

Historical Foundations and Trends and Issues of Technology Education

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Brief Information on the Author

Rafaqat Ali Akbar PhD was born in 1963, and is recently working as Professor of Education and Chairman Department of Elementary Education, Institute of Education and Research, University of the Punjab Lahore Pakistan. He studied science education at the College of Education for Science Lahore and University of the Punjab. He has teaching experience as Science Teacher in Elementary and Secondary Schools. He joined as a lecturer and science education in University 1992.

He is researching in the field of teacher education in Pakistan. His special focus of study is practice teaching/practicum. He has worked on practice teaching/ practicum in Pakistan, United Kingdom and USA. He had his post doctoral research experience from Bham U.K. He has produced several articles in the field of teacher education, teacher, teaching and instructional technology. He is teaching to Phd /Mphil/Ms students' courses of teacher education. Curriculum theory and practice and comparative education He has participated and presented papers in national and international education conferences. He chaired different sessions, act as a keynote speaker and moderator in the educational conferences..He is founder organizer of Post graduate Students Conferences at institute of Education and Research, Lahore Pakistan. He has also worked as the resource person in workshop on educational research, training of teachers, teacher educators and educational managers. He is working as member of different bodies of the university of the Punjab, and other universities in Pakistan i.e, Board of studies in education Doctoral Program committee, Faculty Board Academic Council and Board of Advance Study and Research, Faculty council. He has also worked as member Editorial Board /Advisory Board of different educational research journals and magazines He is chief editor of Journal of elementary education, Journal of early childhood education and is managing editor Bulletin of Education and Research. He is also working as reviewer for different research journals .He is also working as examiner, head examiner and paper setter for under graduates, graduate and post graduate examination in different universities of Pakistan. He is also evaluator of M.Phil and PhD dissertation of different universities in Pakistan. He is enthusiastic and committed to work in collaborative research groups at regional and world level. He is interested in researching education in international/comparative perspective.



Learning Objectives

After going through this module you will be able to:

- know about importance of Historical Foundation of Technology Education.
- know about background of development of Technology Education in Pakistan
- Understand historical phases of development of technology education in Pakistan.
- Review Policy provision about technology education in different Educational Policies in Pakistan.
- Compare between Policy provision about technology education stated in different Educational Policies in Pakistan.
- Know about importance of Trends and Issues in Technology Education.
- know about different trends and Issues in Technology Education in Pakistan
- Identify the trends and issues prevailing in the education system of Pakistan with respect to technical and vocational education in Pakistan.
- Review trends and issues in technology education to suggest measures for effective technology education in Pakistan.

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Glossary

Apprenticeship	Apprenticeship is a process of face to face teaching a skill or trade that is in demand by a skilled person to the novice learner.
Historical Foundation	The study of historical events regard to a specific field or area of mankind contributions towards society to uncover past developments and human endeavour to get insight for future.
History	History is considered as a systematic study and record of past event of mankind. It explains the development and evolution of humanity in chronological order.
Issue	Issues are perceived as something that people are talking about, thinking about: an important subject or topic and is a point for debate and discussion.
Skill	Acquisition or attainment of an ability that required training. It is a psychomotor ability used to perform an activity.
Technology	The organization of knowledge for practical purpose. The application of scientific knowledge in a specific area to solve problems. The practical application of science in industry to invent useful things.
Technical Education	The type of education imparted to students to develop their knowledge and skills to be used in a specific technology. Education relating to technique or proficiency in a practical skill.
Trend	Trend is a general direction in which something moves. It is an inclination of people in a particular direction for adopting of way or strategy to perform any task.
TVET	Technical and Vocational Education and Training
TVETA	Technical and Vocational Education and Training Authority
Vocational skills	Vocational skills are practical, occupation-oriented skills that are needed in professional contexts, e.g. carpentry, artwork (clay and plaster), coloring, painting, gardening, wool knitting, bead-work, embroidery, etc.
Vocationalization	Vocationalization means the introduction of more practical parts for learning that offers the learners an opportunity for field work and provide vocational guidance in an applied way resultantly providing vocational skills to the learners, which lead them to find job in relevant fields.

Preface

In this module you will find a material about development of technology education in Pakistan. The material is presented in chronological order from background of Technology Education to developments in 21st century. The text gives you an insight about historical development of technology education in Pakistan. It reflects on Govt. Policies about technology education which will give you an opportunity to review the education policy and make comparison of policies of different government. This module leads you towards activities and tasks requiring strengthening your knowledge regarding history of technology education in Pakistan.

Let us have a look to current analyses of the technical education and also a look to the future.

We start with a vision for the existing technical education in Pakistan from government policy point of view. After this we will get some ideas about existing technical education structure and status in Punjab. You will be able to rethink about policy of technical education in Pakistan and will look at future needs of technical education.

1. Introduction

The word 'history' is derived from the Greek word *historia* means inquiry or research. History is considered as a systematic study and record of past event of mankind. It explains the development and evolution of humanity in chronological order. History is a continuous dialogue between present and past. It is considered a tool of learning and acquisition of insight from past record and has got status of discipline and area of study. History helps one to draw conclusion from the past events. It sheds the light of the past upon the present and serves as an indicator to plan for future. It gives the lesson to avoid the dangers of present. It is a bridge connecting the past with the present and pointing the road to the future.

The historical foundation is study of the historical events regard to a specific field / area of mankind contributions towards development of society. It helps to uncover past developments and human endeavour to get insight for future. Foundation is the bases on which something is grounded and foundation of technical education is fundamental knowledge on which technical education is founded. While historical foundation of technical education narrates story of its development, its phase and context.

The rapid technological developments have led to radical changes in the world of work. The new technologies are rapidly replacing the old one. It is history of technology and technical education which provide bases for new development in the technology. Thus historical foundation of technology education provides knowledge of past development of technology, contribution of government, Institutions and individuals.

The paradigm shift from semi-skilled economies to the knowledge-based economies has put greater focus on Technical and Vocational Education and Training (TVET) since this education directly relates to the world of work thus it is imperative to acquaint prospective technical education teacher with past history of technology development and technical education.

2. The Historical Foundations of Technical Education

The aim of this module is to develop an understanding of the history of technical education from the time of the subcontinent to the current education system in Pakistan. The module unfolds the works of individuals and organizations those provided education in subcontinent of India. It examines the methods and sources people used to develop individuals through education. It explains the government steadfastness in developing technical and vocational education in Pakistan. All the material is presented in chronological order which reflect on different phases of such development. It is considered that political will is the pivotal of all systems operative in a society. Thus this module helps the students in understanding the context and different governments' aspiration to develop technical education. The students will get help to find out deficiencies, shortcoming and limitations of government about policy of technical education. It reflects the gaps between stated policy and its implementation. The module assists Student Teachers in thinking critically about their own and others' assumptions and assertions about past technical education.

3. Pre-Pakistan Period

The Education in the subcontinent has a strong tradition and rich history. It is believed that in the ancient days, the education was imparted orally by the sage and the scholars and the information was passed on from one generation to the other. After the development of letters, it took the form of writing using the leaves and the barks of trees. Later on residential schools of learning were opened typically in the teacher's house or a monastery and were called Gurukuls. This system is referred as the oldest in India.

At the Gurukuls, the teacher imparted knowledge on various aspects of the religion, the scriptures, the philosophy, the literature, the warfare, the statecraft, the medicine astrology and the history.

As the civilization got evolution the formal institutions like universities were established by the scholars, wealthy people and Rajas of the state. The important subjects were mainly the art, the architecture, the painting, the logic, the grammar, the philosophy, the astronomy, the literature, the Buddhism, the Hinduism, the law, and the medicine. Each university specialized in a particular field of study. After the Muslim invasion anew tradition of education was introduced in India. Muslims rulers were fond of architect and a new wave of construction of buildings like mosques, forts, gardens, haveelies, roads was initiated which require designer, draftsman, builder, engineer, carpenter, painter etc. They also promoted industry based on agriculture, foundry where metal castings were produced, pottery, ceramics, and stoneware etc. All these require skilled worker. The people interested in specific field got training of skills from a expert of the field. The model of teaching and learning was *apprenticeship* students' work with an expert to develop skills of a trade. A strong tradition of transferring of family trade skills from father or elder of family to offspring did exist.

The present system of education was introduced and founded by the British in the 20th century, by the recommendations of Macaulay. It has western style and content. The British Government develops technical institution in different parts of country to meet the requirement of skilled workers, supervisory staff to meet civil, electrical, and mechanical works and industrial needs. They also established Army technical schools for training of local people in various trades to meet army needs.

In July 1941, the Association of principals of Technical Institutions (India), was formed on the model of APTI (England) with the object of formulating a national policy in technical education and establishing all India standards for courses in the major branches in instruction. In 1946, on the recommendation of the Central Advisory Board of Education, an All-India Council for Technical Education was set up. This body contains representatives of the various departments of the Govt. of India, Provincial Govt. States the Central Legislature and of Business Industry and Labour representative. The immediate task of the Council was (a) to survey the entire field of technical education, (b) to consider immediate projects submitted to or initiated by the Govt. of India for development in this field and (c) to promote inter Provincial cooperation in all India schemes of technical education. The Higher Technological Education committee was also set up to advice on the provision of facilities for technical education in India on the lines of the Massachusetts Institute of Technology. This committee also envisaged the establishment of four regional Higher Technical Institutions.

4. Period from 1947-1957

Pakistan came into existence in August 1947 as a result of partition; only three Higher Technical Institutions have fallen within Pakistan. Only few of first rate technical, commercial and art institutions were in the Dominion of Pakistan. These institutes were; Punjab College of Engineering and Technology, Moghalpura. Ahsanullah School of Engineering, Dacca, Craik Technical Institute, Lahore. These institutions were hardly enough to cater for the industrial and military requirement of Pakistan for technical personnel of all kinds. The needs of the trade, industry and other services of Govt. such as communications, transport, etc. required an increasing technically trained manpower.

