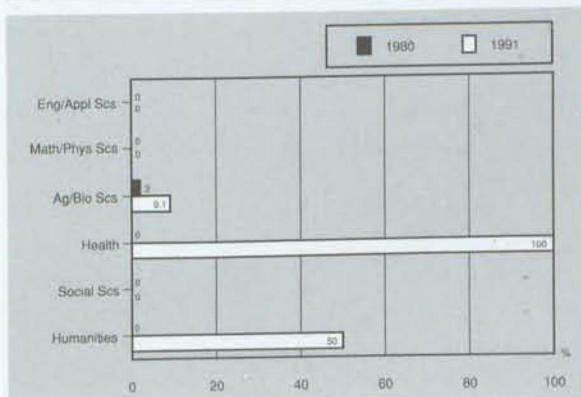
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

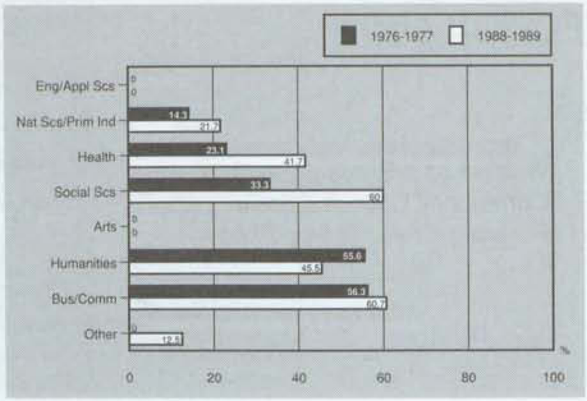


Source: *Statistics Canada; Education, Culture and Tourism.*

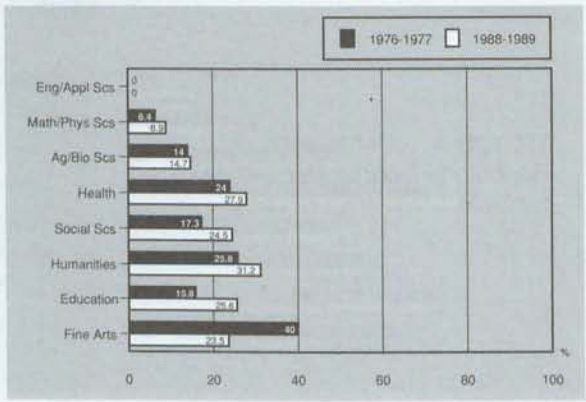
NEWFOUNDLAND

Faculty

Women as a Percentage of
Full-time Community College
Faculty by Field



Women as a Percentage of
Full-time University Faculty
Members by Field

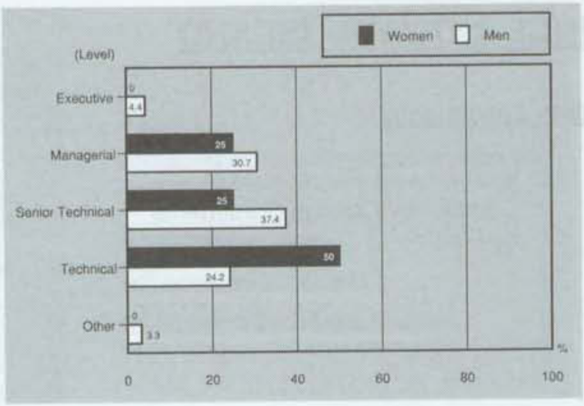


Source: *Statistics Canada; Education, Culture and Tourism.*

NEWFOUNDLAND

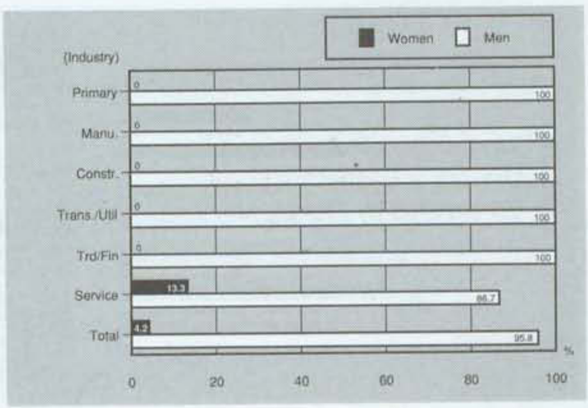
Work-force

Level of Responsibilty by gender
CCTT National Membership



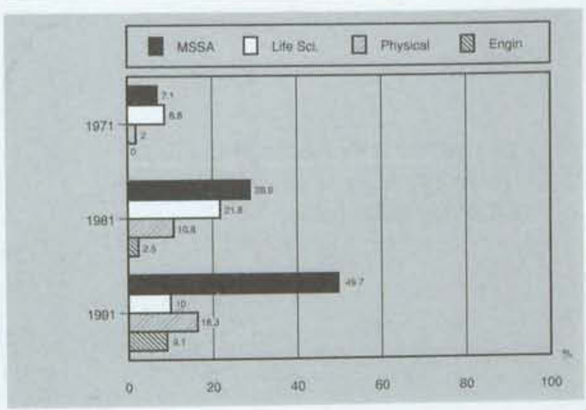
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

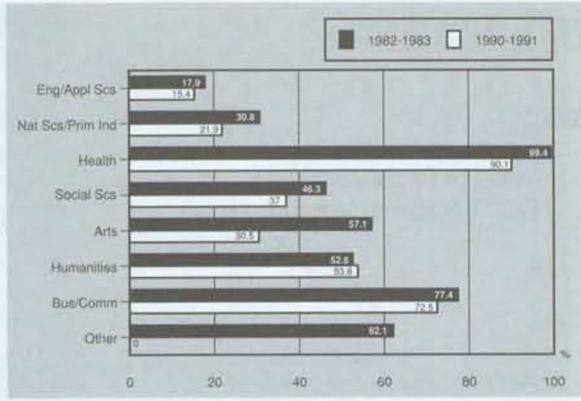


Source: *Census of Canada - 1991 data is estimated through projection.*

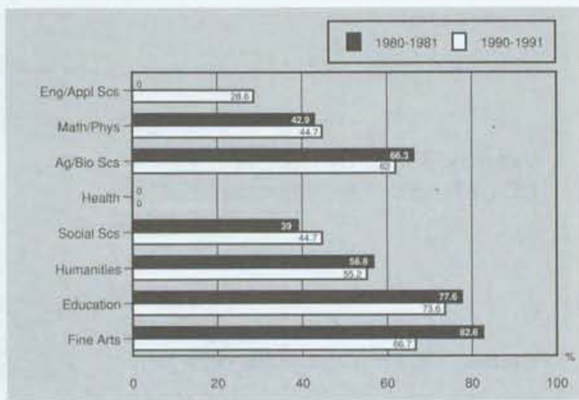
PRINCE EDWARD ISLAND

Full-time Enrolments

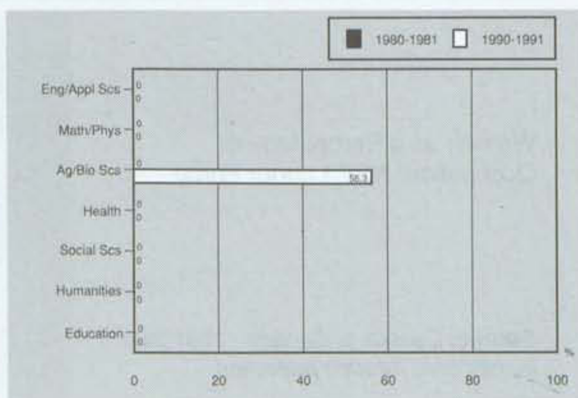
Women as a Percentage of Community College Enrolments by Field



Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

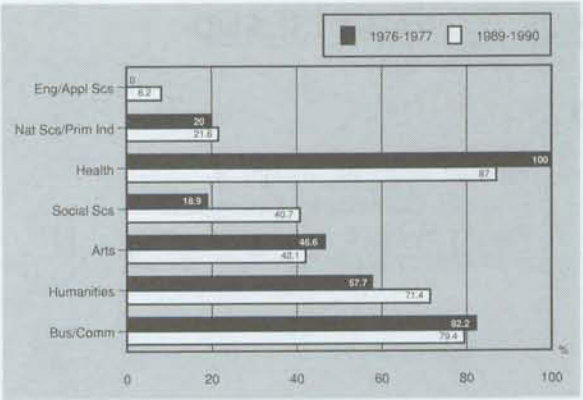
No doctoral programs in Prince Edward Island.

Source: *Statistics Canada; Education, Culture and Tourism.*

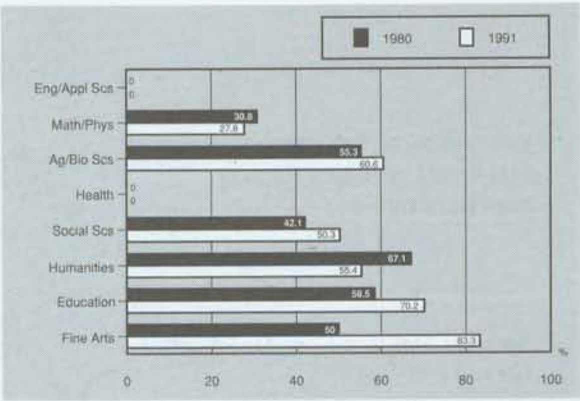
PRINCE EDWARD ISLAND

Graduates

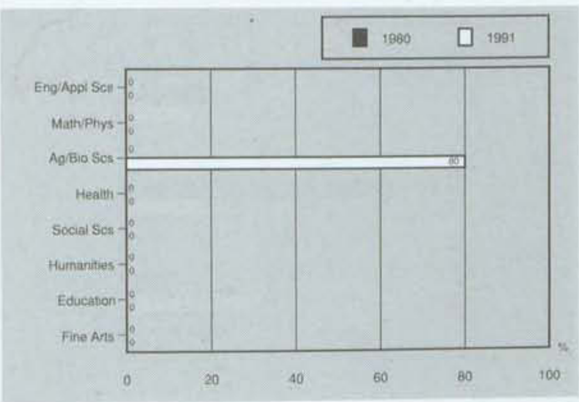
Women as a Percentage of Community College Career Program Graduates by Field



Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

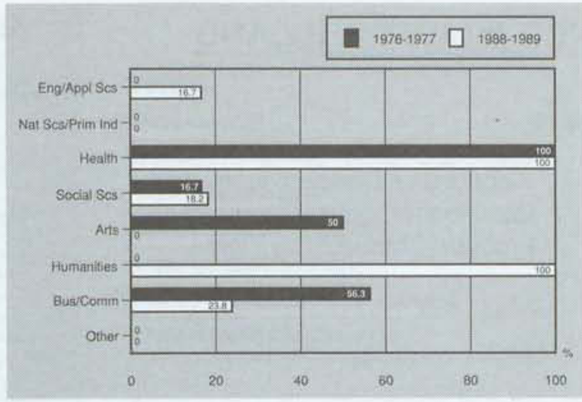
No doctoral programs in Prince Edward Island.

Source: *Statistics Canada; Education, Culture and Tourism.*

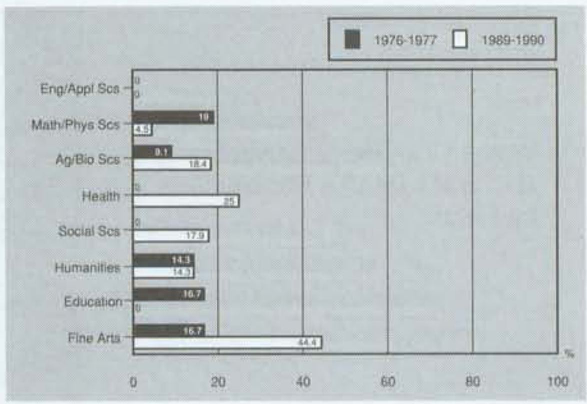
PRINCE EDWARD ISLAND

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field

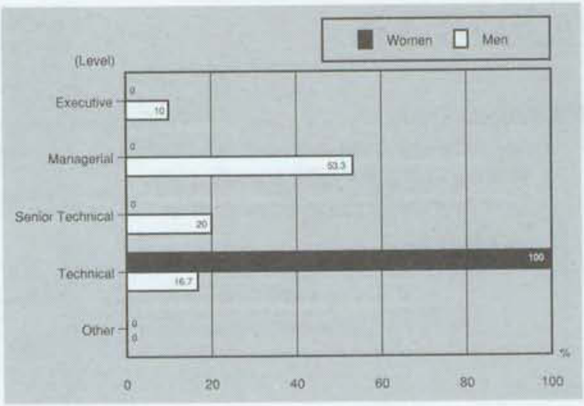


Source: *Statistics Canada; Education, Culture and Tourism.*

Prince Edward Island

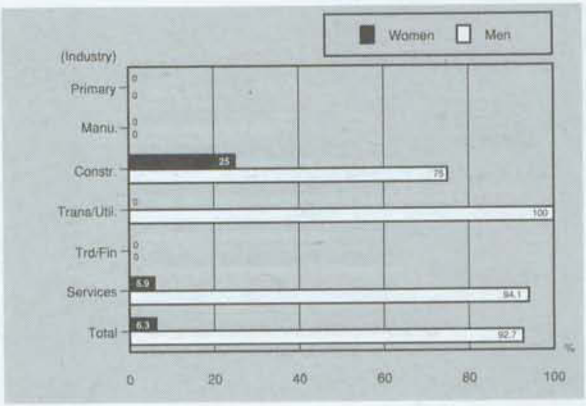
Work-force

Level of Responsibilty by gender
CCTT National Membership



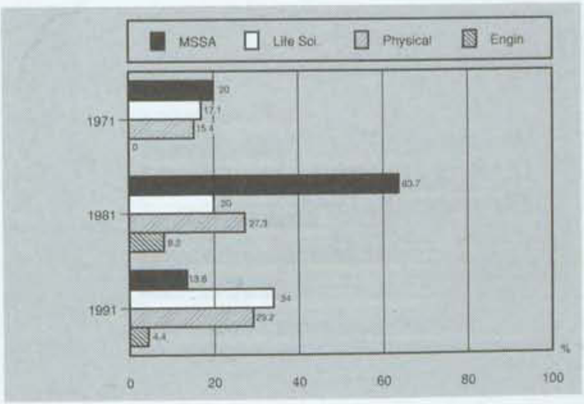
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

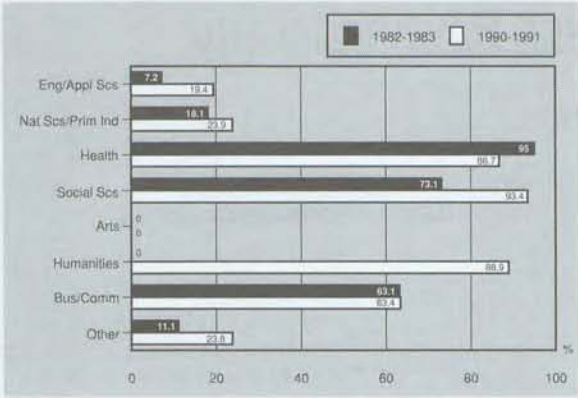


Source: *Census of Canada - 1991 data is estimated through projection.*

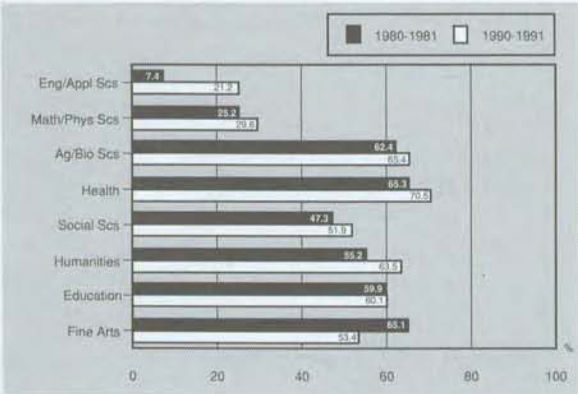
Nova Scotia

Full-time Enrolments

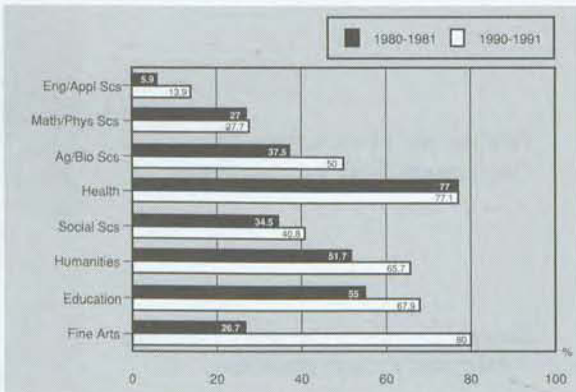
Women as a Percentage of Community College Enrolments by Field



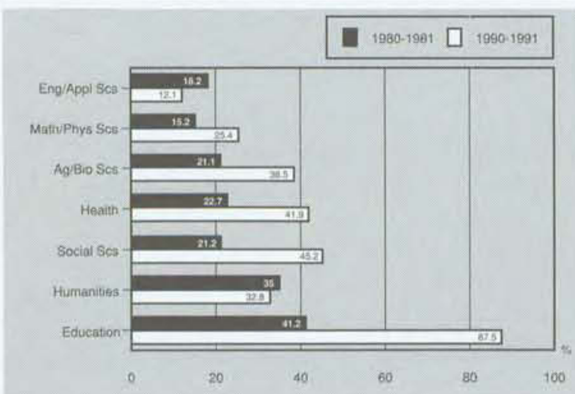
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field



