CHAPTER 4

WOMEN'S TECHNICAL EDUCATION - DIFFUSION AND STABILIZATION

It reminds me of Kennedy's words, "The great society asks not how much but how good; not only how fast we are going but where we are heading".

INTERNATIONAL FORUM:
(A) HIGHER TECHNICAL EDUCATION.

Women in vocation is no longer a sensational thing. The 1975 I.L.O. report indicates that every third economically active person in the world today is a woman. But women have access to all vocations, to all levels of each vocation in all regions of the world, is not true. The participation rate of women in Northern Africa, Middle America and Tropical South America is 12 per cent. In southern Africa, Middle Southern Asia, South Western Asia and Southern Europe, it is 12 to 21 per cent. Areas with very high female activity rates are notably U.S.S.R and Eastern Europe with 40 to 50 per cent. In Eastern Africa, Western Africa, Middle Africa, East Asian Mainland and South East Asia it falls between 30 to 40 per cent. In Asia, women form a large part of the professional and
technical categories outnumbering men in certain categories, largely due to the U.S.S.R. Chemical, pharmaceutical and electronics are their fields of interest. It will be interesting to screen the education trends in few selected countries.

THE SOCIALIST WOMAN.

The socialist woman is a high point in the continuum of the evolution of the status of women. These women are fully interested in their respective national economics. An official publication of the G.D.R. on "Women Under Socialism" claims: "In the Soviet Union as in other countries of the socialist community, women can be met in every vocation". Just as every second job is held by a woman every second apprentice in the G.D.R. is a girl. The percentage of young women and girls in national science and technical courses has increased from 46.1 to 61.7 percent. Girls receive the same education as boys and are given similar employment opportunities. The old prejudice against technical and natural science vocations for girls has been almost completely overcome in the G.D.R. The working methods can improve their skills in various ways, despite domestic duties. Shorter working hours and multi-shift arrangements are some of the incentives for women for going in for technical education (Naymunday, 1975).
THE PROFESSIONAL WOMEN IN MODERN POLAND.

In an interview, Halina Lewicka, a linguist of the University of Warsaw says "The Feminine take-over" reflects the great advance made by Polish women in professional fields. According to her, entirely new social structures have replaced the institution which existed barely more than a generation ago. As a result of war, extermination and concentration camps, losses were particularly heavy amongst the intellectual leaders. Consequently, education at all levels was staffed by inadequately trained people at the beginning of the post-war period. Women played a great part in rectifying this situation. They availed themselves of the ample opportunities offered to them for every form of higher education. Lewicka remarks that "it looks as if the social ascent of women in an irreversible trend. Sooner or later, and depending upon natural, political and economic systems, this process should lead to the balanced distribution of men and women at all professional levels".

THE SOVIET WOMAN

Women have contributed greatly to scientific and technical development in the Soviet Union. As Morton T. Dodge in his study titled "Women in the Soviet Economy" remarks: "in certain erstwhile male professions, the
presence of women in the higher echelons is so substantial that it appears the Soviet women have won equality for the most part.

Among specialists with higher education, women engineers are 31 per cent. Amongst these women with higher education a selected group holds academic ranks also. More women were drawn and retained in the professional field due to the decrease in the male population as a result of the two wars of 1920 and 1930. Dodge analyzes the broad role played by women in the Soviet economy and compares it with the American set up. Only 1 per cent of American women are engineers and technologists, compared to 83% in the USSR.

In spite of such a good picture, the proportion of women is decreasing. The enrollment of women in higher education shot up to an all time high of 77 per cent in 1945 after the two wars of 1920 and 1930. This figures declined to 52 per cent in 1955 and 42 per cent in 1962.

In Soviet Union the state has made efforts to develop a career orientation among girls and young women. The image of the hard working productive and patriotic professional woman is constantly held up before the eyes of young girls. Hence to aspire to follow in the footsteps of a famous woman scientist or engineer is perfectly natural aim for a girl.
The Soviets see women as an economic asset to be effectively utilized and developed (Desai, 1975).

WOMEN OF THE WEST: THE AMERICAN CASE.