Keeping in view importance of education government decided to hold educational conference at Karachi from 27th November to 1st December 1947. The founder of Pakistan Quaid-i-Azam Muhammad Ali Jinnah's message to the participants of conference reveals importance of technical education for a new born state. He said there is immediate and urgent need for giving scientific and technical education to our people in order to build up our future economic life. Living as we do in an age dominated by science with its ever-increasing tempo of technological development we cannot afford to neglect the problem of technical education.

The partition of India has in this respect deprived us of facilities for technical training at many a first rate technical institution. It is, therefore a matter of supreme concern to us that we should lose no time in strengthening and enlarging the scope of the few technical institutions that remain with us and in establishing, if necessary as many as may be required by our own needs. It is unavoidable that in the initial stages we should seek facilities for advanced technical education in foreign countries.

The agenda of educational conference by government in December 1947 reflects focus on technical education by the government. The government sense that all progressive nations have made and are making rapid strides in industrialization and are accordingly developing programmes of technical education. The agenda was set to consider the desirability of establishing a Council of Technical Education immediately in order to survey the field of technical education in Pakistan and to make suggestions for its improvement and finding the venues of overseas scholarships scheme for the training of Technical Personnel. Later on Council of Technical Education was established in 1948. To meet the agenda items requirement a sub committee on technical education was constituted to make proposals on surveying the existing facilities for technical Education and establishing a Council of Technical Education for Pakistan.

The committee recommended for the set up Council of Technical Education for Pakistan and establishing two Technical Institutions in Eastern and Western Pakistan, one for each. The committee also suggested to survey the existing facilities for technical education in Pakistan, especially in the higher stages and suggest ways and means of making up the deficiencies in as short a time as possible. To draw up a five year scheme for the training of scholars at home and abroad in technical subjects and suggest ways and means of implementing that scheme and preperaaation of a comprehensive scheme for the re-organization and development of technical education on modern lines in all its aspects suited to the economic needs of the country.

5. Period from 1957-1971

During first decade of its existence Pakistan was struggling for its economic, political, educational and techonological advancement. Tehenical education was facing a severe problem of producing technicians rather than professionals in the creative sense of the word. Technical education at the moment was receiving great emphasis in developed countries and there was a need to profit from experience of those countries. There was a need to develop the skills of manpower to achieve national self sufficiency and lift of standards of living of people. There was a need to enhance the use of the hands to develop in people a sense of the dignity of manual power skills at all levels to achieve national progress, self-sufficiency, and welfare. These goals may be achieved with widespread knowledge of simple mechanical tasks of daily life and improving state of technical education in the country.

Pakistan education system has fundamental focus on general education with two streams of Arts and Science education. The education system has less contribution towards economic development and sustainability. Therefore it was essential to re-orient of educational programmes in the light of the economic needs of the society particularly by shifting the emphasis to scientific, technical and vocational education. The Government of Pakistan constituted a commission on education in 1959 for recommendations on improving education in the country. The commission analysed the existing education system of the country and suggest measures and means for the improvement of the system. Keeping in view the importance of technical education commission special reflects on it.

As a result it was decided to put emphasis on the technical and vocational education at each level. It was particularly focused on the vast numbers of students terminating their formal education at the elementary level were equipped with necessary skills and attitudes to employ in the economy of the community and contribute towards its development.

Keeping in view the societal need of technical literacy and skilled workforce, the range of skills was classified into four categories:

- 1) the lowest level, the unskilled workers;
- 2) trained operator in factory, semi-skilled workers;
- 3) technicians constitutes the supervisory personnel in industry,skilledworkers;
- 4) creative engineer and executives, skilled and having advance knowledge of technologies.

Thus it was important that education system must be designed to produce all four categories. The unskilled workers by and large were coming from the elementary stage of schooling. The engineer and executive were trained in professional colleges. Education of the skilled operator and technician was most neglected in Pakistani schools. There was a need to develop an adequate training program for these categories of workers that require radical innovations in school program. Students might be oriented with handwork and practical activities compulsory in the school course at the primary and secondary levels and enriching school curriculum by introducing with a variety of optional practical courses in technical, agricultural, commercial, and home economics subjects.

On the recommendations of the commission vocational schools were established and at class VI-VIII technical courses were introduced. The duration of the course in vocational schools varied from two to three years. It was decided that students will be enrolled 50% in general education and 50% in craft and trade instruction. The aim of the program was to prepare pupils either to enter industry as partially trained employees or to enable them to take up apprenticeship courses to perfect their skills. The commission also proposed training of the skilled technician after Class X. To serve the purpose of opening of the new polytechnics institutes there was need of provision for vocational training in day or evening courses in a wide range of trade, technical and commercial subjects at polytechnics

institutes of Dacca, Karachi, and Rawalpindi. While after class XII, qualified students had the opportunity to enter a range of professional colleges and university courses for higher studies in technical education. In addition to provisions for full time technical and vocational training a wide range of training possibilities were decided to provide in the form of apprenticeship courses for practical and manual skills in primary, middle, and general secondary schools.

5.1 Vocational Schools

A large number of pupils in Classes IX and X of the general secondary schools were too young to enter employment and no suitable alternative education is available to them. These pupils may be provided suitable alternative course to provide them with workshop and practical training combined with continued general education. Therefore it was proposed that a system of vocational schools should be established aiming to train pupils to enter industry directly or take up an apprenticeship in industry with an evidence of skill and aptitude in craft studies. The courses provided in these schools should last from two to three years, depending upon the trade studied. Suitable subjects for inclusion in these courses would be fitting machining, automobile mechanics and diesel mechanics work, pattern making, foundry work, welding, electrical installation and automobile electricians work, cabinet making carpenter and joiners work, bricklaying and masons, work, concrete construction shuttering, etc. 50% of the time should be spent on the practical work and the remaining 50% on general education. This general education would include craft, calculations, geometry, and science, technical and trade drawing, basic craft technology language, physical training, and games to absorb into the industrial and commercial life of the country. The existing industrial and trade schools are lacking, suitable educational facilities, lack proper buildings and equipment and study programme. These deficiencies may be mended and their teaching staff was brought up to the necessary strength and standards.

Standard workshops designed and built with special arrangements to make for training of skilled mechanics as teachers. Teachers of general subjects in these schools were given short re-orientation courses to enable them to integrate their teaching with the craft instruction. The courses to be provided for pupils with the required interest and aptitude after completion Class X and were interested to continue their education in vocational courses, to train skilled industrial and commercial staff capable of becoming foremen, supervisors, and technicians were eligible to get admission in Polytechnics or Technical Institutes. The product of these institutions should be equipped to possess: (a) skill in certain industrial processes; (b) an understanding of the principles underlying these processes and this skill (c) an experience in handling the industrial worker in a competitive field where efficiency is essential.

The curriculum of general education in schools was diversified by including practical courses in technical subjects, agriculture, commerce and home economics. At the same time curriculum of technical and vocational schools was included courses in social studies

and humanities. All students pursued a common course through the middle stage, after which the first diversion of students from general to vocational and technical schools should take place. The second diversion should take place after Class X when the students may join polytechnics and technical institutions.

A network of vocational schools were established throughout the country, with the aim of training students who have manual skill and show an aptitude for craft work, for apprenticeship schemes in industry. The duration of the courses in vocational schools was two or three years. Existing trade and industrial schools should be remodeled on the patterns of vocational schools and be properly staffed, equipped and supervised.

5.2 Polytechnic or Technical Institutes

Pupils were admitted to the Polytechnic or Technical Institutes after having passed the present matriculation examination with passes in mathematics, science (physics and chemistry) and drawing. Normally, the duration of the course was three years, at the end of which a diploma was awarded to the qualifier of the course. In addition to a three year course, it was decided to offer a course of two years duration in certain trades and for those workers who are already partially trained or who have some years of industrial experience and wish to extend their knowledge. Courses under taken in these institutes include: mechanical technology; power technology; civil technology; electrical technology; radio and electronics technology; automotive technology.

The objective of these institutions is to train technicians of the supervisory cadre who should possess:

- (a) Skill in certain industrial process;
- (b) An understanding of the principles underlying these processes and the skills involved in them; and
- (c) Training in the handling of industrial workers.

A number of institutions in East and West Pakistan were offering certificate or diploma courses extending over two to four year those are intended to produce supervisory staff mainly in the field of civil and mechanical engineering. There was very little co-ordination among these courses and institutions due to the absence of a proper planning authority. It was of the highest importance that these institutions be brought under unified control as this would enable Government to articulate a clear line of policy for training program at the diploma level. Because diploma level was point of entry into the supervisory jobs as well as higher education of Engineering and Technology. In addition most of these institutions were poorly housed and equipped and the instructional staffs were untrained in teaching methods. Costs in most cases were very high in relation to the quality of the finished products. Once all such institutions were brought under unified control that made possible to operate an effective programme of vocational and technical education.

The commission report also focused on the courses was offered at technical and vocational institutions were restricted in range and scope and it was necessary to add new courses to meet modern requirements. Thus they put special emphasis on the utilization of local resources and on the development of processes appropriate to local conditions. It was proposed that additional diploma and certificate courses in the following fields be offered:

- a. Instrument making and repair
- b. Watch and clock repair.
- c. Radio maintenance and repair.
- d. Refrigerator maintenance and repair.
- e. Tool making
- f. Typewriter mechanics work.
- g. Boiler makers work.
- h. Plumbing and pipe fitting
- i. Coach building
- j. Motor body building
- k. Electrical installations
- l. Furniture and cabinet making
- m. Industrial design and Commercial Art
- n. Gas technology and supply
- o. Paper technology
- p. Boatbuilding and small craft design
- q. Leather technology
- r. Glass and ceramics technology, including technology of scientific glassware.
- s. Food technology, including catering and canteen management.
- t. Printing trades technology.
- u. Building trades technology (Masonry and brickwork, slating and tiling, concrete construction including formwork and shuttering)
- v. X-Ray Technicians work
- w. Ore dressing and mineralogy.
- x. Musical instrument construction
- y. Agricultural science and animal husbandry

The specialties listed above were in addition to the courses which were already being offered at the polytechnics.