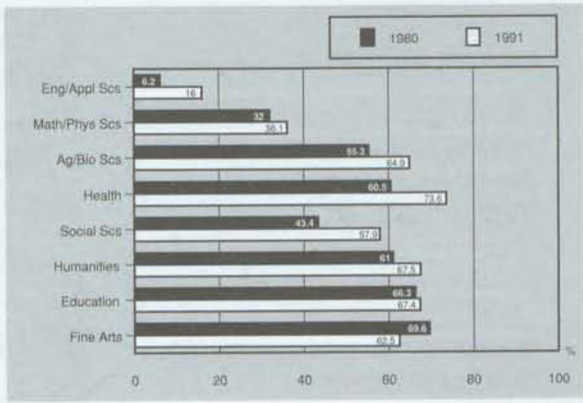
Source: *Statistics Canada; Education, Culture and Tourism.*

NOVA SCOTIA

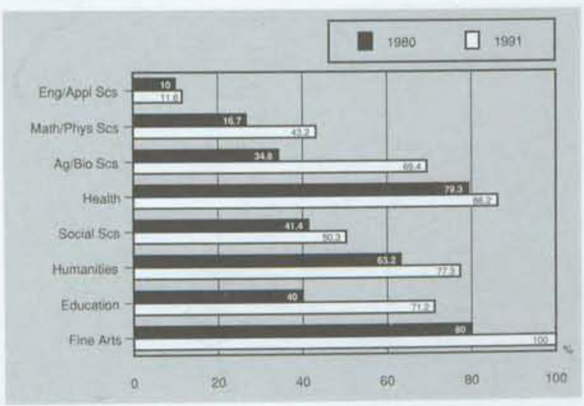
Graduates

Women as a Percentage of Community College Career Program Graduates by Field

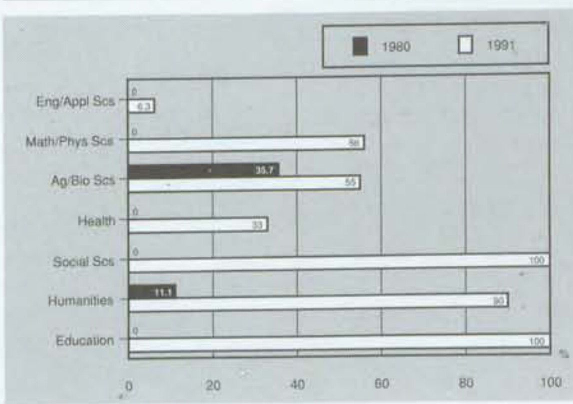
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

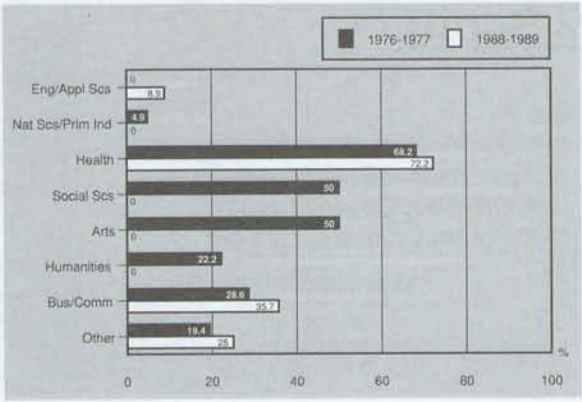


Source: *Statistics Canada; Education, Culture and Tourism.*

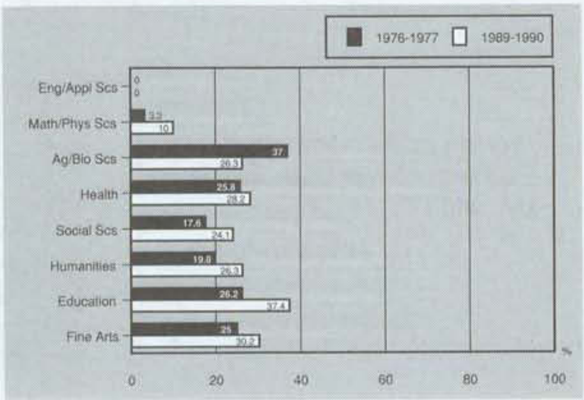
Nova Scotia

Faculty

Women as a Percentage of
Full-time Community College
Faculty by Field



Women as a Percentage of
Full-time University Faculty
Members by Field

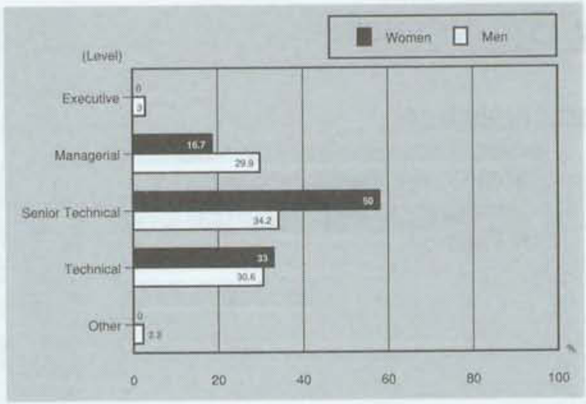


Source: *Statistics Canada; Education, Culture and Tourism.*

NOVA SCOTIA

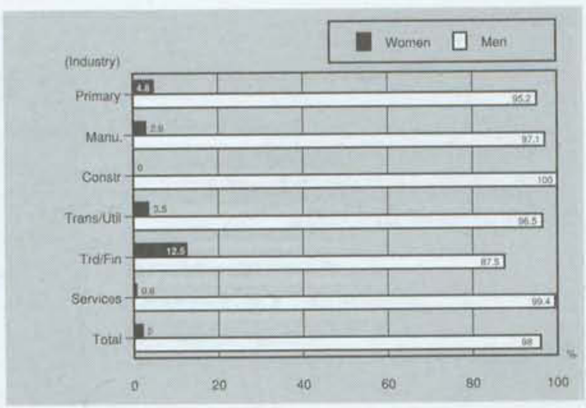
Work-force

Level of Responsibilty by gender
CCTT National Membership



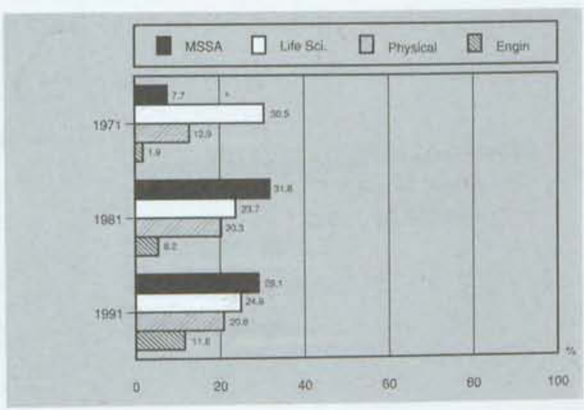
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

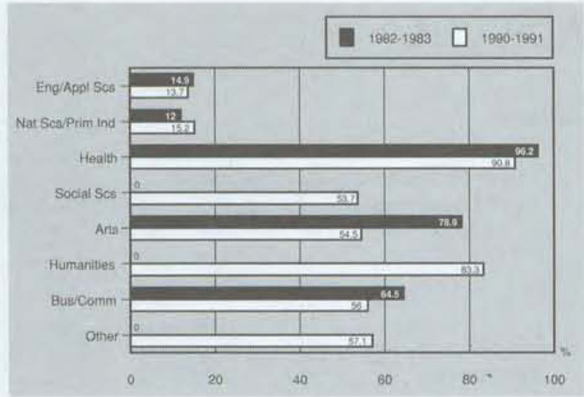


Source: *Census of Canada - 1991 data is estimated through projection.*

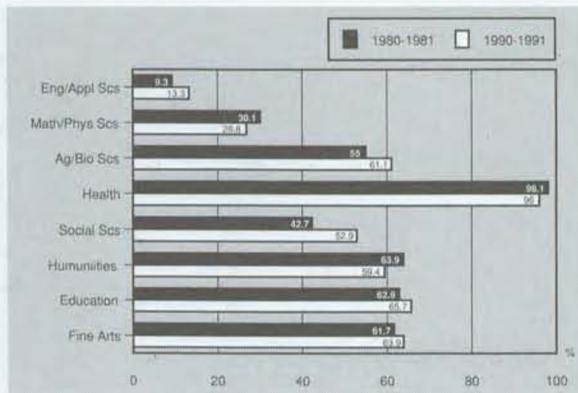
New Brunswick

Full-time Enrolments

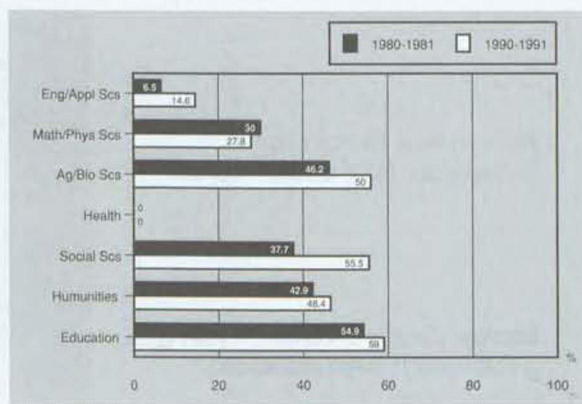
Women as a Percentage of Community College Enrolments by Field



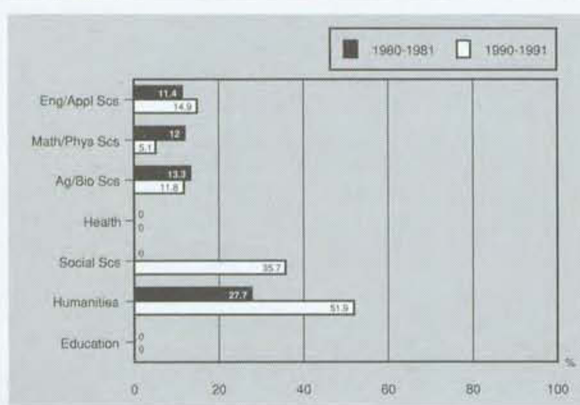
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

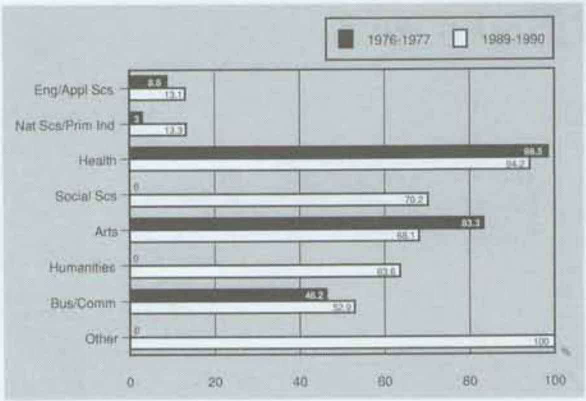


***Source:** Statistics Canada; Education, Culture and Tourism.*

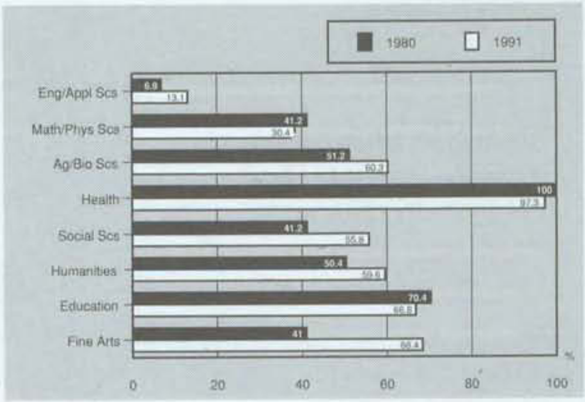
NEW BRUNSWICK

Graduates

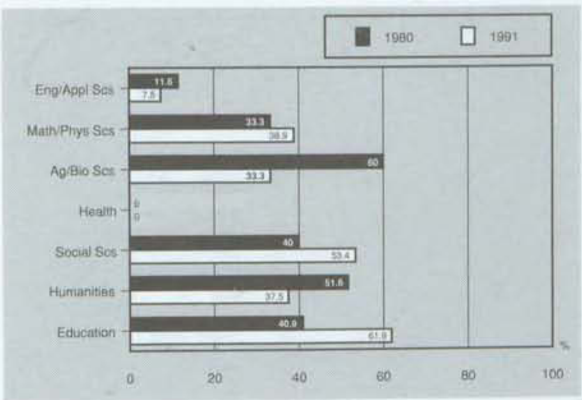
Women as a Percentage of Community College Career Program Graduates by Field



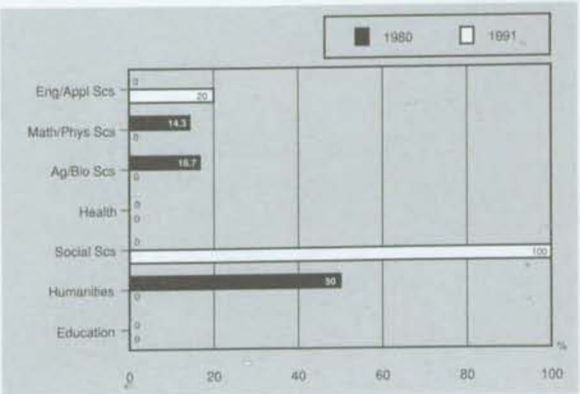
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

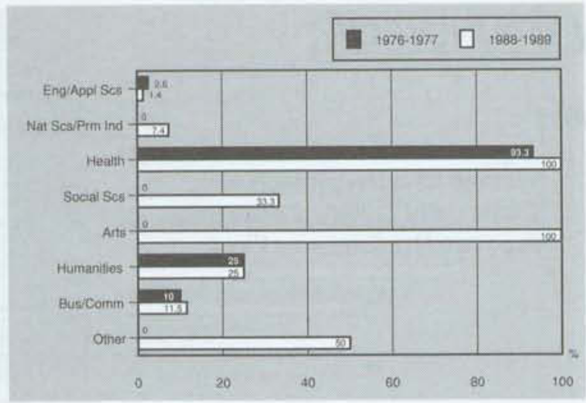


Source: *Statistics Canada; Education, Culture and Tourism.*

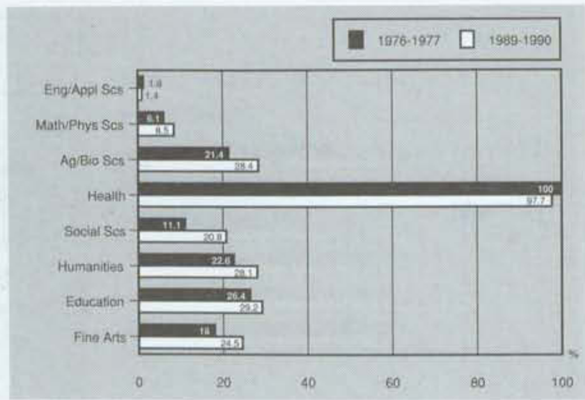
NEW BRUNSWICK

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field

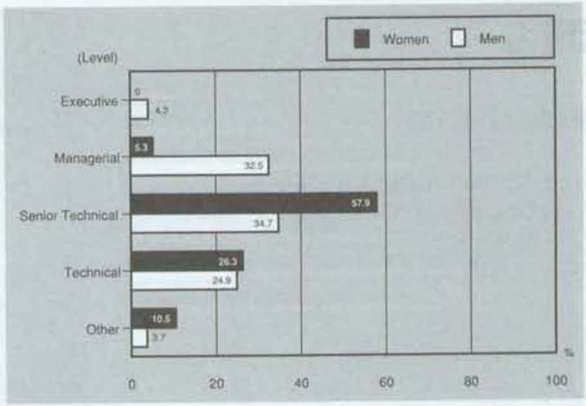


Source: *Statistics Canada; Education, Culture and Tourism.*

NEW BRUNSWICK

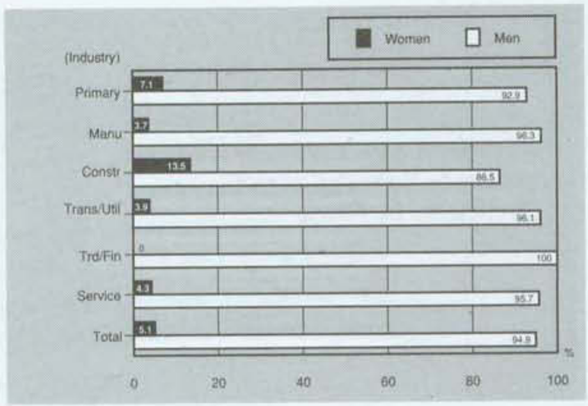
Work-force

Level of Responsibilty by gender
CCTT National Membership



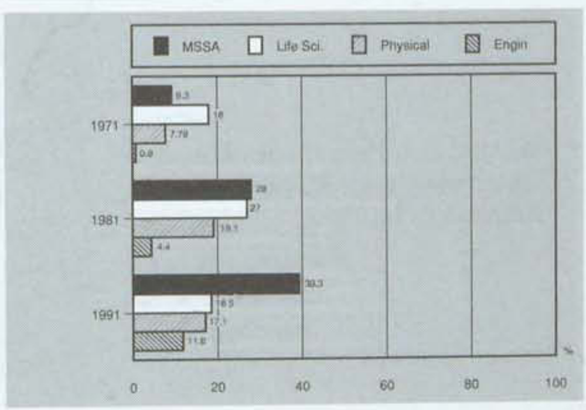
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