The nineteen sixties were a significant period in the lives of women in the U.S.A. There was a manpower shortage in the field of science and technology in the post-sputnik era, coinciding with the second wave of women's liberation. This was followed by the setting up of the committee on the Status of Women, by President John F. Kennedy, with the objective of their role in the fields of science and technology and also in higher jobs. It was noticed that for earth science, chemical, metallurgical, mining and civil engineering there were fewer women in 1960 than in 1950.

A national seminar was organised by the Massachusetts Institute of Technology to study the personal, social and economic factors involved in a woman's professional career. Prof. Bruno Bethleheim, a psychoanalyst, in his speech remarks: "Women want to be good engineers and scientists but they first and foremost want to be "womanly companions" of men and to be mothers". Women are expected to expend only the energy left over from their family commitments. This means low key jobs like engineering aide, technicians etc. but not with responsible careers as scientists, engineers...
and technologist. This involved fundamental changes in the rearing of boys and girls. The discontinuities in the career of women are greater due to child bearing and rearing. The loss of 5 to 7 years create problems in technology as the rate of obsolescence of knowledge is much greater in technology (Daniels, 1982).

Drop out rate before achieving bachelor's degree is greater for women and at master's level, the sexual selectivity is almost drastic. In fellowship programmes the attrition rates of women are twice, those of men (Lantz, 1982).

B) TECHNICIAN EDUCATION.

Except for India and Pakistan, nowhere do separate facilities for technician education for women exist. Hence their problems are same as that of their counterparts. Some of them are listed below.

Identification of Technicians.

There is considerable difficulty in defining who or what a technician is. The issue therefore is how should each country identify the technician and what criteria or indicators should it evolve to determine the technician as an occupational group in different sectors of its national economy?
Technician Institution Management.

Technical institutions are called differently in different countries, like polytechnic, institutes of technology, technical institutes, technical colleges and so on. The number of institutions in each country depend upon the country's population, size, state of economic, technological development and other factors. The institutions must interact with industry, society, government and environment, influencing the environment and responding to changes in the environment. In addition, there is the question of academic management which involves educational innovations, responsiveness to social, economic and technological changes through curriculum reform for stepping into tomorrow's technology with confidence.

Entrepreneurship and Self-employment.

The success of the system may be measured by the employment indicators of its students. In many countries, the rate at which technical education systems are expanding outstrip employment opportunities in the organised sectors of the national economy. In other words, an imbalance between the demand for and supply of technical manpower exists. This leads to another dimension called "Educated unemployment".
A solution to this is that the educational system should promote entrepreneurship, so that the graduates may set up small scale industrial units of their own and provide employment both for themselves and for others. A question which arises as to whether development of entrepreneurship should be regarded merely as an expedient to deal with the problem of educated unemployed, or as an important objective of all systems of technical education so that a new and rewarding way of life may be found by technically qualified persons.

Handicaps for Women Technicians.

There is a lack of occupational mobility in women due to social factors - reluctance to go to rural areas, employers reluctance to employ married women are some of factors leading to further reduction of woman technicians (Desai, 1977).

INDIAN EFFORT GENERAL:

Women took up careers in engineering technology only in 1943. The earlier widespread belief that girls have less aptitude and even intelligence than boys for the pursuit of higher studies, particularly in subjects like mathematics, science, engineering has been disproved by them in professional courses. The 1971 census revealed
that the enrollment of women in engineering/technology was only 19 (.16 per cent) in 1930-61, which increased to 403 (.89 per cent) in 1960-61, while in 1970-71 it rose to 910 (1 per cent). The number of women degree holders in engineering and technology were 3500 (1.4 per cent) in 1971, while only .2 per cent women were found to have the technical diplomas. Women teachers in technical colleges were only 92 (1.2 per cent) in 1971 (Singh, 1977).