5.3 Monotechnics

In some cases Technical Institutes have been developed to meet the requirements to specific trades such as textiles, leather, ceramics, etc., and were known as monotechnics. These were specialised institutes to produce specialist to cater needs of a specific field of technology. It was suggested to establish such institutions to train for the following trades:

- a. Printing and the graphic arts.
- b. Furniture trades to promote the use of plywood and machine construction methods.
- c. The building trades to include experimentation with local materials.
- d. Navigation, including coastal navigation and principles of small craft construction and marine engine maintenance and repair.

Scheme of Study

Courses in industrial relations, management and allied studies were emphasizing in the polytechnic diploma courses and were incorporated at an appropriate level in all technical institutions. It was decided to offer courses i.e. costing and budget control, business economics, industrial relations and psychology factory organization and management, foremanship studies, methods of training within industry, and similar courses as an integral part of all diploma studies to make graduates available to management for assisting managerial and professional staff to become more efficient.

5.4 Supervisors Certificates

Supervisors certificates were issued on completion of Institute courses and before any experience of industry has been gained. This arrangement was not seemed satisfactory for the efficient industrial management because such certificate holders were the theorists without practical knowledge. It was recommended to award the supervisors' certificate to a person who satisfies the following conditions:

- a. Successful completion of technicians Diploma Course at a polytechnic or technical institute.
- b. Two years subsequent experience in an industrial workshop.
- c. A post diploma course (full time, part-time or evening in industrial relations, industrial psychology and Training-within Industry (TWI)

5.5 Evening and Part-time Classes

Evening and part-time courses were particularly suited to the requirements of vocational education and it was recommended that all poly-techniques, technical and other institutions offer such courses as a regular feature of their programs. The industry would develop interest in the institutions at which its employees were receiving further training, and resolutely institutions manifested itself in endowments, scholarships and prizes for successful work. These part-time classes were started on a self supporting basis. The range of courses was extended to meet the special requirements of local industry, and highly skilled personnel were recruited for evening and part time instruction from local industrial undertakings. Special attention was given to the needs of the local and small employer in organizing such courses.

5.6 Management, Industry and Apprenticeship Training

Training given on the job or in apprenticeship schemes accounted for a large part of technical training in advanced countries. The highly specialized and costly tools and machines were available for industrial processes and techniques required careful handling and maintenance if they were stayed in use. It was essential to provide systematic training for operatives who can keep machines running and for mechanics and skilled workers who can put them right when they go wrong. It was considered primarily a function of industry, whose cardinal responsibility was to pay for the training of its own employees. In the interest its efficiency all training and apprenticeship schemes were approved by the appropriate authorities to ensure those conditions of employment and the educational content of the courses were satisfactory.

5.7 Mobile Workshop

Where there was an insufficient demand for a local centre, consideration was given to the provision of mobile workshop vans which can stop in localities for short periods to train local personnel. In other cases it may be founded advisable to give the necessary training in evening or vacation courses in existing technical institutes, polytechnics and schools equipped with workshops.

5.8 On the Job Training

Data regarding training needs of small scale industry was less available. While training of small scale industry workers was necessary to bring small scale industry up to modern requirements and to secure the necessary data on training needs.

It was self-evident that know-how improves productivity, and it was, therefore, necessary for government to ensure the availability of polytechnics, technical institutes, and training centres, to supplement on the job training. It was only reasonable to expect that the costs involved in using these institutions for such training should be borne substantially by

industry. Where firms conduct their own training schemes with the approval of the appropriate authorities, the full cost of such training, including capital cost, spread over a sufficiently long period was accounted as costs of production.

5.9 Directorate of Technical Education

Technical Education was well recognized to be an educational process and forms an integral part of education system round the world. The need was felt to co-ordinate the technical education with main stream educational system. It was recommended the establishment of a Directorate of Technical Education as an integral part of the Education Department in each province. In pursuance of this recommendation the government established a Directorate of Technical Education in East and West Pakistan. All technical institutions other than those administered by the universities were attached to the unified control of the Directorate of Technical Education.

Likewise, the Ministry of Education established a section with the requisite specialized staff to direct the programme of technical and vocational education on sound lines. The section was headed by an officer, with a higher status than that of the Directors of Technical Education in the provinces. He was a person of high academic qualifications, broad vision and suited to give leadership in important field of technical and vocational education.

5.10 Council for Technical Education

A Council for Technical Education was established with branches in each province consisting of educationists and representatives of industry, agriculture, commerce, of the armed forces, technical institutes, and professional bodies. The council of technical education was responsible to coordinate all efforts in the field of technical education, to improve academic and technical standards of instruction and examination, to act as a liaison between the industry and the Education Department, and to advise and guide the department on all matters of technical education.

The Council would act in an advisory capacity to government in order to:

- a. Co-ordinate efforts in the field of technical education;
- b. Collect information on the requirements of industry and commerce, Government Departments and the Defence Services for personnel requiring education and training in engineering and technical institutions;
- c. Improve academic and technical standards by drawing up syllabuses of instruction and unifying examination requirements;
- d. Make the requirements of industry, science, and technology known to the Education Departments;

- e. Bring advice and guidance of experts in industry and commerce to the Education Departments.
- f. to assess the requirements of trained personnel and to advise the appropriate education authorities on the organization of courses in technical institutions.

5.11 Vocational Guidance

Children, who were leaving school, particularly if their parents were poor and there was consequent economic pressure to enter employment quickly, often enter jobs unsuited to their abilities, aptitudes, and interest. This issue was addressed by placing young persons in more suitable employment by the use of the techniques of vocational guidance.

Vocational guidance programme ensured that a pupil was guided and provided counseling into the educational course which best suited his talents and interest and later into the job which most appropriately fitted his training.

It was recommended that Ministry of Education appoint a Vocational Guidance Officer at the Center and the Directorates of Technical Education in the provinces whose responsibility was to maintain close contacts with industry, commerce, and the schools so that he/she might be fully informed about employment opportunities, the prospects they offer and the facilities available for further education which may lead a willing pupil to success in his chosen vocation.

A member of the staff of every school giving craft and practical instruction was appointed as careers master. He was responsible for having thoroughly familiarity with the background and family history of his pupils and their special aptitudes and maintenance of such record. He was also responsible to visit local employers and industrialists in order to gain first hand experience of working conditions, prospects and remuneration and to keep this record.

5.12 Preparation of Manuals

The Ministry of Education, in cooperation with the Directorate of technical education and in close consultation with the industry, the professional organizations, and government departments, prepared handbooks of careers listing the main avenues to progressive employment, with full details of salaries and wages to be expected, prospects of promotion and facilities for further studies on a full time, part time or evening basis. These manuals were made as exhaustive as possible and were re-prepared yearly with up-to-date information and its copies were available in every school and in every community.

5.13 Boards of Technical Examinations

There were wide differences in practice and values attached to the certificates and diplomas issued to students by different institutions after completing the courses. This diversity in certificates and diplomas was generating a problem for employers and employees. It was important to rectify this diversity of certification. Need of a single examining body for examination of different certificate and diploma programmes was felt.

To resolve this issue Boards of Technical Examinations were set up by the appropriate administrative authorities in East and West Pakistan. These examining bodies were given responsibility of maintaining very close contact with industry and constitution of panels of experts in the fields of engineering, textiles, agriculture, building, leather, ceramics, typography, furniture, radio, and electronics etc. for the conduct of examination of theory and practical subjects of different courses in technical and vocational education.

5.14 Training Programmes for Technical Teachers

The success of technical education and training depends to a very great extent upon the quality of the teacher. At that time there was no institution to impart training in methods and instructional techniques to those teachers giving technical instruction in schools and institutes. Therefore it was imperative to develop training courses for the following categories of teachers and instructors:

- a. Teachers of handicrafts for Classes VI-VIII.
- b. Technical instructors for vocational schools.
- c. Technical teachers for secondary schools (Class IX and up-wards).
- d. Technical instructors for polytechnics and technical institutions.
- e. Supervisors for industrial supervision.
- f. Teachers of science, mathematics, mechanics, and technical drawing working in vocational schools, secondary schools with workshop class's polytechnics and technical institutes.

Unfortunately it has been found from experience that the holder of an academic degree in science is out of touch with the requirements of practical mathematics, applied mechanics, and engineering science. Such teachers therefore had the need of short extension courses to re-orientate and re-fresh their teaching and content to bring it into practical application in the field of technology.

5.15 Curriculum for Teacher's Training

The commission gave guidelines for curriculum of training of technical teachers of different levels.

Teachers of Handicrafts:

Qualification for prospective teachers of handicrafts for Classes VI-VIII was proposed the minimum educational standard of matriculation with passes in mathematics science and drawing. In addition to that they had a training in handicrafts for schools for a period of two years. This two-year course should cover (a) the elements of wood work, metal work and simple electricity incorporating the use of the common hand-tools and either, (b) arts and crafts, or (c) agriculture crafts. Particular emphasis was laid upon the techniques of instruction in the practical shop, care and maintenance of tools and equipment, and methods of recording and assessing practical work. Special focus was given during the training course, to develop skills among the prospective handicrafts teachers of instruction in language, civics and social studies, basic craft science, craft calculations, and drawing.