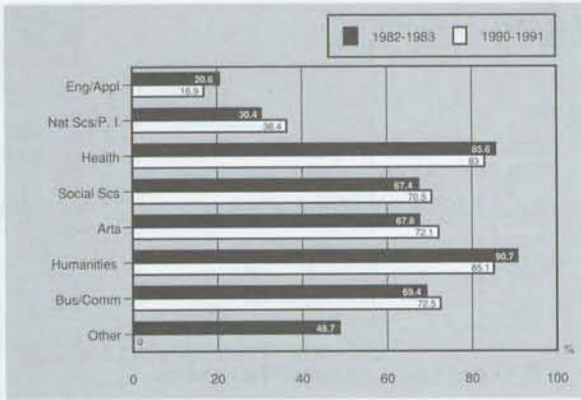


Source: *Census of Canada - 1991 data is estimated through projection.*

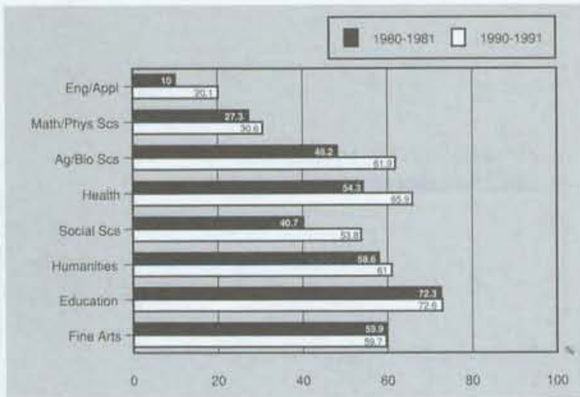
QUEBEC

Full-time Enrolments

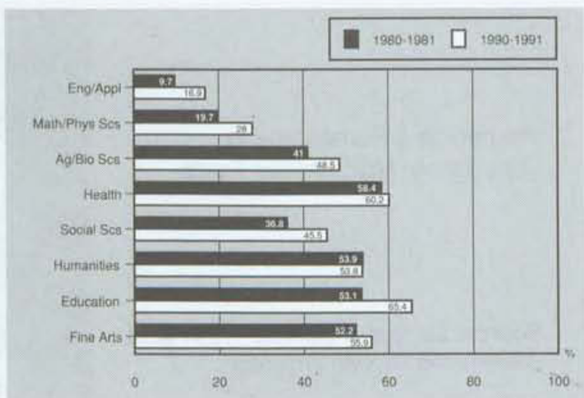
Women as a Percentage of Community College Enrolments by Field



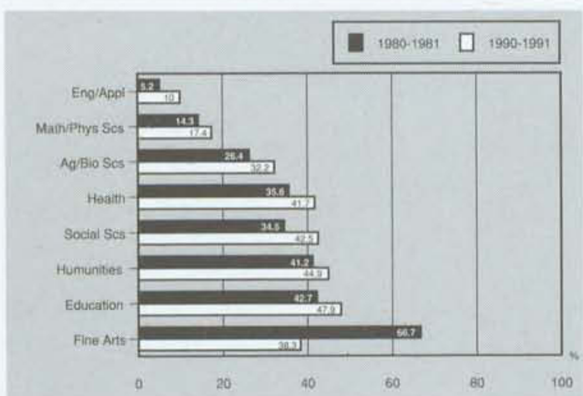
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field



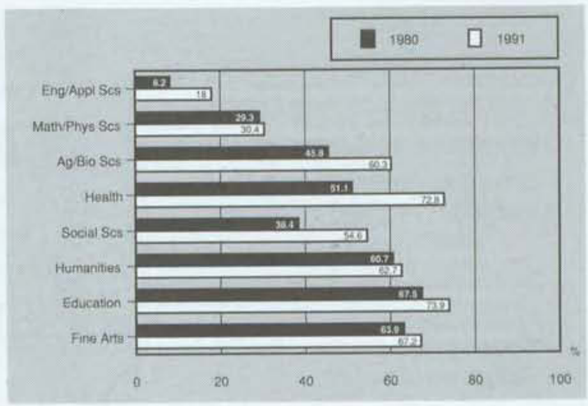
Source: *Statistics Canada; Education, Culture and Tourism.*

QUEBEC

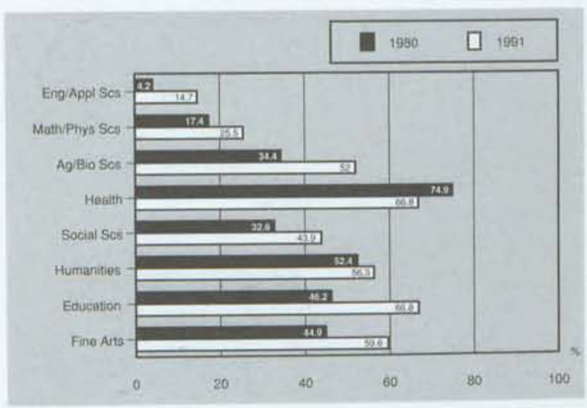
Graduates

Women as a Percentage of Community College Career Program Graduates by Field

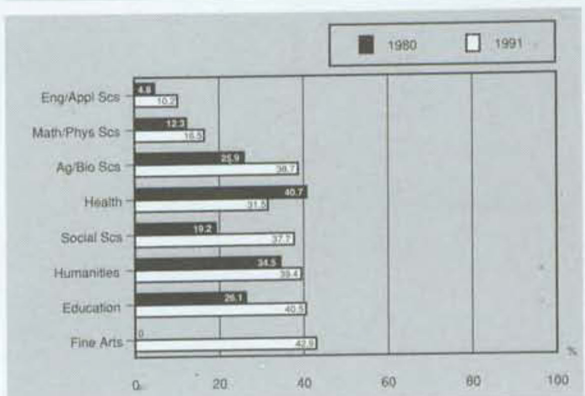
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field



Source: *Statistics Canada; Education, Culture and Tourism.*

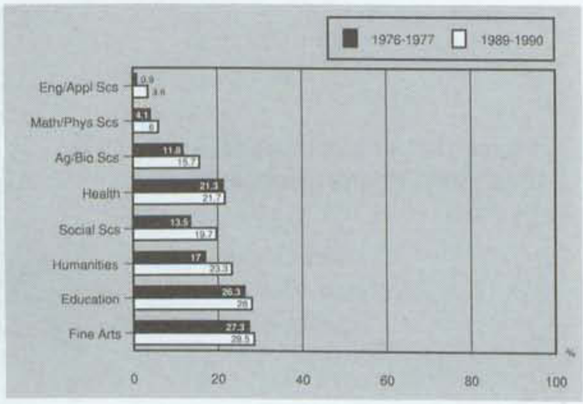
QUEBEC

Faculty

Women as a Percentage of Full-time Community College Faculty by Field

No data available for Québec

Women as a Percentage of Full-time University Faculty Members by Field

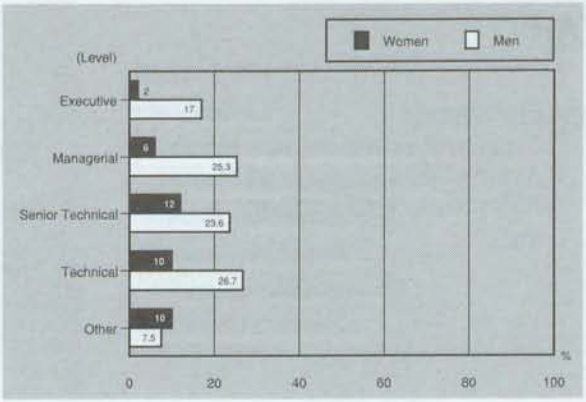


Source: *Statistics Canada; Education, Culture and Tourism.*

Quebec

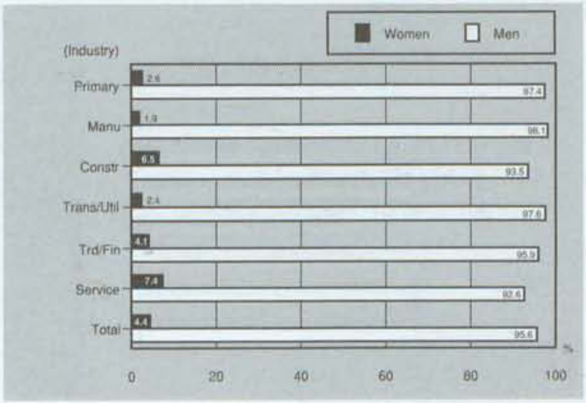
Work-force

Level of Responsibilty by gender
CCTT National Membership



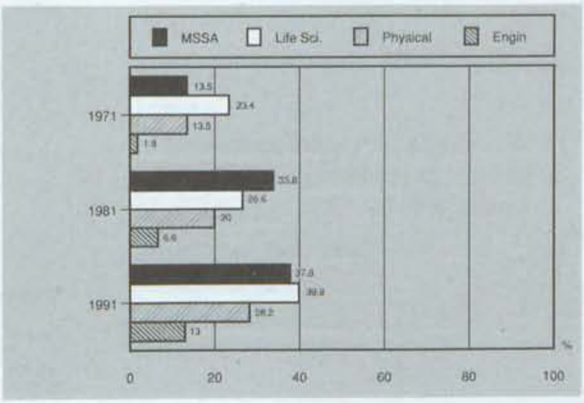
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

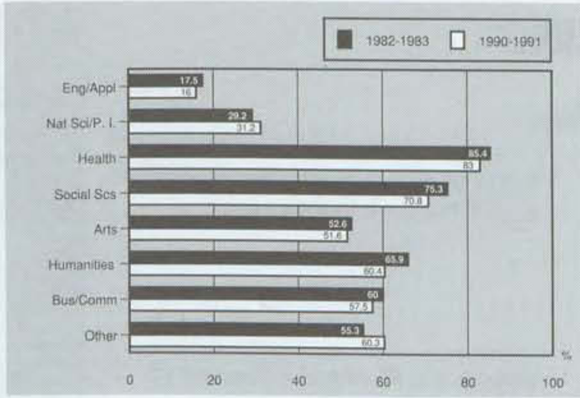


Source: *Census of Canada - 1991 data is estimated through projection.*

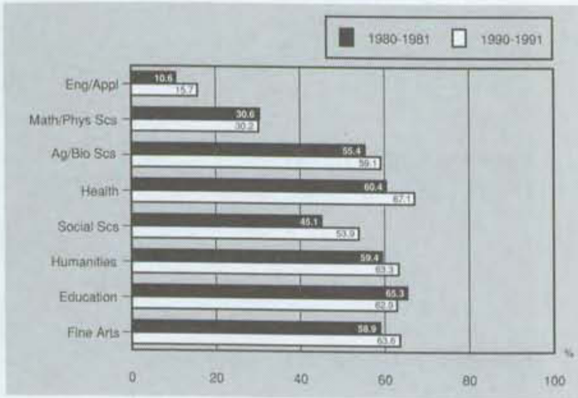
ONTARIO

Full-time Enrolments

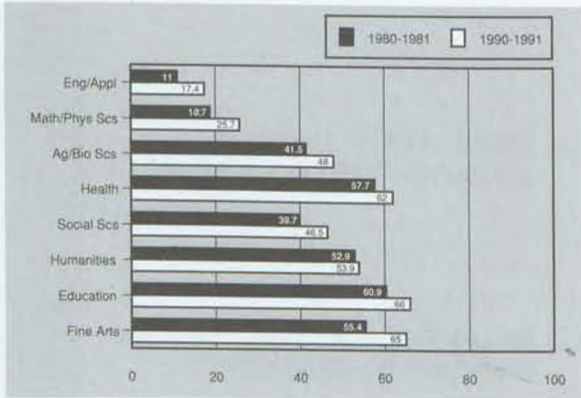
Women as a Percentage of Community College Enrolments by Field



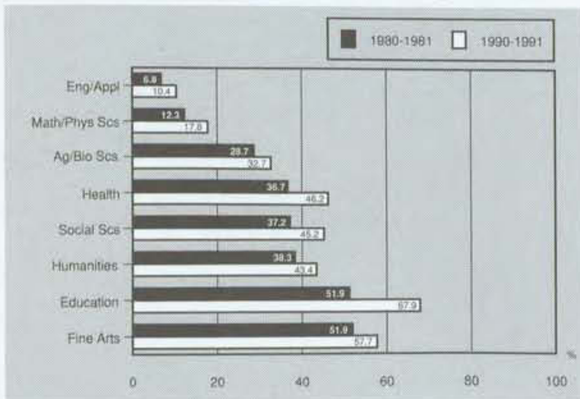
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

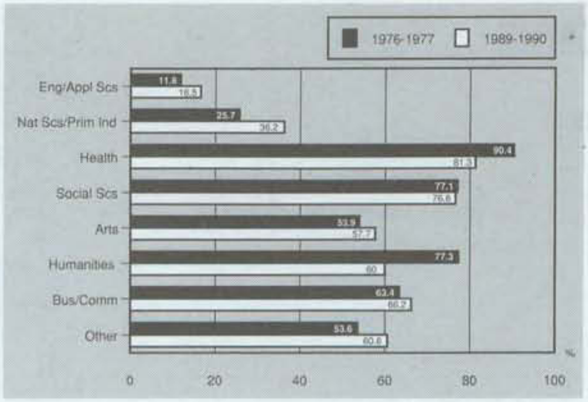


Source: *Statistics Canada; Education, Culture and Tourism.*

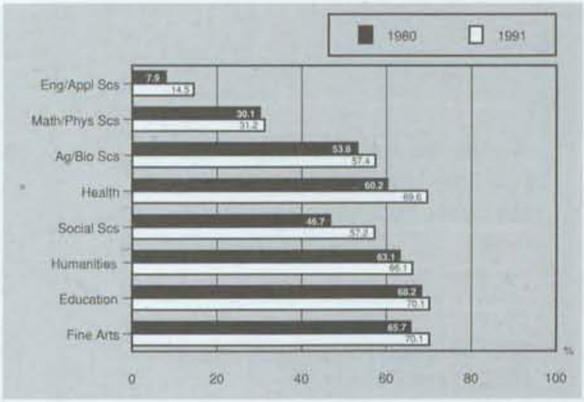
ONTARIO

Graduates

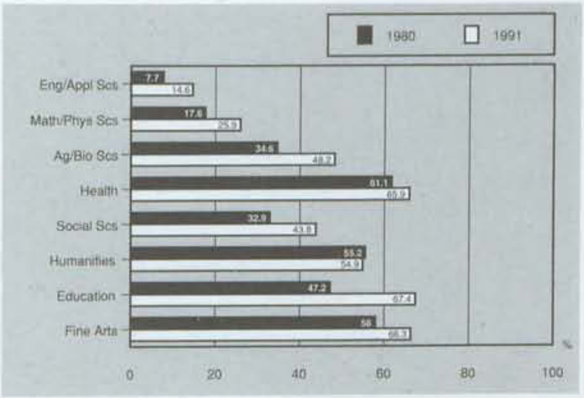
Women as a Percentage of Community College Career Program Graduates by Field



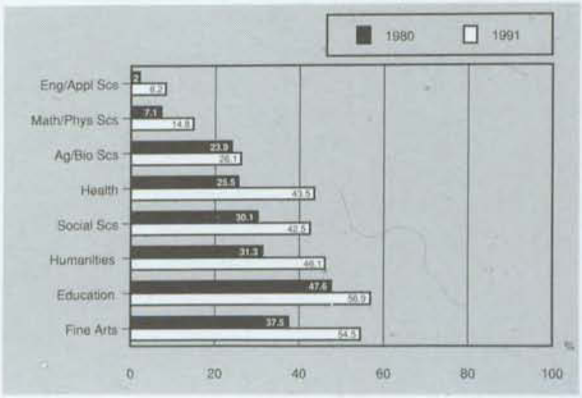
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