SOCIAL ATTITUDE

The U.G.C. appointed a working group to study the recommendations of the G.O.I. committee on the status of women in India so far as they relate to higher education in general and professional education in particular. The Committee noted that the important factor that was responsible for the backwardness of women's education in the country is the prevailing social attitudes towards the education of women. An examination of the contents of the textbooks and other reaching material used would show a neglect of the needs and problems of the lives of girls and women. A surprisingly hostile attitude is also discernible among some people who do not want girls to go in for higher education even if they are intelligent. There is wide disparity in this field as between rural and urban areas. Even among the affluent, some oppose women's
education for traditional reasons while others welcome it as an accomplishment and a symbol of modernisation. The need for women's education has the highest acceptance among the middle classes. For the majority of people who live below subsistence level, poverty is the predominant factor governing the attitude to girls' education. Cities and regions with a higher proportion of Muslims and scheduled castes or Tribes account for a very low level of educational development among women, while those with a relatively high percentage of Christians account for rapid advancement. All these indicate the influence of a large number of sociological factors for the promotion of their education and any plan for the educational development of women has, therefore, to take into account these imbalances and variations in regional or sectional attitudes that contribute to the increase of inequalities between different sections of the population arising out of varied and different attitudes to this question. Only then, equality of educational opportunities can be brought within the access of the majority of women in this country.

There still exists a great deal of prejudice amongst the educated persons, as to what a girl student should learn and even play. If we are to create a society of equal partners, such prejudices must be rooted out and all courses must be open to everyone. While it is very well to think
that women are suited for certain specialised jobs such as teaching, nursing and software programmes, it is not desirable to deny them other openings such as engineering, science and management, as this is a science-based society and an increase in the number of informed persons in these fields is essential for national progress (Desai, 1977).

SOCIAL COMPOSITION.

The SNDT Women's University conducted a survey on the social composition of women students in higher education. Some of the findings are reproduced here.

As regards caste composition, it was found that a majority of students belonged to the upper caste (47 per cent), however, the proportion of the intermediary castes was nearly the same, i.e. 41 per cent. Among the graduates it was found that more than half belonged to the income group of Rs. 600/- and above and most of the parents were in service or in business.

Remarking on the social composition of women students, Kamat said, "A large majority of this privileged minority studying in institutions of higher education belong to the top layers of the social pyramid in terms of status, affluence and all the good things of life; and they expect to remain there by virtue of the acquisition of higher education".
PROBLEMS OF VOCATIONAL EDUCATION.

The National Committee on Women's education (1959) has pointed out the existing difficulties in vocational training for girls. "Vocational education for girls and women to equip them for taking up specific occupations is a relatively new concept in our country. It is a matter of comparatively recent development even in the West. Difficulties arise because the existing system of general education has been carried on for generations with little regard to the needs of industry and commerce. The main object so far has been to secure literary education. Complexities exist because of the lack of coordination between training facilities and requirements of the country. The training facilities for vocational education are also inadequate and as such the number of girls and women taking up vocational education is extremely small and compares poorly with that of boys and men."

The Committee on the Status of Women recommended the:

(a) "development of employment information and guidance services for women entering education, since many of them suffer from lack of information regarding job opportunities and regret their choice of subjects when faced by difficulties in obtaining employment, and
(b) adoption of co-education as the general policy, discouraging the opening of new institutions exclusively for girls.

The committee's reasons for the second recommendation are listed below:

(1) While there is no doubt that some of the women's institutions have displayed considerable dynamism in their overall development and progress, a common tendency noticed in many women's institutions is of the faculty to lapse into routine teaching, neglecting the need for professional improvement. Teachers, both men and women, in coeducational institutions are relatively more keen on professional improvement.

(2) Though women's institutions generally provide better opportunities for extra-curricular activities than provided by co-educational institutions to their girls students, it is also a fact that the atmosphere in girls colleges is often more authoritarian and protective and leaves an average student ill-equipped to meet the challenges of an adult life.

(3) Types of behaviour generally clubbed under the term "overt-teasing" are mostly practised near women's institution.

Hence the concept of girls' wings in boys polytechnics had come into existence in early seventies.
DIFFUSION OF TECHNICAL EDUCATION.

In the year 1963, the Northern and Southern Regional Committees of the All India Council for Technical Education reviewed the progress of women's polytechnics. Some of the findings were as follows:

"Electronics, library science, commercial practice, architectural assistantship, interior decoration and display were found to be the most popular courses amongst girls. The percentage utilisation of seats was found to be 64 per cent only. Out of total enrolled students, 33% left the institute after marriage. Age was, therefore, a significant factor for women students. It was noticed that low income girls were more serious about their studies and taking up jobs. Convent educated girls had a distinct advantage over others for secretarial jobs, far apart from formal education, they have good personality, proper grooming, good knowledge of English, fluency of speech etc. (Singh 1977).