Technical Instructors for Vocational Schools:

Prospective instructors for vocational school needed the minimum qualifications of matriculation (with mathematics, science, and drawing), a technical diploma from a polytechnic or a technical institute, and at least two years experience in an industrial workshop. Such instructors were skilled and experienced craftsmen with a fair degree of basic theoretical knowledge relating to their craft subject. Professional training in the methods of teaching and its subsidiaries was main requirements for teachers of this category. The course was therefore be of one year duration.

Technical Teacher for Secondary Schools:

Prospective candidates for training as teachers of technical subjects in secondary schools need the minimum educational requirements of intermediate with passes in mathematics and science and a pass in drawing at matriculation level would also be desirable. The training course was of three years duration and was included practical training in woodwork, metalwork, electricity and engineering drawing etc. Professional training was also focused including methods of instruction suited work-shops, care, use and maintenance of equipment, and recording and assessment of practical work. Practical mathematics, applied mechanics, and engineering science. This course put emphasis on pedagogy of technical subjects and was directly related to the practical content of the course.

Instructors for Polytechnics and Technical Institutes:

Just as in the case for technical instruction in vocational schools, the first requirement was that a candidate for training should possess a high degree of craft skill and some basic theoretical knowledge. He was therefore holder of matriculation and a diploma in technology from a polytechnic or technical institute and at least two years experience in an industrial workshop. In addition to that he had a training of one year covering technology, methods of instruction in the workshop suited to his speciality, assessment and recording of practical work done, and care and maintenance of workshop tools and equipment. The

course emphasised on the relationship of background studies to the technology studied practical mathematics, applied mechanics, engineering science, applied economics and design.

Apprentice-trainers or Supervisors:

Apprentice trainers or supervisors were experienced men already employed in industrial undertakings and having an understanding of the problems of the trainee. A short course of about two month duration in methods of TWI so that their critical and analytic powers are developed and their understanding of job breakdown for purposes of training is improved. They were also be given some details of the basic background studies of the young apprentice attending evening or part-time classes and the reasons why such training is given.

Teachers of Science, Mathematics:

Instruction of science, mathematics, mechanics, and technical drawing in technical institutions and schools was direly needed because these subjects offer logical explanations of the processes of technology. In other words, they are component parts of a technology which can only become completely intelligible with their aid. All teachers of these subjects in technical schools and institutions were therefore required short extension courses to give them an understanding of the application of these subjects to engineering, building construction, and technology generally. Courses of from two weeks to one month were therefore being arranged for this purpose.

The following steps were taken on the recommendations of commission to provide technical teacher training.

- a) Three permanent teacher training institutions were established in East and West Pakistan and the Centre to produce teachers of handicrafts (two year course) and technical teachers for secondary schools (three year course).
- b) The three polytechnics were given the responsibility to establish training courses for technical instructors (one year course).
- c) Short extension courses for apprentice trainers, teachers of mathematics, science, etc.
- d) Training courses on an emergency basis at existing technical institutions were started to meet immediate training demands in any of the above categories.

5.16 Salaries of Teachers of Technical Subjects

The implementation of a scheme of technical and vocational education required the creation of new categories of teachers, with good industrial experience to be attracted into teaching in face of competition from alternative sources of employment in the industrial

field. This raised the question of competitive salary scales. The Govt. was failed to attract the right kind of personnel those who possess technical skills, good general education, and personality, to teach technical subjects in technical institutes and schools because they had better earning in industrial environment. It was therefore, necessary to review the position carefully and to revise the salary scales with attendant benefits in such a manner as to attract suitably qualified personnel to this important field.

New Educational Policy 1969

New Educational Policy was presented in 1969 and it reflected on the existing situations of technical education in Pakistan at that time. The policy stated that although great emphasis had been laid on the development of technical and vocational Education both in the Second and the Third Five- Year Plans and the Commission on National Education had also emphasized the importance of investment in the sector of Vocational and Technical Education, but it had never been integrated into the over all pattern of education and has remained as a disjointed activity. The result was that the total enrolment in the Technical and Vocational Institutions in West Pakistan was about 8,000 and in East Pakistan about 3,500 in the year 1968 which did not meet the requirement of the country. The neglect of Technical and Vocational Education in the country has been colossal. Government decided to prepare proposals for a new educational policy those were presented in 1969.

Special emphasis was given to technical and vocational education. It was felt that labour productivity may be enhanced by facilitating the acquisition of analytical and technical skills. It was impression that existing educational system was failed to impart the analytical and technical skills in students on which economic progress is based. It is necessary to have massive shift towards vocationally and technically oriented education to provide vocationally oriented technical and agricultural education. The analytical and technical skills which are necessary for higher productivity can be imparted through the curriculum.

The experience of a number of industrial concerns in Pakistan suggests that it is easier for a literate person to acquire technical and analytical skills than it is for one who is illiterate. It is therefore, clear that by facilitating the acquisition of technical and analytical skills literacy plays an important role in raising productivity.

No more than 4% of the total enrolment in 1968 at the secondary stage was in vocational and technical subjects. To encourage the paradigm shift from arts education to vocational and technical education, the system was provided the responsibility of accomplishment of this shift by introducing the diplomas and degrees such as Matric (Tech.), Inter (Tech.) and B.Sc. (Tech.) in well defined technologies like Printing, Wood-work, Plumbing, Tailoring etc. which would add to the dignity of labour.

The educational policy aimed at raising the proportion of those enrolled in vocational and technical subjects at the secondary stage up to 60% of the total enrolment at that stage. Vocational and technical training should be made available in the ordinary high schools,

and technical education and employment which are inter-related was brought into the main focus of economic planning policies. It was an unrealistic target set by the government to raise enrolment in technical education from 4% to 60%. The infrastructure, available facility, support system, teacher training and allocation of budget were not aligned with these targets. In addition to that government did not show its vigor and political will to meet these targets.

5.17 Development of Vocational & Technical Education

To cure the imbalance between General, Vocational and Technical Education in accordance with the aims of the New Educational Policy, the following administrative and structural changes were proposed:

- i. In each province establishment of a separate Directorate of Vocational and Technical Education headed by a Director General was proposed. This directorate was operated through the District School Authorities in regard to the vocational and technical content of secondary education and through the Regional/Divisional College Authorities so far as the Technical College are concerned.
- ii. In the stream of Technical and Vocational Education there were two sub streams, one for the Agricultural Vocation and the other for the Industrial Vocation. Each of them had schools and colleges where students enrolled for Matric (Tech.) Inter (Tech.) and B.Sc. (Tech.). The schools were offering two year courses and the colleges were offering four year courses providing for training for two years after Matric (Tech.) examination and another two year after Inter (Tech.) Diploma examination.
- iii. In order to encourage students to join the Vocational and Technical schools and Colleges 75% of scholarships given by Provincial and Central Govt. were available only for students in these Institutions.
- iv. During the course of training in the Technical Colleges, students required to complete two years apprenticeship in a recognized Industry under a Law which was required to be enacted for this purpose. During the period of apprenticeship training, the students were paid a prescribed Apprenticeship Allowance by the industries concerned.
- v. A Committee was appointed by the Central Govt. consisting of the representatives of the Ministries of Education, Labour and Industries, to examine ways and means by which Industries in the private and public sectors was required to employ only those technical personnel who have obtained a Certificate, Diploma or a Degree from a Vocational or Technical Educational Institution set up under the new Policy. The existing unsatisfactory situation in which such training was the overlapping responsibility of these Ministries was a problem and this problem resolved by unified command training.

In accordance with the aims of the New Educational Policy in regard to the Vocational and Technical Education, the following projection were made and it was aspired to achieve these targets by 1980:

- a) 922 Agricultural Schools with an enrolment of 664,000 capable of earning a Matric (Tech.) certificate.
- b) 60 Agricultural Colleges with an enrolment of 120,000 capable of earning an Inter (Tech.) Diploma after two years and B.Sc. (Tech.) Degree after another two years.
- c) 613 Technical Schools with an enrolment of 442,000 capable of earning a Matric (Tech.) certificate after two years.
- d) 40 Technical Colleges with an enrolment of 80,000 capable of earning Inter (Tech.) Diploma after two years and B.Sc. (Tech.) Degree after four years.

It was suggested that University Grants Commission Secretariat was responsible to constitute a Sub-Committee on Engineering and Technical Colleges and its responsibility was to develop curriculum of Scientific and Technological subjects and extend collaboration with industry, Business Schools and Technical Colleges.

The New Education Policy 1970

The new education policy of the government of Pakistan, 1970 emphasised on Shift to Scientific, Technical and Vocational Education. The policy shifted the emphasis to science, technical and vocational education at secondary level with the expansion and improvement of facilities so as to achieve a ratio of 40:60 between the general streams on the one hand and the science, technical and vocational streams on the other. It was noted that sciences form an integral part of courses in technical and vocational education and also serve as a basis for higher technological education. The general education stream followed a curriculum with an adequate content in science and mathematics. An adequate scheme of vocational training was introduced for those students who did not go into secondary education or drop out from schools, so that they were equipped with knowledge and skills necessary for productive employment within the local community.

Technical and Vocational Education

Education from the secondary level to upwards was diversified with a separate stream for technical education at the various levels including the higher level of education, either by establishing separate institutions or by adding separate wings to existing institutions. Determining the nomenclature for the technical courses leading to the SSC, HSC and Bachelor's examinations was responsibility of the Provinces.

For developing an effective technical and vocational programme, appropriate organizational arrangements were made for (a) curriculum development (b) counseling and gui-

dance service, (c) practical training programs in cooperation with industries, and (d) coordination at the national level.

It was targeted that at the secondary stage at least 60 percent of the total students should be enrolled in science, agriculture, technical and service trades and home economics. It is worthwhile to mention that technical institutions should, in addition to their normal programmes, arrange for short term, sandwich and extension courses in various trades for various kinds of semi skilled/skilled workers and technicians as well as refresher courses for the teachers in vocational subjects in the schools offering vocational courses.