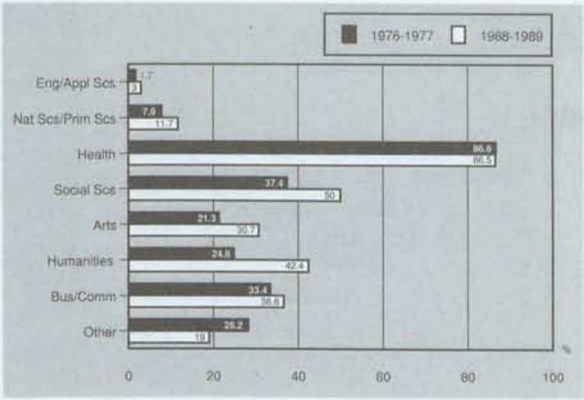


Source: *Statistics Canada; Education, Culture and Tourism.*

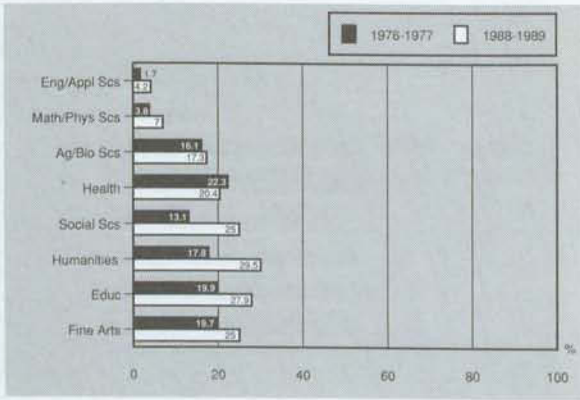
ONTARIO

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field



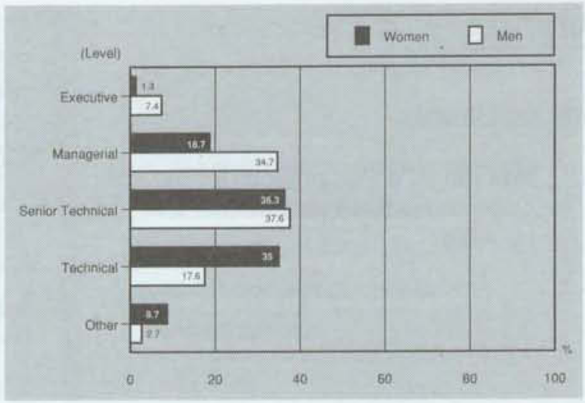
Source: *Statistics Canada; Education, Culture and Tourism.*

Ontario

Work-force

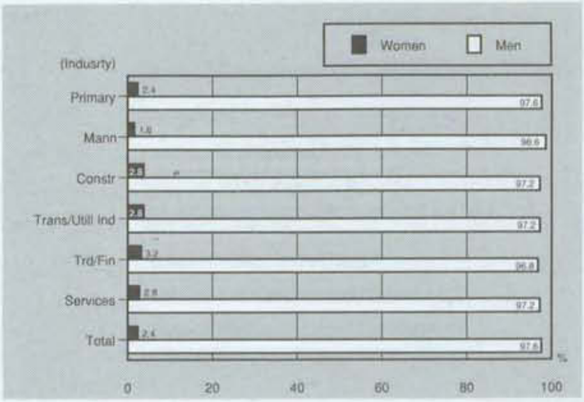
Level of Responsibilty by gender
CCTT National Membership

Source: *CCTT, National Report # 17*



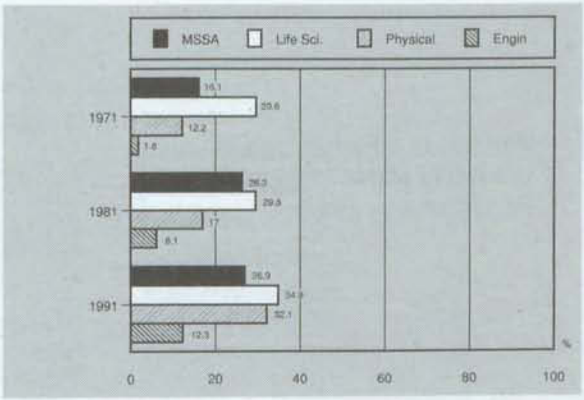
Industry Sector by Gender
CCTT National Membership

Source: *CCTT, National Report # 18*



Women as a Percentage in
Occupation: NSE Labour Force

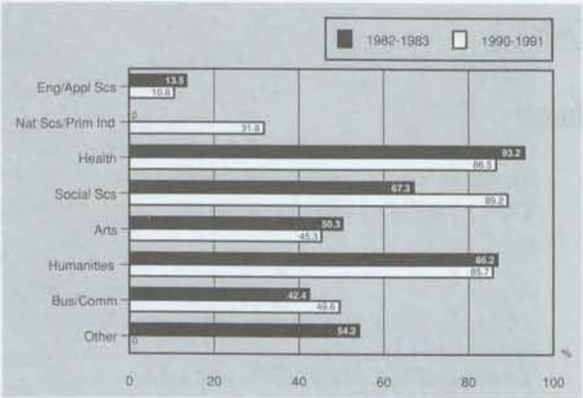
Source: *Census of Canada - 1991 data is estimated through projection.*



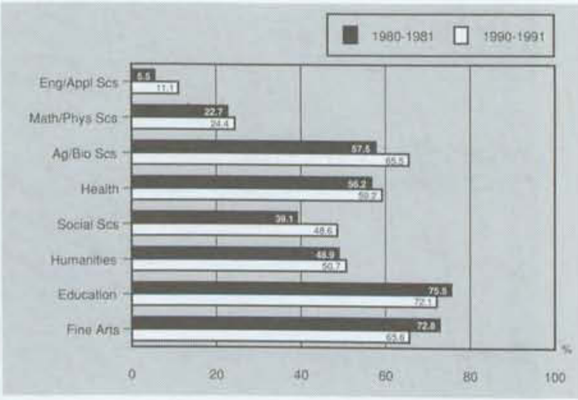
MANITOBA

Full-time Enrolments

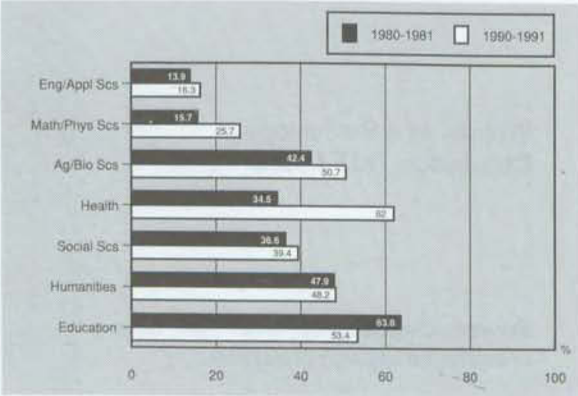
Women as a Percentage of Community College Enrolments by Field



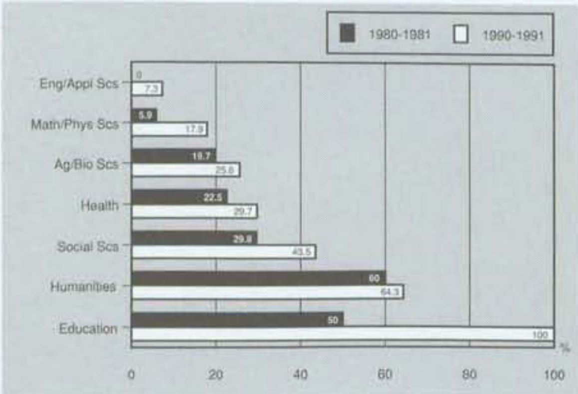
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

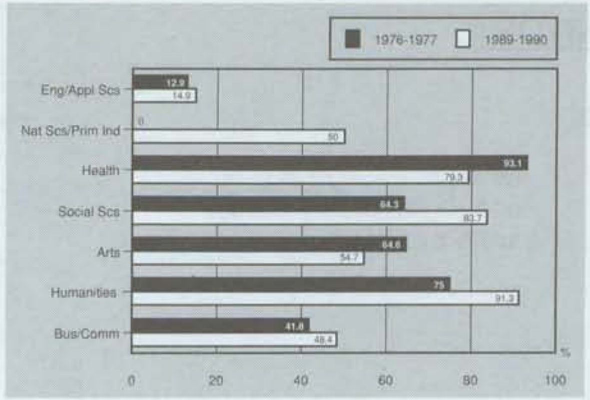


Source: *Statistics Canada; Education, Culture and Tourism.*

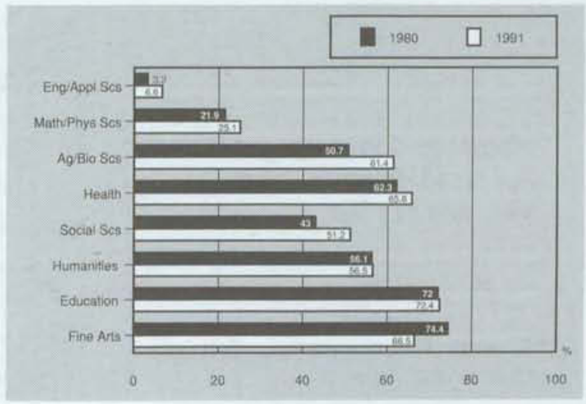
MANITOBA

Graduates

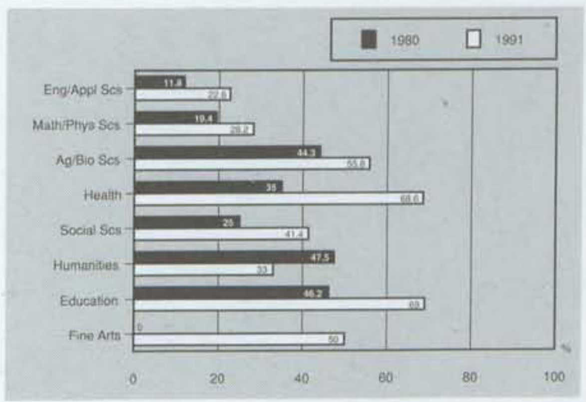
Women as a Percentage of Community College Career Program Graduates by Field



Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



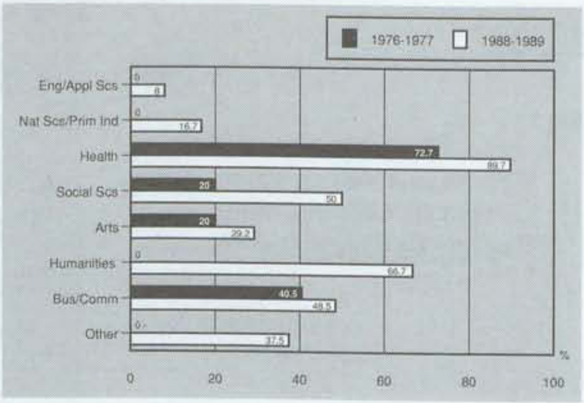
Women as a Percentage of Doctoral Degree Recipients by Field

Source: *Statistics Canada; Education, Culture and Tourism.*

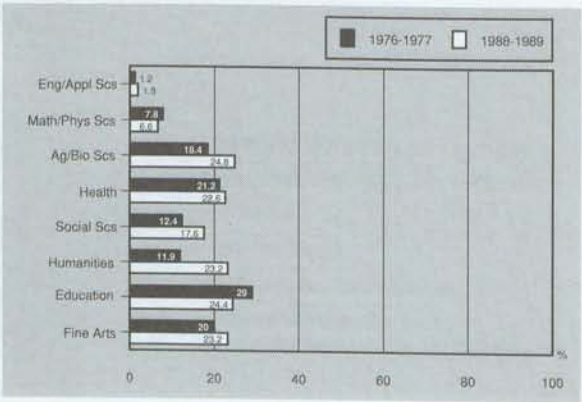
MANITOBA

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field



Source: *Statistics Canada; Education, Culture and Tourism.*

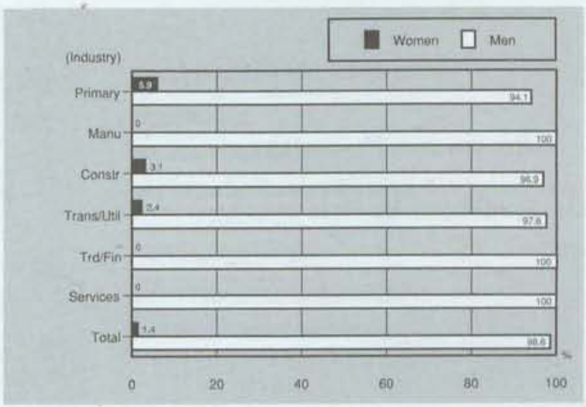
MANITOBA

Work-force

Level of Responsibilty by gender
CCTT National Membership

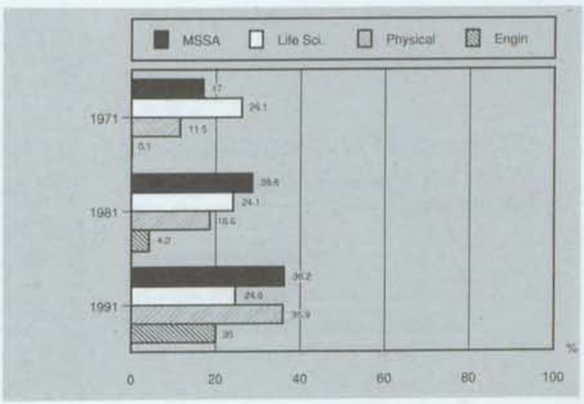
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

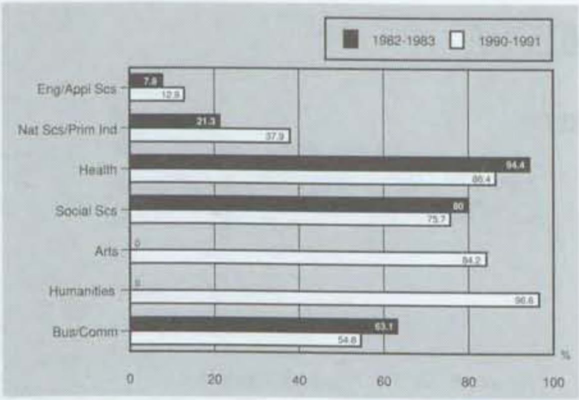


Source: *Census of Canada - 1991 data is estimated through projection.*

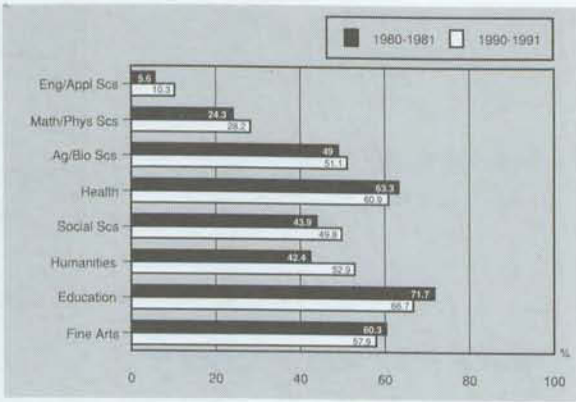
SASKATCHEWAN

Full-time Enrolments

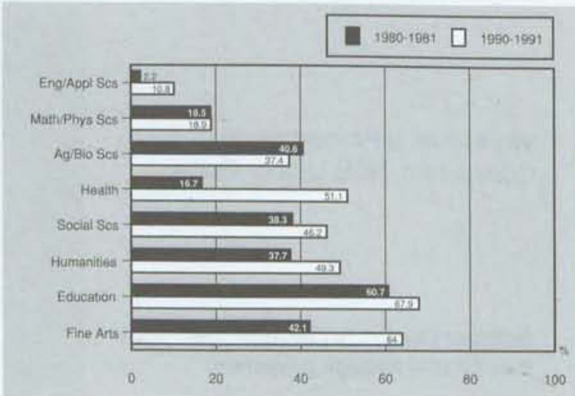
Women as a Percentage of Community College Enrolments by Field



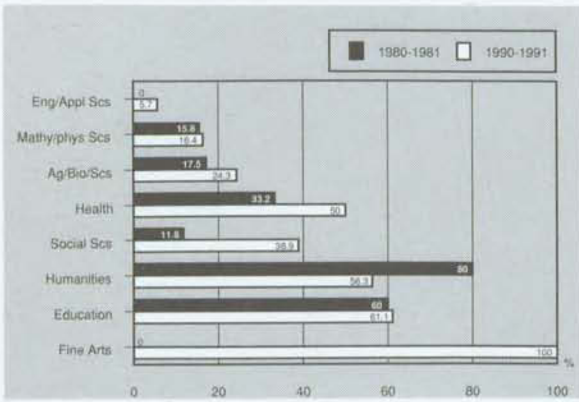
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

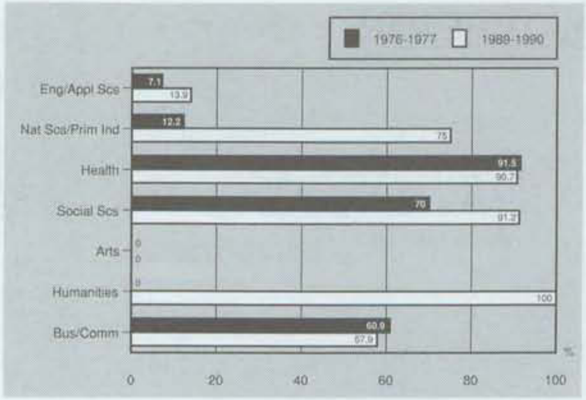


Source: *Statistics Canada; Education, Culture and Tourism.*

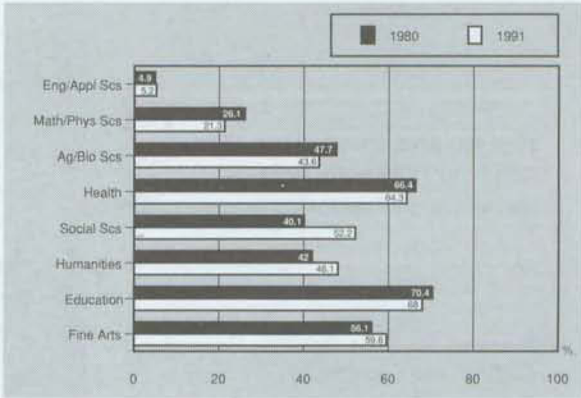
SASKATCHEWAN

Graduates

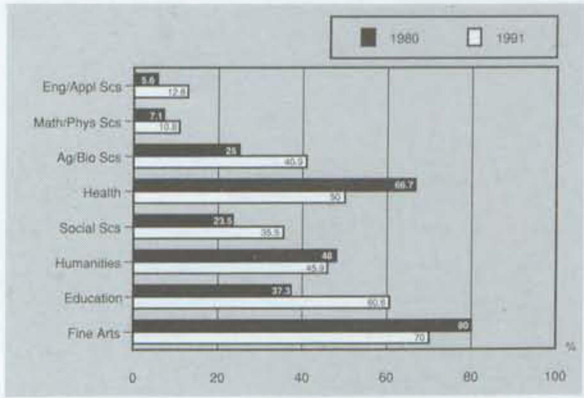
Women as a Percentage of Community College Career Program Graduates by Field



