A Study On The Development
OF TECHNICAL EDUCATION IN MEGHALAYA
With Special Reference To The Role Played
By SHILLONG POLYTECHNIC, SHILLONG.

Abstract

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DISSERTATION SUBMITTED

IN REQUIREMENTS OF PARTIAL FULFILMENT OF

THE DEGREE OF

Master of Philosophy in Education

North Eastern Hill University

SHILLONG

2000

1:0 INTRODUCTION :

Technical Education is that branch of human knowledge which aims at developing the latent treasures of human skills, knowledge, attitudes and ingenuity. It helps in the technical and industrial development and economic prosperity in the country. Technical education gives the student a sound broadbased knowledge of industries, business or commerce.

Technical Education, which is our context also includes Management Education is one of the most crucial component of human resource development. Its goal is to develop the required skills, expertise and professionalism of the technical manpower so that they may be effectively engaged in the production of quality of life of the people, goods and services. Technical Education is, therefore, regarded as areas of high priority in economic planning. In recognition of the importance of this sector, the successive Five year Plans have placed great emphasis on the development of technical and Management Education.

The role of the technical education in the life of the nation is vital. It is the life blood, Prosperity and glory of the nation. The progress, welfare and security of the nation depends critically on a rapid, Planned and sustained growth in the quality of the Technical Education. Technical Education brings about the desired transformation of the society.

Meghalaya is very rich in natural resources and offers immense scope for the expansion of Technical Education for producing trained personnels in different fields of specialisation in order to utilise these resources by developing small, medium and large industry. But Technical Education in the state is far behind the achievement of other states in India. It is therefore, felt necessary to undertake the present study and to trace how far technical education has developed in the state.

1:1 NEED AND IMPORTANCE:

Meghalaya offers a wider scope for Technical Education because of the rich natural resources. For judicious exploitation and utilisation of these resources requires technically trained personnels. But, it seems that technical education has been neglected in the state except Shillong Polytechnic, the only diploma level institution which runs four traditional courses only.

Technical Education has been functioning in the state since its inception, yet, no research scholar has undertaken a study on the Development of Technical Education in the state in general and the contribution of Shillong Polytechnic in particular. It is therefore felt that a systematic study be conducted to trace the development of Education in the state and the achievement made by the Shillong Polytechnic in the course of 34 years of its existence. The problems faced by the state in general and Shillong Polytechnic in particular in the field of Technical Education is also studied.

1:2 STATEMENT OF THE PROBLEM:

The problem of the present study is stated as " A study on the Development of Technical Education in Meghalaya with special reference to the Role played by Shillong Polytechnic, Shillong".

1:3 DEFINITION OF THE KEY TERMS:

The terms used in the prsent study is defined as follows :-

(i) **Development**:

In the present study the term development refers to " the quantitative and qualitative advancement of Technical Education in Meghalaya "

(ii) **Technical Education**:

Technical Education is defined as " the education in vocational and Technical subject which includes the studies in theoretical, practical and applied fields as distinguish in the academic disciplines".

(iii) **Polytechnic:**

The term Polytechnic is defined as "the education which is based on a variety of Technical studies and skills".

1:4 OBJECTIVES OF THE PRESENT STUDY:

The objective of the present study are given below :-

(i). To trace the development of Technical Education in Meghalaya.

(ii). To study the provisions made for students of the state in Higher Technical Education.

(iij). To study the contribution of Shillong Polytechnic towards the development of Technical Education in the state.

(iv). To find out the problems faced by Shillong Polytechnic in particular and the state in general in the field of Technical Education.

1:5 SCOPE AND DELIMITATION OF THE STUDY:

The present study involved a thorough survey on the origin and development of Technical Education in the state since its inception. Various institutions of Technical and Vocational education like Don Bosco Technical School (DBTS), Industrial Training Institutes (I.T.I 's), St. Anthony's College, Shillong Engineering and Management College and other private professional institutions have been studied to have a general picture of Technical Education in the state. But indepth study was also conducted on Shillong Polytechnic.

METHODOLOGY AND PROCEDURE:

3:0 RATIONALE :

The present study is an explanatory and descriptive study which traces out the development, status and problems of technical education in Meghalaya with a preliminary probe into the role played by the Shillong Polytechnic in the State. The study consisted of two types of data collection. The first type deals with the collection

of data through survey records regarding the development of technical education in the State. The second type dealt with the collection of data through the responses elicited through questionnaires and interview of the Principal ans Staffs of the Shillong Polytechnic on accounts of its role in equipping the manpower requirement in the field of technical education. Moreover, the information obtained through the interview of the officers of the Directorate for Higher and Technical Education was also incorporated.

3:1 SOURCES OF DATA:

As mentioned above, the study is predominantly a descripitive study which includes Survey of records available in the Directorate of Higher and Technical Education and Shillong Polytechnic, Shillong. Relevant records refered to by the investigator are both Primary and Secondary souces. This included published and unpublished records which were obtained from different offices such as the Directorate of Economics and Statistics Government of Meghalaya, Planning Department, Labour Department,etc; but the main collection was done from the Directorate of Higher and Technical Education and Shillong Polytechnic.

3:2 TOOLS/INSTRUMENTS OF THE PRESENT STUDY:

In the persent study, the investigator employed questionnaires and interview schedule as the tools to elicit information from the respondents.

3.2:1 CONSTRUCTION OF THE QUESTIONNAIRES:

The investigator constructed three sets of quetionnaires (1) for the ongoing students of Shillong Polytechnic; (2) the outgoing students and (3) the existing teachers of the institution. The questions were developed taking into consideration the various objectives of the present study. The questionnaires included mutiple choice, Yes/No type and open ended questions.

The questionaires for the teachers comprises of these areas : (i) Personal data of the respondent; (ii) Name of the course taught; (iii) Pupil-Teacher Ratio; (iv) Time

alloted for teaching the course; (v) Relevance of the course with job oppotunity; (vi) Methods of teaching; (vii) Industry-Institute Interaction; (viii) Problems faced by them and (ix) Proposal for further improvement.

The questionnaires for the students both the existing and the outgoing comprises of these areas : (i) Personal data of the respondent; (ii) Type of the course pursued; (iii) Problems relating to the course ; (iv) The facilities available in the library, laboratory and workshops, whether adequate or not; (v) Scholarships and Stipends; (vi) Hostel facilities; (vii) Sports and Transports facilities; (viii) Methods of teaching often used by the teachers whether satisfied or not; (ix) Problems generally experienced by them in the institution; (x) Their views about the upgradation of Shillong Polytechnic to a fullfledged Engineering College.

After construction of the items, the questionnaires were given to the experts for comments, suggestions and improvement to determine the suitability, sequencing and systematic arrangements of the tools. On the basis the comments and constructive criticism, the items were modified accordingly. Then the questionnaires were tried out to a few representatives of the relevant population chosen for study to ensure suitability of the questionnaires. A copy of the questionnaires is attached in the appendix.

3.2:2 INTERVIEW SCHEDULE:

To supplement the information collected through Survey of records, the interview schedule was also used by the investigator. The interview Schedule was developed for the Principal Shillong Polytechnic and the officers of the Directorate of Higher and Technical Education, Government of Meghalaya, Shillong. The questions included in the interview schedule for the Principal consists the following areas : (i) Personal data of the respondent; (ii) Historical background if the Institution; (iii) Different courses/ trades offered, planning of the construction of courses. etc; (iv) Procerure of the recruitment of Teachers, Teachers Training and mutiple roles of the teachers;

(v) infrastructural facilities; (vi) Placement and admission procedure, conduct of examination, evaluation and result; (vii) Inspection and Supervision; (viii) financial provision; (ix) Strengths and weakness of the institution; (x) Problems and (xi) Suggestion for improvement.

The questions included in the interview Schedule for the officers of the Directorate of Higher and Technical Education consists of these areas : (1) Government policies in general for technical education in tghe State; (2) Steps taken by the Government to improve Technical Education; (3) Provisions made to technical students in and outside the State; (4) Financial provision (5) Views about the upgradation of Shillong Polytechnic.

3.3 SAMPLE OF THE STUDY:

Having surveyed the records both published and unpublished available in the Directorate of Higher and Technical Education and the Shillong Polytechnic. The investigator selected the population for the study . This consisted of (i) Students both male and female of different course including the ongoing students and the alumni of Shillong Polytechnic; (ii) All the teachers of Shillong Polytechnic ; (iii) The Principal of the institution and (iv) the officers of Higher and Technical Education. These formed the population of the study.

Out of 267 of the existing students only 220 have returned the questionnaires duly filled in and out of 150 of the beneficiaries of Shillong Polytechnic only 135 returned the duly filled questionnaires, and 40 number of teachers out of 53 have returned the duly filled in questionnaires to the investigator. The Principal of Higher and Technical Education were interviewed. These formed the sample of the study.

3.4 DATA COLLECTION PROCEDURE:

Before data collection is done, the investigator sought the permission from the Director of Higher and Technical Education Government of Meghalaya and the Principal

Shillong Polytechnic. After the construction of the tools needed for the study, they were set out to administer to a sample consisting of 53 number of teachers of Shillong Polytechnic, 267 students of the four branches i.e. Civil Engineering , Electrical, Mechanical and Electronics and 150 outgoing students of Shillong Polytechnic, Shillong.

3.4:1 ADMINISTRATION OF QUESTIONNAIRES:

Before the administration of the questionnaires to the existing students and teachers of Shillong Polytechnic, the investigator sought the permission from the Principal of the institution.The Principal favoured the investigator wish in return. Thus, the questionnaires were distributed to the students and the teachers respectively. Questionnaires for the students were distributed in their respective classrooms. The investigator gave a personal appeal and explained them the purpose of the study. They were ensured that the information collected thereof shall be used solely for the research purpose only and never to their disadvatage.

Questionnaires to the beneficiaries or the outgoing students of Shillong Polytechnic were conducted mostly through personal contact in their respective offices,homes, shops,etc. Very few of them were mailed which were returned to the investigator .The time taken for the collection of data was almost four months. After receiving all the questionnaires from the respondents, the investigator thanked them for their kind cooperation and wished them well in life.

3.4:2 ADMINISTRATION OF INTERVIEW SCHEDULE:

Interview schedule was another toll used by the investigator for gathering data to elicit more information on the development of Technical Education in the State and the functioning of the Shillong Polytechnic. Interview schedule was used to collect information from the officers of the Directorate of Higher and Technical Education, Principal Shillong Polytechnic, the Principal and Director of Don-Bosco Technical School (DBTS) Shillong, Officers of the Labour Department, Government of Meghalaya, the Acting

Principal Shillong Engineering and Management College and the Principal I.T.I Shillong. Interview was personally carrried out by the investigator. Prior to the administration of the interview schedule, permission was sought from the authorities concern.

Rapport was first established before any questions were asked. Furthermore, they were explained that the information so obtained will be used strictly for the research purpose only. While the questions were being asked, the respondents were encouraged to elaborate any point they wished in order to make it clear. The responses was legibly recorded by the interviewer himself.

Lastly, the investigator thanked them for sparing their valuable time for the purpose.

3.5 ANALYSIS OF DATA:

The data collected through the questionnaires and interview schedule were analysed and interpreted accordingly. Calculation of percentages was done for the analysis of data. The investigator tried to link all the data collected through survey of records and the observation made during his visits to the institution with the information gathered through questionnaires and interview schedule.

MAJOR FINDINGS OF THE STUDY

5.0 INTRODUCTION

In this chapter the investigator high lights the major findings of the present study which can be described under the following heads:-

5.1. DEVELOPMENT OF TECHNICAL EDUCATION IN THE STATE:

(i) Educational Administration in Meghalaya was inherited from Assam. The Director of Public Instruction (DPI) was the head of the Directorate and was assisted by the Additional Directors, Joint Directors, Deputy Directors, etc. So, Technical Education, was manned by the Deputy Director with two dealing assistants. In course of time a post of Joint Director was created and an incumbent was promoted leaving the post of Deputy Director vacant. Very recently, the Directorate of Public Instruction was trifurcated, the three Departments came into existence, they are (a) Directorate of Elementary and Mass Education; (b) Directorate of Higher and Technical Education and (c) Directorate of Research and Training. Thus, the Directorate of Higher and Technical Education is headed by the Director of Higher and Technical Education and he is assisted by the Joint Director with three supporting staffs. Therefore there is an increase of one staff only in a span of 28 years.

(ii) Shillong Polytechnic was established in 1965 under the composite State of Assam . At the outset, the institution offered Civil Engineering discipline only with the intake capacity of 60 students with ten number of teaching and non-teaching staffs. But at present it rose up to 53 number of teachers and 30 non-teaching staffs.

Electrical and Mechanical Engineering was started in 1978 with the intake of 30 students in each branch. In 1993, the State Government introduced electronics, but its academic session started in 1996.

Shillong Polytechnic was all along affiliated to the State Council for Technical Education, Assam. It was only in July 1992 that the State Council for Technical

Education, Meghalaya was formed. The Council is to advise the Government on various aspects of Technical Education.

(iii) When Meghalaya achieved its statehood, there were only two ITI's in the State, i.e., I.T.I. Shillong established in 1964 and I.T.I. Tura established in 1965. Both the institutes are imparting Engineering and Non-Engineering trades.

(iv) St. Anthony's College very recently started professional courses such as Computer, Mass Communications, Bachelor of Business Administration, Biotechnology, Information Technology, etc.

5.2 DON BOSCO TECHNICAL SCHOOL SHILLONG

Don Bosco Technical School, is one of the oldest Technical Institution in the State to provide Engineering and Non-Engineering Trades. It was recorded that the Institution issued the first Diploma Certificates to trainees in the Trades of Shoe-making, Tailoring, Carpentry and Mechanics on 30th January, 1932. At present, the Institution is providing more than a dozen Engineering and Non-Engineering trades.

Therefore, the institution play an important role to educate the young boys and girls in the technical sector, to feed them into the demands of various industries in North-East India and to facilitate them for launching self employment. Don Bosco Technical School had produced thousands of skilled personnels which have been absorbed by the government departments & by private sectors. According to the information given by the existing principals, many of the passed out students from that institute have launch their own enterprises.

Besides the diploma courses provided in Shillong Polytechnic, I.T.I's and Don Bosco Technical School, there are also a number of private institutions which provide professional courses. Some of them are: Arena Multimedia Limited, Shillong; Cubic Computer Education, Shillong; Grace Computer Training and Education, Shillong and Aptech Computer Education, Shillong.

(v) Shillong Engineering and Management College is founded by the North Eastern India Trust for Education and Development (NEITED) in 1999. At present, the College is offering two management courses, i.e., Bachelor of Business Administration (BBA) and bachelor of Computer Applications (BCA) with the intake of 30 students in each branch. Medical and Dental Courses will also be incorporated in the Institution in due course of time.

5.3. PROVISIONS MADE BY THE STATE GOVERNMENT :

Since Meghalaya has no engineering college except Shillong Polytechnic, the only diploma institution, the state Govt. have made certain provisions for student in Technical Education as below:-

1. The Govt. of India under the scheme of 'Reservation of seats' in degree and diploma level engineering/technical/pharmacy/architectural institutions for those states and U.Ts which do not have any facility for training of technical or which lack facility in some specific fields of Technical Education, the state is currently making allotment of about 82 (1999) Engineering seats in the first year B.E/B.Tech level in various engineering college in the country.

2. There are about 30 other engineering seats earmarked for the student of Meghalaya in the Regional Engineering College (R.E.Cs) all over the country.

3. The North Eastern Institute of Science and Technology (N.E.R.I.S.T) is also providing seats to about 20 students of the state at the diploma level and few seats at the degree level mainly in the civil, electrical and mechanical engineering courses. 10% of the total seat N.E.R.I.S.T is allotted to Meghalaya and 30% is open to all.

4. 15 seats are earmarked to Meghalaya in the diploma courses outside the North Eastern States.

5. After the adoption of the National Policy of Education, the state Govt. white paper on education have taken an important steps for the development of technical education

in the state i.e., the State Council for Technical Education Meghalaya which is the apex body was created in July 1993, ending the 28 years long affiliation of Shillong Polytechnic with the State Council for Technical Education, Assam.

6. The community polytechnic scheme of the Govt. of India with 100% direct central assistance has been adopted in the Govt. Polytechnic Shillong.

7. The state Govt. has provided scholarship and stipends, book grant, journey expenses etc. to the technical students studying inside and outside the states. The details of which are as follows :-

	Degree level	**Diploma level Outside the State**	**Student of Shillong Polytechnic**
(i) Stipends	Rs. 350 PM	Rs. 250 PM	Rs. 150 Pm
(ii) Journey expenses	Rs. 200	Rs. 200	-
(iii) Book grant	Rs. 1000	Rs. 500	Rs. 500

(iv) Scholarship - as per the rate fixed by the Government of India and the State Govt.

5.4. SHILLONG POLYTECHNIC: ITS CONTRIBUTION:

INTRODUCTION

Shillong Polytechnic, the only Diploma Institution was established in 1965 under the composite state of Assam. When the Institution was established, the main objective was developed industrial & technological skills by giving adequate exposure to students in the field of Technical Education, to cater to the need of manpower requirement in the state. As mentioned earlier, at the initial stage there was only a Diploma course in civil Engineering with 10 number of faculty including the Principal and the supporting staff. At present the number of courses has increased to four branches, i.e. Civil, Electrical Mechanical and Electronic & Telecommunication with 53 number of teaching staff and 13 number of non-teaching staff. At present, the institute has adequate building of its own with good infrastructural facilities.

(I) Shillong Polytechnic plays a crucial role in equipping manpower resources development with great potential for adding value to products and services contributing to improvement of the economy in the State and in improving the quality life of the people. The institution, besides, giving the basic knowledge, skills and attitudes expertise and professionalism of the technical manpower it also brings about an attitudinal change among the people towards Technical Education.

(ii) Shillong Polytechnic has become as an instrument of social and economic change. It has produced a number of trained personnel in which the majority of these have been absorbed in the government departments and very few of them had started their own entrepreneurs who in turn provided jobs for other people as well. The responses of the respondents on the following important themes confirms the important contributions of Shillong Polytechnic.

a. Man-Power Supply :

Based on the responses given by all categories of the respondents (100%) Shillong Polytechnic plays a very important role in providing manpower supply to the state. The out turn of Shillong Polytechnic till 1995 were 1,800 (Technical Man-Power Projection, 1998). These were observed in different government departments of the state.

b. Job Opportunities:

According to the views given by the teacher respondents (95%) and the passed out students (94.8%) the courses of study offered by Shillong Polytechnic were relevant to the job opportunities in the state. It was also according to their expectation. But 5.18% of the passed out students viewed that the courses of study did not help them to get job and to set up their own entrepreneurs.

Based on the above two opinions, it may be concluded that courses offered in the institution were suited for government jobs, but they do not provide scope for self

employment and do not suite the emerging needs of the present situation.

c. Employability:

According to the study of technical man power profile 1995 : India and the state conducted by the institute of Applied man power research, New Delhi, 1998, there were still good opportunities of employment existed for diploma holders in civil engineering in the state as 2/3 of them are absorbed with in one year of passing the examination. The following table shows the position of discipline-wise absorption pattern 1992 in Diploma level .

	Discipline	Time Taken 95% absorption Years	Absorption within one Years (percent)
1.	Civil Engineering	2	66.70
2.	Mechanical	3	50.00

This table corresponds with the view expressed by the 92.5% of teachers respondent that the courses are relevant and there is no excess of man power in the diploma level in the state though they feel that this may be critical in the years to come as there may be excess of technically trained personnel in one field or the other if no action is taken by the Government to diversify the courses.