Centres for Advanced Study and Research

The doctoral programs in the universities in the disciplines of science and technology have continued to remain weak and therefore, it is necessary that a determined effort be made in the Fourth Five year Plan to strengthen these programs.

Technical Education through Industrial Consortia

Government made effort in setting up technical institutions supplemented by instituting training programs and by establishing training institutions in various fields of technology through the efforts of individual or consortia of industrial concerns. Government technical institutes were established supplemented by similar efforts on the part of industrial concerns individually or through consortia.

Secondary Curriculum

There was a need to align the curriculum and text books with the suggested changes so the curriculum at the secondary stage were re-designed with particular emphasis on science and technical subjects and manual arts. A large number of students were diverting to technical, agricultural and industrial streams designed to prepare them for absorption into the economic life of the country.

Pedagogy in General Colleges

The Fourth Five Year Plan reflected that it was necessary to launch emergency training program of the duration of 2 to 6 months in teachers training colleges, general colleges and technical institutions. Introduction of pedagogy as a subject at the Intermediate and Degree levels and Technical institutions were considered as a means of meeting the demand for additional teachers. These training programs are intended to supplement the facilities of training under the normal programs of teacher education.

6. Period from 1972-1990

During this period government issued a policy on education which significantly contributed towards development of technical education in Pakistan.

6.1 The Education Policy 1972-1980

The education policy 1972-1980 was presented in 1972. Like other policies it also focused on technical and vocational education. Keeping in view gaps in implementation of previous policies the Government suggested different measures to enhance status technical education in the country. The Policy states that one of the objectives of education is building up and nurturing the total personality of the individual, dynamic, creative and capable of facing the truth as it emerges from the objective study of reality: an individual able to comprehend fully the nature of technical and social change and having deep concern for the improvement of society. The policy urges that designing curricula relevant to the nation's changing social and economic needs compatible with our basic ideology and providing a massive shift from general education to more purposeful agro-technical education. Providing a comprehensive programme of studies through the integration of general and technical education and by keeping options open for transfer from one course of study to another.

6.2 Shift towards Science and Technology

The policy was aimed that by 1980, about 40% of the enrolment in degree classes would be in technologies and other occupation, and 30% in sciences. Technical and occupational education streams similar to those at high and intermediate stages will be introduced at the degree level as well in the major vocational fields.

Policy recommended that it was essential that a student who leaves school after matriculation/intermediate is ready to accept social responsibility by getting absorbed in our socio-economic framework as a trained, middle class technician or worker. For this purpose, vocational and occupational subjects were added to general education at this stage. The expansion of science and technical education was resulted in the progressive integration of general and technical education in secondary schools and colleges. In the past the general tendency has been to establish separate institutions for technical education. These institutions have not always produced efficient industrial workers. The education given in them also lacked the necessary cultural content and in practice, they catered for the rejects of the general stream and certain stigma was attached to their programmes.

There was massive shift from enrolment in arts towards enrolment in science and technical subjects, from an aimless general education to a more purposeful agro-technical education. To this end, the enrolment in arts subjects was maintained more or less at that time level while significant increases was made in all high schools and general colleges in the provision of facilities for science and technical education.

6.3 Integration of General and Technical Education

The purpose of the integration of general and technical education was to equip secondary and college students for gainful employment, including self employment, industry, agriculture, business, home economics and education in addition providing them a program of general education. The facilities for vocational/occupational studies were provided for such integration.

Education was introduced as an elective subject at the matriculation, intermediate and degree levels. In this way, a major part of the vocational training of teachers was conducted in institutions of general education. The proposed program of diversification of courses of study at the secondary and intermediate stages, and of progressive integration of general and technical education, cannot be launched effectively without an adequate supply of qualified teachers. To meet the immediate needs during the first three or four years, specially developed, short in service science and technical teacher training programs were launched during summer vacations. Regularly trained teachers were subsequently become available as the number of college students studying education and technical subjects as their optional courses increases.

6.4 Technical Colleges

Polytechnics institutes were converted into technical colleges. Their present programs of certificate and diploma courses however were remained continue. After completing a 3 year diploma course, students were encouraged to undergo two years of industrial training/experience, for which opportunities were provided for such training. For diploma holders, a one year additional course leading to the degree of B. Tech. was provided in these institutions. For the purpose of admission to the degree programme, the two years industrial training/experience was considered an additional qualification.

New initiative were needed for industrial establishments in the public sector, and those taken over by the government were required to accommodate as many students of Technical Colleges as possible for industrial training/experience. Appropriate legislation requiring industry in the private sector to provide similar facilities was introduced. In addition to diploma and B.Tech. degree courses, the Technical Colleges introduced a variety of programmes covering new areas of technology which require urgent attention for modernization and development. In addition to the massive programmes of technical subjects were introduced in the high schools and general colleges. Those were undergoing new programmes were awarded certificates, diplomas and degrees such as matric (Industrial), Matric (Agriculture), F.Sc. (Industrial), F.Sc. (Agriculture), F.Sc. (Home Economics), B.Sc. (Industrial), B.Sc. (Agriculture), B.Sc. (Business), B.Sc. (Education) etc.

6.5 Adult and Continuing Education

In addition to the use of traditional approaches in classrooms and workshops extensive use of new educational technology and non conventional methods such as films, records, T.V., Radio Libraries, exhibitions, seminars demonstrations, charts, models posters, pictures, and other suitable materials was introduced.

6.6 New Areas of Technology

Technical Colleges/ Institutes were assisted to develop new areas of technology including inter-alia, the following:

- Electronics and Instrument Technology
- Textile, Cotton and Wool Technology
- Para medical Technology
- Leather Technology
- Mineral Technology
- Printing and Graphic Technology
- Timer Technology
- Oceanography and Marine Engineering
- Aeronautics
- Plastic and Rubber Technology
- Gas and Petroleum Technology
- Arts and Fine Arts
- Ceramics and Glass Technology
- Architecture
- Development Economics

Some of these Colleges/Institutes were assisted to offer specialized instruction in technologies of critical national importance leading to the degree of Master of Technology. The different institutes in were developed into centres of excellence in certain specialized technologies.

6.7 Curricula, Book Production

To review and up-date the curricula for all stages of education, including technical and vocational education, to keep them constantly under review and to revise and modernize them at regular intervals, the National Curriculum Bureau was strengthened and re-organized and Curriculum Centres were established and or developed in each Province.

Many of the present courses of teacher training are out dated and not orientated to the scientific and technological aspects of education or the use of modern methods and techniques. All teacher training courses were revised and re-formulated according to the national aims of technology education and requirement of changing word of industries and economic development.

6.8 National Education Policy an Implementation Program 1979

National education policy an implementation program 1979 realized that Scientific, vocational and technological education, training and research in the country was promoted to strengthen and to use this knowledge for socio-economic growth and development thereby ensuring a self reliant and secure future for the nation.

6.8.1 Policy Statement

Policy reveals in its policy statement that inspite of several efforts in the past the technical and vocational education is still not job-oriented. Moreover, there are hardly any arrangements for identifying the needs and providing training to 80% rural population to make them more productive in order to strengthen this large sector of our economy. In order to improve technical and vocational education, it has been decided to introduce production oriented curriculum related to the market requirements in all technical and vocational institutes.

All the technical and vocational institutions were encouraged to generate funds for supplementing their resources by producing saleable goods during training. Small production units were established with technical and vocational institutes under a phased program. Evening programs were introduced in technical and vocational institutes for the benefit of the community wherever needed. Separate vocational schools for dropouts of the school system were established. Equipment needed for various levels of technical and vocational institutes was standardized. A mechanism for standardizing, testing and certification of technical and vocational skills required through formal, non-formal or traditional system of training in consultation with trade industry and other users of the output of these institutions was introduced.

Practical on the job supervised training for diploma and B.Tech. students was made compulsory and suitable legislation for providing this training in industrial organizations and undertakings was enacted. In order to provide close liaison with industry the teachers of polytechnics and technical colleges were encouraged to provide consultancy and advisory

services to the industry. Personnel from industry were invited to advise these institutions on production methods.

It was decided to establish a teacher training colleges for the training of teachers of technical and vocational institutes at national level.

6.8.2 Rationale for Technical and Vocational Education

Government was intended to establish more than 150 technical and commercial institutions and more than 3,000 schools offering agro-technical education. These insitutions were suffering from inadequate instructional facilities and poor curriculum which was neither production oriented nor suited to the market requirements. Technically trained personnel find better jobs in and out side Pakistan in teaching as well technical fields. So, more trained and experienced personnel having no attraction towards the teaching. Non availability of right type of trained teachers was also a serious problem. Pre-service teacher training in the field of technical and vocational education was non existent at that time. It was the need to establishe a college for Technical Education to provide pre-service training to the teachers and to improve in-service training program. This college was giving the responsibility to undertake activities such as establishing academic models for training, staff development, preparation or translation of books needed for various levels of training. It was observed that the pay structure of technical teachers was poor and there was a need to make it more attractive so that they can be retained in the country.

6.8.3 Medium of Instruction

The material of instruction available in Pakistan for technical subjects was in English and it was a little bit difficult for students to understand such material clearly. It was also a barrier for creativity of students. To address this issue there was a need to produce content in Urdu language. Writing of Urdu books in scientific, professional and technical subjects was encouraged. Selected books in various crucial subjects were translated for adoption in Universities and Colleges.

7 Period from 1991-2014

This period consist of last decade of 20th century and 1st decade of 21st century. The world was changing on the basis of advancement in the science and technology. Pakistan was still behind the advanced countries and was striving for its development and economic prosperity.