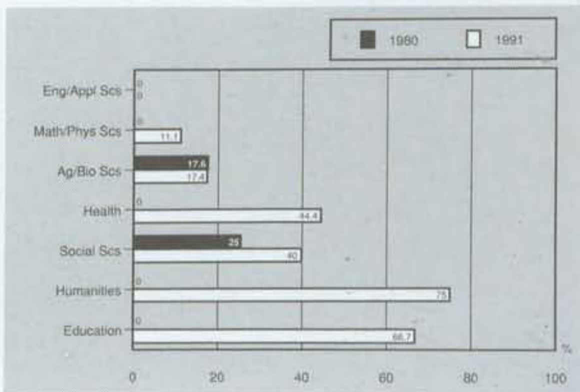
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



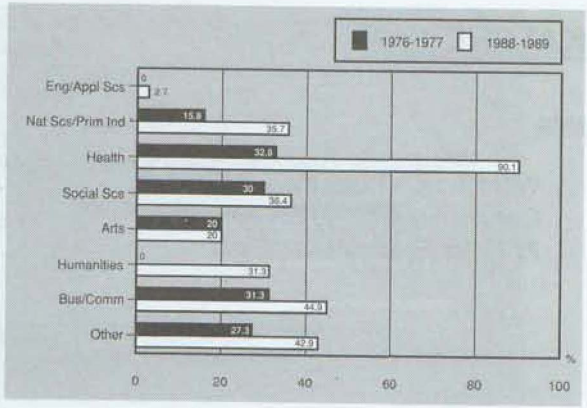
Women as a Percentage of Doctoral Degree Recipients by Field



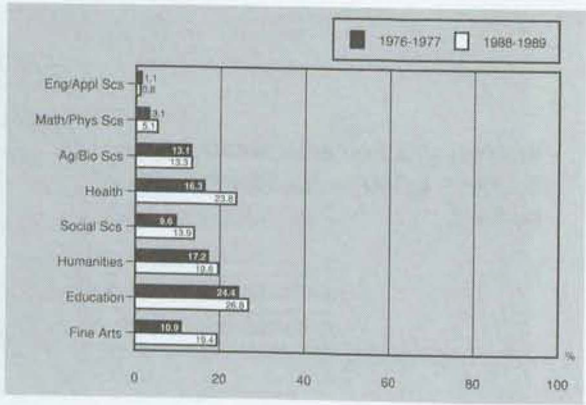
Source: *Statistics Canada; Education, Culture and Tourism.*

SASKATCHEWAN

Faculty



Women as a Percentage of Full-time Community College Faculty by Field



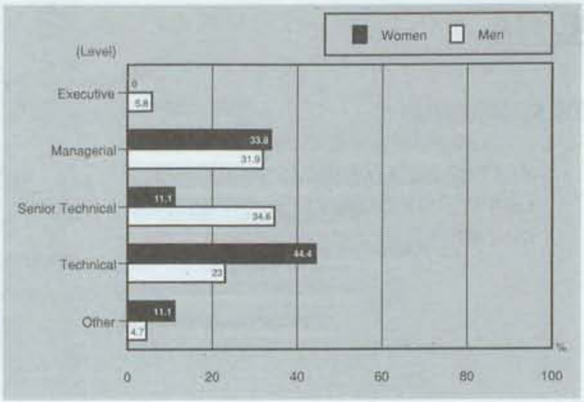
Women as a Percentage of Full-time University Faculty Members by Field

Source: *Statistics Canada; Education, Culture and Tourism.*

SASKATCHEWAN

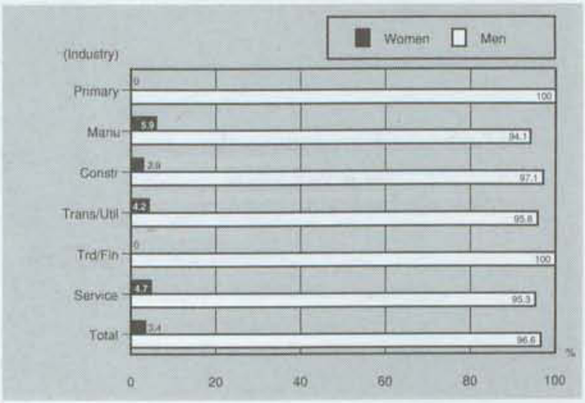
Work-force

Level of Responsibilty by gender
CCTT National Membership



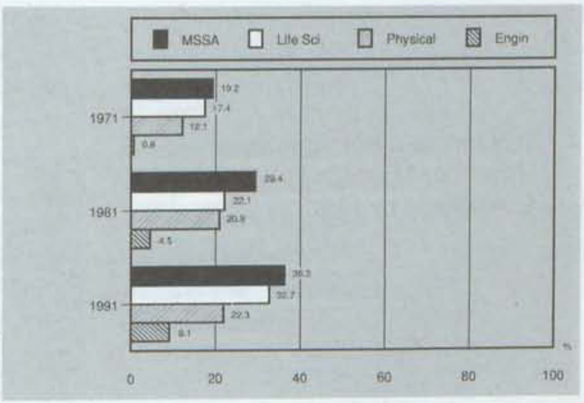
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

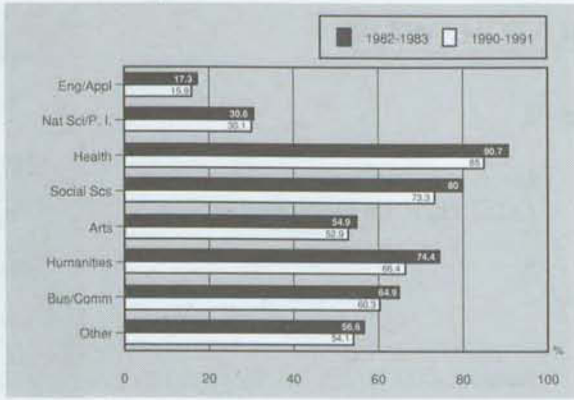


Source: *Census of Canada - 1991 data is estimated through projection.*

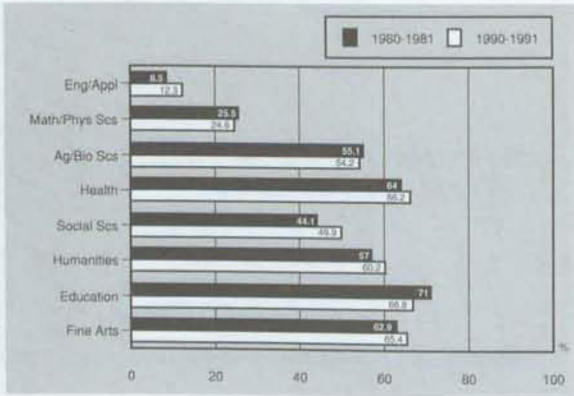
ALBERTA

Full-time Enrolments

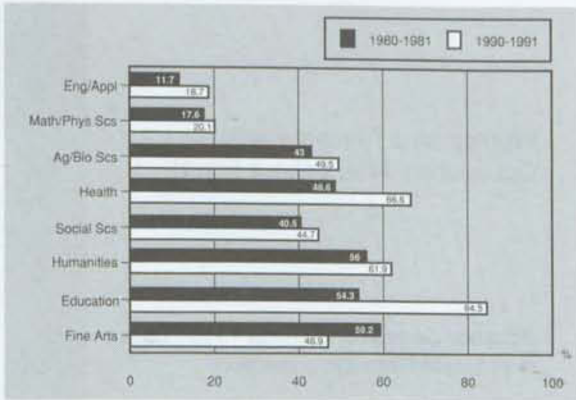
Women as a Percentage of Community College Enrolments by Field



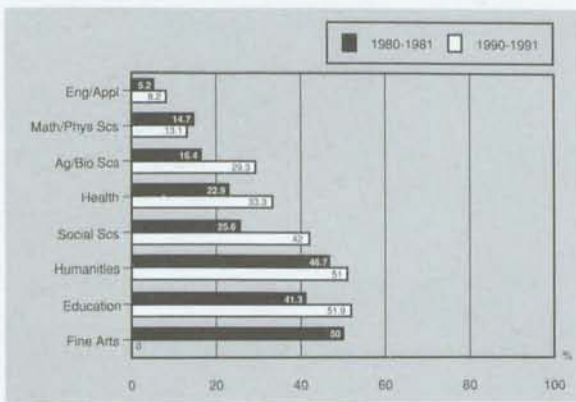
Women as a Percentage of University Bachelor's Level Enrolments by Field



Women as a Percentage of University Master's Level Enrolments by Field



Women as a Percentage of University Doctoral Level Enrolments by Field

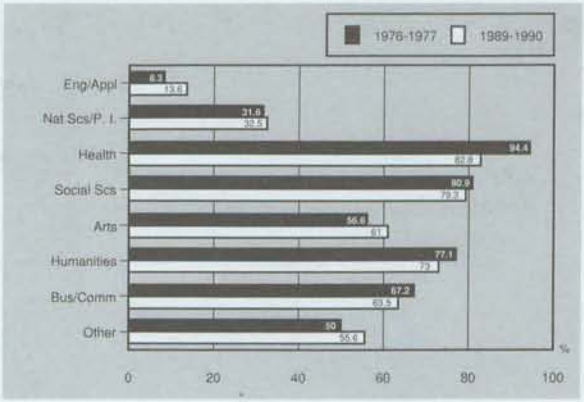


Source: *Statistics Canada; Education, Culture and Tourism.*

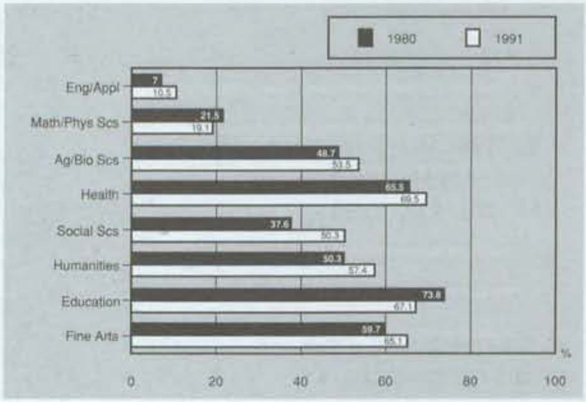
ALBERTA

Graduates

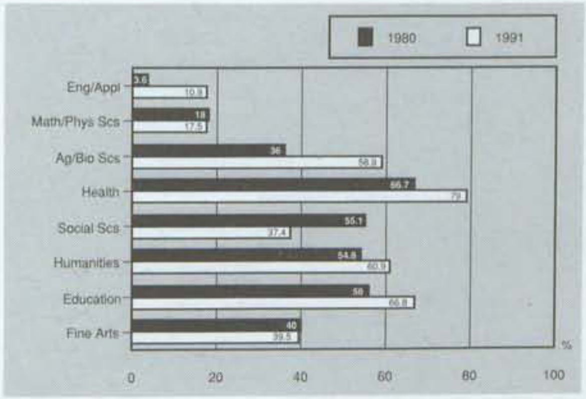
Women as a Percentage of Community College Career Program Graduates by Field



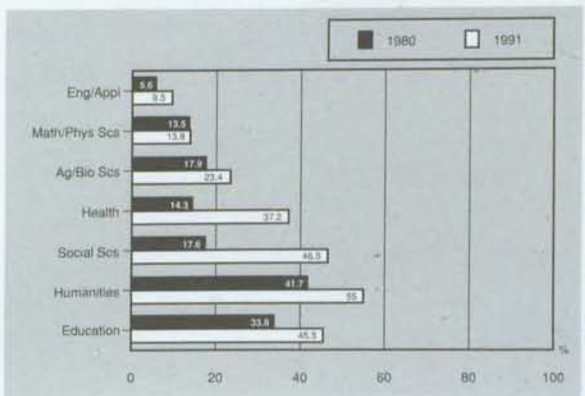
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

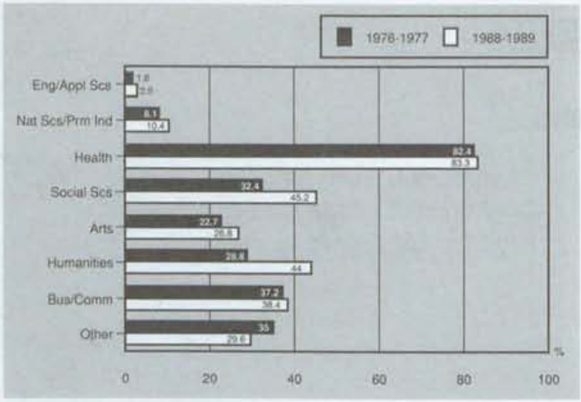


Source: *Statistics Canada; Education, Culture and Tourism.*

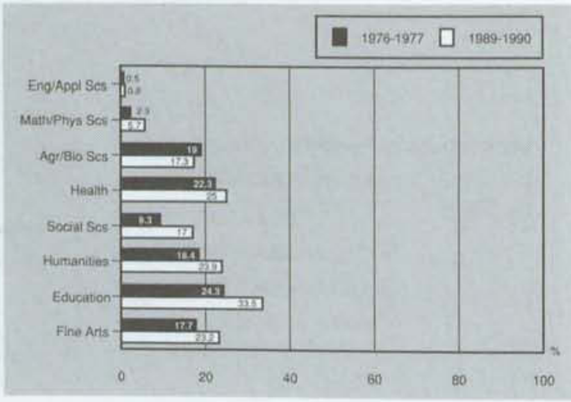
ALBERTA

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field

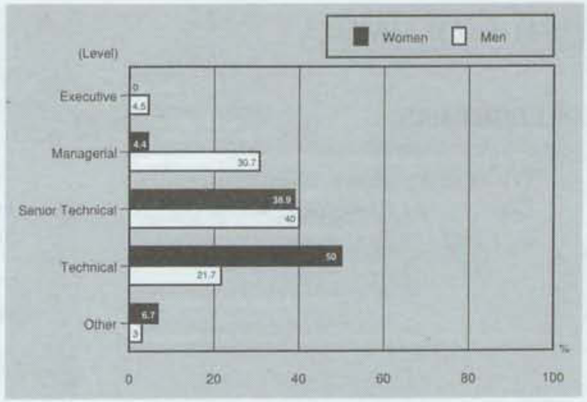


Source: *Statistics Canada; Education, Culture and Tourism.*

ALBERTA

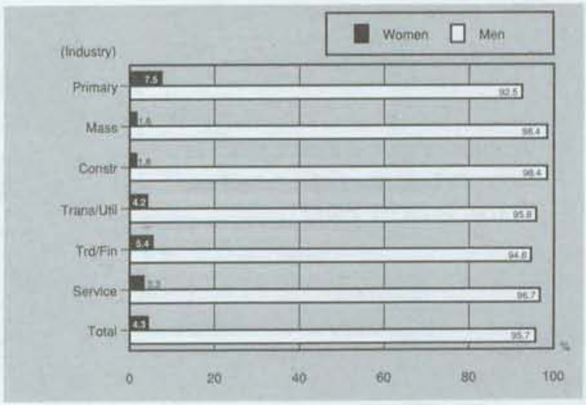
Work-force

Level of Responsibilty by gender
CCTT National Membership



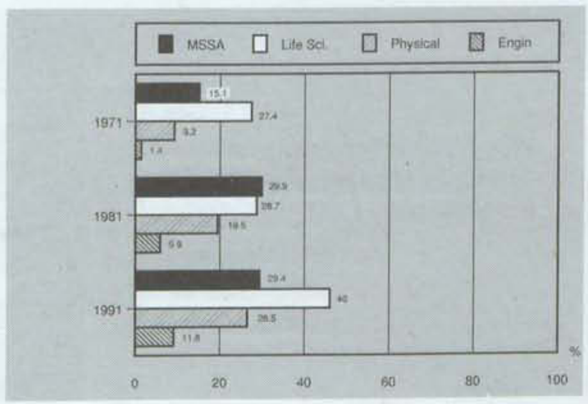
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