As mention earlier, the courses run by the Shillong Polytechnic are traditional in nature. As such, the student are not equipped with technical skills which will not only make them better suited to the emerging job markets but also do not give them the skills for self employment. According to the opinion of the beneficiaries of Shillong Polytechnic about 85.8% of them were placed in different Government departments where as only 17.5% started their own enterprise.

d. Financial Return:

93.3% of the respondents from the beneficiaries of Shillong Polytechnic highly agreed that the financial return were proportionate to investment in Education. Whereas did not agree to the same. It may be conceived that those who are in the government job enjoyed good salary whereas those who are setting their own enterprise, the rate of return is not consistent. Moreover, there was no financial return for the unemployed trained personnels.

5.5 INFRASTRUCTURES:

Following are the reviews expressed by all categories of respondents on the functioning of Shillong Polytechnic:

i. Building

Shillong Polytechnic has adequate building which includes both administrative and class rooms. This is supported by the responses given by the Principal by the institution.

ii. Laboratory

100% of the respondents both the present and the outgoing students mentioned that the institution has provided laboratory facilities but 80.6% of the respondents from the ongoing students and 88.8% from the beneficiaries expressed that they were not satisfied with the provision made for them. This revealed that the facilities provided are outdated and defected. Therefore, in order to make practical meaningful, facilities should be up to date.

iii. Library

The Principal of the Institution mentioned that the library facilities in the institution are adequate, whereas 81.8% of the existing students and 88.8% of the alumni of Shillong Polytechnic critically disagreed to that statement. So, there was a contradiction of opinions. The students expressed that most of the books available in the library

were out dated and not relevant to the course of study. Therefore, there is an urgent need to improve the library facilities.

iv. Hostel Facilities:

At present, the state government has provided Hostel facilities for boys only but there is no Hostel facilities for girls. In fact, the Hostel building was constructed, but facilities such as electricity, water supply etc. was not provided. Actually, these are the many problems which can be tackled easily but unfortunately, the government do not show much interest to solve these problems.

5.6 PRACTICES FOLLOWED:

a. Courses of Study:

At the beginning, Shillong Polytechnic had only Civil Engineering Discipline with the annual intake of 60 students. In 1978, Mechanical & Electrical Engineering Courses were introduced with the intake of 30 students in each branch. In 1993, Electronics & Telecommunication was also introduced but its academic session began in 1996 with the intake of 30 students.

b. Methods of Teaching:

The methods of teaching generally used by the teachers are depending to the need of the situation. But the most commonly used methods according to the responses from the teachers are lecture methods, discussion methods, demonstration methods, question-answer, field trips etc. In most cases, combination of more than one method was used at a time. Besides, the teachers also employed audio aids, visual aids & Audio-visual aids which were used according to the need of the situation in order to facilitate teaching-learning process.

All the teachers of Shillong Polytechnic which deals with the engineering courses, their educational qualifications were Bachelor of Engineering (B.E.) and above, whereas the lectures in other disciplines such as Humanities, Science and Mathematics

etc. were Masters Degree. Except those Instructors & laboratory staffs were diploma degree holders.

Based from the interview with the Principal Shillong Polytechnic, there was an irregular deputation of teachers to the Technical Teachers Training Institute (TTTI), Calcutta, that's why the teachers also have suggested that untrained teachers should be deputed to the Technical Teachers Training Institute.

c. System of Examination:

Based from the records available in Shillong Polytechnic and the interview with the Principal of that institution, it was found that since its inception till late 1970's the institution followed the annual system of examination. But since 1978 onwards, it followed the semester system of examination. It was only in 1992 that the annual system was again introduced which is in force presently.

d. Guest Lecturer:

100% of the respondents both the existing and the outgoing students indicated that there was no itinerant or resource persons that come and deliver lecture in the institution because as mentioned earlier, the state has no collaboration with the industrial set up in or outside the state.

e. Industry-Institute Interaction:

Industry-Institute collaboration is one of the most important aspect of technical education i.e. to link the theoretical knowledge and practical application. But it was found that was no arrangement for the Shillong Polytechnic to have such an interaction with any industry or factory. This was revealed from 100% of the respondents both teachers and students that there was no provision for industry-institute collaboration.

f. Inspection and Supervision:

On account of response obtained from the Principal Shillong Polytechnic, inspection & supervision in the institution is conducted by the All India Council for Technical Education, Eastern Region, Government of India, at least once in two years. This showed that inspection was very irregular.

5.6 FUTURE PLANS IN TECHNICAL EDUCATION

(I) Keeping in view the current needs , in technical education, the Education Department was informed that the Ministry of Human Resource Development (HRD), Government of India, has included the State of Meghalaya in the Third Technician Project of the World Bank. This project aims at developing the youths to make them better suited to the emerging job markets and to give them the skills for self employment. The plan of the project as proposed by the State Government are :

(a) Starting three years diploma courses in Computer Engineering and two years diploma courses in Information Technology with the intake of 30 and 20 students respectively.

(b) To set up Tura Polytechnic and to introduce these courses:

Computer Applications	-	40 intake capacity
Food Processing and Preservation	-	40 intake capacity
Medical Electronics	-	40 intake capacity

(c) To set up Jowai Polytechnic and to introduce the following courses:

Architectural Assistantship	-	40 intake capacity
Automobile Engineering	-	40 intake capacity
Costume Design and Garment Technology (only for girls)	-	40 intake capacity

(ii) The Meghalaya State Council has also proposed that the first phase of workshop for revision of the existing curricula and preparation of new ones of various levels at

5.7 FUTURE PLAN IN TECHNICAL EDUCATION

The contribution of Shillong Polytechnic is remarkable in the field of Technical Education in the state, Yet as mentioned earlier the need for Technical Education hardly needs emphasis in the minds of students who are undergoing general courses especially in liberal arts the department of Education feels that there should be a major thrust towards promoting Technical Education.

The Education Department was informed that the Ministry of Human Resource Development (HRD) Govt of India has included the state of Meghalaya along with other North Eastern States in the third Technician Project of the World Bank. Meghalaya is the only state which is not only enlisted for upgrading its existing Polytechnic at Shillong but also creating two more Polytechnics at Tura and Jowai. This project aims at equiping the youth with technical skills which will not only make them better suited to thge emerging job markets but also give them the skills for self-employment in the informal sector. The detailed plan of the project proposed by the State Government is as below.

5.8. Polytechnics and Courses are as follows:-

(a) **Shillong Polytechnic** :-

(i) Modernisation of Laboratories & Workshop with new equipment.

(ii) Repair and renovation of existing building including boys and girls hostel.

(iii) Starting of three years diploma course in Computer Engineering - 30 intake capacity.

(iv) Starting of two years post diploma course in information Technology - 20 intake capacity. AICTE to be moved for obtaining approval for new courses.

(b) **Tura Polytechnic** :-

(i) Courses to be introduced in the new Polytechnic at Tura are :-

Computer Application	-	40 intake capacity
Food processing & preservation	-	40 intake capacity
Medical Electronics	-	40 intake

(ii) AICTE approval has been obtained for setting up of new Polytechnic at Tura with two courses - Computer Application & Food Preservation. For medical Electronics AICTE approval is to be obtained.

(c) **Jowai Polytechnic:-**

(i) Courses to be introduced in the new Polytechnics at Jowai are :-

Agricultural Assistantship	-	40 intake capacity
Automobile Engineering	-	40 intake capacity

Costume Design & Garment Technology (only for girls) - 40 intake capacity.

(ii) AICTE approval has to be obtained for the new Polytechnic at Jowai and its courses.

(iii) Vacant land of Kiang Nongbah Govt. College, Jowai has been identified for setting up of the new Polytechnic.

The Meghalaya State Council had also fixed that the first phasse of work-shop for revision of the existing curricula and preparation of new ones of various diploma level courses will be held from 3-9 May 2000 with the experts to be drown from Technical Teachers Training Institute (TTTI) Calcutta and resource person from different department the joint effort from the faculty members of Shillong Polytechnic.

Besides, the State Government has also pleaded the Government of India to allot more seats to the students of Meghalaya in Modern Engineering Degree Courses like Leather Technology, Polymer Science & Technology, Food Processing & Preservation, Fashion Technology and Information Technology, But only one seat is only alloted i.e, Leather Technology.

diploma courses will be held from 3-9 May, 2000, with the experts to be drawn from TTTI, Calcutta; resource persons from different departments and the faculty of Shillong Polytechnic.

(iii) The government of Meghalaya has also pleaded the Government of India to allot more seats to the students of Meghalaya in the Engineering Degree courses like Food Processing and Preservation, Fashion Technology and Polymer Science and Technology, Leather Technology and Information Technology. But only one seat is allotted, i.e., Leather Technology.

5.9 Problems

1) Ever since the creation of the State of Meghalaya the state has not been able to set up any Polytechnic though the state has been contemplating setting up a Polytechnic at Tura. This was due to paucity of resources. The state is eking out an assistance with limited number of courses in conventional discipline in one and only Shillong Polytechnic.

2. Under the scheme of Govt. of India 'Reservation of Seats .....' upto 1994 - 95 session, the Government of India used to reserve engineering seats (degree and diploma) State - wise, Institution - wise and discipline - wise. The State Govt. could satisfactorily nominate the students in order of merit to the selected colleges knowing their status and facilities available particularly the availability of hostels for both girls and boys. Since 1995 - 96 session the system has revised by the 6/9 seats have been reserved state-wise and branch-wise. Donor state have been given option to offer seats in the institution of their choice. The system created great inconvenience to nominate the students in order of merits and discipline due to the fact that many donor state do not confirm the name of the institution and student were nominated to the authority of the concerned state for allotting colleges from their end.

3. Today the major problem in Technical Education in the State is the lack of proper industrial atmosphere in the Technical Institutions for which the students do not get proper acclimatisation to the actual field of the Industry. Lack of Industry-Institute interaction make the students more theoretical centred rather than theoretical cum practical centred.

4. Another technical education problem in the state is that at present there is no separate Directorate for Technical Education because the existing Directorate of Technical Education is grouped together with Higher Education. Besides, there is a shortage of staffs and lack of adequate finance and other infrastructural facilities in the State.

5. Shillong Polytechnic is the only Technical Institute in the State for providing diploma courses. Students have to travel long distances to avail of the facilities of the Polytechnic. There is, therefore, an element of inconveniences and regional imbalance.

6. The problems faced by the students and the Teachers of Shillong Polytechnic are as follows :-

(a) No hostel facilities for girls.

(b) Inadequate textbook and library facilities.

(c) Inadequate practical equipment and workshop facilities.

(d) Shortage of water supply.

(e) Inadequate Sports facilities.

(f) Lack of transport facilities.

5.10CONCLUSION & SUGGESTIONS:

Inspite of the, great emphasis on the importance of Technical Education at the national level there has been not much expansion of technical facilities in the state. Technical Education in the State has been neglected for a very long time. Shillong Polytechnic, the only institution of its kind in Meghalaya was established way back in

1965 under the composite state of Assam. The Institution is conducting Diploma courses in traditional courses in Civil, Electrical and Mechanical Engineering. Proposals for establishment of two new Polytechnic at Tura and Jowai were submitted to the All India Council for Technical Education with copies of curriculum and syllabi of courses to be followed in the proposed polytechnics other than the traditional courses. Till today there is no provision of diversified courses & no additions of courses except Electronics. Engineering being the latest which was approved in 1993 and commenced from the academic year 1996 with an intake capacity of 30 students.

Some of Selected Indicators 1991, 1995 as projected in the study on Technical Manpower Profile 1995: India and the states, 1998, gives a picture of the position of Technical education in the state in comparison to national level.

Table 5

Parameter	1991			1995		
	Meghalaya	India	% to India	Meghalaya	India	% to India
1. Population (thousand)	1775	846313	.21	1945	91766	0.21
2. No. of Diploma Instn.	1	843	0.11	1	1322	.07
3. Intake (Sanctioned)	120	133433	0.09	150	175190	.08
4. Outturn	105	65152	0.16	84	90734	.08
5. Stock of Diploma Holder	1690	859250	0.20	1800	1079090	0.17
6. Teacher student Ratio	1.8	1.16				
7. Shortage of teachers	14%	18%				

This table reveals the fact that there was an increase of diploma institution at the all India level but in Meghalaya the position remains the same even after 28 years of its creation. The intake of students at all India level is significant where as there is slight increase of intake capacity in Meghalaya and percentage in India decreased in 1995. The Students teacher ratio is also high at all India level. However, Shortage of

teacher is less in the state of Meghalaya compare to India level.

1. Taking into consideration the problems faced by the state government in matters of reservation of seats, it is suggested that the government of India should revert its present system of reservation of seats to the previous one where seats are reserved state-wise, institution-wise and discipline-wise.

2. For the smooth functioning of Technical Education in the State, there is an urgent need to create a separate Directorate for Technical Education.

3. Industry-Institute collaboration has been the theme of numerous studies, discussions, seminars and conferences in India. Industry-Institute interaction needs to be promoted in a big way in the state through apprenticeship opportunities, consultancy and sponsored research. There is a need to encourage and strengthen mobility and exchange of faculty between the academic institution-institutions, national laboratories and industrial development.

Since, the state of Meghalaya is industrially backward, it creates another problem to arrange Industry-Institute interaction programme. But this can be done by collaborating with the neighbouring states such as Assam which have many industries and factories.

4. Co-ordinated and concerted efforts are needed to be made to upgrade the infrastructural facilities in technical Education in the State with special reference to Shillong Polytechnic. The facilities such as availability of equipment, water supply, hostel facilities, library, transport and other facilities need to be provided by the Government. Outdated equipments in the laboratory & workshops should be replaced with new ones and defective tools to be repaired. Books available in the library also should be up-to-date and relevant to the courses of study. Besides, journal, encyclopaedia etc. should be in plenty to enrich the knowledge of the students.

5. Regional imbalances in the State can be solved immediately as the Government have proposed to set up two more Polytechnics in the State, i.e., one at Tura and the other at Jowai, with diversified courses.

6. For the smooth functioning and in maintaining the standard and discipline of the institution, inspection & supervision should be conducted regularly.

7. Hundred percent of the respondents strongly suggested that Shillong Polytechnic should be upgraded to a full-fledged Engineering College. But the emergence of Shillong Engineering and Management College, Dental and Medical College in the State poses another problem if Shillong Polytechnic is also upgraded to a full-fledged Engineering College, because a small State like ours cannot absorb the students that will come out from these Colleges either in Government jobs or in private entrepreneurs. Even though Shillong Engineering and Management College is not functioning till now, but after some time courses will be started as soon as possible. Even though there is all round pressure to upgrade Shillong Polytechnic, yet, the matter is to be considered by the State Government.

5.11 SUGGESTIONS FOR FURTHER RESEARCH:

In the present study, the investigator brings out some solutions, yet, inspite of the efforts made by the investigator, there are several aspects which could not be included in the present study. Therefore, further researches are suggested and recommended in the following areas.

(1) An investigation of the attitudes of the society towards Technical Education in the State.

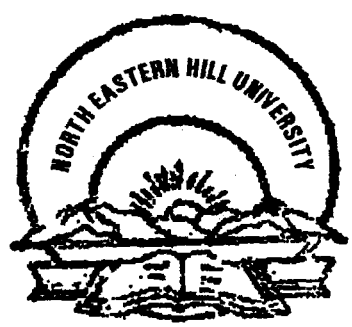
(2) A comparative study of Shillong Polytechnic with other polytechnics in North-East India.

A STUDY ON THE DEVELOPMENT OF TECHNICAL EDUCATION IN MEGHALAYA WITH SPECIAL REFERENCE TO THE ROLE PLAYED BY SHILLONG POLYTECHNIC, SHILLONG.

By

PROMAR LYNGDOH

TO



A

DISSERTATION SUBMITTED

IN REQUIREMENTS OF PARTIAL FULFILMENT OF THE DEGREE OF
MASTER OF PHILOSOPHY IN EDUCATION.
NORTH EASTERN HILL UNIVERSITY
SHILLONG
2000

NORTH – EASTERN HILL UNIVERSITY SHILLONG
APRIL, 2000

I Promar Lyngdoh declare that the Subject matter of this thesis entitled " A Study on the Development of Technical Education in Meghalaya with special reference to the Role played by Shillong Polytechnic, Shillong", is the record of work done by me, that the content of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for my research degree in any other University / Institute.

This is being submitted to the North Eastern Hill University for the award of the degree of Master of Philosophy in Education.

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ACKNOWLEDGEMENTS

It is my priviledge to express my gratefulness to all those who have encouraged and helped me in completing my research work and I record my deep sense of gratitude to Dr. C. Nongbri my Supervisor for her constant inspiration, guidance, openness, patience and for giving her time whole heartedly at every stage of research work which enabled me to complete the writing of the dissertation in time.

I would also like to express my gratidute to the Head of the Department and all the members of the faculty, Education Department, NEHU, for all their valuable giudance and suggestions.

My sincere and humble gratitude goes to my mother, my wife, my sons and all members of my family who have been a source of inspiration, encouragement and upholding me throughout the course of my study. Their moral and financial support enabled me to undertake my study and finish it in time.

I delightly convey my heartfelt gratitude to all my friends, who have directly or indirectly helped me.

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"Technical Education will empower technology, technology is the tool for nation development."

-Abdul Kalam

CHAPTER - I

INTRODUCTION

1 : 0 THE CONTEXT:

The aim of all education is primarily to enrich the latent genius and the hidden talent of the people, for the benefit of the country and the society at large. General education, aim at an all round balanced development of the body and the mind, to help the individual to flower his genius, so that he can render his mite for the service of the nation. Technical Education on the other hand, is that branch of human knowledge, which aim at developing the latent treasures of human skills and ingenuity, in order to develop not only the human body and mind and enrich the society at large, but at the same time, to help in the technical and industrial development and economic prosperity of the state in particular and the nation in general. Technical education basically prepares all the manpower required starting from craftsmen or machine operator to Research and Development (R & D) engineers.

Technical education is a new branch of applied science, which has come lately to the fore as a direct result of the massive Revolution in the eighteen century in Europe. The industrial revolution in Europe about two centuries ago, had completely revolutionised the whole Socio-economic Fabric of the society and consequently brought about a colossal change in the way of life of the people. The spirit of science and scientific outlook motivated the nations of Europe and the impact of the industrial revolution soon spread throughout the European countries and the Western World where a new industrial civilisation had developed. A new discipline of technical education was born to train and equip the future set of skilled workers with the latest techniques in a systematic way, so as to keep the industries going. The increasing number of industries led to endless competition in industries where there was an awareness in maintaining the standard of the industrial products, a trained body of technicians was deemed necessary to oversee and supervise the body of skilled persons in the industries. There was thus born the class of technicians above the

technically skilled persons in order to watch and enforce standards and specifications in the process of manufacture and construction. Thus, it is evident that there emerged three distinct classes of technical personnel, viz, skilled workers, technicians and engineers are the distinct offshoots of the 'Industrial Revolution'.

1:1 OBJECTIVES OF TECHNICAL EDUCATION:

According to the Radhakrishnan Commission, Education has to be flexible, capable of adaptation to the changing needs and conditions of man. If this is true of education in general, then it is even more true for technical and technician education. A U.N.E.S.C.O. Report (1978), reviewing the policy and planning of technical and vocational education in 23 countries including India and in accordance with the Revised Recommendations adopted by the general Conference of U.N.E.S.C.O. at its eighteen Session in 1974 the objectives of technical education are :

1) Technical and Vocational Education should be geared in fulfilling the manpower requirements for economic development and social requirements for employment.

2) Technical and Vocational Education should be developed in such a way as to provide broader educational opportunities for an increasing proportion of the population.

According to the Damadoran Committee Report (1971), the main objective of technical education programmes in Polytechnics is to give the students a sound broad based knowledge of a chosen field combined with actual experience in industries, business or commerce, as the case might be. A technician must have a broad based of abilities ; he must have a mastery of techniques relevant to the immediate employment and an understanding of science and mathematics which is few enough to permit further extension to new applications and education must lead to a development of confidence and competence for self employment. In other words,

technician courses being broad based must have provisions for diversification, preparing a student for entrance into a technician function, facilitating mobility as well as future occupational advancement. Polytechnic education should aim to develop practical skills and an attitude to understand, appreciate and apply concepts to practical situation.