7.1 National Education Policy 1992

The objective of the policy was to redesign and expand technical vocational and engineering education facilities in the light of new emerging technologies needed for Industry, thereby enhancing the employability of the educated youth.

Background

Technical and vocational education was being offered at prevocational, vocational, technical and professional levels. Those who qualify as scientists and engineers make only a minority of the total work force. With the advent of new technological age, the old skills may no more be needed and fitted in the changing needs of society. The new worker has to be trained on different types of machines demanding different types of skills.

Over the years, increase in the number of technical and vocational institutions has been accompanied by a sizeable growth of technical, vocational and agrotechnical education in various regions of each Province. However, this spread is not in line with the needs of job market. There was a need to expand a demand oriented technical and vocational education, and to reinforce general education with vocational subjects in an attempt towards vocationalization (polytechnicalization) of education. Introduction of a new model of vocational high school may be a useful innovation.

Context and Conceptual Framework for Technical & Vocational Education

The technical and vocational institutions were not dispersing equitably to enable rural poor to benefit from these institutions. In this period of rapidly advancing frontiers of knowledge and intense scientific and technological activity, the research base in the universities was remained narrow. The technical and vocational education was failed to find equilibrium of the type which could ensure the employability of the educated youth. The policy of 1992 perceives the issue as one of vital importance and proceeds to present a strategy which should enable the students to appreciate its worldview in the context of new scientific and technological advancements. The vocational school can concentrate on agricultural technical commercial and biomedical education, among others.

Government showed its intent of using general schools as technical schools in the evening shift to capture the drop outs of general education. It was decided to set up an Institute of Education Technology (IET) for preparing and producing educational materials for dissemination through second TV channel. All the best in scientific and technological fields for the industrial growth of the country and above all manage education effectively and efficiently.

Policy Provisions

- The number of technical and vocational institutions was increased and facilities for technical and vocational education were made available at tehsil level in accordance with the needs of the area.
- The private sector was invited to set up technical and vocational institutions and was provided incentives for this purpose (through Provincial and Federal Education Foundations).
- The curricula were kept under constant review to ensure that changes on account of advancement in technologies as well as emerging technologies are incorporated in the courses of study.
- A network of technical teacher training institutes was established, one in each Province, linked with the National Teacher training College at the Federal level.
- A large number of trade schools were developed in the rural areas as a part of general middle and secondary schools in the evening shift.
- One vocational subject was made a compulsory part of general education.
- More opportunities were provided for the technical and vocational education of women.
- A parallel stream of vocational high schools were introduced so that one such school for males at tehsil level and one for females at district level is located in line with the needs of the area.
- One polytechnic college for male was established at each district headquarters and one polytechnic for females at each division headquarter depending upon the needs of the area.
- A network of colleges of high technology offering study programmes leading to graduate and postgraduate degrees were established in the country wherever feasible. Some of the existing degree colleges were converted into colleges of higher learning and technology. The study programmes were oriented towards acquisition of practical skills.
- Industrial training for engineering and technology graduates was regulated through legislation.
- Opportunities were provided to polytechnic graduates for higher studies at home and abroad.
- Linkages were established between technical and vocational institutes and industrial units.
- Production units, wherever feasible were established in selected vocational and technical institutions.
- A national council of technical and vocational education was established.

- Curricula was revised and modernized in accordance with the advancement of knowledge in technology. Facilities for agrotechnical education in general schools were improved.
- Computer education was made a compulsory part of the curriculum at all levels of technical and vocational education.
- The whole process of vocationalization of education was reactivated and new subjects were added aligned with growing industrialization in the country to increase the employability of the educated youth.
- Suitable arrangements were made for testing and certification of the skilled learners trained outside the school system.
- Technical education was introduced as a separate stream of education in general schools at appropriate level, preferably as evening shift.
- Broadcast of lectures on technical and vocational education was started to engage the students studying in distance education setting. Thus technical colleges and universities were required to make arrangements for:
 - (b) late night broadcast lectures of eminent professors in identified and selected subject areas, and (c) special enrichment programs broadcast on new scientific disciplines not yet generally included in university syllabuses such as genetic engineering, superconductivity, fibre glass optics, ceramic engineering particularly catering for advanced students as well as educationists, planners decision makers and the educated general public was made easily accessible to learners.
- Science Parks for private entrepreneurs were established in the universities so that the Private Sector could make use of the knowledge generated by the university scientists for problem solving as well as for use in the development of new technologies. The Centre shall maintain technology transfer unit for passing on information to the Private Sector and enabling this sector to set up industrial units for equipment production.
- The number of polytechnics was targeted at 99 as compared to 60 in 1992; similarly, the Colleges of Technology will increase from 11 to 19.

7.2 National Education Policy 2009

Education and skills for the labour market is a contributing factor with employment, labour, economic and regional development policies. The present system of technical education has s in two main shortcomings: it has a narrow base due to which a large number of young people remain outside the system and the quality of skills it produces does not appropriately match the needs of the labor market. To meet the need of the development of technology there is a need to reform curriculum.

Curriculum Reform

Use of Information Communication Technologies (ICTs) in Education was promoted in line with Ministry of Education's National Information and Communication Technology

Strategy for Education in Pakistan. ICTs were utilized creatively to assist teachers and students with a wide range of abilities and from varied socio-economic backgrounds. The course of computer was introduced as a compulsory subject for class 6 to 8 and elective in secondary and higher secondary classes.

Strengthening Skill Development and Innovation

The formal Technical and Vocational Education (TVE) system was not a major supplier of skills to the country's labour market. As a structure it suffered from rigidities that fail to cater to the dynamism required by the market. Secondly the structure did not fit in local requirements that vary across geographic units i.e. provinces, districts, tehsils. It is that skill development and market requirements did not match.

TVE also was suffering from the issues of access as well as quality. Hence, the base of technical and vocational skills provided to contribute to the economy in Pakistan was narrow. The inadequate quality systems from both a smaller number of total years of preparation and limitations of the curriculum, compared to the more advanced system as well as the issue of availability of quality instructors.

On the demand side, jobs in the public sector continued to be a priority. Most of these jobs required specialized skills and even a general matriculation certificate with no technical or vocational content was deemed satisfactory to fill the junior administrative level.

The technical intensity of production processes was increase as new technologies became more pervasive, thereby raising the demand for TVE skills of a higher quality. While Vocational Training is concerned various experiments in the country have not succeeded and most reform proposals invite controversy. The TVE curriculum was developed in standardized modules for each trade to eliminate differentials across various training institutions to provide opportunities to the trainees for horizontal/vertical mobility and also help in assessment and certification of apprentices in non formal sectors for their entry into formal vocational/technical sectors.

Strategies

- National Vocational and Technical Education Commission (NAVTEC) has already prepared a set of strategies for this sector. These provide a basis for development of implementation plans for the technical and vocational sector.
- A National Qualifications Framework (NQF) was established in consultation with professional bodies (like PEC, PM&DC, ICAP etc.) along with a changed program structure that encompasses all qualifications in the country, both academic and vocational/technical.
- Government was required to develop a suitable framework for technical and scientific education and training with close involvement of Chambers of Commerce and Industry.

- Commerce stream was introduced under technical education and vocational training regimes.
- A University of Technology was established at the national level to meet the requirements of introducing new trades in technical education.
- B.Tech technologists were registered by the Pakistan Engineering Council.
- Vocational training facilities, Polytechnic Institute and Colleges of Technology were established on need basis.
- Faculty training in pedagogical, communication and ICT skills was required at all levels to enhance the efficiency of teaching in higher education.
- Modern information and communications technologies (ICT) are essential to enhancing efficiency, efficacy and impact of programmes of development in the higher education sector.
- ICT effectively leveraged to deliver high quality teaching and research support in higher education, both on-campus and using distance education, providing access to technical and scholarly information resources, and facilitating scholarly communication between researchers and teachers.
- Existing standardization of libraries and library professionals was reviewed keeping in view latest developments in the field of medical, engineering, information technology and other fields of professional and higher education to support academic work and research.
- The lecturers selected through the Public Service Commissions was required to get at least six months pre-service training diploma in teaching methodologies, communication skills research and assessment techniques, so as to equip them with necessary teaching skills to undertake the job.

Activity 1:

Keeping in view the recommendations on development of technology education during period of 1947-57 in Pakistan identify three areas which were poorly enacted.

Activity 2:

Write down the commonalities in the Five year plans of Pakistan and recommendations of education policies for the period of 1957-71.



Activity 3:

Write the significant measures taken by Govt. on technical and vocational education in Pakistan in chronological order from 1947 to 2014.

Reflection 1:

Think about your institution where from you have got your technical education degree/certificate and reflect about available laboratory facility for your practical work keeping in view the recommendations of government in educational policy.



Reflection 2:

Reflect on precisely what you have learnt after studying this module.

Reflection 3:

The history of technical and vocational education is necessary for prospective technical and vocational teachers. Reflect on the statement.

8. Trends and Issues in Technology Education

In this chapter you will find a material about trends and issues and technology education. The material is presented in the light of global development in technology education in 21st century. The text gives you an insight about trends and issues in technology education in Pakistan. It reflects on the problems which are hindering advancement of technical and vocational education in Pakistan and give you insight about ways and methods being adopted to improve technology education in the country. This module leads you towards activities and tasks requiring strengthening your knowledge regarding trends and issues in technology education in Pakistan.

Let us have a look to current analyses of the technical education and also a look to the future.

The chapter of trends and issues in Technical Education is taught to prospective teachers because it helps teachers to understand the developments, problems and barriers in advancement of technology education. It describes the nature of relationship between national and international issues and help to understand national and global perspectives and their impact on technical education in the country. It helps the prospective teachers to understand what are the challenges and innovations in the field of technical and vocational education. Helps them to adopt and adapt viable strategies and approaches for the improvement of technical education in the country. A prospective teacher equipped with information about issues, problems and challenges hinders the efficient applications of strategies is empowered with techniques and approaches to handle those issues, can resolve the problems and challenges and can play his roll effectively in progress of educative process effectively.