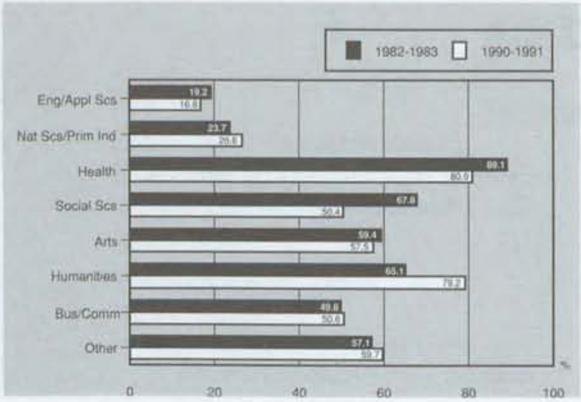


Source: *Census of Canada - 1991 data is estimated through projection.*

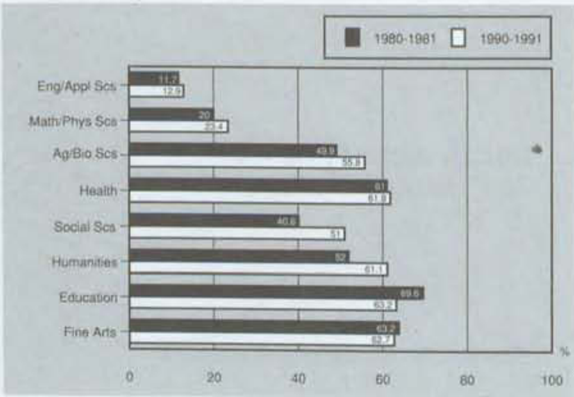
BRITISH COLUMBIA

Full-time Enrolments

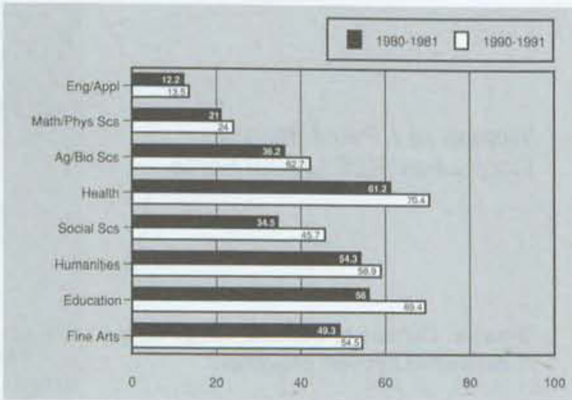
Women as a Percentage of
Community College Enrolments
by Field



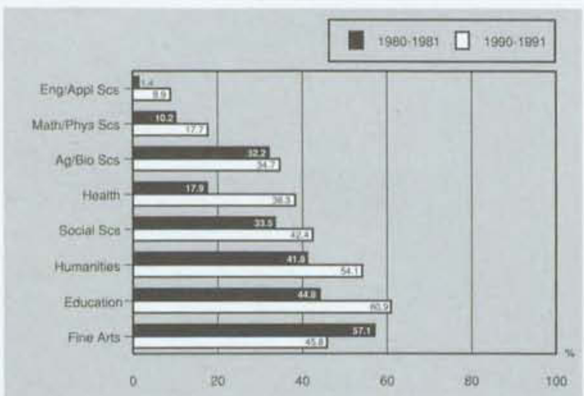
Women as a Percentage of
University Bachelor's Level
Enrolments by Field



Women as a Percentage of
University Master's Level
Enrolments by Field



Women as a Percentage of
University Doctoral Level
Enrolments by Field

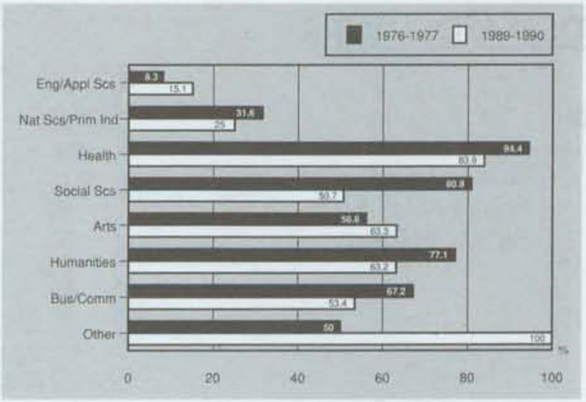


Source: *Statistics Canada; Education, Culture and Tourism.*

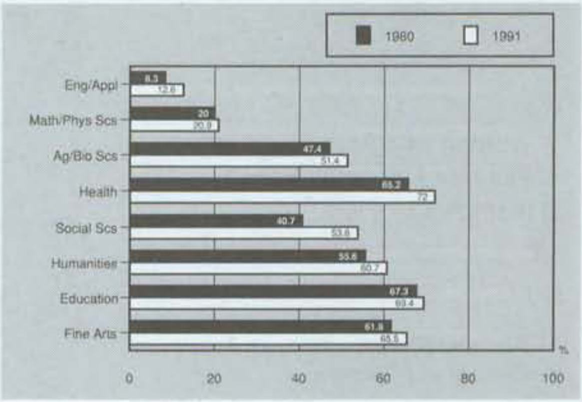
BRITISH COLUMBIA

Graduates

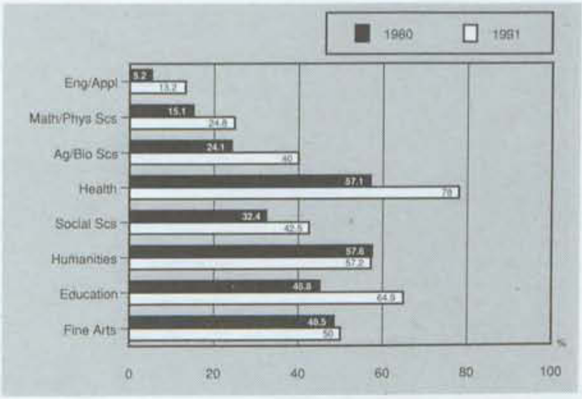
Women as a Percentage of Community College Career Program Graduates by Field



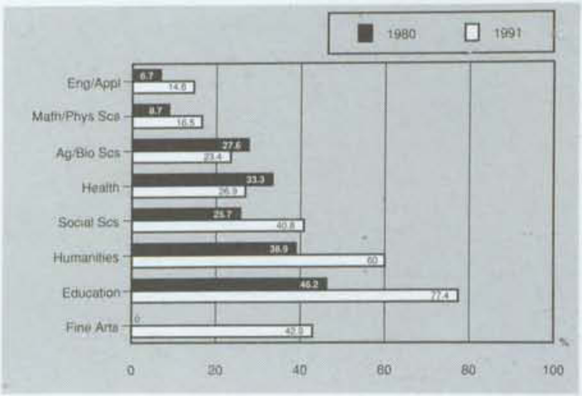
Women as a Percentage of Bachelor's Degree Recipients by Field



Women as a Percentage of Master's Degree Recipients by Field



Women as a Percentage of Doctoral Degree Recipients by Field

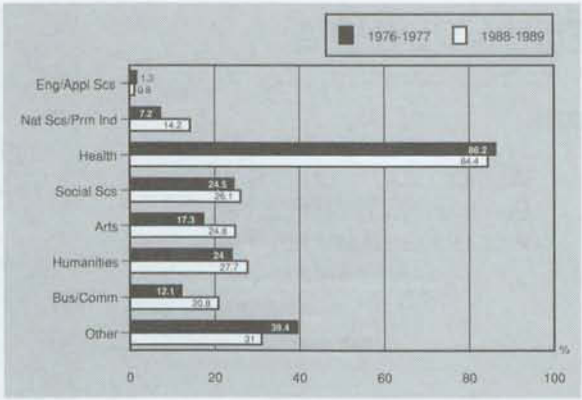


Source: *Statistics Canada; Education, Culture and Tourism.*

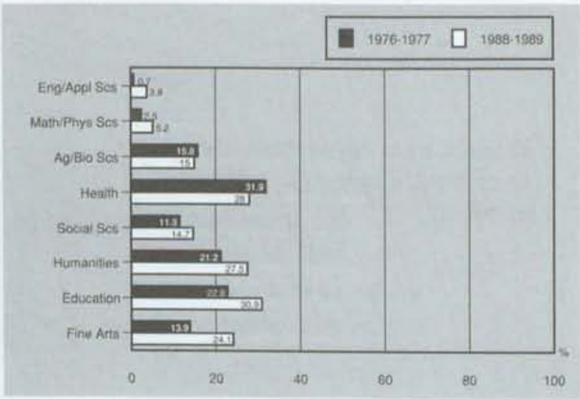
BRITISH COLUMBIA

Faculty

Women as a Percentage of Full-time Community College Faculty by Field



Women as a Percentage of Full-time University Faculty Members by Field

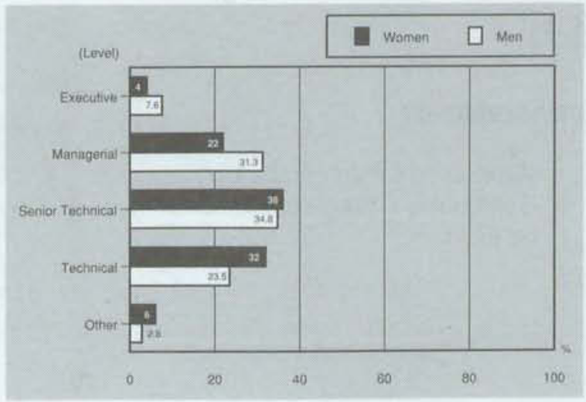


Source: *Statistics Canada; Education, Culture and Tourism.*

BRITISH COLUMBIA

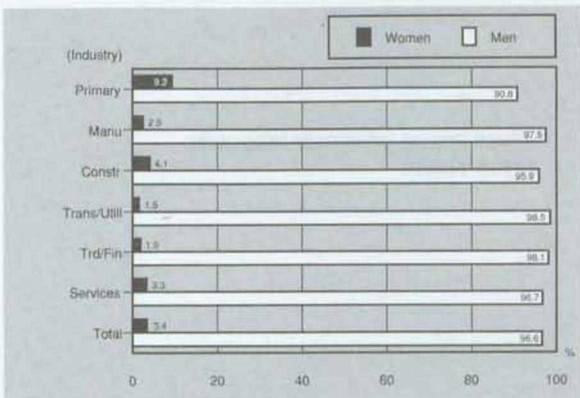
Work-force

Level of Responsibilty by gender
CCTT National Membership



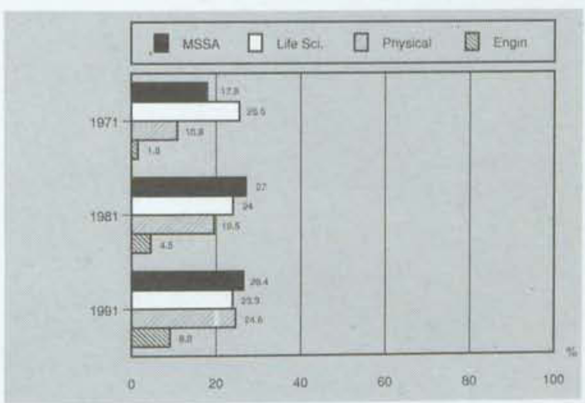
Source: *CCTT, National Report # 17*

Industry Sector by Gender
CCTT National Membership



Source: *CCTT, National Report # 18*

Women as a Percentage in
Occupation: NSE Labour Force

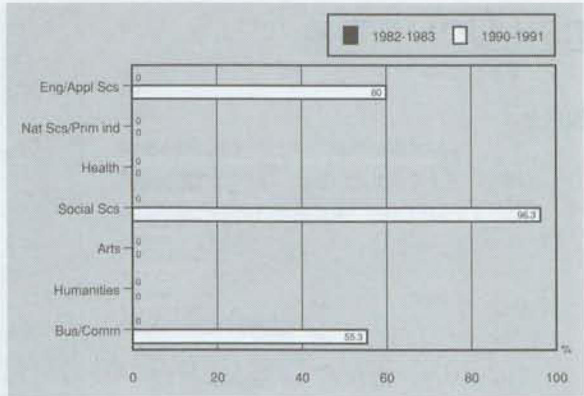


Source: *Census of Canada - 1991 data is estimated through projection.*

YUKON

Full-time Enrolments

Women as a Percentage of
Community College Enrolments
by Field

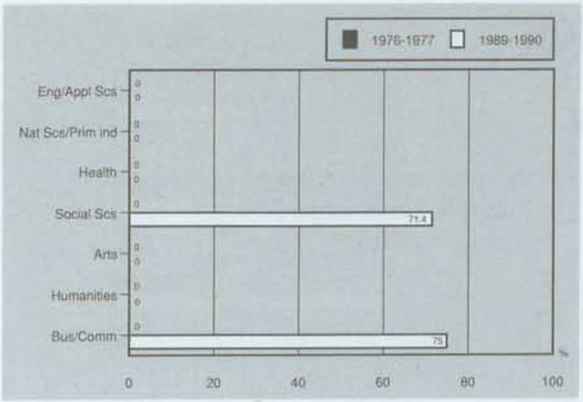


There are no university programs in the Yukon.

YUKON

Graduates

Women as a Percentage of Community College Career Program Graduates by Field



There are no university programs in the Yukon.

YUKON

Faculty

Women as a Percentage of
Full-time Community College
Faculty by Field

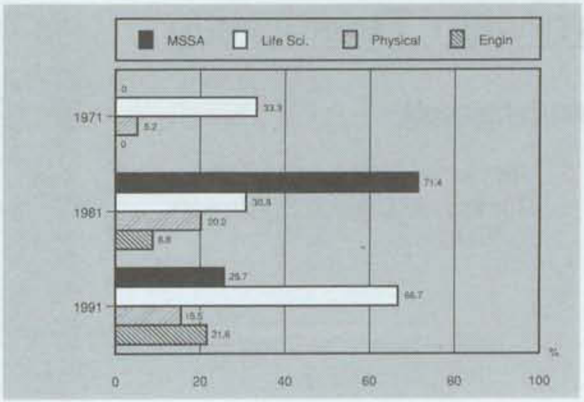
Community College teachers
are not surveyed

There are no university programs in the Yukon.

YUKON

Work-force

Women as a Percentage in Occupation: NSE Labour Force



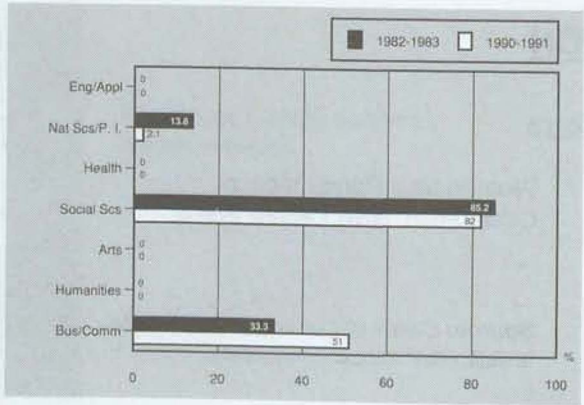
Source: *Cenus of Canada — 1991 Data is estimated through projection.*

Technicians and Technologists eligible for membership from the Yukon can apply to any provincial association; however, they are more likely to be found as members of the Alberta association.

NORTHWEST TERRITORIES

Full-time Enrolments

Women as a Percentage of Community College Enrolments by Field

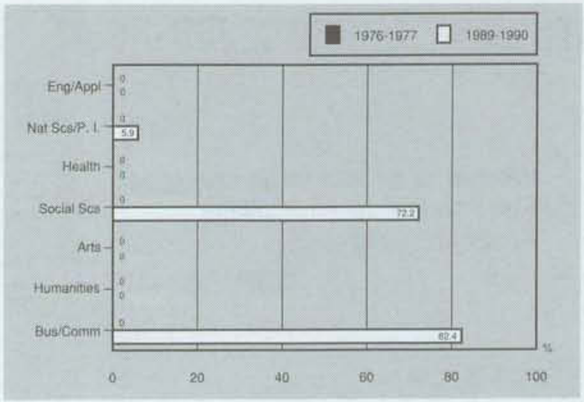


There are no university programs in the Territories.

NORTHWEST TERRITORIES

Graduates

Women as a Percentage of
Community College Career
Program Graduates by Field

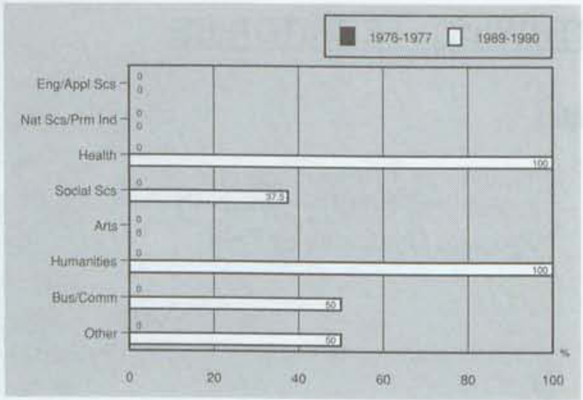


There are no university programs in the Territories.