In India, then, the process of technical and vocational education is expected to contribute to the achievement of society's goals of greater democratisation and social, cultural and economic development, at the same time developing the potential of individuals for active participation in the establishment and implementation of these goals. Technical and vocational education thus should be firmly rooted in a broad based general education. Technical or polytechnic education, shares all the foregoing objectives along with its other levels.

1:2 THE ROLE AND IMPORTANCE OF TECHNICAL EDUCATION IN THE MODERN EDUCATIONAL SYSTEM:

The place and importance of technical education in the entire system of education in India cannot be minimized. Technical education is one of the most crucial components of human resource development. One of the most important goal of technical education is to develop the required skills, expertise and professionalism of the technical manpower so that they may be effectively engaged in the production of quality, goods and services for contributing the quality of life of the people. For the industry to become competitive locally as well as globally in the domestic and international markets, improvement in the quality of products and services is imperative. This is to a large extent contingent upon the quality of people working in the industrial sector, their training and retraining. Fulfilment of this poses a great challenge to the Technical Education System in terms of improving the quality and standards of training of the technical

manpower as per the demands of the industry and also to retain and upgrade the knowledge skills of working technical personnel. Technical education is very important in arousing the spark of genius and creativity which is the hallmark of all scientific and engineering achievements.

The role of technical education in the life of the nation is vital. In the present world no nation can exist without it. It is the life blood of the nation. It is the key to national prosperity and glory. In the atmosphere of highly explosive international situation, every nation is concerned with its safety and security.

The progress, welfare and security of the nation depend critically on a rapid, planned and sustained growth in the quality and extent of technical education. It is universally agreed that technical personnel both men and women can help to achieve the target of national development. Technical education in the Indian context as per the A. I. C. T. E. Act which covers Engineering, Technology, Management, Architecture and Pharmacy, is one of the most crucial components of human resource development with great potential for adding value to products and services, for contributing to the national economy and for improving the quality of life of the people.

Technical education can also provide intensive and extensive training for the in-service personnels to meet the increasing manpower needs to the country. According to the document of Science Policy Resolution of 1958 the key to national prosperity lies, ...in the modern age in the effective combination of technology, raw materials and capital. Polytechnics were given a boast during the late sixties in which the main thrust of technical education was on the diploma level. The middle level personnel were to be responsible for mediating between the skilled workmen and degree holders. They were to be the bridge between the reality and the vision. The research and design technologists were expected to provide theoretical base for technology, in which the graduate engineers were to translate into reality.

In the world in which technologies change swiftly, the real challenge is to equip the students with more basic knowledge and skills that will enable them to adapt successfully in the future to a succession of changing jobs requiring different specific skills many of which cannot be foreseen. As we enter the next century, we will have to keep abreast with the developments in irradicate the several areas such as micro-electronics, informatics, telematics, bio-technology, engineering design, material sciences, oceanography, instrumentation and space technology, etc. A well-conceived and co-ordinated approach to the introduction of emerging technologies in our industry will further accelerate the pace of our development and socio-economic growth especially in the export-oriented sector.

1:3 DEVELOPMENT OF TECHNICAL EDUCATION IN INDIA

Before discussing the development of Technical Education in Meghalaya, it is essential to give a brief account of the development of Technical Education in India and North-East India in the following paragraphs just at a glance to see the gradual development of Technical Education.

(i) INTRODUCTION :

The Industrial Revolution came to India only at the outset of the 20th Century and along with it, the technical education. Although India has made a humble beginning, almost about 150 years ago, it was after India achieved her political independence that the real industrial development took place and technical education was increased in a rapid pace in order to catch up with the other industrially advanced countries of the world.

Technical education in India has not been an indigenous growth, geared to the need and aspiration of the people in India, but is the legacy of British rule to cater to

their material needs and empire building. It appears from the account of the Radhakrishnan Report (1948-49) that by 1825, Technical schools were in operation in Bombay and Calcutta to train personnels like overseers needed to construct and maintain public buildings, roads, canals and ports ; and artisans and craftsmen needed to produce instruments and apparatus for use in the army, navy and survey departments.

(ii) **The Wood Despatch (1854)**: stressed the importance of Vocational and Technical instruction and the need for establishing Vocational Colleges and Schools of Industry. Therefore, by 1856, three Colleges of Engineering had been set up in the three Presidencies of Bengal, Bombay and Madras.

(iii) **The Calcutta University Commission (1917-19)**: proposed a radical reorganisation of the College of Engineering in Bengal, they recommended the establishment of departments of technology of Science to provide courses in subjects like Technological Chemistry, dyeing and tanning. They further endorsed the complete separation of Technical and industrial education.

(iv) The Hartog Report shows the number of various types of institutions in existence in 1927. Table 1:1 below sets out the information in an adopted form.

Kinds of Institutions	Number in 1927
University Departments of Engineering	3
Engineering Colleges	4
Engineering Schools	10

The Sheer number of separate Technical and industrial schools had gone up considerably between 1917 and 1927, a number of Ten years as Table 1:2 will testify.

Provinces	Number of Technical and Industrial Schools		
	1917	1922	1927
Madras	40	41	63
Bombay	26	31	33
Bengal	59	86	153
United Provinces	28	37	111
Punjab	33	27	24
Bihar and Orissa	38	32	43
Central Provinces	9	7	2
Assam	7	12	15
Total for British India	**338**	**271**	**444**

1:4 DEVELOPMENT OF TECHNICAL EDUCATION IN THE POST INDEPENDENCE PERIOD:

The All India Council for Technical Education (A. I. C. T. E) was created in 1945 and has been functioning till today, determining general policies and co-ordinating between various agencies. The N. A. Sarkar Committee set up in 1945 and reporting in 1946, deal with the question of institutions of higher technological education in India. It was on the recommendation of this committee that the Indian Institute of Technology (I. I. T's) were set up in Bombay, Kharagpur, Kanpur, Madras and Delhi between 1951 and 1961.

The University Education Commission 1948-49 (Radha - Krishnan Commission) recommended the setting up of Institutions of a different kind to produce not merely

men skilled in technology but " *a sound, well integrated individuals and citizens*" capable of *"a spirit of adventure, resourcefulness and self-reliance*". For achieving this, the report suggested the inclusion of courses in general education and of a practical courses like business administration, labour relations and Industrial finance within the Technical Curriculum.

The Kothari Commission (1964-66) has taken a priority to include scientific, Technical and research education at the University stage. The Commission made a number of recommendations in connection with Polytechnic education, relating to curricula and courses, equipment, teachers and industrial experience.

Prior to 1960 the various reports have been attempted to categorise technical personnel in their own way. The Technical Education and Vocational Training (T. E. V. T) report (1960) and the Manpower Survey used the terms "*graduate engineers*" and "*diploma holders*". The Commission used the term "*Technician*" for the first time to refer to diploma holders. Moreover, the working group on Technical Education and Vocational Training (1960) identified Polytechnics as those institutions which offered courses of three years duration " *in branches of immediate use to government departments and industry*" and were organised in big cities. The Commission classified Technical education into four different levels as follows:-

1) Indian Institutes of Technology.
2) Regional and State Colleges of Engineering.
3) Polytechnics.
4) Industrial Training Institutes.

Table 1:3 Showing levels of Technical Education in India

Types of Institution	Entry Qualification	Category of personnel	Qualification given	Duration in the course
Indian Institutes of Technology (IIT)	Higher Secondary (+2) for graduate course. Degree for Post graduate course	Technologist	Graduate, Post graduate and Research	5 years
Regional or State College of Engi-neering (R. E. C)	Higher Secondary (+2)	Technical personnel	Graduate Degree	4 years
Polytechnics	Secondary (10)	Technician	Diploma	3 years
Industrial Training Institutes (ITI)	Secondary (10)	Technician skilled personnel	Diploma Certificate	1 year

As shown in the above table, technologist hold post graduate and research degrees, Technical personnels hold graduate degrees, technicians hold Diploma and skilled personnels hold certificates.

After Independence almost up to 1980, expansion of technical institutions was smooth. As a result, the regional requirement of manpower, both at the degree and diploma levels was, by and large met according to the planned need in the country. In 1947 when India becomes independent there were 100 Industrial Training Institutes, 53 Polytechnics and 33 Engineering Colleges Preparing Students for the award of Certificates, diploma and bachelor's degree. Post graduate education was essentially a post independence phenomenon. Technical Education in India showed a great

expansion in the period of fifties, sixties and eighties in which emphasis was both on quality and quantity.

During the period from 1900 to 1986, the number of Degree level Engineering Colleges in the Country rosed from 5 with an intake of 1000 to 266 with an intake of 61,677.

Table 1:4 shows the number of engineering and Technology institutions existing at various points of time (1947 - 1989)

Years	Total number of institution Degree	Number of institutions that conducted programmes at the level of:			
		Doctorate Degree	Master's Degree	Post graduate Degree	Bachelor's Degree
1947	46	0	4	0	42
1950	58	1	6	1	53
1955	80	1	14	2	74
1960	118	2	27	5	111
1965	151	7	37	9	144
1970	163	20	62	14	155
1975	197	32	84	22	169
1980	226	41	94	19	216
1985	358	58	115	16	347
1989	383	74	143	17	372

1:5 GROWTH AND PRESENT STATUS:

A brief account was given in the state of Technical Education in India at the time of independence and the subsequent trends of development in the following years. The trends of growth of Engineering Education at the diploma and degree levels is

shown in table 1:5 and 1:6

Table 1:5 shows the number of diploma level institutions and intake

Years	Number of institutions all categories	intake
1940	12	700
1947	43	3400
1960	195	26000
1970	309	43500
1980	332	49000
1986	746	115000
1990	879	121300
1994*	988	152250

* From the AICTE directory 1994 and the rest from ISTE documents

Table 1:6 shows the number of University level institutions and intake

Years	Number of institutions (all categories)	intake
1940	11	600
1947	44	3200
1961	113	16500
1971	139	18200
1980	157	28500
1986	287	59500
1990	337	66590
1994*	370	87530

* From the AICTE directory 1994; the rest from ISTE document

1:6 DEVELOPMENT OF TECHNICAL EDUCATION IN NORTH-EAST INDIA:

The North-East is an umbrella term used to denote the so called " *Seven Sisters*" which includes the state of Assam, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram and Tripura. The seven states together account for 7.7 percent of the geographical area of the country and 3.73 (1991) percent of the population. This is an area which is multilingual, multiculture and multireligious in nature. The North-East region as a geographical unit display certain common social, economic and political features.

The region is rich in natural and human resources. However, the means to harness these into economic prosperity and material comforts for the region are at a stage where minimal utilisation is made and a rapid depletion of resources takes place. This could be improved through Technical Education.

1:7 THE ROLE OF TECHNICAL EDUCATION IN NORTH-EAST INDIA:

Technical Education is helping for assessment of manpower surveys and planning in the state. In the face of the ozone depletion, global warming, the dismal climatic consequences like heavy rains and floods, deadly cyclones and typhoons, the rise in the level of Sea water and the huge toll of life and property, the whole issue of Industrial development all over the world need to be examined. Industrial Countries contribute 25 percent higher pollutants to the ecosystem than the rest of the nations, waste products of different categories, like solid waste affluent, harmful gases etc., can deplete resources, harmful residences which cannot be absorbed by the ecosystem. Thus technical education play a very important role to prevent from further deterioration.

Since, the North - East is predominantly rural in nature, land is one of the most important components of the life Support System and the economy is predominantly

agricultural. Old methods of agriculture which lead to soil erosion and degradation can be reduced by technological means by imparting technical education to maintain productivity of the land for Sustainable development. Technical Education Presumably aim to educate people for self independence whether working for others or engaged in self-entrepreneurship. Technical education is the instrument of social and economic change.

1:8 CLASSIFICATION OF INDUSTRIES IN N. E INDIA BY THE RAW MATERIALS:

North - East India is increasing in the number of industries. Classification of industries by the raw material would include:

A. **Mineral** - Based Industries like Coal, Petroleum, Natural gas, Petrochemicals, Fertilizers and Cement.

B. **Forest** - Based Industries like - Plywood, Paper, Matches.

C. **Crop** - Based Industries like tea, coffee, rubber, sugar and tobacco.

D. **Fibre** - Based Industries like jute, Cotton, coir, sisal, silk and spun silk.

E. **Oil** - Based Industries like mustard, linseed, rapeseed, ground nut, Soyabean and Sesame.

In addition, Cottage industries exists in the form of weaving and handicraft, bamboo and Cane products, bill, metal, jewellery, food processing, backery and the like. North- East India is very rich in water resources livestocks and poultry etc.

North-East India is perhaps the last part of the Country to receive the impact and influences of industrial development in the post independence era, and accordingly the development and expansion of Technical Education.

Table 1.7 shows the number of institutions imparting Technical and Vocational Education of various kinds as on September 1992

Institutions	Assam	Arunachal Pradesh	Meghalaya	Nagaland	Manipur	Mizoram	Tripura
Engineering Colleges	3	-	-	-			
Medical Colleges	3	-	-	-	1		
Agricultural Colleges	2	-	-	1	1		
Veterinary Colleges	1	-	-	-			
Polytechnics	8	2	1	1	1	1	1
Technical and Industrial Schools	27	2	3	3	19	1	1

1:9 MEGHALAYA AND ITS SETTING:

Before we examine the importance of Technical Education in the State of Meghalaya it is necessary to have a brief discussion of the State and its setting. The educational system that exist in the state is also mentioned.

The name Meghalaya was given by Professor S. P. Chatterjee of Calcutta University in the year 1928-32 who visited this land with a purpose in connection with his research work on the geomorphology of this region. During his field work he observed that the region was covered with excessive cloud and hence he named it as Meghalaya. Its meaning is "*The abode of clouds*". Meghalaya came into existence

as an Autonomous State of Assam on April 2, 1970. It became a full-fledged State on January 21, 1972 and Shillong a lovely hill Station is its capital.

The region lies approximately between 25.47° N to 26.10° N latitude and 89°45'E to 92° 47 'E longitude.

The total area of the state is 22, 429 Sq. Km and its Population according to the 1991 Census was 17, 74,778. The state is a land - locked territory of lovely hills with abounding Sylvan beauty. Impressed with the scenic beauty of Khasi Hills, Sir Joseph Hooker (1856) compares the pastures of Mairang to those of New Zealand. Khasi Hills was also called "*The Scotland of the East*" and Shillong which is situated in the heart of the land is known as the "*Queen of Hills stations in India*". The state is bounded on the North by Goalpara, Kamrup and Nowgong Districts of Assam, on the East by Karbi Anglong and North Cachar hills in the Assam, on the South and West it is bounded by Bangladesh. The original composite districts of United Khasi and Jaiñtia Hills and Garo Hills have now been divided into 7 (seven) administrative districts as follows :

Sl. No	District	Headquarters
1.	East Khasi Hills District	Shillong
2.	West Khasi Hill District	Nongstoiñ
3.	Ribhoi District	Nongpoh
4.	Jaiñtia Hills District	Jowai
5.	East Garo Hills District	Williamnagar
6.	West Garo Hills District	Tura
7.	South Garo Hills District	Baghmara.

The District - wise break up of area and population is given below :-

Sl. No	District	Area in Sq. Km	Population
1.	East Khasi Hills District	2,748	5, 37, 906
2.	West Khasi Hills District	5, 247	2, 20, 157
3.	Ribhoi District	2,448	1, 27, 312
4.	Jaiñtia Hills District	3, 814	2, 20, 473
5.	East Garo Hills District	2, 603	1, 88, 830
6.	West Garo Hills District	3, 714	4, 03, 027
7.	South Garo Hills District	1, 850	77, 073

Typically, the indigenous population of the state consist predominantly of the Khasi Jaiñtia and Garo tribes who are the descendants of the very ancient people having distinctive Cultural traits and ethnic origins which follow Matrilineal system of inheritance. Besides, the inhabitants of the state consists of Marwari, Bihari, Assamese, Punjabi, Bengalee, Nepali etc. At present it has a mixed ethnic population consisting of tribals and non-tribals who follow a variety of religious beliefs and speaks several languages.

The official language of the state is English. The literacy percentage of the state according to the 1991 Census is 48.26 percent in the ratio of 44.78 percent female and 51.57 percent male which stood lower than the national average of 52.11 percent. Considering the 1981-1991 decade, it is found that there is an increase in the rate of literacy from 42.22 to 48.26 percent only.

1:10 GEOGRAPHICAL FEATURES OF MEGHALAYA:

Meghalaya has a rugged physical features. The Khasi and Jaiñtia Hills Districts form a plateau generally of rolling grassland and the area itself may be divided into

three Zones., the Ribhoi, the Rilum and the Riwar.

The Ribhoi covers the Northern portion of the region. This area slopes downwards from the Central belt to the Brahmaputra Valley. The climate is warmer than that of the Rilum. The area is a plateau with flat lands and valleys. Thick forest and bamboo groves cover the area. It is a very fertile region but the whole area is sparsely populated.

The Rilum is the Central belt extending from the Jaiñtia plateau in the east to the Lyngngam in the west. The Shillong region of this area has the highest elavation in the Khasi - Jaiñtia Hills. It is an irregular plateau with ravines through which flow rivers and rivulets. Pine trees and different kinds of trees grow in abundance, and the beautiful grasslands contributing to the attractive scenic beauty of the area. The high cliffs to the South, dropping precipitously to the Bengal plains.

The Ri - War is on the Southern side of the Khasi-Jaiñtia Hills. The Climate is warm and the area is bisected by long ridges, gorges, elevated rivers and valleys. It is an Agriculturally productive area. The main Products being Oranges, Bananas, Pineapples, Betel nuts, bay leaves, black pepper, brooms, etc. There are also substantial Lime and Stone Quaries. The people inhabiting the Southern Zone, especially the Shellsites and the War Jaiñtias, had constant contact with the Bangla traders and were thus subjected to outside influences to a great extent.

The Western part of Meghalaya Plateau (Goro Hills) is highly dissected region with an average height of about 600 metres above the Sea Level. The important Physiographic Features in the Garo Hills are the Tura Ranges, the Maheshkola-Adaguri range and the SimSang Valley.

The Tura Range runs in the east-West direction from Siju to Tura and is about 50 km long. The highest of this peak is the Nokrek with an Altitude of 1412 metres. The Tura Range is the typical Horst (Block Mountain) .The Kylas Range which lies east of Simsang river, rises abruptly as a Hog-Back mass and is higher than the

neighbouring hills. The rest of Garo Hills consists of hill ranges running from North to South. The Peaks of these Hills ranges vary in height from 450 to 600 metres.

Garo Hills is covered with thick forest and bamboo groves. The low land is very fertile. Traditionally, the Garo practised Jhum cultivation.

The climate of Meghalaya has been much controlled and characterised by the seasonal and periodical winds of South West Monsoon and North - East Winter cold wind. More or less, the climate of the state is temperate. Cherrapunjee and Mawsynram are recorded as the areas with the heaviest rainfall in the world.

Meghalaya is a land of surpassing scenic beauty. Waterfalls, cascades, meadows or prairie, valleys, rapid rivers, mountain lakes, rising peaks with abundance flora and fauna.

The economy of the state is predominantly agricultural. The majority of the people are engaged in agricultural and allied activities. The state is very rich in mineral and natural resources but these have not been properly tapped. Uranium at Domiasiat (Langrin) is one of the best in the world. Due to hilly and difficult topography of the land, and the organism setting, the pace of economic development in the state is slow.