CASE OF GUJARAT.

IMPRESSIONS.

It will be interesting to know how far technical education for girls in Gujarat has grown and how successful students have become productive members of the society by
finding gainful occupation. Other related aspects of girls education regarding the extent of wastage, stagnation are also important.

The Directorate of Technical Education's 1973 figure indicate average utilisation of seats as 73% in women's polytechnics in Gujarat; the percentage utilisation of seats provided for different courses in order of priority were as shown below.

- Commercial practice: 111.11%
- Architectural assistanship: 57.95%
- Costume design & Dress making: 53.33%
- Commercial art: 36.67%

The figures revealed that 57% of the girl trainees had completed the courses, 43% was the stagnation or wastage figures, out of which 27% was at first year level itself. Female students seeking admission in polytechnics on an average had 45% or more, but below 63% marks at the S.S.C.E. They came from middle class families engaged in public and private service (63 per cent) and the business (23%) class. Only 5% mill labourers and 5% cultivators took advantage of these institutions. The female students normally come from low or middle income groups. It was found that 60% of the students guardians had an annual income of less than Rs.3600, while 24% fell in the income range of Rs.3000-6000.
As for the employment potential, those with diplomas in electronics and radio engineering topped the list, followed by commercial practice and architectural assistantship. It was found that 43 per cent of successful diploma holders were unemployed. The main reasons reported, in order of merit, were being financially better off, waiting for marriage, having young children, unfavourable family circumstances and desiring to go to U.S.A. Roughly 20 per cent of the unemployed diploma holders were intermittently employed, but left the jobs due to inadequate salary, unsuitable job, leave vacancies etc. Students were not found to be keen in taking advantage of employment exchanges; only 60 per cent had registered their names with the employment exchange (Mehta, 1973).

Technical education vitally affects the goals of education in general, hence efforts should be to formulate successful and foresighted policies which can promote accelerated research, industrial growth, national development and with other disciplines help in creating a variable social order.

DESIRE AND TRENDS.

Another study was carried out by B. Parikh of Gujarat University on the Ahmedabad Girls' polytechnic in 1978. Some of her findings are interesting and are mentioned below:
People from higher castes dominated polytechnic education, inspite of the common belief that low and middle caste people go in for polytechnic education. The same case existed for higher technical and general education for women. 74.14% of the students came from urban areas and 25.86% came from rural areas. There seems to be no child marriage system among the students. Marks obtained at S.S.C. level were found to be quite high. 71.55 per cent of the students secured between 60-70%, while 1.72 per cent got 80 per cent and 26.73 per cent got 50 per cent. It means that a majority of first class students were coming willingly to professional courses.

A majority of the students resided with their parents (93.1%). The rest were staying in hostels or with relatives. 81.03 per cent of the students were found to be staying in suburban areas while rest were staying in the walled city area. As far as the type of houses were concerned, 73.44 per cent were living in independent houses, while the rest were staying in flats and chalies. 46.35 per cent had their own houses. The family size of 35.33 per cent students was found to be small while 41.39 per cent was middle size category. This leads to the conclusion that students were coming from well off families.

The parents' education ranged from primary to high professional degrees. 40.52% of the students' parents
belonged to the service class - both private and Government - while others belonged to the business class. The income of 89% of the parents fell in the range of Rs. 500-2500 per month, which indicated that rich people were attracted more to these courses or it may be other way, only rich people could afford the expensive training programs. None of the students faced financial difficulties because they were getting sufficient money from their parents.

99.66 per cent of the students had some knowledge about the polytechnic before joining. Most of the students had adjusted with the course willingly (87.07 per cent). Students normally spent 3-4 hours for studies and 1-2 hours for hobbies. A majority felt that the courses were quite easy (39.48 per cent), while 40.52 per cent found them tough. 83.36% of the students were willing to go in for government jobs. The first choice was for commercial practice, than architecture assistancehip, while costume designing and dress making were rated last. This shows a reluctance for blue collar jobs.

The above study revealed that high caste, high placed, rich and well educated people in society were taking advantage of professional education.