NORTHWEST TERRITORIES

Faculty

Women as a Percentage of Full-time Community College Faculty by Field

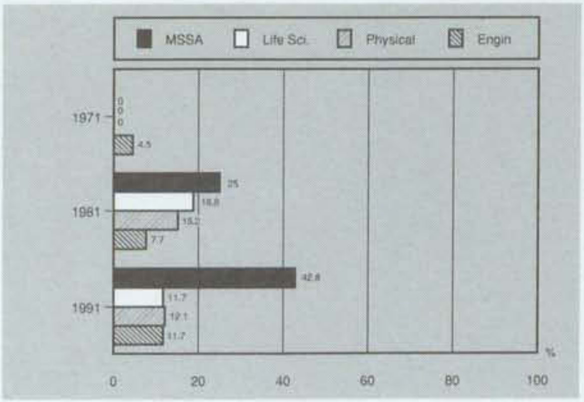


There are no university programs in the Territories.

NORTHWEST TERRITORIES

Work-force

Women as a Percentage in Occupation: NSE Labour Force



Source: *Cenus of Canada — 1991 Data is estimated through projection.*

Technicians and Technologists from the Northwest Territories eligible for membership in provinicial organizations are directed to join the Alberta organizations. Thus, some portion of the figures for Alberta include NWT technicians and technologists.

APPENDIX III

EASY REFERENCE TABLES

TABLE 1. SUMMARY OF OUTCOMES, STRATEGIES, AND CHANGE AGENTS

OUTCOMES, RECOMMENDATIONS NO.	STRATEGIES	CHANGE AGENTS
Image: women are and can be technicians, technologists, scientists & engineers; 1, 6, 24, 25, 29	Media campaigns, TV series, Natl S&T Week, role model programs	Media, ISTC, CRTC, CBC, all professional assoc., CLFDB, WITT, WISE, SCWIST, WISEST, etc.
Self esteem, knowledge and skill base: I can do math; I know it's useful; I want to work as a technician, technologist, scientist or engineer; 2, 3, 5, 7, 16, 17, 24, 26, 27	Industrial education for all students, curriculum changes, Math Crisis Teams, use of new and innovative career guidance materials, hands-on exploratory courses, coop programs, counsellor/teacher workshops, exploratory courses, role model, extra-curricular programs, advocacy	CTF and prov. affiliates, ministries of Education, CGCA, CGCF, school boards, ACCC, all professional assoc., ISTC, WITT, WISE, SCWIST, WISEST, role models, etc.
Technology, math & science are not what smart students do but what all students do; 3, 4, 5, 7	Teacher education, curriculum changes, Toy of the Year Award, new career guidance tools, extra-curricular programs	CEA, ministries of Education, ISTC, CGCA, prov. science educators, school boards, CTF, CSTM
Academic excellence at women-friendly technical institutes, colleges and universities; 8, 9, 12, 28	Code of respect and ethics, equity & childcare programs, non-harassment policy & procedures, Women Do Math conferences, Learning Styles training, inequality in the classroom training, career upgrading courses, curriculum training	AUCC, CAUT and prov. counterparts, ACCC, CLC and related unions, deans of trades, technology, science and engineering
Increased number of women in trades, technology, science & engineering; 8, 9, 10, 11, 13, 17, 24	Marketing and recruitment programs, technical exploratory courses, income support programs, flexible academic programs, transferability, coop education, research, advocacy, mentoring	Deans of trades, technology, science and engineering, EIC, AUCC, ACCC, professional and support assoc., CLFDB
More women faculty promoted & tenured in technology, trades, science & engineering; 8, 13, 14, 15, 24	Proactive hiring, tenure system changes, flexible career pathways, career upgrading courses and strategies, data base of candidates, equity action plans	Deans, dept. chairs in trades, technology, science and engineering, EIC, all professional and women's assoc.
Application of knowledge and know-how to society by motivated students; 4, 5, 7, 16	Revised,'humanized' curricula include women's perspectives and social use and environmental impact analysis, career guidance materials emphasizing this	Educators, CGCF, ISTC, professional assoc.
Doors open wide for women to be hired, promoted, & tracked to top positions; 18, 19, 20, 24	Employment and pay equity action programs, data bank inventory, communications strategies, equity advisors, management training, selection training, mentor and career development programs	Employers, unions, EIC, boards of directors
Women-friendly workplaces, innovation & productivity; 18, 20, 21, 22	Women's advisory councils, gender-awareness programs, networks in place, mentorship programs, child care, flexible work conditions, non-harassment policies and programs	Employers, professional and support assoc.
Professional excellence, women as full participants & leaders; 23, 24, 29	Status of women committees, gender-awareness workshops, appointments to chairs and committees, election to councils, research	RSC, CCPE and affiliates, CCTT and affiliates, WITT, WISE, SCWIST, WISEST, etc.

TABLE 2. SUMMARY OF ELEMENTARY AND SECONDARY EDUCATION RECOMMENDATIONS, STRATEGIES, CHANGE AGENTS AND TIME FRAMES

RECOMMENDATIONS	STRATEGIES	CHANGE AGENTS	TIME FRAME
1. Active portrayal of women by media	• CRTC action plan • New drama series • Natl S&T Week and Festival of Engineers • Committed women mentors and role models • Informing parents	CBC, CRTC, CEA, Canada Council	Year 2 Year 3 Year 1 Year 1 Year 1
2. Empower young women	• Hands-on development of tool skills	CMEC, CEA, CSTM, prov. ministries of Education	Year 3
3. Train teachers in gender equity	• Education courses on equity • Courses on teaching methods for different learning styles	Prov. ministries of Education, CADE, CMEC	Year 4 Year 4
4. Enhance learning of technology, math & science	• Revamp teaching of math and science • Increase required technical, math & science courses for graduation • Increase math & science in teacher education • Review teacher qualifications • All teachers to complete high school math & science • Monitor participation and success • Toy of the Year Award	Prov. ministries of Education, CADE, CEA, CTF, professional assoc.	Year 3 Year 4 Year 3 Year 3 Year 4 Year 2 Year 2
5. Provide teacher & counsellor training on career information	• In-service workshops on equity, gender roles, science careers • Strengthen guidance system • Career exploration initiatives • Industry/labour/government/education partnerships	Women's S&T assoc., CGCA, CGCF, professional assoc.	Year 2 Year 4 Year 3 Year 3
6. Use role models in technology, math, science & engineering	• Invite role models to visit • Role model resource package • Recruit women to teach math & science • Train women as math & science specialists	Professional assoc., women's S&T assoc., ministries of Education	Year 2 Year 2 Year 2 Year 1
7. Develop and sponsor extra-curricular programs	• Job-shadowing, enrichment and work experience programs • Presentations showing contributions of science to society • Math Crisis Teams • Expanded conferences, science & computer clubs • Science & technology fairs where students submit projects • Girls in technology and science workshops	CTF, ISTC, professional assoc., prov. ministries of Education, women's S&T assoc.	Year 3 Year 3 Year 2 Year 4 Year 2 Year 2

TABLE 3. SUMMARY OF POST SECONDARY EDUCATION RECOMMENDATIONS, STRATEGIES, CHANGE AGENTS AND TIME FRAMES

RECOMMENDATIONS	STRATEGIES	CHANGE AGENTS	TIME FRAME
8. Provide a welcoming climate for women	• Equal opportunities & pay equity programs • Accountability measures • Proactive marketing • Non-harassment policy • Harassment awareness • Gender sensitivity program • Gender language policy • Childcare system & facilities	CAUT, AUCC, deans of trades, technology, science and engineering (T&T, S&E)	Year 2 Year 3 Year 2 Year 2 Year 2 Year 2 Year 3 Year 5
9. Attract women undergraduates in trades, technology, science, math & engineering	• Visits to schools • Sponsorship of career days, conferences and contests • Information sessions with teachers, parents, guidance counsellors • Exploratory courses • Accessible transfers among universities & colleges • Women Do Math conferences • Alternate Learning Styles training • Income support • Incentive programs • Monitor attraction programs	Deans of trades, technology, science and engineering, AUCC, CAUT, ACCC, CLC and related unions, women's S&T assoc.	Year 2 Year 1 Year 2 Year 2 Year 2 Year 2 Year 3 Year 2 Year 3 Year 2
10. Attract mature & minority students in trades, technology, science, mathematics, & engineering	• Part-time technician/technology programs • Part-time science and engineering programs • Introductory courses • Transferability of qualifications and credit • Flexible admissions • Credit for work and experience • Monitor attraction programs	Deans of trades, technology, science and engineering, professional assoc., CLFDB	Year 3 Year 4 Year 3 Year 3 Year 3 Year 3 Year 1
11. Establish academic support & social services for students	• Transferability of credit • Support services • Voluntary mentorship • Support for Canada Scholars • Trades and Apprentice Recognition/Scholarship program support • Assertiveness training • Women's advocate • Advisor to the deans of science, technology & engineering • Mechanism to monitor attrition	Deans of trades, technology, science and engineering, ACCC, CAUT, AUCC (and prov. counterparts), CLC	Year 1 Year 1 Year 2 Year 1 Year 2 Year 3 Year 2 Year 3 Year 2
12. Provide an environment of respect & equity	• Code of behaviour • Safety Audit Kit • Editorial policy • Support of non-harassment policy	Deans of trades, technology, science and engineering	Year 2 Year 3 Year 2 Year 1
13. (a) Faculties of engineering and science must attract to & retain women in post-secondary and graduate studies	• Identifying students • Supporting career upgrading • Flexible fellowship rules • Financial and counselling assistance • Investigate family needs • Network • Professional development	Deans of trades, technology, science and engineering, ACCC, AUCC, CLFDB, professional and support assoc., dept. chairs in T&T, S&E, CAGS	Year 2 Year 2 Year 2 Year 2 Year 3 Year 2 Year 2

Table 3. Summary of Post Secondary Education Recommendations, Strategies, Change Agents and Time Frames (cont'd)

RECOMMENDATIONS	STRATEGIES	CHANGE AGENTS	TIME FRAME
13. (b) Institutes of trade and technology attract to and retain women in non-traditional program areas	• Supporting career upgrading • Financial and counselling assistance • Technology management courses • Improve access to degree programs	Deans of trades, technology, science and engineering, ACCC, AUCC, CLFDB, professional and support assoc., dept. chairs in T&T, S&E, CAGS	Year 2 Year 2 Year 3 Year 3
14. Increase number of faculty women in technology, trades, science & engineering	• Employment equity plan • Recruitment and hiring goals • Term appointments available • Integrated short-term, part-time positions • Guest lecturers • Proactive spousal job searches • Database of qualified women	CAUT, EIC, deans of trades, technology, science and engineering, dept. chairs in T&T, S&E, professional and women's assoc.	Year 3 Year 3 Year 3 Year 4 Year 1 Year 1 Year 3
15. Revise tenure & promotion criteria	• Flexible requirements and time frame for tenure • Parental leaves with no penalties • Recognition of faculty participation	CAUT, EIC, deans of trades, technology, science and engineering, dept. chairs in T&T, S&E, professional and women's assoc.	Year 2 Year 1 Year 2
16. Revise programs to be realistic & humanistic	• Social and environmental impact • Revise curricula for diversity & women's views • More appealing presentation • Faculties to review academic courses • Incorporation of gender issues in curriculum	AUCC, ACCC, CAUT, deans of trades, technology, science and engineering, dept. chairs in T&T, S&E	Year 3 Year 2 Year 1 Year 3 Year 3
17. Develop cooperative education programs	• Government support for coop education • Exploratory courses for experienced women • Orientation programs • Evaluation of work experiences	AUCC, ACCC, professional and support assoc., deans, EIC, CLFDB	Year 2 Year 2 Year 2 Year 2

TABLE 4. SUMMARY OF THE WORKPLACE RECOMMENDATIONS, STRATEGIES, CHANGE AGENTS AND TIME FRAMES

RECOMMENDATIONS	STRATEGIES	CHANGE AGENTS	TIME FRAME
18. Develop equity policy & strategies	• Coop programs • Employment equity • Gender-awareness program • Management training • Exit interviews • Remove systemic barriers • Advisory group	Employers, unions, EIC, boards of directors	Year 2 Year 2 Year 4 Year 3 Year 3 Year 2 Year 2
19. Recruit & hire more women technicians, technologists, scientists & engineers	• Hiring objectives • Improved selection process • Train for selection • Incentives for recruitment program • Attraction programs	Employers, unions, EIC, boards of directors	Year 2 Year 2 Year 2 Year 2 Year 4
20. Institute programs for career development & promotion strategies for women	• Training and career development programs • Mid-career training • Mentorship for new technical employees, scientists and engineers • Mentorship for women with management potential • Networking • Equity advisor	EIC, professional councils and assoc., unions, ACCC employers	Year 2 Year 3 Year 2 Year 2 Year 2 Year 2
21. Revise work & family policies	• Flexible work and schedules • Childcare • Adopt supportive family policies • Review benefits	Employers, unions, EIC, boards of directors, professional assoc.	Year 4 Year 4 Year 4 Year 4
22. Create non-harassment policy & program	• Develop non-harassment policy, procedures • Harassment sensitization program • Monitoring system	Employers, unions, EIC, boards of directors, professional assoc.	Year 2 Year 2 Year 1

TABLE 5. SUMMARY OF PROFESSIONAL ASSOCIATIONS/SOCIETIES RECOMMENDATIONS, STRATEGIES, CHANGE AGENTS AND TIME FRAME

RECOMMENDATIONS	STRATEGIES	CHANGE AGENTS	TIME FRAME
23. Welcome women as equal participants & prevent gender biases	• Increase women's membership • Appoint more women • Nominate more women • Committee on women's issues • Invite women speakers • Develop code of ethics and application guidelines • Gender-inclusive documents • Special events • Give gender-awareness workshops	RSC, professional councils, and assoc., women's S&T assoc.	Year 1 Year 2 Year 2 Year 2 Year 1 Year 3 Year 2 Year 2 Year 3
24. Provide data on women members	• Track progress • Natl data bank • Expand surveys • Distribute surveys	Professional assoc., women's groups, EIC, educators	Year 2 Year 3 Year 2 Year 3
25. Campaign for public awareness of women in science & engineering	• Promote occupations • Distribute career information • Natl S&T Week & Festival of Engineers • Women on awards committees	Professional and women's S,T&E assoc., media, EIC, ISTC	Year 2 Year 2 Ongoing Year 2
26. Sponsor attraction programs for women in technology, trades, science and engineering to schools	• Comprehensive school visits plan • Develop role model training • Visits & monitoring • Adopt a school	Professional and women's S,T&E assoc., educators, CEA, CTF	Year 2 Year 2 Year 2 Year 3
27. Organize career advisory programs at work	• Develop local career advisory programs • Advisor training program	CTF, CGCA, CGCF, professional assoc., women's S&T organizations	Year 2 Year 2
28. Establish linkages with technical institutes and universities on equity policies for women	• Discussions on ethics at school • Open communication channels	Professional assoc., deans, AUCC, CAUT, ACCC, CLC and related unions	Year 2 Year 2
29. Include women's perspectives	• Ongoing strategy	Professional assoc., employers, unions, EIC	Throughout years

Table 6. Chronological Table of Strategies for Elementary and Secondary Educators

YEAR	STRATEGIES	CHANGE AGENTS
ONE	• Natl S&T Week and Festival of Engineering • Committed women mentors and role models • Informing parents • Train women as math & science specialists	• Media • Professional assoc., CEA • CBC, CRTC • Professional assoc., women's S&T assoc.
TWO	• CRTC action plan • Toy of the Year Award • Monitor participation and success • In-service workshops on equity, gender roles, science careers • Role model resource package • Invite role models to visit • Recruit women to teach math & science • Science & technology fairs where students submit projects • Girls in technology and science workshops • Math Crisis Teams	• CRTC • Prov. ministries of Education, CEA • Prov. ministries of Education, CEA, CTF • Women's S&T assoc., CGCA, CGCF • Professional assoc., women's S&T assoc. • Professional assoc., women's S&T assoc. • Ministries of Education, women's S&T assoc. • CTF, ISTC, professional assoc., women's S&T assoc. • CTF, ISTC, professional assoc., women's S&T assoc. • CTF, professional assoc., women's S&T assoc.
THREE	• New drama series • Hands on development of tool skills • Review teacher qualifications • Increase science and mathematics in teacher education • Revamp teaching of math and science • Job-shadowing, enrichment and work experience programs • Presentations showing contributions of science to society • Industry/labour/government/education partnerships • Career exploration initiatives	• CBC, Canada Council • CMEC, CEA, CSTM • Prov. ministries of Education, CEA, CTF • Prov. ministries of Education, CEA, CTF • Prov. ministries of Education, CEA, CTF, professional assoc. • CTF, professional assoc., women's S&T assoc. • CTF, ISTC, professional assoc., women's S&T assoc. • CGCA, CGCF, professional assoc., women's S&T assoc. • CGCA, CGCF, professional assoc., women's S&T assoc.
FOUR	• Education courses on equity • Courses on teaching methods for different learning styles • Increase required math & science courses for graduation • All teachers to complete high school math and science • Strengthen guidance system • Expanded conferences, science & computer clubs	• Prov. ministries of Education, CADE, CMEC • Prov. ministries of Education, CADE, CMEC • Prov. ministries of Education, CADE, CMEC, CTF • CADE, ministries of Education • CGCA, CGCF • CTF, ISTC, professional assoc., women's S&T assoc.