1:11 THE EDUCATIONAL STRUCTURE AND PATTERN IN THE STATE:

The Education Department, Government of Meghalaya has very recently announced the new structure of school education in the state as per the government Notification No. EDN - 167/89/47 dt. 23rd March 1990 and its implementation is being taken up. The educational structure in the state are as follows:-

Primary stage comprises of classes i, ii. iii and iv. The age of admission for formal education in class I is 6 +. Upper Primary stage comprises of three classes V, VI and VII generally for the age group of 10 to 12 years. Secondary school comprises of classes VIII, IX and X (13 to 15 years). Higher Secondary School comprises of

classes XI and XII (16 to 17 years).

After passing Upper Primary Examination the student become eligible for admission to an Industrial Institutes or general education in Secondary Schools. After passing Secondary stage, students enters the Higher Secondary School, Pre-University course or Polytechnic or Vocational courses. After Pre- University or higher Secondary, the student becomes eligible for three years Degree courses in arts, Science and Commerce or for a professional course in areas like Medicine, Engineering, Agriculture, Veterinary, etc. The state has made provision for instruction in Professional courses like law and teacher education besides Postgraduate and Research level studies in different disciplines.

1:12 THE ADMINISTRATIVE MACHINERY (SET UP):

The administration of education in the state is associated with Senior Officers of the Education Department. The administrative machinery comprises of :-

1. The Secretariat level
2. The Directorate level
3. The Inspectorate level.

The Secretariat level:

The State Education Department is headed by the Minister and the Secretariat is headed by the Education Commissioner and the Secretary who is a Senior member of the Indian Administrative Service. He is assisted by Joint Secretary, Under Secretary and Deputy Secretary. The Secretariat is concerned with policy decision and controls the Directorate and Inspectorate.

The Directorate level:-

The Directorate of Public Instruction of Meghalaya was established on 2nd April 1970 with the setting up of the autonomous State of Meghalaya, having the jurisdiction

over the whole of Meghalaya excluding the areas comprising the Municipality of Shillong. Subsequently, the educational administration of the entire state was transferred to the Directorate when Meghalaya became a full-fledged state on 21st January, 1972.

The Director of Public Instruction is the Chief administrator of the state at this level. Prior to the reorganisation of the Directorate, there was only one Director of Public Instruction and he was assisted by many other officers under him.

Very recently, the Directorate was reorganised as approved on account of the plan of Action. These includes of these levels.

1. Directorate of Elementary and Mass Education
2. Directorate of Higher and technical Education.
3. Directorate of Educational Research and training.

Each level is headed by the D.P.I. who is assisted by Additional D.P.I., Deputy D.P.I. and other officers. The Director of Higher and Technical Education is headed by the Director of Public Instruction and he is assisted by a joint Director and three staffs. This Directorate is responsible for Higher and Technical Education in and outside the state in diploma, degree and post-graduate levels.

Inspectorate or Field Set-Up:

The Inspector of schools who is supposed to be the Principal Education officer in the District is in charge of the inspectorate and administration of Secondary, Higher Secondary and Teacher Training Institution located in the District. He is assisted by the Assistant Inspector of Schools. The Deputy Inspector of Schools is in charge in each sub-Division administering primary and upper primary level of education.

1:13 IMPORTANCE OF TECHNICAL EDUCATION IN THE STATE:

As mentioned earlier, in Meghalaya the natural resources and potentials are great for the area is fortunate in its abundant rainfall and water falls. It is rich in its flora

and fauna and exportable products such as pineapples, oranges, bananas, bay leaf, cinnamon to name a few. Besides, other agricultural crops and forest produce for local and outside consumption. It has plants with important exotic medicinal properties. The State has rich mineral resources such as coal, Salimonite, Uranium, limestone and rocks of various types suitable for construction purposes, but these have not been harnessed judiciously due to shortage of qualified technical personnel in the state .

A linkage between manpower requirement and related education is necessary not only to prevent wastage of resources but also to maintain a uniform and a high standard of education. The future of the state lies in the economic utilisation of its natural resources and the development of human potentials. In this connection, attention must be given toward improving entrepreneurial skills among the local people taking into consideration the local environment . This kind of education is to develop the indigenous skills by professional and technical education . Perhaps the backwardness of the state is attributable to the fact that we often do not know to utilize the available resources and to develop the traditional and inborn qualities which are congenial to the people .

Technical education has therefore an important role to play in bringing about the desired transformation of the society in Meghalaya. Creative provision for technical education is needed not only for exploitation of the natural resources in the state ,but also for making use of the opportunities which emerges out of the developmental programmes in the state and to prevent the world from the present and future hazards and grievances .

The state of Meghalaya offers immense scope for the expansion of technical education . The natural resources can be tapped and harnessed by developing small, medium and major industries. The natural resources in the state can be classified broadly into two categories-namely, forestry and geological deposits .

Under the first category , comes various kind of trees such as sal, teak, titachamps follock, Pine, Chaplash Walnut, Mahagony, etc, covering an area of 8,500 Sq .Km, i.e, about 38% of the total area of the state (area is 22,549 sq.km) .These forest wealth can be exploited with proper planning of small and medium industries such as timber treatment, Mechanised timber works for dressing, sizing and splitting etc ; establishment of a plywood factory at Byrnihat is the modest beginning in this direction .

Under the second category comes the various geological and mineral deposits such as coal, limestone, sellominite, mica, felspar, gymsum, dolomite, cement etc.

Thus, the exploitation of these natural resources of the state requires the availability of technically trained personnels in different fields of specialisation such as timber treatment, carpentry and timber technology, cement and ceramic technology, paints and varnishes process etc. The diversification of courses in the existing technical institution can be planned and new institution can be established keeping in view the needs and requirements in the state.

1:14 NEED AND IMPORTANCE OF THE STUDY:

As mentioned earlier, Meghalaya offers immense scope for the expansion of Technical Education because of the rich natural resources. Exploitation and utilisation of these resources again demands technically trained personnels. Yet, it seems that technical education has been neglected over the years. There is no Engineering College in the state except Shillong Polytechnic, the only diploma level institution.

Technical Education has been functioning in the state since the formation of the state which is about 28 years now. Yet, no research Scholar has undertaken a study on the Development of Technical Education in the state in general and the contribution of Shillong Polytechnic in particular in the field of technical education. It is therefore felt that a systematic study be conducted to trace the development of technical education in the state since its inception and to study what has been achieved by Shillong

Polytechnic in the course of 34 years of its existence. It is also proposed to find out the problems faced by the state in the field of technical education in general.

1:15 STATEMENT OF THE PROBLEM:

The problem of the present study is stated as "A Study on the Development of Technical Education in Meghalaya with Special reference to the Role played by Shillong Polytechnic, Shillong."

1:16 DEFINITIONS OF THE KEY TERMS :

The terms used in the present study is defined as follows:-

i. **Development:-**

In the present study the term development refers to "the quantitative and qualitative advancement of Technical Education in Meghalaya."

ii. **Technical Education :-**

Technical Education refers to "the education in Vocational and technical subjects which includes the studies in theoretical, practical and applied fields as distinguish in the academic disciplines."

iii. **Polytechnic :-**

The term Polytechnic is defined as "a branch of study which is based on a variety of technical studies and skills."

1:17 OBJECTIVES OF THE PRESENT STUDY:

The objectives of the present study are given below:-

1. To trace the development of Technical Education in Meghalaya.
ii. To study the provisions made for students of the state in Higher technical Education.
iii. To study the contribution of Shillong Polytechnic in particular and the state in general in the field of Technical Education.
iv. To find out the problems faced by Shillong Polytechnic in particular and the state

in general in the field of Technical Education.

1:18 SCOPE AND DELIMITATION OF THE STUDY:-

The present study involved a thorough survey on the origin and development of technical education in the State since its inception. Various institutions of technical and Vocational education like Don Bosco Technical School (DBTS) Shillong, Shillong Engineering and management College St. Anthony's College etc, have also been studied to have a general picture of technical education in the state. Indepth study was also conducted on Shillong Polytechnic taking into consideration the different courses offered by the institution, the existing position of the institute and the problems faced by the students both past and present and the teachers. The study was ~~deliminated~~ delimited to a very few passed out students available in some offices which the investigator spotted and interviewed during his investigation.

"In many things a comprehensive survey of a subject is the shortest way of getting at a precise knowledge of a particular division in it"

-Charles Hodge

CHAPTER - II

A REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION:

The previous chapter highlighted the background of the present study. The present chapter deals with a review of related studies and literature pertaining to the area of research undertaken by the investigator. The review includes the studies conducted in India and abroad. The review is grouped into five sections. Section 2:1, describe the trends of the Development of Technical Education. Section 2:2, pertains to the importance of Technical Education in the country. Section 2:3, deals with Training of Technical Teachers. Section 2:4, indicates the curriculum and Teaching - Learning strategies. Section 2:5, discusses the future trends of Technical Education. The following are the reviews done in the different fields.

2.1 DEVELOPMENT OF TECHNICAL EDUCATION:

1. With regard to the development of scientific and technical education in India, the Wood Despatch (1854) praises the success of the Thomason College of Civil Engineering at Roorke established in 1847. By 1856, three more colleges of Engineering had been set up in the three presidencies of Bengal, Bombay and Madras, of these the Calcutta College, called the Bengal Engineering College was later shifted to Sibpur. For some reasons, the Bombay scheme failed and the Poona School became the Poona College of Engineering. In Madras School of Engineering in Guindy became the Guindy College of Engineering. The College of Engineering and Technology in Jadavpur started granting diplomas in Mechanical and Engineering courses in 1908.

2. **University Commission (1948-49)** suggested the inclusion of courses in general education and of a practical courses like Business administration, Labour relations and Industrial Finance within the technical curriculum. The report stratified technical personnel according to the functions they performed :

1) Senior Engineers and Administrators

2) Engineering Scientists, Design and Development Engineers

3) Engineers required for production, operation, maintenance and sale.

3. The working group on Technical Education and Vocational Training (1960) made a survey of the types of institutions providing technical Education at various levels tracing the development of Polytechnics as those institutions which offered courses of three years duration " in branches of immediate use to Government departments and industry " (Report, 1960). The report laid special emphasis on polytechnic education, suggesting that new linking in regard to their objectives and functions was essential. They were to be organised in big cities and a number of courses to be increased.

The Commission used the term " Technician " for the first time to refer to diploma holders. In course of time, four distinct levels within technical education came to be distinguished. They were :

1) Indian Institutes of Technology.

2) Regional and State Colleges of Engineering.

3) Polytechnics.

4) Industrial Training Institutes.

4. **The Education Commission (1964 - 66),** looked upon education as the main instrument of change for developing human resources. The Commission had given a priority to the inclusion of scientific and technical education and research at the University stage as basic component of education. The report classifies technical training in term of levels of skills and indicates the institutions responsible for such training :

1) Research and Design Engineers - with Post Graduate qualifications from Universities or IIT's.

2) Engineers - Graduates trained in the Regional and State Colleges of Engineering.

3) Technicians - diploma holders trained in the polytechnic institutions.

4) Semi-Skilled and Skilled workers - trained at Junior Technical or Technical high school.

The Commission made a number of recommendations specially in connection with polytechnic education, relating to curricula and courses, equipment, teachers and industrial experience.

5. Reviewing the development of Technician education in India, the Damadaran Committee (1970 - 71) finds very little growth or development taking place before Independence. This is not surprising since the growth of Technical Education depends on " the Socio - economic and industrial condition of the country " and its development is controlled by the " needs and requirement of the economy ". But since Independence there has been a rapid expansion in the number of institutions. Whereas there were 53 diploma level institutions in existence in 1947, in 1966 there were 284. This was due to the changed circumstances in the country, and hence it was vital to the economy and development of the country that its technician education be the right kind.

6. **Kumar (1995)** in his article "Technical Education and Economic development " reached to the conclusion that technical education plays a dominant and vital role in the economic development. The author suggested that technical education must be suited to the development of economy and Science Technology and Culture of the country. Technical Education helps in promoting the development of economy, Science and Technologies. It has a close relationship with the degree of industrialisation. Due to the development of high Tech. and its rapid application of industries future Technical Education should be highly relevant to the need of Industry. With the further internationalisation of the development of national economy all over the world, it is increasingly important to generate further Technical personnel adaptable to the requirement of Globalisation of economic life across the world.

7. **ABDUL KALAM, A. P. J. (1995)** in his paper " Technical Education for Nation Development " (A vision is the text of the XIII ISTE Karnataka Convention Commemorative Lecture delivered on December 18, 1994 at REC Calicut during the XXIV Annual Convention of the ISTE) the lecture covered an overview of India's Technological Strength and found that the most important resource for the realisation of the challenging missions which is responsible for generation of high Technology are the contribution of Talented and Technical Manpower.

The author called for an integrated development of technical education with renewal factor of detail design, quality testing and newer curricula. The need for a vision to make the nation great and ensure better quality of life to its people with futuristic focus was emphasised.

8. **VERMA (1998)** in his paper " Integrated Technical Education System A New Concept" illustrates the present system of Technical Education in the country. The present scenario of Technical Education is basically a 3-Tier system. At the lowest and grassroots level a vast network of ITI's is set up. Then come the Diploma education. The third Tier is of degree holders having four years of undergraduate studies after 10 + 2 Schooling.

In this paper the drawbacks of the present system are pinpointed under the present change in the world like economic development and globalisation need to exchange the system of education is felt. A new Model of Technical Education is suggested which will provide better practical skills, know-how and excellence in the field of Technical Education. The paper also mentioned the advantages of new model.

2.2 THE IMPORTANCE OF TECHNICAL EDUCATION

1. **MAULIK, T. N. AND RAY SOBHEN (1995)** in the article "Technical and Vocational Education in the context of Globalisation of Indian Economy" defined and discussed the importance of Technical and Vocational Education (TVE) as a mean

to get job or be his own master by either starting a new productive activity or service which may satisfy the felt need by the community, enterprise, etc. It prepares the individual for understanding the Societal needs and realise his own potentiality for bringing about economic development of the country through improvement of quality of life of the people.

A structural change in the system of Technical and Vocational Education in the country in the form of "liberalisation", through diversification of courses has been suggested in the context of Globalisation of Indian Economy. It is also proposed that all leading engineering and technological Institutions should be allowed to open a TVE cell each for identifying both the urban as well as rural needs and for developing the curricula and course materials accordingly.

2. **ATAL, YOGESH (1996)** made a critical study on "Science and technology for Social Development" and discusses the dominant themes and suggestion offered at a seminar on the role of science and technology for social development in India, held on 12-14 December 1994 in New Delhi. Although India has created a highly intelligent expert base in the field of Science and Technology, these experts have failed to contribute to national development or link their knowledge with local social and organisational concerns.

It is argued that scientists must develop empathy for the people and consider the social implication of their developments. In India the major themes in need of discussion by Science and Technology are (1) Sustainable development, (2) Production forms that promote employment, (3) Agricultural development and (4) The employment of rural areas to slow urban migration. These issues must be addressed with an emphasis on culture specific solution, which demand close cooperation between natural and social scientists. Education is also fundamental to the goal and social development, and western science and technology should be critically adopted.

3. **DHAR, R. D. (1997)** in his article " Role of Engineers for Rural Development " emphasized that the development of the country depends on the success of the total upliftment of rural masses by extending the boon of Science and Technology to the doorsteps of villages. The author suggested that to fulfil this need, the engineers and technocrats should come forward with zeal of enthusiasm to play their roles for involvement in the following activities. (A) Socio-Economic Survey both human and physical resources. (B) Dissemination of information through communication media. (C) Transfer of Technology to the rural people by Technical Institution in educating and training the villagers to acquire skills and knowledge to use technological tools ,etc. (D) Man power development and training to teach people basic skills and knowledge on occupational activities and (E) Technical services and other support services like adoption of extensive use of machineries and appliances like tractor, harvester, pump set, etc. for minimizing labour and increasing yields of crops.

4. **DKHAR, R. (1998)** in the article "Need of Industry linked Technical Education "stressed on the importance to have a linkage between Industry and Technical Education. The author stressed that every industry has to attract talented personnel in the area of applied Science and Technology to bring excellence in the quality of products, research and development for surviving in the International Competition in respect of quality and cost.

The paper suggested and recommended that the technical education system must reopen to the rapidly changing technological needs of the work by continuously evaluating, updating curriculum, introducing new courses, modernizing infrastructures for producing creative, innovative and highly skilled persons. Such approach if updated the Industries may cooperate much more as they will be benefited by recruiting the person who have gone through competency based curriculum partnership from the industries will be encouraged from the planning stage of curriculum, Industrial Training

and evaluation.

5. **JOSHI, J. G. (1998)** in the paper "Role of Quality Functions in Technical Education" found that there is a direct input of Technical Education on Industrial Growth. In this paper General architecture of quality functions which include planning, Syllabus design, implementation, teaching methodologies, Infrastructure, Continuous assessment, development and feedback to modify the plan for quality improvement is discussed.

The author specified the objectives of quality functions in Technical Education. Quality Functions helps to make technical education more relevant, efficient, more competitive, update and excellent. Therefore, the author suggested that the quality of engineering should be improved. For excellent Technical Education, Industry - Institute Interaction with bidirectional growth and development should be promoted.

6. **CHANDY, K. T. (1998)** in an exploration of the problems of Technological innovation among India's small farmers arguing that government support is crucial for adoption of productivity-increasing, employment-generating agricultural Technology. Three major changes are identified as prerequisite for adoption of adequate modern technology by small farmers: (1) Institutional changes, via land reform that would provide a minimum land holding to each family; (2) Organized technical services, e.g., form input, knowledge and post harvest Technology; and (3) Storage services. These changes require active government involvement as well as support from Non government development agencies.

7. **KUMAR, S. AND MEHTA, A. K (1998)** conducted a study of Schedule Castes and Schedule Tribe students in the Technical Institute of Education. The study revealed that inspite of the best effort to provide equality of educational opportunity, reservation in the educational institutions, freeships and scholarships, etc., among the weakers sections of the society, yet the position has not changed much.

In order to study the enrolment of S.C. and S.T. students, 3-years admission data were obtained by the investigators from the faculty of technology and engineering in the M. S. University of Baroda. It can be observed that an average of about 6.7 percent students belong to S.C and S.T category in the faculty of technology and engineering. The result also indicate, that, the enrolment of S.T students is lesser than S.C.

With regards to family background, occupational structure and parental education of the S.C and S.T students, the result of the study revealed that 25% of the parents were engaged in low status and less income generating occupation with respect to the parental education of S.C and S.T students of the faculty of technology and engineering. It was discovered that 50% of them had education up to school level or were illiterate. It is concluded that 50% of them were not able to help their children even at the school level due to their low educational background.

The study reveals that the rate of failure remain about 50% in both the years for B.E. II. III. IV. The stagnation is higher in case of S.T.'s. when compared to S.C.'s.

The main problems face by the S.C. and S.T. students were problems related to *accommodation and physical facilities, academic and financial problems. Educational* measures has been suggested to reduce rate of failure of S.C. and S.T. students so that standards of education could be improved. It is also needed to attract more students from S.C.'s and S.T.'s in Technical Education.

2.3 TRAINING OF TECHNICAL TEACHER:

1. **DHANAN JAYA, M. H. (1989)** in the paper "Training of Engineering Teachers: Need for new areas and approaches" discussed the need for organised Training for Engineering Teachers and other employees of Engineering Colleges so that they become capable to take up different roles to participate in running and developing of technical institutions. An attempt was also made to clearly identify the areas in which the teachers should be trained to play various roles along their careers as teachers.

Training modules were also identified for the purpose.

2. **SEN, A. K. (1995)** made a critical study regarding "Technical Education Sans practical Skill" and found that in India Engineering Colleges and Polytechnics started functioning in isolation with out any linkage with the industry since inception and as a result we are churning out year after year thousands of so called Theoretical graduates and diploma holders whose performance in job positions leaves much to be desired. The author stressed that technical education cannot grow in isolation away from its mother, i.e. practical skills because Technical Education and Practical skills are inseparable from each other.