8.1 Importance of Trends and Issues in Technical and Vocational Education

It is important to study the trends and issues in technical and vocational education because education is a strong mean to develop a nation and taking it to its destination. Without education it is impossible for a nation to progress and acquire economic autonomy and prosperity thus it is necessary to determine the issues hindering the progress of education and having a look on trends which are basis of development.

Trend is a general direction in which something moves. It is an inclination of people in a particular direction for adopting of way or strategy to perform any task. Trends are ways means and methods to be adopted for the advancement and transformation of any process, program, or system. Trends are results of human experience, knowledge, and laws and theories specific to a phenomenon facing a problem that a stopping its pace. Trend give insight to the personnel or people or functioning in a system to act in the direction which remove barrier of the system and enhance its performance. Trends normally lead towards

the progress of the system, or program. These are example of others people who have practiced those action and strategies and are proven are certified for better result.

Issues are perceived as something that people are talking about, thinking about: an important subject or topic and is a point for debate and discussion. According to the dictionary meaning issue is a subject or problem that is often discussed or argued about, especially a social or political matter that affects the interests of a lot of people. Issue is a problem or topic for which people are sensitive and conerned that is discussed about for well accepted solution. When we talk about issues in technical and vocational education it means the problems, barriers, obstacles which stop and slow down advancement of technical education in the country and people, planners and intellectual show their concern on the causes of such problems and trying to find solutions of those problems.

The nations in the contemporary world face different problems, challenges and issues in technical and vocational education. The variation in challenges and issues has contextual causes in each country. Each of them perceives these problems its own way. The people of a country bear different opinions from each other about those problems which they are facing. Everyone assumes that he is right and conflicts arise among people when a strong disagreement came into existence about what to believe and what to do. Conflict is a natural part of lives as a result people learn more about themselves and others which leads towards a consensus on the solutions of those problems. People encounter their issues on the basis of differences of opinion and differences in values which they matter. The issues which a discussed in a society are a result of our own opinions and values, can lead to healthy growth and maturity for resolution.

There are several issues finding platform for discussion among stake holders, palnners, teachers and politicians. Hence the society could provoke the changes in upcoming time. Educational communities facing controversies regarding technical and vocational education include, poor planning, poor teacher training, non availability of infrastructure, low budgetary allocation, lack of modern tools and equipment, use of ICT in education, gender inequity and brain drain.

All the above mentioned and other issues can be categorized into three domains: Local issues, school level, national level issues, and global issues. The different issues and trends are discussed in the following.

8.2 Technical and vocational education and training (TVET) Reform

Technical and vocational education and training TVET means development and application of knowledge and skills for middle-level occupations needed by society from time to time.

According to UNESCO Technical and vocational education is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical

skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. For the most part, general and academic education is seen as that which builds analytical skills, knowledge and critical thinking, while TVET develops craftsmanship, practical experience and practical problem-solving. Critical thinking and analytical skills are needed in the case of a good plumber or electrician who must routinely make judgements in order to solve problems. Equally, a good surgeon needs a large set of practical skills to masterfully operate a patient. TVET is one of the most powerful instruments for enabling all members of the community to face new challenges and to find their roles as productive members of society. It is an effective tool for achieving social cohesion, integration and self-esteem.

Technical and vocational education and training (TVET) play an important role for socio-economic development of a country. All the developed countries on the globe have progressed through the advancement of technology. TVET is strongly associated with high growth rates in economies and the labour market. In the context of the growing importance accorded to lifelong learning and the current global financial and economic crisis, policymakers increasingly focus on the importance of TVET. Indeed, UNESCO has recently received a new mandate to develop new areas of expertise; the ILO has given TVET an important position in its Decent Work Agenda; and the Organisation for Economic Cooperation and Development (OECD) has undertaken an extensive review of TVET policies in a number of its member states. Technical and vocational education and training (TVET) systems must consider changes and challenges of globalisation, rapid changing technological scenario, the information and communications revolution, and fast social change. These challenges have consequences of the increased mobility of labour and capital, uneven impacts on rich and poor, and emerging market economies in both rural and industrial sectors. Future jobs will require more diverse vocational abilities and knowledge, calling for education reform and a guaranteed system of lifelong learning for all.

In spite of ambitious planning and policy statements by government Pakistan did not achieve goals and targets of technical and vocational education and training (TVET). TVET sector in Pakistan needs extensive reforms to meet the challenges of indigenous and global skilled labour market. Technical and vocational education and training (TVET) refers to education and training that prepares people for an employment and develop them more industrious for economic fields. TVET enhance human potentials and broaden their horizon and choices. TVET plays a significant role for socioeconomic development, autonomy and prosperity of a country. It is considered one of the key approaches for nation development in both developed and under-developed countries. It is generally believed that TVET could be an effective tool to reduce unemployment in semi-urban areas, which ultimately cut down people migration to metropolitan cities. Societal and economic development depends on the strength of TVET as it provides access to skills and entry routes into the labour market. For under-privileged and marginalised groups in particular, it can be an important route towards a better life.

The term education reform means a systematic and organized change in education system by re-structuring its major components to build education system in total on intended requirements. Reforms can be accomplished with innovative developmental projects, policy changes, power devolution and decentralizations. System of education are not stagnant and still. It always requires transformation to meet needs of changing world of knowledge of science and technology. Such changes and development in education system make a nation competitive with other nations. Pakistan has gone through different phase of development of technical and vocational education and training with a focus on different aspect on each phase. These phases may be outlined as:

1. 1947-1958 Initial policy formulation stage
2. 1959-1970 Expansion and development period
3. 1971-1977 Experimentation period
4. 1977-1988 Second expansion period
5. 1989-1997 Quality improvement period
6. 1997-2010 Good governance and self reliance
7. 2009-2016 TVET reforms and implementation.

Pakistan is a developing country with higher population growth and having the youth of age 15-24 years old as major part of the population. With the fast growing youth population, the TVET's sector capacity for delivering demand-driven training services for increasing workforce with technical and professional skills remain insufficient to meet the modern labour market challenges. Moreover, the Labour Force Participation (LFP) rate in Pakistan is relatively low only 44% as compared to other developing countries in the region.

Pakistan has gone down in meeting the international TVET standards. Thus, extensive TVET reforms are essential to support it in order to meet the demands of workforce in a technologically advanced economy and global markets.

Keeping in view the importance of TVET Pakistan government has taken steps to overcome the challenges faced by TVET and to improve it efficiency. In 2005 National Vocational Technical Education Commission (NAVTEC) was established for reforming TVET in the Pakistan. NAVTEC documented a vision in National Skill Strategy (NSS) known as "Skilling Pakistan", which aimed to reform Pakistan's TVET to make it a demand-driven skill oriented. Technical Education and Vocational Training Authorities (TEVTAs) were established in each province of Pakistan to promote vision of Skilling Pakistan. The development of the workforce's skill in Pakistan is one of the neglected areas and a little portion of the skilled work force is going to be prepared in the technical and vocational institutions in the country. Just 3% of the all the students are enrolled in TVET sector, lowest from any regional countries. The early TVET system in Pakistan has put focus on theoretical knowledge learning rather than practical work. However, the National Education Policy in 2009 has recognized the importance of skill development and strengthening

the TVET system with innovation by making it a demand oriented sector. Technical and vocational institutions in Pakistan are offering time and curriculum limited based training which needs to be transformed into a flexible and ability based training. These institutions are focusing on supply-driven skills training which requires to be transformed to demand-led skills development. Reforms in TVET should aim at:

- i. Provision of relevant skills for economic development
- ii. Improving access, equity and accessibility and
- iii. Assuring quality for skills development.

There are more than three thousands TVET institutions across the country in both public and private sectors. These are centres of teaching learning of technical and vocational education and should bear responsibility of such reforms. Government is responsible to plan and devise implementing mechanism for the support of these institutions. Government should focus on good governance, teachers licencing, TVET program accreditation, monitoring and evaluation, competency based curricula, introducing Innovative education and training, and providing conducive learning environment in institutions.

8.3 Vocationalization

Vocationalization means the introduction of more practical parts for learning that offers the learners an opportunity for field work and provide vocational guidance in an applied way resultantly providing vocational skills to the learners, which lead them to find job in relevant fields.

Keeping in view importance of job place oriented practicals different countries have put more emphasis in order to vocationalize the current curricula by adding more practical subjects in technical and vocational course.

Pakistan has made an effort to make the three years diploma courses more practical oriented and 60% of practical subjects have been included in curricula. Still it has not been implemented in true sense due to outdated technologies, financial constraints and lack of physical facilities, equipment and trained teachers. It hinders the growth of qualified technicians to compete in national and global markets. It is an imperative requirement to prepare prospective technician to the competitive labour market by vocationalizing TVET.

Recommendations are here proposed for the Skilling Pakistan reforms, which are currently being Government must make necessary arrangement on the development of skill oriented curriculum to vocationalizing of TVET curriculum and in its accordance systematic training of TVET teachers or instructors with modern methodologies for delivering practical and demand-driven TVET knowledge to students to meet the needs of global labour markets. Establish institutions-Industries linkage to place students in industry for apprenticeship to provide them hands on experience and developing more understanding of actual job world.

8.4 Apprenticeships

'Apprenticeship' is a term from the Middle Ages, which can mean very different things. For the World Bank for example, the 'traditional' apprenticeship is offered by a small business owner, which is willing, for a fee, to teach a skill or trade that is in demand. The training period varies in length, depending upon the technical difficulty of the trade and how quickly apprentices master the body of skills.