TABLE 7. CHRONOLOGICAL TABLE OF STRATEGIES FOR POST-SECONDARY EDUCATORS

YEAR	STRATEGIES	CHANGE AGENTS
ONE	• Sponsorship of career days, conferences and contests	• AUCC, CAUT, ACCC, CLC
	• Monitor attraction programs	• AUCC, deans, ACCC
	• Transferability of credit	• ACCC, CAUT, deans
	• Support for Canada Scholars	• Deans
	• Support services	• Deans
	• Support of non-harassment policy	• Deans
	• Proactive spousal job searches	• CAUT, deans, dept. chairs
	• Guest lecturers	• CAUT, deans, dept. chairs
	• Parental leaves with no penalties	• CAUT, EIC, deans, AUCC, ACCC
	• More appealing presentation	• CAUT, deans, dept. chairs
TWO	• Non-harassment policy	• CAUT, AUCC, deans, ACCC
	• Proactive marketing	• CAUT, AUCC, deans, ACCC
	• Harassment awareness	• Deans
	• Equal opportunities & pay equity programs	• CAUT, AUCC, deans, ACCC
	• Gender sensitivity program	• CAUT, AUCC, deans, ACCC
	• Visits to schools	• CLC, unions, women's S&T assoc.
	• Information sessions with teachers, parents, guidance counsellors	• Deans, AUCC, women's S&T assoc.
	• Exploratory courses	• AUCC, ACCC, CLC, EIC
	• Accessible transfers among universities & colleges	• AUCC, ACCC
	• "Women Do Math" conferences	• Deans, AUCC
	• Income support	• ACCC, CLC, EIC
	• Monitor attraction programs	• AUCC, ACCC, CLC
	• Voluntary mentorship	• Deans
	• Mechanism to monitor attrition	• Deans, ACCC, AUCC
	• Women's advocate	• ACCC, CLC
	• Trades and Apprentice Recognition/Scholarship program support	• ACCC, AUCC, EIC, CLC
	• Code of behaviour	• Deans
	• Editorial policy	• Deans
	• Identifying students	• Deans, dept. chairs
	• Supporting career upgrading	• Professional and support assoc., CLFDB, deans, EIC
	• Financial and counselling assistance	• Deans, AUCC, ACCC, CLFDB
	• Flexible fellowship rules	• ACCC, AUCC, professional assoc.
	• Networks	• Deans, dept. chairs, CAUT
	• Professional development	• Professional and support assoc.
	• Flexible requirements and time frame for tenure	• Deans, CAUT, ACCC
	• Recognition of faculty participation	• Deans, CAUT, AUCC, ACCC
	• Revise curricula for diversity and women's issues	• Deans, dept. chairs, women's S&T assoc.
	• Orientation programs	• Deans, dept. chairs
	• Courses for experienced women	• Deans, dept. chairs
	• Government support for coop education	• EIC, CLFDB
	• Evaluation of work experiences	• Dept. chairs, deans, professional and support assoc.

TABLE 7. CHRONOLOGICAL TABLE OF STRATEGIES FOR POST-SECONDARY EDUCATORS *(CONT'D)*

YEAR	STRATEGIES	CHANGE AGENTS
THREE	• Accountability measures • Gender language program • Alternate Learning Styles training • Incentive programs • Introductory courses • Transferability of qualifications and credit • Credit for work and experience • Flexible admissions • Part-time technician/technology programs • Assertiveness training • Advisor to the deans of science, technology & engineering • Safety Audit Kit • Investigate family needs • Improve access to degree programs • Employment equity plan • Recruitment and hiring goals • Database of qualified women • Term appointments available • Social and environmental impact • Technology management courses • Incorporation of gender issues in curriculum • Faculties to review academic courses	• AUCC, deans, ACCC • Deans, AUCC, ACCC • CAUT, deans, CLC • AUCC, ACCC, CLC • Deans, professional assoc. • Deans, professional assoc. • Deans • Deans, AUCC, ACCC • Deans, AUCC, ACCC • ACCC, deans of technology and trades • AUCC, ACCC • Deans • ACCC, AUCC, CLFDB • ACCC, AUCC • CAUT, EIC, CLFDB • Deans, dept. chairs • ACCC, AUCC, CAUT, professional and women's assoc. • ACCC, AUCC, CAUT • Deans, dept. chairs • ACCC, CLFDB • Deans, dept. chairs, women's S&T assoc. • Deans, dept. chairs, women's S&T assoc.
FOUR	• Integrated short-term, part-time positions open • Part-time science and engineering programs	• Deans • Deans
FIVE	• Childcare system & facilities	• Deans

TABLE 8. CHRONOLOGICAL TABLE OF STRATEGIES FOR THE WORKPLACE

YEAR	STRATEGIES	CHANGE AGENTS
ONE	• Monitoring system	• Employers, unions, EIC
TWO	• Coop programs	• Employers, unions
	• Remove systemic barriers	• Employers, unions, EIC
	• Advisory group	• Employers, boards of directors, unions
	• Employment equity	• Employers, boards of directors, unions
	• Hiring objectives	• Employers, boards of directors, unions, EIC
	• Improved selection process	• Boards of directors, unions, employers
	• Train for selection	• Employers, unions
	• Incentives for recruitment program	• Employers, unions
	• Networking	• Professional councils and assoc., unions, employers
	• Mentorship for women with management potential	• Professional councils and assoc., unions, employers
	• Mentorship for new technical employees, scientists and engineers	• Employers, professional assoc. and councils
	• Equity advisor	• Employers
	• Training and career development programs	• EIC, unions, employers, professional assoc. and councils
	• Develop non-harassment policy, procedures	• Employers, unions
	• Harassment sensitization program	• Employers, unions
THREE	• Exit interviews	• Employers, unions
	• Management training	• Employers, unions, EIC
	• Mid-career training	• Employers, unions, ACCC
FOUR	• Flexible work and schedules	• Employers, unions
	• Gender-awareness program	• Employers, unions
	• Attraction programs	• Employers, unions, EIC
	• Childcare	• Employers, unions
	• Adopt supportive family policies	• Employers, unions
	• Review benefits	• Employers, unions

Table 9. Chronological Table of Strategies for the Associations/Societies

YEAR	STRATEGIES	CHANGE AGENTS
ONE	• Increase women's membership • Invite women speakers	• RSC, professional and women's assoc. and councils • RSC, professional and women's assoc. and councils
TWO	• Committee on women's issues • Special events • Nominate more women • Appoint more women • Gender-inclusive documents • Expand surveys • Track progress • Promote occupations • Distribute career information • Women on Awards committee • Comprehensive school visits plan • Develop role model training • Visits & monitoring • Develop local career advisory programs • Training program for advisors • Discussions on ethics at school • Open communication channels	• RSC, professional assoc. and councils • RSC, professional assoc. and councils • RSC, professional assoc. and councils • RSC, professional assoc. and councils • RSC, Professional assoc. and councils • Professional assoc., women's S,T&E assoc. • Professional and women's S&T organizations, EIC • Professional and women's S,T&E assoc., media, EIC, ISTC • Professional and women's S,T&E assoc., EIC • Professional and women's S,T&E assoc. • Professional and women's S,T&E assoc., educators • Professional and women's S,T&E assoc., educators • Professional and women's S,T&E assoc., educators • CGCA, CGCF, professional assoc. and women's S&T organizations • CGCA, CGCF, professional assoc. and women's S&T organizations • Professional and women's S,T&E assoc., deans • Professional and women's S,T&E assoc., AUCC, CLC
THREE	• Give gender-awareness workshops • Develop code of ethics and application guidelines • Natl data bank • Distribute surveys • Adopt a school	• Professional assoc. and women's S&T organizations • Professional assoc. and women's S&T organizations, RSC • Professional assoc. and women's S&T organizations, EIC • Professional assoc. and women's S&T organizations, EIC • Professional assoc. and women's S&T organizations, EIC
ALL YEARS	• Awareness of women's perspectives • Natl S&T Week & Festival of Engineers	• Professional and women's S&T organizations and councils • Professional and women's S&T organizations and councils

APPENDIX IV

GLOSSARY OF TERMS AND ACRONYMS

GLOSSARY OF TERMS

Representative Community College Disciplines within Fields of Study

Engineering and Applied Sciences

Chemical Technologies
- Chemical Engineering Technologies
- Biochemical Technologies
- Metallurgical Chemical Technologies
- Industrial Chemical Technologies
- Photographic Chemical Technology
- Chemistry

Electrical/Electronic Technologies
- Electrical/Electronic Engineering Technologies
- Avionics Technologies
- Marine Electronics Technologies
- Electro-Mechanical Technologies
- Telecommunications Technologies

Mathematics and Computer science
- Mathematics
- Computer Science

Transportation Technologies
- Air Transportation
- Motor Transportation
- Rail Transportation
- Marine Transportation

Engineering Technologies
- Engineering - General
- Engineering - Mechanical
- Engineering - Architectural and Construction
- Engineering - Aeronautical
- Engineering - Industrial

Natural Sciences and Primary Industries

Natural Sciences
- Agriculture
- Agriculture Technology/Science/Engineering

Agriculture Business
- Biology
- Plant Sciences
- Animal Sciences

Primary Industries
- Forestry Technologies
- Mining Technologies
- Hunting and Trapping
- Petroleum Resources Technology

Resource Processing Technologies
- Forest Products Processing
- Metal Processing
- Petroleum Refining Technologies
- Food Processing Technologies

Environmental and Conservation Technologies
- Environmental Control/ Protection Technologies
- Land Resources Technologies
- Wildlife and Forest Conservation Technologies
- Water Science Technologies
- Air Purification Technologies

Health Sciences and Related

Nursing
- Diploma Nursing
- Nursing Aide/Orderly
- Nursing Refresher
- Psychiatric or Mental Health Nursing
- Dental Nursing

Diagnostic and Treatment Medical Technologies
- Emergency Para-medical Technologies
- Chiropractic Technologies
- Medical Laboratory Technologies
- X-ray/Radiology/Radiotherapy/Nuclear Medicine Technologies

Combined Laboratory and Xray Technology
- Physiotherapy
- Dental Hygiene/Assistant Technologies
- Pharmacy Technologies

Medical Equipment and Prosthetics
- Dental Appliances
- Optical Prosthetics/Lenses
- Orthopaedic Prosthetics
- Auditory Prosthetics

Other Health-related Technologies
- Dietetics/Dietary Technologies
- Mental Health Technologies
- Speech Therapy
- Health Care Support Technologies
- Biological Sciences Technologies
- Public/Environmental Health
- Health Education

Social Sciences and Services

Protection and Correction Services
- Correctional Technologies
- Para-legal Technologies
- Police Technologies/Criminology
- Protection Technologies

Social Services
- Child Care Services
- Youth Services
- Gerontology
- Care of the Disabled
- Social Services/Welfare Technologies
- Domestic Science and Related
- Community Planning/Urban Design

Recreation and Sport
- Recreation Leadership/Leisure Services
- Physical Education Instruction
- Travel and Tourism

Educational and Counselling Services
- Counselling Services Technologies
- Educational Services

Personal Development
- Orientation Courses

Communications Skills Development
- Life Skills
- Occupational Skills Development

Social Sciences
- Anthropology
- Archaeology
- Economics
- Geography
- Political Science
- Psychology
- Sociology

Arts

Fine Arts
- Commercial and Promotional Arts
- Graphic and Audio-visual Arts
- Creative and Design Arts
- Personal Arts
- Mass Communications
- Other Applied Arts

Humanities

Journalism
- Library Science
- Religion/Theology
- Languages
- History
- Philosophy
- Other Humanities

Business and Commerce

Secretariat Science
- Management and Administration
- Merchandising and Sales
- Service Industry Technology

Representative University Disciplines Within Fields of Study

Engineering and Applied Sciences

Architecture
Engineering (all types)
Forestry
Landscape Architecture

Mathematics and Physical Sciences

Astronomy
Chemistry
Computer Science
Geology
Materials Science
Mathematics
Metallurgy
Meteorology
Oceanography
Physics
Statistics

Agriculture and Biological Sciences

Agriculture
Biology
Botany
Fisheries and Wildlife Management
Food Science and Nutrition
Household Science
Veterinary Medicine/Sciences
Zoology

Health Professions and Occupations

Dentistry
Epidemiology and Public Health
Medicine/Medical Sciences
Medical Technology
Nursing
Optometry
Pharmacy
Rehabilitation Medicine

Social Sciences

Administration/Management
Anthropology
Archaeology
Canadian/Other area studies
Commerce/Business
Demography
Economics
Geography
Law and Jurisprudence
Political Science
Psychology
Social work/Social Welfare
Sociology

Humanities

Classics
History
Journalism
Languages, Literature
Library Science
Linguistics
Mass Communication Studies
Philosophy
Religious/Theological Studies
Translation and Interpretation

Education

Educational Psychology
Kinesiology
Physical Education
Recreation
Teacher Training

Fine and Applied Arts

Fine Art
Industrial Design
Music
Other Performing Arts

Work-force Natural Sciences and Engineering (NSE)

Physical Sciences

Physicists
Chemists
Geologists
Meteorologists
Physical sciences technicians and technologists
Occupations in physical sciences not elsewhere classified

Life Sciences

Agriculturalists
Biologists
Life sciences technicians and technologists
Occupations in life sciences not elsewhere classified

Architects, Engineers and Community Planners

Architects
All engineering specialties
Community planners and professional engineers not elsewhere classified
Surveyors
Draughting
Architectural technicians and technologists
Occupations not elsewhere classified

Mathematics, Statistics, systems Analysis and related fields

Mathematicians
Statisticians and actuaries
Systems analysts and programmers
Occupations in the field not elsewhere classified.

WORK-FORCE PRINCIPAL INDUSTRY SECTORS

Primary Trade/Finance

Agriculture & Related Service Industries
- Livestock
- Field crops
- Etc.

Fishing & Trapping Industries

Logging & Forestry Industries
- Does not include wood processing

Mining, Quarrying & Oil Well Industries
- Metals
- Non-metals
- Coal
- Crude oil
- Gas
- Stone quarries

Manufacturing

Manufacturing Industries
- Food processing
- Wood processing
- Textiles
- Pulp & paper
- Primary metal industries

Construction

Construction Industries
- Residential
- Industrial
- Commercial

Transportation/Utilities

Transportation & Storage Industries
- Air/Ground transport
- Pipelines
- Warehousing

Utilities & Communication Industries
- Electric
- Gas & water utilities
- Postal
- Broadcasting
- Telecommunications

Wholesale Trade Industries
- Farm products
- Petroleum
- Food
- Household goods
- Auto parts
- Hardware
- Machinery
- Equipment

Retail Trade Industries
- Food
- Beverages
- Drugs
- Clothing
- Auto sales & service
- Sporting goods
- Photography
- Stationery

Finance& Insurance Industries
- Banks
- Trusts Co.
- Credit unions
- Investment firms
- Life, property & casualty insurance

Service

Real Estate Operator & Insurance Agents

WORK-FORCE PRINCIPAL INDUSTRY SECTORS *(cont.)*

Business Services Industry
- Engineering/architectural firms

Computer sales & service
- Legal/management services
- Personnel/accounting services

Government Services Industries
- Defence
- Labour
- Employment
- Human resource
- Administrative services

Educational Service Industries
- Education — all levels
- Librairies
- Museums

Health & Social Service Industries
- Hospitals
- Health & day care facilities
- Social services
- Pharmaceuticals

Accommodation Food & Beverage Industries
- Hotel
- Motel
- Campgrounds
- Restaurants
- Taverns

Other Service Industries
- Professional associations
- Sports clubs
- Equipment rental
- Motion pictures

GLOSSARY OF ACRONYMS

ACCC	Association of Community Colleges of Canada
AUCC	Association of Universities and Colleges of Canada
AWES	Association of Women in Engineering and Science
CADE	Canadian Association of Deans of Education
CAGS	Canadian Association of Graduate Schools
CAUT	Canadian Association of University Teachers
CAWIS	Canadian Association of Women in Science
CBC	Canadian Broadcasting Corporation
CCPE	Canadian Council of Professional Engineers
CCTT	Canadian Council of Technicians and Technologists
CCWE	Canadian Committee on Women in Engineering
CCWEST	Canadian Coalition of Women in Engineering, Science, Trades and Technology
CEA	Canadian Education Association
CGCA	Canadian Guidance and Counselling Association
CGCF	Canadian Guidance and Counselling Foundation
CLC	Canadian Labour Congress
CLFDB	Canadian Labour Force Development Board
CMEC	Council of Ministers of Education, Canada
CRTC	Canadian Radio-television and Telecommunications Commission
CSTM	Council of Science and Technology Ministers
CTF	Canadian Teachers Federation
EIC	Engineering Institute of Canada
ISTC	Industry, Science and Technology Canada
MSSA	Mathematics, Statistics and Systems Analysis
NABST	National Advisory Board on Science and Technology
NSE	Natural Sciences and Engineering
RSC	Royal Society of Canada
SCWIST	Society of Canadian Women in Science and Technology
SSHRC	Social Sciences and Humanities Research Council
WISE	Women in Science and Engineering
WISEST	Women in Scholarship, Engineering, Science and Technology
WITT	Women in Trades and Technology (WITT) National Network