The paper shows the present picture in India and highlights that in certain areas we have surplus of trained manpower while in others shortfalls or the level of skill and knowledge attained is far below the desired level. This pathetic scenario is the result of wrong planning.

It is suggested that continuous and intensive Industry-Institute Interaction is necessary to tide over the situation and it assumes special significance at this Juncture due to India's recent move of restructuring and globalising of its economy and signing of General Agreement on Tariff and Trade (GATT). Practical training should be an integral part of Technical education and proper planning should be done.

3. **SINGHAL, R. K. (1995)** in the article "Training inputs for a model Engineering Teacher" emphasised that education is a very decisive force to bring about Social changes and technological development. Education has really created the difference between the developed and developing countries. Relevance of education will need matching on a one to one basis with the available jobs and relating our education to the social and economic requirement.

The paper surveys the various types of engineering institutions operating in India followed by demand from various employment Sectors on Engineering graduates.

Accordingly, the main requirement for the preparation of an engineering graduates have been work out. The main role has to be played by the engineering teachers to achieve the aims of technical education and preparation of engineers and therefore the function of engineering teachers have been summarized. Based on self and personal experiences and experimentation in the industry and academic institutions, the author has recommended and suggested a course in master of Education and Technology as main Teaching Input for a Model Engineering Teacher.

4. **SHIVARAM, M. N. (1995)** in the paper "Training for competency Based Training. A Metamorphosis Role of Technical Education in the context of Globalisation and the Indian Economy" emphasised on the importance of providing need based training support to industry. There is a tremendous Scope for the Technical Institutions to rise up to the requirements of industries. Furthermore, the author stressed that the mission of Technical institutions should be to provide Trained Manpower required by the user system through competency based. Hence, at this point of objectives between the World of work and World of Training for work.

The author concluded and suggested that the goal for instruction is to provide opportunities for trainees to master skills, knowledge and attitudes. The approach to curriculum and design process has to be developed for competency based. Lastly, the transfer of know-how could be provided by establishing a nodal centre for training of trainers in the area of Competing Based training and curriculum development.

5. **TULSI, P. K. (1997)** in her article " proper Training of Technical Teachers through Distance Education" argued that the need for training and retraining of teachers will continue to exist and increase due to changing boundaries of disciplines, rapidly changing technologies, innovation in teaching-learning, emerging information and communication Technologies and entry of new teachers in the system.

The author suggested the following strategy to be adopted for training of technical

teachers through Distance Education.

- Identifying training needs of Technical Teachers.
- Identifying the institutions / organisations.
- Identifying changes in administrative Structures.
- Creating adequate Facilities.
- Developing relevant course materials.
- Building linkages with other similar Institutions.
- Self Monitoring and Evaluation.

6. **VERMA, R. K. (1998)** "evaluated the faculty accountability in Technical Education" and found that education has failed to achieve its goals of excellence and efficiency. The educated unemployed youth has virtually created distrust in the system of Technical Education. The cause of deterioration of quality of Technical Education is due to lack of promotion of Excellence for the maintenance of standards in Technical Education. Appraisal is introduced, but focus is made on Performance Appraisal and Development System. (PADS)

It is suggested that faculty should be accountable to all the students, parents, their community and profession. Faculty Accountability should be evaluated and assess of Junior faculty by senior faculty and vice versa. Recruitment of faculty also should be based on merit and promotion on the basis of performance rather than on seniority.

2.4 CURRICULUM AND TEACHING - LEARNING STRATEGIES

1. **HINCHLIFFE (1993)** Examines the provision of Secondary Technical Education in Egypt and the demand for technical School graduates, especially form courses in agriculture. Egypt's Secondary School System is more strongly vocationally oriented than those of most other developing countries. Interviews with potential employers and Secondary School graduates (not specified) indicate that the supply of graduates from agriculture Schools is far greater than likely demand Severe Constraints on the

effective working of the labour market are apparent.

2. **BHANSALI, V. K. (1995)** described the basic understanding of entrepreneurship and Entrepreneurs. His findings was that technical in India has never been given due importance by policy makers. Engineering Education has failed to attract talented and motivated engineers into its fold. In the long run this is bound to affect the quality of teaching adversely unless remedial measures are initiated on priority basis. In India, Engineers have proved to be rather poor entrepreneurs. Engineering education lacks creativity and training to meet future challenges.

It is therefore comparative to introduce Entrepreneurship Development as an integral part of technical education. This would transform from "Job seekers to job creator". This paper suggested some practical aspects of Teachers' Training Industry - Institution linkages and the creation of a cadre of talented and dedicated Teachers at the National level.

3. **RATNALIKAR, N. V. (1995):** Editor "Engineering Education Kasturba Society Vishrantwadi, Pune, in his paper " Effective Industry Institution Interaction only through a Technical University established by Industry " Perceived that we have been talking of the necessity of interaction between institution and Industry for more than one decade, and still little has been achieved in this direction. The world has been moving so fast that today not merely interaction, but meaningful and effective partnership is the need of the hour. Economic reforms, Globalisation and World market to which our Industry stand exposed today compel the 'Industry and the Institution' to move closer and enter into a partnership so that we an face the fierce competition in the world market and service. If this partnership is not forged, our economy will be hampered.

It is suggested that the only effective and meaningful way for Industry is to establish a private Technical University. This will ensure a perfect partnership between industry and institutions and this will make a substantial contribution to the performance of the

Industry even in the Global market.

4. **BHATTACHARYA, S. K. (1995)** in his article "A Conceptual Model of Teaching Applied Engineering Subjects " presents a conceptual Model of Teaching where emphasis is on developing problem solving abilities in students rather than covering the Syllabus by the teacher. It also shows a direction as to how to correlate effective development programmes including preparation of Teaching-learning material. The purpose of developing a model of teaching applied engineering subjects is to help students learn effectively keeping in view the challenges of the world of work where they are going to be employed.

The Model is basically an interactive one rather than the traditional expository ones. The conceptual teaching model in terms of its orientation and the four concept viz. its Syntax, Social system, Principles of reaction, and Support System is presented in this Section.

5. **DUTT (1997)** highlights the importance of experiential learning - a teaching learning strategy which may be gainfully employed in technical education. In experiential learning the learner is directly in touch with the realities being studied.

Experiential techniques increasingly tap the experiences of learners. Such as group discussion, the critical incidents process, simulation exercise, role playing, Skill practice exercises, consultancy, group therapy and community development. However, experiential learning may be singled out as the most unique strategy of teaching learning which can produce adequate trained technicians engineers with desired changes in knowledge, attitudes and skills.

6. **BASU, C. K. (1997)** in the paper "Integration of Technology Education in Basic and General Education Curriculum in Asia Pacific Countries" presented at Asia pacific School principals Forum, "Managing School for the 21st Century " Manila, Philippines. Despite the expansion of Technical -Vocational Education and training (TVET) in

nearly all Asia Pacific Countries during the past 10 - 15 years, many of the region's policy makers have called for greater and more effective integration of Technical - Vocational Components in basic and general education curricula. The idea that Technology Education should be part of the General education curriculum is not totally new to Asia Pacific Countries. Technology Education was introduced into curricula of some Asian Countries after World War II.

In Australia, the National Training Reform Agenda, which sought to strengthen the link between Senior Secondary schooling, general education, TEVT, and post options, emerged in the early 1990's. The Korean Governments decided to provide Technology Education for all secondary school students in 1989 and revised its curricula to include the following Competencies; Working with others in teams; communicating ideas/information effectively; solving problems and thinking creatively and critically; Increased attention towards curriculum integration has been increasingly evident in the United States, India (where efforts to vocationalise secondary education were initiated in 1986), the Philippines (where entrepreneurship development was introduced in Schools), and Japan (where Technology Education has been expanded to reflect environmental awareness and Global consideration).

7. **GROVER, R. P. , DAK, T. M . (1997)** made a critical study on "Sociological perspectives of Rural Industrialisation and Labour Mobility in Haryana ". Interview data obtained from 200 entrepreneurs in 18 villages in Haryana state, India, show that, despite a strong Industrial Base only about 25% of the Industries were non-traditional , and all used power and machines. Further, only about 33% of the entrepreneurs were pursuing non hereditary occupation, all of which were non-traditional and modernised. Hereditary occupations were prominently traditional.

Rural engaged in non traditional Industries were occupationally more mobile than those in traditional Industries. The shift from hereditary occupations was found to be

influenced significantly by caste , age, education, family pattern, mass media exposure and income of the entrepreneurs. Infrastructural facilities also exerted a positive influence on labour mobility. Modernisation of Rural Crafts is needed requiring technological help, training facilities and adequate financial investment.

8. **THAKAR, INDIRA (1997)** "Visualized that the theory and practice in Technical education need to be amalgamated into a rich blending containing the richness of both these aspects". The author described that the domain of learning covered by the curricula is cognitive in nature. Moreover, theoretical models are idealised. Engineering is a practical science and cannot be split clearly into academic and practical subjects. The correct blending of theory and application would speed up the process of learning and help the students to face the challenges of the field, when they step into the job market.

9. **SINGH, B.B. (1998)** made a study "Towards Excellence in Professional Education". The objective of the paper is to deal with the various parameters affecting the quality and Standard of Professional education in our country. These parameters may be listed as students, teachers, Political and financial environment, Teaching-learning systems, curricula, infrastructural facilities, administration, etc. It has been emphasised that in today's context the role of a teacher, associated with professional education, is much more significant than that of the students Community. Also, various remedial measures for the upgradation of professional education as regards the improvement in Classroom Teaching, restructuring of the curriculum, academic exchange at the University level, infrastructural facilities, interdisciplinary interaction and establishment of technology part have been suggested. Along with the aforementioned parameters the need of a healthy Socio-economic, cultural and political environment have been visualized very strongly for meeting the goals of professional education.

2.5 FUTURE TRENDS OF TECHNICAL EDUCATION:

1. An International Symposium (Berlin, Germany, October 16-20, 1995) on "Challenge of the Future". Future trends in Adult and continuing Technical and Vocatio Education, report on an International Symposium on the strengthening of t Development and improvement of Vocational education begins with a description UNEVOC, the International Project on Technical and Vocational Education.

Section 2 presents discussion of the following topics, adult and continuir Technical and Vocational Education and its relationship with the World of wor Contribution of Technical and Vocational Education to careers for wome Transformation of work, changing orientation and Policy environment; changir provision and participation patterns; Technical Teachers and changing in content ar educational approaches.

Section 3 highlights essential components for future development; languag general Principles, World of work, culture, women, migrants, equal status, fundin responsibility, Teachers, learning, life-long learning curriculum, guidance ar counselling, Communication and implementation strategies.

Section 4 contains 10 presentations; "Adult and continuing Technical ar Vocational Education in India" (Arun K. Mishra, Ajit Kumar); "The Contribution Technical and Vocational Education to the opening up of careers for women" (Hil Foster); "The change and impact of culture on the worker and on work" (Henning Solli Olesen); "The Changing Provision and participation patterns in adult and continui Technical and Vocational Education" (Neleh N Tomambong Ningo); "Adult learni and transformation of work" (Paul Belanger); "The changes in the contents a educational Approaches" (Aker Aragon Castro); "The Changing Orientation and Poli environment of adult and continuing Technical and Vocational Education" (Sure Munbadh); The Transformation of work in the different Regional Context" (Fernan

Bogontes); "The Tossed Salad - Approach to cultural Identity to the contemporary work place" (John C. Hinchcriff); and "ICES (International Centre of Educational System) - Activity in consolidation of international and Non-Governmental Actors for Adult and Continuing Education" (S.T.Peshkov).

Appendixes include daily schedule; working development; list of main participants and convention on Technical and Vocational Education adopted by the general Conference of UNESCO at its 25th Session, Paris, November 10, 1989.

2. **BURADE, K.D. (1995)** "Introduction of Entrepreneurship to Engineering Education" described Entrepreneurship as a creative and innovative response to the environment. The author stressed that today's economy is demanding more entrepreneurs in our country. The Government policies and the economic environment greatly encourage the establishment of new and small enterprises. Besides, the increasing employment problems has forced Indian policy makers to explore new avenues to lead students towards self employment. This will also curve out parts of students from taking up higher education towards self dependency.

This can be achieved through well planned programmes and strategies should be properly decided, where major emphasis will be an individual development so that students are able to evolve their competencies and capabilities in the realistic manner.

3. **NATARANJAN, R. (1995)** in the paper, "Distance Education in India its suitability for programmes in Engineering and Technology" described that distance education may be offered either through institution created for this purpose (Single mode) or through existing Universities (dual mode). Each has strengths and weaknesses, but partnerships melt the best aspects of both as experience with professional continuing education for engineer in India.

4. **NATARANJAN, R. (1995)** described about the multiple functions of Engineering faculty, which include Teaching, research activities, consultancy, administration,

profession, Society activities and continuing education activities. The importance to be attached to the recruitment and selection of engineering faculty is highlighted. The author suggested that the recruitment process should ensure that the competencies latent and interests of prospective faculty match the needs and requirements of the Institution. The possession of the Ph.D. degree is a prerequisite for the faculty position in Institutions. The promotion of academic excellence, career advancement for faculty and the need to enhance the image of faculty are also examined.

5. **SYKES, ABEL B,Jr (1996)** viewed that Community Colleges are poised to play a vital role in Vietnam and other Pacific Rim nations currently seeking to develop their business Sectors and economics. Projects and Partnerships with U.S. Community Colleges are currently in progress in India, Malaysia, Japan, Taiwan and Korea. In addition, the Vietnamese Ministry of Education and Training has expressed interest in establishing a Community College System on Vietnam. Currently, the Vietnamese Educational System places High School aged students on either a University preparation, Vocational Technical College, Secondary Technical education or Teacher Training Track.

The Ministry, however , has identified major problems in this system, including inappropriate curriculum, a lack of training in the right areas of business/Industry and of continuity, a lack of development, outdated facilities and equipment and poorly trained and low paid staffs. Although Vietnam has recognised the need for the Community College System , the upper level educational hierarchy is unfamiliar with participatory curriculum development, tax supported education, and open involvement policies is moving slowly. Another major barrier is funding, as sources for loans are limited and politics can interfere with funding efforts. U.S. College through feasibility studies funding or improving the understanding of International development.

6. **United Nation Educational, Scientific and Cultural Organisation, Paris, (France 1996)** discussed on the Theme "Promotion of the Equal Access of Girls and Women to Technical and Vocational Education Studies on Technical and Vocational". The Monograph include the final report of the International Expert Meeting on the Promotion of Equal Access of Girls and Women to Technical and Vocational Education (TVE) held in Seoul, Republic of Korea and country discussion papers. The final report is composed of an introduction that proposes many member states requires special measures to ensure genuine equality of opportunity for males and females; description on the opening ceremony; and synthesis of the country experience "that highlights patterns that emerged. Discussion on the major issues". Separate strategies for future actions into four areas; T.V.E. aspects of general education; T.V.E. and Training as preparation for an occupation; T.V.E. as continuing education and employment and Social environment. A "Statement for Beijing Conference" is followed by a participant list. The fourteen countries discussion papers submitted by participants described "Promotion of the Equal Access of Girls and Women to Technical and Vocational Education" in each country.

7. **KRISHNA, V.V., KHADRIA. (1997)** in the paper "Phasing Scientific Migration in the context of Brain Gain and Brain Drain in India" conceived that India's experience of migration of Highly Qualified Personnel (HQP) broadly falls into three distinct but overlapping periods, namely, 1940s - 1970s and 1990s and beyond. In the post Independence period upto 1960's India did not really experience brain drain. The demand pattern created by official policies to expand the University Sector and strengthen the infrastructure in Science and Technology determined human resources policies in training and higher education and even attracted some established Indian Scientists from abroad.

Beginning in the 1970's, India began to experience brain drain, for which several

economic and sociological factors were responsible, including the over supply of highly qualified personnel. Even though different trends are discernible during 1980's and 1990s India continued to lose its Scientific and technical human resources, despite the new opportunities created by the present trend of Globalisation. Any relative short term gains visible in the form of brain gain and arresting the process of brain drain are likely to be neutralized by the lack of appropriate long-term policy measures. Such policy interventions rather than adhoc, are advocated to address the problems.

8. **PILLAI, S.(1997)** in the article "Excellence in Technical Education" found that over the past 2-3 decades, there has been a succession of topics related to technical education such as examination reform, curriculum development, Semester System, Autonomy, Governance, continuing education, etc. But the two topics which have gained currency of late with such ritualistic exercises are Industry-Institution Interaction and excellence in Technical Education.

The author found that the quality of Technical Education in the country is low and deteriorating. It is suggested that to achieve improvement there should be a change from Status Quo. Good quality can be achieved with excellent personnel. Good system and structure based on lasting values and principles.

"Our grand business is not to see
what lies dimly
at a distance, but to do what lies
clearly at hand"

-Carlyle

CHAPTER - III

METHODOLOGY AND PROCEDURE

3.0 RATIONALE :

The present study is an explanatory and descriptive study which traces out the development, status and problems of technical education in Meghalaya with a preliminary probe into the role played by the Shillong Polytechnic in the State. The study consisted of two types of data collection. The first type dealt with the collection of data through survey of records regarding the development of technical education in the State. The second type dealt with the collection of data through the responses elicited through questionnaires and interview of the Principal and Staffs of the Shillong Polytechnic on accounts of its role in equipping the manpower requirement in the field of technical education. Moreover, the information obtained through the interview of the officers of the Directorate for Higher and Technical Education was also incorporated

3.1 SOURCES OF DATA:

As mentioned above, the study is predominantly a descriptive study which includes Survey of records available in the Directorate of Higher and Technical Education and Shillong Polytechnic, Shillong. Relevant records referred to by the investigator are both Primary and Secondary sources. This included published and unpublished records which were obtained from different offices such as the Directorate of Economics and Statistics Government of Meghalaya, Planning Department, Labour Department, etc.; but the main collection was done from the Directorate of Higher and Technical Education and Shillong Polytechnic.

3.2 TOOLS/INSTRUMENTS OF THE PRESENT STUDY:

In the present study, the investigator employed questionnaires and interview schedule as the tools to elicit information from the respondents.

3.2:1 CONSTRUCTION OF THE QUESTIONNAIRES:

The investigator constructed three sets of questionnaires (1) for the ongoing students of Shillong Polytechnic; (2) the outgoing students and (3) the existing teachers

of the institution. The questions were developed taking into consideration the various objectives of the present study. The questionnaires included multiple choice, Yes/No type and open ended questions.

The questionnaires for the teachers comprises of these areas : (i) Personal data of the respondents; (ii) Name of the course taught; (iii) Pupil-Teacher Ratio; (iv) Time allotted for teaching the course; (v) Relevance of the course with job opportunity; (vi) Methods of teaching; (vii) Industry-Institute Interaction; (viii) Problems faced by them and (ix) Proposal for further improvement.

The questionnaires for the students both the existing and the outgoing comprises of these areas : (i) Personal data of the respondent; (ii) Type of the course pursued; (iii) Problems relating to the course ; (iv) The facilities available in the library, laboratory and workshops, whether adequate or not; (v) Scholarships and Stipends; (vi) Hostel facilities; (vii) Sports and Transports facilities; (viii) Methods of teaching often used by the teachers whether satisfied or not; (ix) Problems generally experienced by them in the institution; (x) Their views about the upgradation of Shillong Polytechnic to a full-fledged Engineering College.

After construction of the items, the questionnaires were given to the experts for comments, suggestions and improvement to determine the suitability, sequencing and systematic arrangements of the tools. On the basis the comments and constructive criticism, the items were modified accordingly. Then the questionnaires were tried out to a few representatives of the relevant population chosen for study to ensure suitability of the questionnaires. A copy of the questionnaires is attached in the appendix.