It is in the interest of the company to provide the apprenticeship when it is employing and giving a (modest) salary to the apprentice. Apprenticeship, explains that the category ranges from the informal purely work-based learning-by-doing - which still predominates in developing countries - to formal structured programmes of general education and vocational preparation sponsored by large industrial firms in some advanced economies.

The OECD prefers the broader term 'workplace learning' to encompass all these things. Advantages to apprenticeship for all the parties involved - the individual, the company, the education system and the labour market more than apprenticeship is associated with moderate gains in subsequent employment for participants, particularly relative to job training and labour market programmes, but also relative to full-time vocational education

8.5 Teachers in TVET: Training and Recruitment

Comparative studies on technical and vocational teacher education declare that 'the technical and vocational teacher occupies mainly a significant position in modern society: he is the link between industrial society and the educational system of a country. Teacher bears the responsibility of achieving to the goal of binding humanity and technology. He contributes towards the social and economic development of a nation through strengthening the technical and vocational education. Trained teachers are considered more efficient in performing their roles and responsibilities.

Technical and vocational education is offered in different types of schools, as well as outside of formal education setting. Thus there are different types of technical and vocational teachers responsible for teaching and instruction in these settings. So different categories of teachers are needed to be trained and recruited. The different categories are as follows:

1. Teachers or lecturers working in formal school or college settings and giving instruction in vocational courses;
2. Instructors and laboratory assistants working in school or college settings in Technical and vocational laboratories;
3. Trainers, tutors and others in enterprises who integrate training and education To trainees and apprentices;
4. Instructors and trainers working in technical and vocational training institutions supported by governments and private authorities;
5. Instructors and trainers working in employers' organisations, such as chambers of commerce, sectoral training institutions or privately-run training companies and

providers that focus on upgrading of technical competences, training in communication skills.

For preparation of an efficient and effective technical and vocational teacher, it is imperative to launch technical and vocational teacher education programme for different levels of teachers. There special arrangements may be made for in-service and lifelong learning to give teachers access to possibilities to update their knowledge and competences to meet the changing needs of technological knowledge and environment. It is worthwhile to mention that, ideally, training for a vocational teacher should take more time than that for a general secondary school teacher, due to the requirement for the TVET teacher to have more practical experience. Such teachers not only require practice teaching experience but need field based industrial experience.

Grollman and Rauner (2007) identify four models of TVET teacher education:

1. A model mainly based on the recruitment of practitioners of a certain field of occupational work who complete additional courses in teaching and training and management techniques, usually leading to a teaching certificate which provides the necessary qualification for work in the education sector;
2. A model which is based on a sequence of studying relative to a specific subject matter e.g. at the level of a first level tertiary education degree (Bachelor's degree), then obtaining appropriate entry qualifications to the education sector by acquiring general teaching skills in a designated programme;
3. A model which is based on the concurrent study of a subject matter and educational sciences leading to first or second level tertiary education degree (Bachelor's or Master's degree). Often the subject matter takes the form of a moderate portion of an ordinary business or engineering degree and sometimes special vocational didactics are added; and
4. The last model is based on an integrated conception of vocational disciplines, which entail the subject matter as derived from the world of work and based on competence-development within the domain.

The 1973 UNESCO study on teacher education concludes that technical and vocational teachers are usually recruited from one of three groups: qualified workers and technicians in employment; secondary technical or general school-leavers; or teachers of general subjects usually of basic science or mathematics who, through in-service courses, are converted into vocational teachers. Due to non availability of trained technical and vocational teachers the diversity in recruitment practices of teachers does exist. There is either, on the one hand, a highly professionalised model of teacher education and recruitment associated with a strong isolation from the world of work or, on the other hand recruitment choices are based on experience in the field. Each of recruitment models is facing serious type of deficiency. Highly professionalised teachers are rich in pedagogy and deficient in in-

dustrial experience while teachers having field experience are lacking in pedagogical skills required to teach prospective workforce.

On the other hand, the TVET teacher faces a problem of status, that teachers in TVET do not have the same status as their colleagues in general education, which is a problem that needs to be resolved because TVET teaching profession is attractive and having social significance. Technical and vocational teachers and trainers are responsible to impart knowledge and develop skills in the workforce, the status that they actually have is not high enough for this role. The parity of esteem between teaching in TVET and teaching in general education is still wishful thinking, and indeed difficult to establish.

8.6 Implementing the Technical and Vocational Education Policy

Technical and vocational education is always a point of focus in all education policies stated by government due to its significant role in economic development of the nation. Government has taken different measures to improve status of technical and vocational education in the country but we are still deficient in and for behind from regional countries as well as other developing countries around the globe. It is all due to poor implementation of policy regarding technical and vocational education. Poor policy implementation is considered due to appointment of majority of untrained or poorly trained teachers with a minimum academic qualification and vocational education qualification, poor in-service teacher training, lack of relevant resources, overloaded timetables, negative attitudes of heads and poor institutional- industrial relationship. It is important to look at the different factors which cause poor implementation of policy.

8.7 Specialised Teachers

It is well known that qualified teachers are more effective in their performance as compare to non-qualified teachers. Training equip the teacher to determine the concepts to be taught, skills to be developed, approaches to be used for effective learning. There is a consensus on it that specialised teachers for technical and vocational education are more needed than in general education, because technical and vocational teacher occupies a most vital position in modern society. Vocational teacher is a link between industrial society and the education system. They train work force required to run industry, enhance production and consequentially generate economy for the country. Trained teacher better understand education process and move forward to implement innovations and change as compared to less qualified or untrained teacher.

8.8 Material resources

Material resources are also essential for successful; implementation of vocational education. Material resources like textbooks, infrastructure, equipment and consumables are

vital for the success of technical and vocational education. Their availability contributes substantially to the teaching-learning situation.

Technical and Vocational subjects require specialised workshops where practical equipment could be kept. The specialised equipment is paramount in promoting effective transfer of skills. Such practical skills are very important in preparation of learners for the world of work. This is because vocational subjects require a lot of practical skills and as such they require special equipment and infrastructure so that the pupils are trained sufficiently. No policy can produce results in the absence of material resources.

8.9 Financial resources

Availability of adequate financial resources is also important for successful implementation of a vocational education programme. Vocational education is designed to ensure that appropriate skills and attitudes are imparted to the pupils that require a big amount of practical work in laboratories that cost.

Finance is a key to meet day to day expenditures. Technical and vocational institutions require maintenance of machines, tools and equipments, purchase of consumables. If there is constraint in budgetary provision then it is difficult to meet such expenditures which hinder efficiency of teacher and is a big obstacle in policy implementation.

8.10 Dessimation of Policy Framework

When the policy framework are prepared and documents are ready to be implemented than these may be dessimated to all stake holders. Teachers of technical and vocational institutions are the people who are the implementers of that policy. They are the people who are translators of policy decisions into action. It is observed that such policies documents are not carefully transmitted to all level stake holders, particularly to the teachers. Policy document and other related materials in the form of booklet may be provided to all teachers and be placed in the libraries. To develop a better understanding of policy among stakeholders, seminars and workshops conducted at school, district or provincial levels enriching understanding and make clarities among participant.

Our institutions are suffering from the problem of short of teachers. The teachers working in technical and vocational institute have over loaded timetable. They are less motivated because of short of pay, lack of facilities at institute, lack of or ineffective conduct of in-service staff development workshops and seminars limited funding for attachment of pupils and teachers to local industries, political interference in posting and transfer, corruption and poor governance by government, negative attitude of principles, e.t.c. This demotivation of teachers is barrier of implementation of policy in true sense.

8.11 Women and Technical and vocational Education and Training

Gender is a socially constructed category. It limits the life experiences, opportunities, access to resources, and power balance between women and men. Men and women are socialized differently. They have different expectations about appropriate behavior and social roles, and they are held to different standards of behavior. Due to such variations the society has a different approach about each gender.

Gender Equity in technical and vocational education and training is an issue faced by developing countries and especially by Pakistan. Technical and vocational education and training is considered operating and handling machines, tools and equipments necessary for industry. It is assumed that it is male oriented profession. Disparities between men and women are reported as: risk of unemployment or imposed part-time work, lower wages, and more difficult access to managerial posts. There is a continual gap between men's and women's wages, which has narrowed over time, but still not vanished. It is evident that men and women of similar skill levels who are in identical occupations earn different wages.

The capacity of Technical and vocational education and training provision must cater for the diversity of its clientele, including women. It is evident from data that our education system has failed to offer female students the same career education possibilities as it are given their male peers. Most often women are predominant in crafts, such as cosmetics, health care assistance, home economic which pay substantially less than trades which are typically male-dominated such as carpentry, electricity and plumbing. UNESCO has the policy to promote the equal access of girls and women to technical and vocational education. In recent years increasing the participation of girls' especially from rural areas in TVE, minimizing the gender bias and leading towards gender equity.

There is a need to plan a gender sensitive program of non formal low technical vocational training for rural girls, gender inclusive curriculum and educational and vocational guidance both for girls and parents. Opportunities for female participation in male-dominated industries may be created for the access and equity keeping in view context and the capacity of stakeholders. Gender affects girls during their education in preparation for the workforce and women's earnings in the workforce. Their enrollment in technical and vocational education may be increased and specialized curricula may be introduced.

Activity 4:

Select any one of the trend in technical and vocational education of your own choice and reflect on that in Pakistani context.

**Activity 5:**

Organize a group discussion of your peers for identifying of trends and issues in Technical Education and participants recommendations on improvements of Technical and vocational education in Pakistan.

Reflection 4:

Think about your institution where from you have got your technical education degree/certificate and reflect about the issues and innovations in practices in those institutions.

**Reflection 5:**

Keeping inview the trends and issues suggest measures to improve technical and vocational education in Pakistan.