3.2:2 INTERVIEW SCHEDULE:

To supplement the information collected through Survey of records, the interview schedule was also used by the investigator. The interview Schedule was developed for the Principal Shillong Polytechnic and the officers of the Directorate of Higher and

Technical Education, Government of Meghalaya, Shillong. The questions included in the interview schedule for the Principal consists the following areas : (i) Personal data of the respondent; (ii) Historical background of the Institution; (iii) Different courses/ trades offered, planning of the construction of courses. etc; (iv) Procedure of the recruitment of Teachers, Teachers Training and multiple roles of the teachers; (v) infrastructural facilities; (vi) Placement and admission procedure, conduct of examination, evaluation and result; (vii) Inspection and Supervision; (viii) financial provision; (ix) Strengths and weaknesses of the institution; (x) Problems and (xi) Suggestion for improvement.

The questions included in the interview Schedule for the officers of the Directorate of Higher and Technical Education consists of these areas : (1) Government policies in general for technical education in the State; (2) Steps taken by the Government to improve Technical Education; (3) Provisions made to technical students in and outside the State; (4) Financial provision (5) Views about the upgradation of Shillong Polytechnic.

3.3 SAMPLE OF THE STUDY:

Having surveyed the records both published and unpublished available in the Directorate of Higher and Technical Education and the Shillong Polytechnic, the investigator selected the population for the study . This consisted of (i) Students both male and female of different course including the ongoing students and the alumini of Shillong Polytechnic; (ii) All the teachers of Shillong Polytechnic ; (iii) The Principal of the institution and (iv) the officers of Higher and Technical Education. These formed the population of the study.

Out of 267 of the existing students only 220 have returned the questionnaires duly filled in and out of 150 of the beneficiaries of Shillong Polytechnic only 135 returned the duly filled questionnaires, and 40 number of teachers out of 53 have returned the

duly filled in questionnaires to the investigator. The Principal of Shillong Polytechnic and the officers of Higher and Technical Education were interviewed. These formed the sample of the study.

3.4 DATA COLLECTION PROCEDURE:

Before data collection is done, the investigator sought the permission from the Director of Higher and Technical Education Government of Meghalaya and the Principal Shillong Polytechnic. After the construction of the tools needed for the study, they were set out to administer to a sample consisting of 53 number of teachers of Shillong Polytechnic, 267 students of the four branches i.e. Civil Engineering , Electrical, Mechanical and Electronics and 150 outgoing students of Shillong Polytechnic, Shillong.

3.4:1 ADMINISTRATION OF QUESTIONNAIRES:

Before the administration of the questionnaires to the existing students and teachers of Shillong Polytechnic, the investigator sought the permission from the Principal of the institution. The Principal favoured the investigator's wish in return. Thus, the questionnaires were distributed to the students and the teachers respectively. Questionnaires for the students were distributed in their respective classrooms. The investigator gave a personal appeal and explained them the purpose of the study. They were ensured that the information collected thereof shall be used solely for the research purpose only and never to their disadvantage.

Questionnaires to the beneficiaries or the outgoing students of Shillong Polytechnic were conducted mostly through personal contact in their respective offices, homes, shops, etc. Very few of them were mailed which were returned to the investigator .The time taken for the collection of data was almost four months. After receiving all the questionnaires from the respondents, the investigator thanked them for their kind cooperation and wished them well in life.

3.4:2 ADMINISTRATION OF INTERVIEW SCHEDULE:

Interview schedule was another tool used by the investigator for gathering data to elicit more information on the development of Technical Education in the State and the functioning of the Shillong Polytechnic. Interview schedule was used to collect information from the officers of the Directorate of Higher and Technical Education, Principal Shillong Polytechnic, the Principal and Director of Don-Bosco Technical School (DBTS) Shillong, Officers of the Labour Department, Government of Meghalaya, the Acting Principal Shillong Engineering and Management College and the Principal I.T.I Shillong. Interview was personally carried out by the investigator. Prior to the administration of the interview schedule, permission was sought from the authorities concern.

Rapport was first established before any questions were asked. Furthermore, they were explained that the information so obtained will be used strictly for the research purpose only. While the questions were being asked, the respondents were encouraged to elaborate any point they wished in order to make it clear. The responses was legibly recorded by the interviewer himself.

Lastly, the investigator thanked them for sparing their valuable time for the purpose.

3.5 ANALYSIS OF DATA:

The data collected through the questionnaires and interview schedule were analysed and interpreted accordingly. Calculation of percentages was done for the analysis of data. The investigator tried to link all the data collected through survey of records and the observation made during his visits to the institution with the information gathered through questionnaires and interview schedule.

"Give Vocational Training to the manually minded and the children's courts of the future will have less to do"

-Lawes

CHAPTER - IV

ANALYSIS & INTERPRETATION OF DATA

4:0 ANALYSIS AND INTREPRETATION OF DATA:

The present chapter is concerned with the analysis and interpretation of data collected from official documents, records, reports and the like to find out the development of Technical Education in the State with special reference to Shillong POlytechnic, Shillong. The chapter is presented in two sections:

I - Development of Technical Education,

(i) Directorate level,

(ii) Institutional framework.

II - Intrepretation of responses from the respondents.

4:1 Development of Technical Education in the State

(i) Directorate level:

Technical Education in Meghalaya was inherited from Assam The Directorate of Public Instruction of Meghalaya was established on 2nd April 1970 with the setting up of the autonomous state of Meghalaya having the jurisdiction over the whole of Meghalaya excluding the areas comprising the municipality of Shillong. Subsequently, after the creation of the State of Meghalaya in 21st January 1972, all the educational administration was transfered to the Directorate. Prior to 1993, there was one Director of Public Instruction (DPI) and he was assisted by the Additional Directors (who are looking after general education, schools, planning and budget, Technical education, Director SCERT, Joint Directors of Public Instructions incharge of planning and technical Education, schools, colleges and Deputy Directors who assist the DPI and other officers. Very recently, the Directorate of Public Instruction was trifurcated as approved on account of the Plan of Action. These includes the following levels.

1. Directorate of Elementary and Mass Education.
2. Directorate of Higher and Technical Education.
3. Directorate of Educational Research and Training.

Each level is headed by the DPI who is assisted by Additional DPI, Deputy DPI and other officers. Prior to the reorganisation of the Directorate level, Technical Education was manned by the Deputy Director and he was assisted by two staffs. In course of time, a post of Joint Director was created and an incumbent was promoted leaving the post of the Deputy Director vacant. At present Technical Education is headed by the Director of Higher and Technical Education. He was assisted with a Joint Director along with three staffs only. So there is an increase of one staff only in a span of 28 years.

The development of Technical Education in general can also be traced from the Financial Allocation given in Table 4:1 as under:

Plan Period	Year	Annual Allocation (in lakhs)
The approved 5th Plan for	1974-75	—
Technical Education	1975-76	—
was 32 lakhs	1976-77	6.00
The approved 5th Plan	1977-78	6.30
outlay for the sector	1978-79	7.20
was 112 lakhs	1979-80	9.00
	1980-81	11.00
	1982-84	Not available
	1985-86	20.00
	1986-87	23.00
	1987-88	25.00
	1988-89	30.00

Plan Period	Year	Annual Allocation (in lakhs)
	1989-90	39.00
The approved 5th Plan outlay	1997-98	60.00
for Technical Education	1998-99	60.00
was 500 lakhs	1999-2000	60.00

4:2 INSTITUTIONAL FRAMEWORK:

Diploma courses to train technicians are offered in Shillong Polytechnic, Shillong and Vocational training courses to train skilled workers are offered in the Industrial Training Institutes (ITI's) and Don Bosco Technical School under the overall guidance and supervision of the National Council for Technical and Vocational Trade (NCTVT), these can be mentioned as below:-

4:3 Shillong Polytechnic:

Shillong Polytechnic was established in October, 1965 under the composite state of Assam. It was one of the technical institution in Assam offering Diploma degree in Engineering. The main purpose for setting up of the institution was to cater to the need of technical manpower in the field of industrial development and economic prosperity in the state.

The main objectives when the institution was established, was to give adequate exposure to the students and skills he is suppose to master before entering into the world of work in practical situation. Technical Education presumably aims to educate people for self dependence whether working for others or engaged in self entrepreneurship. Training for the service sector for providing service to the public at large at a reasonable cost could be one of the main thrusts of Shillong Polytechnic.

Initially, when the institute was established Shri. A.K. Patmapati, Assistant Professor of Assam Engineering College, Guwahati was appointed as the first Principal

but due to some reasons he was not able to resume his duty. Therefore, in his place Shri.T.R.V. Subbu, Head Department in Civil Engineering, Assam Engineering Institute, Guwahati was appointed as the Principal of Shillong Polytechnic.

Besides, the Government of Assam then appointed one Head of Department and three Lecturers in Civil Engineering, one lecturer in Mathematics, one part-time Lecturer in Chemistry and English each and other supporting staff, office staff and Librarian.

(i) **Building**:

At the initial period Shillong Polytechnic did not have a permanent building of its own. The Tribal Research Institute building at Mawlai was utilised for office, Classes, laboratories and library purposes. A temporary building was constructed for workshop practice classes. The Boys' Hostel was also established and two houses near Mawlai Petrol pump was rented for the same purpose. But unfortunately, on the night of 14th May,1968, due to the consumption and destruction of the blazing and devastating fire to the Tribal Research Institute building where the Shillong Polytechnic was functioning, the institute was shifted to the rented houses for managing office and classes on temporary basis till better arrangements was made. For this reason, the government has temporarily closed down the Boys' Hostel. Lastly, in the early 1970's the institution was shifted to the permanent campus owned by the institution in which the area of the land was 16.25 acres. When Shillong Polytechnic was shifted to the existing permanent campus, buildings and other infrastructural facilities served for the purpose of classrooms, workshops, laboratory, hostels, library, residential quarters, etc., were constructed.

Subsequently when the State of Meghalaya was created, the educational administration was transferred to the Directorate of Public Instruction, Meghalaya on 21st January, 1972. The Shillong Polytechnic was also transferred to the Directorate

of Public Instruction. At present the Institute is functioning in its permanent building having a Plinth area (SQM) and Built-up area (SQM) as below:

(a) **Plinth Area (SQM)**:

Type of Construction	Instructional Building	Administrative Building	Amenities	Hostel/ Residence	Total Area
a) RCC	2675 m^2	1195 m^2	1500 m^2	4675 m^2	10,145 m^2
b) Shed	1476.39 m^2	----------	--------	---------	1476 m^2

(b) **Built-up Area (SQM)**:

Academic Administration	Playground	Hostels	Staff Quarters	Others	Total
3870 m^2	4000 m^2	3430 m^2	1245 m^2	1500 m^2	10,175 m^2

(ii) **Courses of Study**:

At the beginning, Shillong Polytechnic had only Civil Engineering with the annual intake capacity of 60 students Table 4:2 shows the the courses offered, intake capacity & year of approval.

Course	Duration	Sanctional Intake	No. of students admitted	Year of approval by the Council
1) Civil Engg.	3 years	60	60	1965
2) Electrical Engg.	3 years	30	30	1978
3) Mechanical Engg.	3 years	30	30	1978
4) Electronic and Telecommunication	3 years	30	30	1993

(iii) **Strength of Staff**:

As mentioned earlier, the Shillong Polytechnic was initially started with the strength of 10 teaching staff was increased with the introduction of 3 more courses which at present numbering about 53. The break up into different disciplines is as given below:

	Course	No. appointed
(a)	Civil Engg,	11
(b)	Electrical Engg.	6
(c)	Mechanical Engg.	7
(d)	Electronics	6
(e)	Science and Mathematics	8
(f)	Humanities	4
(g)	Workshop staff	11
	Total –	**53**

The prerequisite appointment of Teachers is Bachelor of Engineering from respective disciplines in Engineering Master degree holder in other disciplines like Mathematics, Science, English. The qualification of the workshop instructor is a diploma holder in respective discipline.

(iv) **Admission Procedure**:

Admission is opened to all permanent resident of Meghalaya. The minimum qualification for admission to diploma programmes in engineering should be passing the 10+ examination with a minimum aggregate of 45% in Science and Mathematics in a single setting but in case of SC/ST, the minimum aggregate of marks is as prescribed by the Government of Meghalaya that is 40%.

The admission to these programmes is centrally administered by the State Government and the criterion for selection of candidate is based on the merit ranking of 10+ level Secondary School Leaving Certificate Examination and on the basis of entrance test conducted by the Government of Meghalaya. The reservation policy of the state is also followed.

(v) **Methods of Teaching**:

The methods of teaching generally used by the teachers depend upon the need of the situation. The most commonly used methods are lecture method, Discussion, Demonstration method, question and answer, field trips,etc. Combination of more than one method at a time is being followed by the teachers.

The Shillong Polytechnic was following a semester system as the system of examination. It was till 1st September 1992 that the system of examination was changed to annual system with the formation of the State Council for Technical Education to look into all aspects of its development and to advise the Government on various aspects of Technical Education.

Accordingly, the expert committee to review, revise and recommended new syllabus for the annual pattern of Education was framed with expert members from Shillong Polytechnic in various disciplines one expert member in curriculum Development from TTTI Calcutta and the members of the Meghalaya State Council for Technical Education.

(vi) **Examination System**:

Initially, the Shillong Polytechnic followed the semester examination known as term examination of 6 months duration as followed by Assam. This continued till 1992 when the Meghalaya State Council for Technical Education was formed in Meghalaya which switched over to annual system of examination.

The students performance are assessed both internally and externally. The internal essessment include weekly / monthly tests and assignment. If the students do not clear the exam in one sitting, there is an arrangement to repeat for two back subject in which they have to clear in one compartmental examination. The component parts of the course includes both theory and practical.

(vii) **Fees**:

Fees collected from students are nominal. The amount of registration fees is Rs. 20/- per student (Rupees Twenty only) and examination fees of Rs 50/- per students. The marksheet fees is only Rs. 5/- each students.

(vii) **Intake and Outturn:**

The educational statistics presented in the Table 4:2 provides intake and outturn discipline-wise and level-wise in the years 1984-85 to 1989-90, 1995 and 2000.

Table 4:3

Year	Civil			Electrical			Mechanical			Electronics		
	1	2	3	1	2	3	1	2	3	1	2	3
1984-85	42	37	88.09%	10	10	100%	6	6	100%			
1985-86	52	45	86.5%13	11	84.6%		4	4	100%			
1986-87	22	22	100%	20	18	90%	6	6	100%			
1987-88	26	23	88.46%	20	19	95%	6	6	100%			
1988-89	119	46	38.6%32	22	68.7%		32	11	34.37%			
1989-90	138	45	32.6%79	28	35.89%		55	10	18.18%			
1995	45	42	93.3%30	21	70%		30	21	70%			
2000	56	24	42.9%23	03	13.4%		23	2	9%	18	02	11%

1 = No. of students registered, 2 = No. passed and 3 = Percentage of passed.

*Table 4:3 indicates that there was a good percentage of passed in Shillong Polytechnic since 1985 onwards, but it shows a declined of the number of passed in the result of

the year 2000

(ix) **Financial Expenditure of Shillong Polytechnic**:

The progress and development of Shillong Polytechnic can also be traced from the financial expenditure made by the State Government to the institution. This expenditure comprised of both recurring and non-recurring expenditure during 1973-74 to 96-97.

Table 4:4 shows the Financial Expenditure of Shillong Polytechnic.

Year	Expenditure
1973-74	Rs.2,59,246
1974-75	Rs.2,59,240
1975-76	Rs.2,85,164
1976-77	Rs.4,08,496
1977-78	Rs.4,47,669
1978-79	Rs.6,24,547
1987-88	Rs.23,65,938
1988-89	Rs.27,18,670
1989-90	Rs.29,34,920
1990-91	Rs.32,60,378
1991-92	Rs.36,64,790
1992-93	Rs.40,65,241
1993-94	Rs.43,99,630
1994-95	Rs.49,99,630
1995-96	Rs.64,22,872
1996-97	Rs.85,74,741

A comparison of expenditure for Shillong Polytechnic can be traced as mentioned above. In 1973-74, the Government earmarked Rs.2,59,246 (Rupees two lakhs fifty nine thousand two hundred and forty six) only, which increased to Rs.85,74,741 (Rupees Eighty five lakhs seventy four thousand seven hundred and forty one) only in 1996-97 which shows an increase of 33 times.

4.4 INDUSTRIAL TRAINING INSTITUTE IN MEGHALAYA

(i) INTRODUCTION :

At present there are seven (7) Industrial Training Institutes (ITI's) and two (2) Industrial Training Centres (ITC's) in Meghalaya which have been affiliated to National Council of Vocational Training (NCVT) in certain trades.

The training wing of Directorate and Craftsmen Training implements the programmes for the Ministry of Labour, Government of India. The Government of India has identify many trades, prepared their syllabi and issued the National Trade Certificates to passed out trainees. All the IIT's and ITC's can introduce these identified trades in their own instittutes or centres and seek affiliation with the National Council for vocational Training under the Ministry of Labour, government of India through the state government after complying with all the norms as prescribed. The Ministry of Labour will then examine the reports submitted thereon by the standing committee constituted by the state government and may or may not grant affiliation depending on the merits of each case.

(ii) OBJECTIVES OF INDUSTRIAL TRAINING INSTITTUTES:

The objectives for setting up of I.T.I's under the Craftsman Training Scheme introducing by the Government of India in 1950 are:-

(1) To ensure a steady flow of skilled workers in different trades for the domestic industry.

(2) To raise the quality & quantity of the Industrial Production by systematic

training of workers.

(3) To reduce unemployment among the educated youths by equipping them for suitable Industrial employment/employable training.

(4) To cultivate & nurture a technical and Industrial attitude in the minds of the younger generation.

(5) To help Craftsmen to meet the existing as well as future need through the vast network of I.T.I's in the various States/union territories in the country.

ORIGIN OF I.T.I's IN MEGHALAYA:

The details about the emergence of the Industrial Training Institutes in Meghalaya, the courses offered the existing position of the teaching staffs the admission procedure and system of examination followed, inspection and supervision and provision of infrastructural facilities is mentioned as follows:-

4.5 I.T.I., SHILLONG:

Industrial Training Institutes, Shillong was created in 1964 by the government of Assam. The I.T.I Shillong was set up as a guest Institute of I.T.I. Guwahati. It was only after the state of Meghalaya came into being that this I.T.I. could be shifted to Shillong in 1976 and was housed temporarily in the Meghalaya State Electricity Board Factory at Shillong. Persistent efforts were required to have the building set up in its own campus at Rynjah, Umpling and it was only in 1985 that I.T.I Shillong was shifted to its permanent campus.

(1) COURSES/TRADES OFFERED IN I.T.I. SHILLONG :

At present I.T.I Shillong is offering ten trades including both Engineering and Non-Engineering Courses. Table 4:5 shows different trades, duration, entry qualification and intake capacity.

Table 4:5

Sl. No.	Trades	Duration	Entry qualification	Intake Capacity	Remarks
1.	Stenography (English) 1 unit	1 year	S.S.L.C. (passed)	32	Because of high demand 32 trainees were admitted every year.
2.	Surveyor 1 unit	2 years	-Do-	16	
3.	Draughtman (civil) 1 unit	2 years	-Do-	16	Introduced in 1993
4.	Electrician 2 unit	2 years	-Do-	32	intruduced in 1992
5.	Mechanic (Radio & T.V.) 1 unit	2 years	-Do-	16	This is not a trade of NCVT.
6.	Mechanic (Motor & Vehicle) 2 unit	2 years	Passed viii Standard	32	
7.	Wiremen 2 units	2 years	-Do-	32	
8.	Fitter 2 unit	2 years	-Do-	32	
9.	Welder 2 unit	1 year	-Do-	12	
10.	Plumber 1 unit	1 year	-Do-	16	

(2) **TEACHERS**:

At present, the total numbers of teachers in I.T.I., Shillong is 23. The break up of teachers into different trades are as follows:-

(i)Principal - one, (ii) Group Instructor- one, (iii) Mill/Wright Foreman - one, (iv) Vocational Instructor (Stenography)- One (v) Vocational instructor carpentry - one, (vi) Vocational Instructor Plumber - one, (vii) Vocational Instructor Mechanical (radio & T.V.) - one, (viii) Vocational Instructor Filler - two (because two units), (ix) Vocational Instructor Electrictian - two, (x) Mathematics Instructor - one, (xi) Engineering Instructor - one, (xii) Social Studies Instructor - one, (xiii) Language Instructor - one, (xiv) Engineering Instructor - one, (xv) Typing Instructor - one.

4.6 I.T.I TURA:

I.T.I. Tura was set up by the Government of Assam in 1965 in its own campus. In the preceding years, the I.T.I. Tura faced many problems particularly due to poor response from the local youths and providing necessary equipment, but at recent times, the local youths have begun to realise the importance of Vocational Training and are coming forward for admission.

COURSES/TRADES OFFERED IN I.T.I.TURA

The trades offered in I.T.I. Tura are as follows :-

Sl.No.	Trades	Duration	Entry qualification	Intake	Remarks
1.	Stenography 1 unit	1 year	S.S.L.C. (passed)	16	Because of high demand
2.	Electrician 2 units	2 years	-Do-	32	32 trainees were admitted every year
3.	Mechanic(R & T.V) 1 unit	2 years	-Do-	16	Introduced in 1993
4.	Welder 1 unit	2 years	Passed VIII Standard	16	
5	Fitter 2 units	1 year	-Do-	32	

Sl.No.	Trades	Duration	Entry qualification	Intake	Remarks
6.	Mechanic(M & V) 2 units	2 years	-Do-	32	
7.	Plumber 1 unit		-Do-	16	Introduced in 1992
8.	Carpentry 1 unit			16	
9.	Typing 1 unit			16	This is not a designated trade of NCVT

(II) **NUMBER OF TEACHERS:**

There are 18 number of teachers in I.T.I.Tura. The distribution of teachers into different trades are as under :-

(i) Vice-principal - 1, (ii) Group Instructor -1, (iii) Vocational Instructor Stenography - 1, (iv) Vocational Instructor Welder - 1, (v) Vocational Instructor Carpentry - 1, (vi) Vocational Instructor Plumber - 1, (vii) Vocational Instructor Mechanical (Radio and T.V.) - 1, (viii) Vocational Instructor Fitter - 2 (because there are 2 units), (ix) Vocational Instructor Electrician - 2 (because there are 2 units), (x) Vocational Instructor Mechanical (M.V.) - 2 (because there are 2 units), (xi) Mathematics Instructor -1, (xii) Social Studies Instructor -1, (xiii) Language Instructor -1, (xiv) Engineering Instructor -1, (xv) Typing Instructor -1.

4.7 I.T.I. FOR WOMEN AT SHILLONG:

I.T.I for women at Shillong was established in 1987 and academically it was functioning in 1988. Now, it is functioning temporarily at Umpling in the same building of I.T.I. Shillong.

TRADES OFFERED IN I.T.I. FOR WOMEN AT SHILLONG I.T.I.

Sl.No.	Trades	Intake Capacity
1.	Dress making 1 unit	16 introduced in September 1998
2.	Hair & Skin Care 1 unit.	16 introduced in August 1993
3.	Advance course in Dress making	20

(1) **NUMBER OF TEACHERS:**

There are 5 number of Teachers in I.T.I. for women in Shillong. The break up are as follows :-

(1) Vice Principal - 1, (2) Vocational Instructor in Advance course in Dress making - 1, (3) Vocational Instructor in Dress making - 1, (4) Hair and Skin Care - 1, (5) Social Studies - 1.

4.8 I.T.I JOWAI:

I.T.I.Jowai at Khlieh-Tyrshi was set up in 1991 through Plan Scheme in its own permanent buildings. At present we have four trades. They are:-

Sl.No.	Trades	Duration	Entry qualification	Intake	Remarks
1.	Stenography 1 unit	1 year	S.S.L.C. (passed)	16	Introduced in August 1992
2.	Electrician 1 unit	2 years	-Do-	32	Introduced in August 1992
3.	Welder 1 unit	1year	Passed VIII Standard	16	Introduced in August 1992
4.	Mechanic (M.V) 1 unit	2 years	-Do-	16	Introduced in August 1992

TEACHERS:

At present there are 9 number of teachers at I.T.I. Jowai. The distribution of teachers for each trade are: (1) Vice Principal - one, (2) Mathematics Instructor - one (3) Engineering Drawing Instructor - one, (4) Language Instructor - one, (5) Social Studies Instructor - one, (6) Vocational Instructor Stenography - one,(7) Vocational

Instructor - one, (8) Vocational Instructor Mechanical (M.V.) - one.

4.9 I.T.I NONGSTOIN:

I.T.I. Nongstoin was set up in 1991 in a rented building with two trades only. They are (1) Carpentry 1 unit. Its seating capacity is 16 and this trade was introduced on August 1991 (2) Wireman 1 unit. Its seating capacity is 11. The trade was introduces on August 1992.

There are 6 members of teacher at I.T.I. Nongstoin. They are (1) Vice Principal - one, (2) Mathematics Instructor - one (3) Engineering Instructor - one, (4) Social Studies Instructor - one, (5) Vocational Instructor Carpentry - one, (6) Vocational Instructor Wireman - one,

4.10 I.T.I. WILLIAMNAGAR:

I.T.I. Williamnagar came into existence in 1993-94 under State Plan Schemes. It has only one trade i.e. Wireman in 1 unit with the intake of 16 students. It was introduced during the academic session 1995-96.

TEACHERS:

These are 5 students in I.T.I. Williamnagar (1) Vice-Principal-one, (2) Mathematics Instructor - one, (3) Engineering Drawing Instructor - one, (4) Social Studies Instructor - one, (5) Vocational Instructor Wireman - one.

4.11 I.T.I. NONGPOH:

I.T.I. Nongpoh was set up in 1995-96 under State Plan Schemes. It was expected to start three trades of Wireman, Plumber and Welder, but at present it has only one trade i.e. Wireman 1 unit only with the intake of 16 students. This trade was introduced during the academic session 1996.

TEACHERS:

There are only six teachers in the I.T.I. Nongpoh. They are (1) Vice-principal - one, (2) Mathematics Instructor - one, (3) Social Studies Instructor - one, (4) Engineering

Drawing Instructor - One, (5) Vocational Instructor Wireman - one, and (6) Vocational Instructor Welder - one.

The Directorate of Employment and Craftsman Training, Government of Meghalaya Shillong has proposed to set up new I.T.I. in Baghmara in the trade of Wireman. The scheme is to be implemented immediately.

(1) **Admission Procedure in I.T.I.**:

Admission to the I.T.I. is open to all. Admission is based on merits. The procedure followed in the State is both written test and personal interview. Candidates who have qualified through the written test have to face the personal interview conducted by the local committee headed by the Deputy Commissioner and the principal as its secretary. The members are drawn from different sources like State Directorate of Employment and Craftsmen training. Labour Department, Member of the Legislative Assembly etc.

(2) **System of Examination**:

I.T.I's follow the annual system of examination. The performance of the students are assessed both internally and externally. The Government of India fixed the programmes for the All India Trade Test for all the I.T.I.'s and I.T.C.'s in the country every year. The State Government is to collect question papers from the Ministry of Labour and then conduct the examination on such dates and timings as fixed by the Government of India. It may be noted that only such trades either in the government I.T.I.'s or private I.T.C.'s which have been affiliated with the National Council for Vocational Training (N.C.V.T.) under the Ministry of Labour. Government of India through the state government after complying with all the norms as prescribed, are legible for collecting the question papers.

Therefore, the external examination is conducted by the NCVT, New Delhi. This is also a special arrangement for students to repeat those papers (subject) in which they have not cleared in one sitting, but it was usually done after six months. Results

are declared by the State Government National Trade Certificate issued to the successful candidates.

3. **Training of I.T.I. Teachers**:

The prerequisite qualification for the I.T.I. teachers are graduate for language, social studies and mathematic instructors and National Trade Certificate holders for vocational teachers. It has always been the endeavour of the state directorate to see that the quality of training is improve and is in line with the direction of the Directorate General of Employment and Training (DGET), Ministry of India. In service training for the competency of I. T. I. teachers / instructors are deputed to Advance Training Institute conducted by the Goverment from time to time.

4. **Inspection and supervision**:

Inspection and supervision is conducted regularly by the State Directorate of Employment and Training, Labour Department. But for the affiliation of new trades, inspection is done by the standing committee initiated by the State Goverment and National Council for Vocational Training.

Provision of Stipends:

All local youths of the State Goverment I.T.I's are awarded special stipends at the rate of Rs. 400/- P.M for trade requiring HSLC / SSLC passed as minimum entry qualification and Rs. 350 /- P.M to trainees in trade requiring class VIII passed as a minimum entry qualification.

5. **Infrastructure**:

It is the responsibility of the State Goverment to provide adequate tools and equipments and also replacing the old ones. The state government has made all its best efforts to provide adequate infrastructional facility to the I.T.I's in the state such as adequate building Teaching aids, library, trade shop and Drawing Hall; yet there are many drawbacks and problems encountered by the Industrial training Institutes in the

State.

6. **Apprenticeship Training**:

The Directorate is also respopnsible for implementing Appresticesship Training in accordance with the Apprentiship Act 1961 of the Government of India in the certificate course. There are two types of training (1) Craftsman Training through I.T.I. and (2) Apprentitiship Training through I.T.C.'s private institutions affiliated to N.C.V.T. In meghalaya seats have been located in different trades in different establishments such as NEEPCO, MCCL, All India Radio Shillong, Kendra Doordarshan Shillong and Eastern Mining Pvt. Ltd. passed out trainees (During the last ten years)

The Directorate of Employment and Craftsmen Training, Government of Meghalaya has conducted a survey of the passed out trainees from the I.T.I.'s in the last ten years i.e. from 1987-97. The record revealed as follows:-

1.	I.T.I Shillong	574	(including all trades)
2.	I.T.I. Tura	116	(including all trades)
3.	I.T.I. Women at Shillong	65	Dress making
		11	Hair & Skin care.
4.	I.T.I. Nongstoin	10	Carpentry
5.	I. T. I. Jowai	8	Stenography and Mechnical (Diesel)

During the last ten years about 1000 (one thousand) trainees have come out successfully in various trades from I. T. I's and I. T. C's. Effort was being made by the Directorate to know about their employments. According to the statistics available, many of them have been employed in government undertakings like Meghalaya State Electricity Board, Meghalaya Transport Corporation, Mawmluh Cherra Cement Limited etc, and as well as government offices. A survey was also conducted where it was found that quite a few have also set up their own ventures like steel fabrication, motor

garage, dress-making and others.

PROSPECTS OF PASSED OUT TRAINEES AND THEIR APPROXIMATE EMPLOYMENT :

The following statistics indicates the number of trainees passed out from Industrial training Institute/ industrial Training Centres during the last three years 1994 to 1997.

Sl. No.	Designated Trades		Total of passed out trainees
1.	Mech(M/V)	-	72
2.	Electrician	-	115
3.	Wireman	-	68
4.	Plumber	-	27
5.	Welder	-	11
6.	Welder	-	26
7.	Stenography	-	58
8.	Mech(R & T. V)	-	49
9.	Surveyer	-	18
10.	Carpentry	-	20
11.	Draughtsman(Civil)	-	21
12.	Dress Making	-	50
13.	Hair & Skin Care	-	33
14.	Mechanist	-	13
15.	Cutting and Tailoring	-	12
16.	Hand Compositer	-	05
17.	Book Binder	-	05
18.	Letter Press Minder	-	02
19.	Desk Top Publishing	-	12
20.	Data Preparation and Computer Software (DPCS)	-	35
	Total	-	**622**

The survey conducted by the Directorate of Employment and Craftsmen Training Labour Department Government of Meghalaya in 1997 through questionaire and correspondence with the employers reveal the placement position of passed out trainees as follows :

Sl. No.	Trades	Service Holder	Self employed
1.	Electrician	32	34
2.	Wireman	20	10
3.	Mech(M/V)	07	39
4.	Plumber	00	04
5.	Fitter	05	04
6.	Welder	02	05
Sl. No.	**Trades**	**Service Holder**	**Self employed**
7.	Stenography	11	00
8.	Mech(R & T. V)	05	24
9.	Surveyer	06	00
10.	Carpentry	02	09
11.	Draughtsman(Civil)	07	00
12.	Dress Making	04	21
13.	Hair & Skin Care	00	11
14.	Mechanist	02	09
15.	Cutting and Tailoring	00	12
16.	Hand Compositer	01	03
17.	Book Binder	02	02
18.	Letter Press Minder	01	01
19.	DTP(Desk Top Publishing)	Introduced in 1997	
20.	DPCS(Data Preparation and Computer Software)	- 21	00
	Total:-	**128**	**188**

SECTION II

ANALYSIS AND INTERPRETATION OF DATA

4:12 Data collected from the Officers of Directorate of Higher and Technical Education in Meghalaya.

The investigator interviewed the officers and their views are compiled as follows :

(i) Government Policies:

The need for Technical Education in Meghalaya hardly needs emphasis. Keeping in view the current apathy in the minds of students undergoing general courses , the Department of Education feels that there should be a major thrust towards promoting Technical Education . The State has not been able to set up any Polytechnic nor provide diversified courses in the existing Polytechnic. The State has been contemplating of setting up a Polytechnic at Tura but due to paucity of fund, the same has not been possible.

Positive steps have been taken by the Government. to solve the shortage of teaching staff.

(ii) Provision of facilities:

The provision provided to diploma students of the State was the adoption of Annual System of examination instead of semester which ease the problems of students and the institution.

For the degree and higher technical education , the Government. under the scheme 'Reservation of Seats' is making arrangement for the allotment of seats for students of the state to study outside. The number of seats offered is approximately 82 in Degree Course and 15 in Diploma. Beside 10% of the total seats in NERIST is made available to students of the state for admission with 10% opened to all states in North East.

(iii) Vision for Shillong Polytechnic:

Shillong Polytechnic is the pioneering institution in the State in the field of technical education. The Government is keen to develop the institution by introducing more modern courses of engineering which will bring job potential for students and will help in the industrial growth and development of the state.

(iv) Financial Provision:

The annual financial provision per year for Shillong Polytechnic is approximately Rs 140 lakhs including recurring and non-recurring expenditure. There is also a provision for scholarship, stipends, etc for the students studying in Shillong Polytechnic and as well as those studying outside the State.

(v) Strength and Weaknesses:

The strength of the institution is that it provides products and services and contributes to providing man-power to different Government departments necessary for promoting the economy of the State.

The weakness of the institution is that the courses provided till recently pertains to traditional courses which fails to develop self-employment in students.

(vi) Access of Man-power:

According to them, there are some unemployed technical personnel in the State but the Government is making all efforts to absorb them in various fields for development of the state.

(vii) Steps taken to remedy the shortcomings:

The possitive steps taken by the Government are :

– Diversification of courses like Computer Engineering to provide the students the opportunity to enter into the emerging markets.

– Opening of two more Polytechnic in the State.

– Opening of Community Polytechnic.

4:13 Responses from the Principal Shillong Polytechnic.

The investigator interviewed the Principal Shillong Polytechnic Shillong on the following points and his responses are interpreted as follows :–

(i) Historical background of the Institution:

Shillong Polytechnic the only diploma course in Technical Education in Meghalaya was established in 1965 under the composite state of Assam with the main purpose of catering the need of Technical man-power in different branches of Industrial development and the economic prosperity in the State.

(ii) Objectives:

The main objectives of the institution is to give adequate exposure to the students in the concepts and skills in different courses of study and to prepare them to enter the world of work. Another objective is to develop the industrial and technological skills among the students so that they are able to take up their own enterpreneurs or to set up their own units in the State. Thus, the main objective is to help the students to become self-reliant and to be able to stand on their own legs.

(iii) Management of the Institution:

When Meghalaya achieved its statehood in 1972, all the administrative control of Shillong Polytechnic came under the Government of Meghalaya but the academic control was under State Council for Technical Education, Assam. But when Meghalaya State Council for Technical Education emerged in 1992, all the acedemic control also came under the Meghalaya State Council for Technical Education since July 1993.

(iv) Courses of Study:

At present, Shillong Polytechnic offers diploma course in Civil Engineering, Mechanical Engineering, Electrical Engineering and Electronics.

(v) Strength of the Teaching Staffs:

At present, there are 53 number of teachers in the institution. The breaking up of

the teachers into different disciplines are : (a) Civil Engineering – 11 ; (b) Electrical Engineering – 6 ; (c) Mechanical Engineering – 7 ; (d) Electronics – 6 ; (e) Science and Mathematics – 8 ; (f) Humanities – 4 and (g) Workshop Staffs – 11.

The pre-requisite for the appointment of teachers in the institution should be the Bachelor of Engineering (B.E). For other disciplines like Science, Mathematics, Humanities etc the teachers should be Master Degree holders. The teacher should at least have 5 years work experienced for becoming the Head of the Department. Besides Teaching, the teachers play a multifarious role such as research work, extension work, development of curriculum and laboratory work.

In order to improve the competency of the teacher, the State Goverment used to depute Polytechnic teacher for training in the Technical Teachers' Training Institute (TTTI) Calcutta but deputation of teachers wasa irregular.

(vi) Infrastructure:

From the point of view of the principal the institution have adequate class room, teaching aids, practical laboratory and workshop. The institution also provide adequate library facilities in repect of text books, reference materials etc.

However, the library is very small and crowded with limited space to accommodate students for reading. Therefore, there is an urgent need to improve the existing condition of the library. It is suggested that adequate number of journals should be purchased and reading room with sufficient space is needed. He, further, suggested that one post of Assistant Librarian should be created for its smooth functioning.

(vii) Admission procedure :

The annual intake of Shillong capacity of Shillong Polytechnic is 150 number of students in all the branches. This includes 60 number of students in Civil Engineering, 30 number of students in each branch of Electrical, Mechanical and Electronics.

Admission is opened to all the permanent resident of Meghalaya and Reservation

policy of the State is followed. The addmission procedure followed in the institution is both written test and pesonal interview. The requried percentage of marks of the students is base on merit with at least 45% in mathematics for general category.

(viii) System of Examination:

Shillong Polytechnic follow the annual system of examination. The students performance are assessed both internally and externally. The internal assessment include weekly / monthly tests and assignment. If the students do not clear the final exam in one sitting, there is an arrangement for two back subject in which the students have to complete in one compartmental examination in order to set promotion in the next higher class.

The final examination in the institution is conducted by the Meghalaya State Council for Technical Education (MSCTE). The teachers of Shillong Polytechnic also get involved in setting the questions papers for external exam.

(xi) Inspection and Supervision:

Inspection and supevision in Shillong Polytechnic is generally conducted by All India Council for Technical Education, Estern Region Goverment of India, at least one in two years.

(xii) Strengths and Weaknesses:

As mentioned earlier, the present strength of Shillong Polytechnic is that it has adequate teaching staff which is 53 in number with the annual intake of 150 students. The non - teaching staff is also numbering about 35. The institution is gaining its popularity in the state and it has produced a number of passed out students every year which were absorbed by different departments in the state and private enterprise too. However, the institution is facing same problems such as lack of adequate infrastructure shortage of laboratory attendants and other staff.

(xi) Financial provision:

According to the view of the principal, the financial provision made by the Goverment as per budget provision is not sufficient. Therefore, more fund is necessary for regular maintenance of tools, and equipments of various types and also maintain the work of the institute campus.

4.14 Responses of the Teachers of Shillong Polytechnic

(i) Teacher - Students ratio :

Cent percent of the respondents said that the existing number of students enrolled in Shillong Polytechnic is manageable for the effective transaction of the course. Almost all the respondents (i.e. 90%) of the respondents suggestet that the teacher pupil ratio should be 1:30 very few respondents (55) came down to 1:20 and four number of respondents (10%) viewed that the teacher pupil ratio should be 1:45.

Nevertheless, since the annual intake of students in all the three branches is 30 each except civil engineering which has 60 number of students, it is believable that the existing Teacher - pupil ratio is quite manageable.

(ii) Sharing of the course :

At present there are four branches of study in Shillong Polytechnic. The breaking up of the teachers into different branches are a follows :-

(a) Civil Engineering	-	11
(b) Electrical Engineering	-	6
(c) Mechanical Engineering	-	7
(d) Electronics	-	6

(iii) Time schedule for the disposal of the course :

With regard to the time schedule alloted for the disposalof completing the course,

there was no general agreement among the respondent. The time needed for the disposal of the course vary from one teacher to another. Their responses vary from 6 hours to 300 hours approximately. This show that there is an imbalance of weightage of the course among the teachers.

90 Percent of them described that the time alloted to them is enough to finish the course in the class room regularly and if there is no disturbance such as strikes, public curfew etc.

(iv) Component parts of the course

: Hundred percent of the respondents asserted that the course of study in Shillong Polytechnic includes both theory and practical .

(v) Development of the course of study :

Majority (90 %) of the teachers report that the course of study is developed by AICTE and they were not involved in developing the course. Only few among them (10%) get involved in developing the course of study. The existing course laid great stress on knowledge, skill, practicals, attitudes etc.

(vi) Students' needs and aspirations:

87.5% of the respodents recommended that the students' need an aspiration are met to some extent where as 12.5% strongly agreed that the students' needs an aspiration met by the course to a great extent.

(vii) The course and job opportunity:

Almost all the respondents i.e. (90 %) viewed that the course of study offered in Shillong Polytechnic are related to job opportunity in the state because majority of the beneficiaries of Shillong Polytechnic have been absorbed by state department Goverment of Meghakaya, private enterprise or self employed.

(viii) Improvement of the existing curriculum:

All the respondents expressed that the present curriculum should be modified. It

is suggested that there should be an improvement in the Computer section. 50% of them, prefered the semester system rather than the annual system because the semester system examination is conducted once in every six months in which the course is not so lengthy like that of the annual system.

Furthermore, the course should be more practical in day to day life application and should be as per the needs of the industries. They further suggested that managerial and technological skills should be created for self employment. Interaction with Computer for better exposure in the global senario, the curriculum should provide an opportunity for Industry - Institution interaction Vocational training should be an essential part of the course and the course should be job - oriented. Lastly, It has been suggested that some more new and modern course should be introduced in the institution in order to check the imbalance and to bring the quanlitative and quatilitive improvement of technical education in the state.

(ix) Methods of teaching:

The method of teaching generally used by the teachers depends according to the situation and types of lesson. In short, different types of method are used at a time. The most commonly used method are, lecture method, discussion method, demonstration method, question - answer, field trip, etc.

(x) Industry - Institution interaction:

Hundred percent of the respondents said that at present there is no arrangement for constant interaction between the students and the industrial sector or job - giving agencies.

(xi) Teaching Aids:

The teaching aids often used by the teachers include Audio aids, visual aids and Audio - visual aids. Various teaching aids are used according to the need of the situation.

(xii) Manpower needs:

92.5% of the respondents viewed that there is no needs of manpower in technical education in the state. The rest remained silent.

(xiii) Linkage between manpower needs and provison of facilities in technical education in the state:

All the respondents agreed that there is no linkage between manpower and provision of facilities in technical education in the state. Infact the state Goverment have tried to take initiative but not much importance is taken by the state Goverment. Technical education in the state is far below the achievement of other state in India.

(xiv) Important steps to improve technical education:

All the respondents have expressed their opinion freely how to suggest certain steps and measure to improve technical education in the state. Only two respondents remain silent. Their suggestion how to improve technical education in the S. P. S. in particular and the state in general can be summerised as under :

(a) To improve the curriculum as per the needs of the modern changing world. Curriculum should be in accordance with the industrial and technological bases.

(b) The quality and competency of the teachers should be improved by deputing them for training.

(c) Higher studies and vocational teachers should be provided to the teachers.

(d) Industry - Institution interaction should be introduced.

(e) The Goverment should provide adequate facilities to Shillong Polytechnic and the technical students who study outside the state.

(f) Awareness to the masses should be created about the importance of technical education.

(g) Semester system should replace the annual system.

(h) Admission should be conducted with entrance exam to be followed by an

interview. Students should be admitted on the basis of their capabilities.

(i) Students should be motiviated to be enthusiastic in technical education and self employment status.

(j) Polytechnic should be provided with AICTE pay scale

(k) Shillong Polytechnic should be upgraded to a fullfledged Engineering College.

(xv)Strength of teaching staff:

Almost all of the respondents viewed that the prsent strength of the teaching staff in the institution is adequate. Very few of them felt that the teaching staff is not adequate thay have suggested that two more lecturers / senior instructor should be recruited in each department.

(xvi) Problem faced by the teachers:

The problem encountered by the teachers of Shillong Polytechnic can be summarised as under

(a) Lack of adequate practical equipments in the laboratory and workshop. The existing facilities are below the standrad and are few in numbers.

(b) The standard of the students are very low.

(xvii) Upgradation of Shillong Polytechnic:

Hundred percent of the respondents viewed that it's a high time to upgrade Shillong Polytechnic to a fullfledged Engineering college because it is the only technical institution offering diploma degree in the state. Secondly, its upgradation will help bringing about the economic development in the state. Thirdly, it will help the poor students to aspire for higher studies.

4:15 Data collected from the students of Shillong Polytechnic.

(i) Problems relating to the course of study:

185, i.e., 84.09%, of the students expressed that they are facing one common

problem, i.e., books are not readily available in the library. The rest (15.9%) felt that the time is too short for completing the course.

(ii) Infrastructural facilities:

18.18% of the respondents agreed that the facilities available in the library are satisfactory, whereas majority of them (81.8%) critically disagreed that the reading material available in the library are satisfactory. They pointed out that the existing books available in the library are outdated and irrelevant to the course. There are no journals or encyclopaedias in the library.

The respondents have suggested that the books should be up-to-date and relevant to the course of study. Journals, encyclopaedias, etc., should be made available to enrich the knowledge of the students.

(iii) Laboratory:

Cent percent of the respondents mentioned that the institution is providing facilities for practical work in the laboratory and workshops, but majority of them, i.e., 80.6%, indicated that they were not satisfied with the provision made whereas 11.36% remained silent.

In order to make practical meaningful, they have suggested that the facilities in the workshops and equipments in the laboratory should be up-to-date, and adequate because the existing ones are very old, outdated and defective and very often there are disturbances during practicals. This problem made them dissatisfied to the facilities offered.

(iv) Scholarship and stipends:

The students of Shillong Polytechnic are getting stipend of Rs.150/- per month and Rs. 500/- as textbook grant, and the scholarship as sanctioned by the State government.

(v) Hostel faclities:

At present hostel facilities are provided only for male students. There is no hostel facilities for girls even though the hostel building for girls was erected due to nonavailability of water supply, electricity, etc.

(vi) Transport and sport facilities:

Hundred percent of the respondents agreed that there is no transport facilities provided by the institution for its students.

Majority of them asserted that there is no adequate sports facilities in the institution. The facilities provided comprised of playground, common rooms with different sports materials.

(vii) Methods of Teachings:

All the respondents were of the opinion that they were satisfied to some extent with the methods of teaching used by the teachers.

(viii) Guest lecturers:

Hundred percent of the respondents said that there was no guest lecturer who came and deliver lectures from outside the institution.

(ix) Problems generally experienced by the students:

All the respondents have expressed their free opinion about the shortcomings experienced by them in the institution. These problems can be summarised as follows :-

(i) No hostel provision for girls.

(ii) Inadequate textbooks.

(iii) Inadequate practical equipments.

(iv) Shortage of water supply.

(v) Sports facilities are not adequate.

(vi) Lack of transport facilities in which the students from the outskirts failed to attend the first class in time.

(vii) Lack of sanitary facilities.

(viii) Strikes by the staffs.

(x) Upgradation of Shillong Polytechnic to a fullfledged Engineering College:

100% of the respondents strongly recommended for the upgradation of Shillong Polytechnic to a fullfledged Engineering College. The reasons behind this are as follows :-

(i) To reduce the expenditure on the part of students.

(ii) To serve for higher studies especially for the poor and needy who could not afford to study outside the State.

(iii) Shillong Polytechnic is highly desirable to upgrade to a fullfledged Engineering College because it is the only technical institution in the State.

(iv) Unemployed students from Shillong Polytechnic can join if the institution would be upgraded to a fullfledged Engineering College.

(v) it will increase the economic background and prestige of the State.

4:16 Responses obtained from the beneficiaries of Shillong Polytechnic.

(i) Teachers' qualification and Methods of teaching:

The respondents indicated that all the teachers in the Shillong Polytechnic had the required qualifications. These were Bachelor of Engineering (BE) in the Engineering and Technical disciplines and Post Graduate degree holders for other disciplines.

All the respondents reported that the teachers used different methods of teaching such as lecture methods, Demonstration methods, discussion, Question-Answer, etc. They generally used a combination of different methods at a time depending on the need of the situation.

90.37% of the respondents expressed that they were satisfied with the methods

of teaching applied by the teachers but the rest of them remained silent.

Hundred percent of the respondents said that there was no itenerant or guest lecturers who came from other institutions, industry or State departments to deliver lectures in the institution.

(ii) Facilities:

88.8% of the respondents expressed that they were not satisfied with the provision made in the institution especially with regards to the library facilities and laboratory equipments. 56.29% of the respondents agreed that the hostel and co-curricular activities provided in the institution was satisfied.

(iii) Relevance of the course with the work:

Almost all the respondents (94.8%) pointed out that the course of study offered in Shillong Polytechnic was according to their expectations and it was relevant to the work they were associated with.

(iv) Industry-Institute interaction:

Cent percent of the respondents rightly mentioned that there was no arrangement for Industry-Institute interaction.

(v) System of examination:

Almost all the respondents (86.6%) said that the system of examination followed in the institution during their time was Semester System, except 13.3% was under the annual system of examination.

Cent percent of the respondents agreed that the scheme of evaluation followed in the institution comprised both internal and external. 82.9% strongly agreed that the scheme of evaluation was satisfactory to a great extent whereas the rest (17.037%) felt that it was satisfactory to some extent only.

(vi) Job opportunities:

After the completion of the course of study, the duration that the respondents

remained jobless varied from one person to another. Taking them together the duration gap was from a week to 3 years. 85.18% of the respondents have been absorbed in the government departments and semi-government jobs. 17.5% have established their own private enterprises such as garage for repairing of motor vehicles, steel fabrication, etc., whereas 5.18% of the respondents turned to become businessmen like contractors, dealers in spare parts, etc.

(vii) Financial return:

Majority of the respondents (94.8%) agreed that the financial returns were proportionate to investment in education except 5.9% did not agree.

(viii) Opinion of the respondents on the role of Polytechnic:

Hundred percent of the respondents rightly recommended that Shillong Polytechnic plays a crucial role in equipping man-power in the State because majority of the passed out students of Shillong Polytechnic have been absorbed in the government departments, private agencies or by establishing their own private enterprises.

Majority of the respondents (72.59%) viewed that there was the excess of manpower in some fields because there were many passed out students who remained unemployed in the State whereas 27.4% strongly disagree to the former and according to them, they conceived that at present there is no excess of technically trained personnel in the State because a lot of technical manpower is still needed to utilise the abundant resources of the State.

(ix) Problems:

The problems encountered by the beneficiaries of Shillong Polytechnic was not completely different from those of the existing students. The problems generally faced by them during their execution of the course were lack of proper classroom, tools and equipments for practical laboratory and inadequate textbooks, the course was more

theoretically oriented and so on.

(x) Views about the upgradation of Shillong Polytechnic:

All the respondents strongly recommended that Shillong Polytechnic deserved to be upgraded to a fullfledged Engineering College because it s the only technical diploma institution in the State and partly because there is no Engineering College in the State.

"The search for truth is in one way hard and another easy. For it is evident that no one can master it fully or miss it wholly. But each adds a little bit to our knowledge of future and from all facts assembled there arises a certain grandeur"

-Aristotle

CHAPTER - V

DISCUSSION OF FINDINGS

MAJOR FINDINGS OF THE STUDY

5.0 INTRODUCTION

In this chapter the investigator high lights the major findings of the present study which can be described under the following heads:-

5.1. DEVELOPMENT OF TECHNICAL EDUCATION IN THE STATE:

(i) Educational Administration in Meghalaya was inherited from Assam. The Director of Public Instruction (DPI) was the head of the Directorate and was assisted by the Additional Directors, Joint Directors, Deputy Directors, etc. So, Technical Education, was manned by the Deputy Director with two dealing assistants. In course of time a post of Joint Director was created and an incumbent was promoted leaving the post of Deputy Director vacant. Very recently, the Directorate of Public Instruction was trifurcated, the three Departments came into existence, they are (a) Directorate of Elementary and Mass Education; (b) Directorate of Higher and Technical Education and (c) Directorate of Research and Training. Thus, the Directorate of Higher and Technical Education is headed by the Director of Higher and Technical Education and he is assisted by the Joint Director with three supporting staffs. Therefore there is an increase of one staff only in a span of 28 years.

(ii) Shillong Polytechnic was established in 1965 under the composite State of Assam . At the outset, the institution offered Civil Engineering discipline only with the intake capacity of 60 students with ten number of teaching and non-teaching staffs. But at present it rose up to 53 number of teachers and 30 non-teaching staffs.

Electrical and Mechanical Engineering was started in 1978 with the intake of 30 students in each branch. In 1993, the State Government introduced electronics, but its academic session started in 1996.

Shillong Polytechnic was all along affiliated to the State Council for Technical Education, Assam. It was only in July 1992 that the State Council for Technical

Education, Meghalaya was formed. The Council is to advise the Government on various aspects of Technical Education.

(iii) When Meghalaya achieved its statehood, there were only two ITI's in the State, i.e., I.T.I. Shillong established in 1964 and I.T.I. Tura established in 1965. Both the institutes are imparting Engineering and Non-Engineering trades.

(iv) St. Anthony's College very recently started professional courses such as Computer, Mass Communications, Bachelor of Business Administration, Biotechnology, Information Technology, etc.

5.2 DON BOSCO TECHNICAL SCHOOL SHILLONG

Don Bosco Technical School, is one of the oldest Technical Institution in the State to provide Engineering and Non-Engineering Trades. It was recorded that the Institution issued the first Diploma Certificates to trainees in the Trades of Shoe-making, Tailoring, Carpentry and Mechanics on 30th January, 1932. At present, the Institution is providing more than a dozen Engineering and Non-Engineering trades.

Therefore, the institution play an important role to educate the young boys and girls in the technical sector, to feed them into the demands of various industries in North-East India and to facilitate them for launching self employment. Don Bosco Technical School had produced thousands of skilled personnels which have been absorbed by the government departments & by private sectors. According to the information given by the existing principals, many of the passed out students from that institute have launch their own enterprises.

Besides the diploma courses provided in Shillong Polytechnic, I.T.I's and Don Bosco Technical School, there are also a number of private institutions which provide professional courses. Some of them are: Arena Multimedia Limited, Shillong; Cubic Computer Education, Shillong; Grace Computer Training and Education, Shillong and Aptech Computer Education, Shillong.

(v) Shillong Engineering and Management College is founded by the North Eastern India Trust for Education and Development (NEITED) in 1999. At present, the College is offering two management courses, i.e., Bachelor of Business Administration (BBA) and bachelor of Computer Applications (BCA) with the intake of 30 students in each branch. Medical and Dental Courses will also be incorporated in the Institution in due course of time.

5.3. PROVISIONS MADE BY THE STATE GOVERNMENT :

Since Meghalaya has no engineering college except Shillong Polytechnic, the only diploma institution, the state Govt. have made certain provisions for student in Technical Education as below:-

1. The Govt. of India under the scheme of 'Reservation of seats' in degree and diploma level engineering/technical/pharmacy/architectural institutions for those states and U.Ts which do not have any facility for training of technical or which lack facility in some specific fields of Technical Education, the state is currently making allotment of about 82 (1999) Engineering seats in the first year B.E/B.Tech level in various engineering college in the country.

2. There are about 30 other engineering seats earmarked for the student of Meghalaya in the Regional Engineering College (R.E.Cs) all over the country.

3. The North Eastern Institute of Science and Technology (N.E.R.I.S.T) is also providing seats to about 20 students of the state at the diploma level and few seats at the degree level mainly in the civil, electrical and mechanical engineering courses. 10% of the total seat N.E.R.I.S.T is allotted to Meghalaya and 30% is open to all.

4. 15 seats are earmarked to Meghalaya in the diploma courses outside the North Eastern States.

5. After the adoption of the National Policy of Education, the state Govt. white paper on education have taken an important steps for the development of technical education

in the state i.e., the State Council for Technical Education Meghalaya which is the apex body was created in July 1993, ending the 28 years long affiliation of Shillong Polytechnic with the State Council for Technical Education, Assam.

6. The community polytechnic scheme of the Govt. of India with 100% direct central assistance has been adopted in the Govt. Polytechnic Shillong.

7. The state Govt. has provided scholarship and stipends, book grant, journey expenses etc. to the technical students studying inside and outside the states. The details of which are as follows :-

	Degree level	Diploma level Outside the State	Student of Shillong Polytechnic
(i) Stipends	Rs. 350 PM	Rs. 250 PM	Rs. 150 Pm
(ii) Journey expenses	Rs. 200	Rs. 200	-
(iii) Book grant	Rs. 1000	Rs. 500	Rs. 500

(iv) Scholarship - as per the rate fixed by the Government of India and the State Govt.

5.4. SHILLONG POLYTECHNIC: ITS CONTRIBUTION:

INTRODUCTION

Shillong Polytechnic, the only Diploma Institution was established in 1965 under the composite state of Assam. When the Institution was established, the main objective was developed industrial & technological skills by giving adequate exposure to students in the field of Technical Education, to cater to the need of manpower requirement in the state. As mentioned earlier, at the initial stage there was only a Diploma course in civil Engineering with 10 number of faculty including the Principal and the supporting staff. At present the number of courses has increased to four branches, i.e. Civil, Electrical Mechanical and Electronic & Telecommunication with 53 number of teaching staff and 13 number of non-teaching staff. At present, the institute has adequate building of its own with good infrastructural facilities.

(I) Shillong Polytechnic plays a crucial role in equipping manpower resources development with great potential for adding value to products and services contributing to improvement of the economy in the State and in improving the quality life of the people. The institution, besides, giving the basic knowledge, skills and attitudes expertise and professionalism of the technical manpower it also brings about an attitudinal change among the people towards Technical Education.

(ii) Shillong Polytechnic has become as an instrument of social and economic change. It has produced a number of trained personnel in which the majority of these have been absorbed in the government departments and very few of them had started their own entrepreneurs who in turn provided jobs for other people as well. The responses of the respondents on the following important themes confirms the important contributions of Shillong Polytechnic.

a. Man-Power Supply :

Based on the responses given by all categories of the respondents (100%) Shillong Polytechnic plays a very important role in providing manpower supply to the state. The out turn of Shillong Polytechnic till 1995 were 1,800 (Technical Man-Power Projection, 1998). These were observed in different government departments of the state.

b. Job Opportunities:

According to the views given by the teacher respondents (95%) and the passed out students (94.8%) the courses of study offered by Shillong Polytechnic were relevant to the job opportunities in the state. It was also according to their expectation. But 5.18% of the passed out students viewed that the courses of study did not help them to get job and to set up their own entrepreneurs.

Based on the above two opinions, it may be concluded that courses offered in the institution were suited for government jobs, but they do not provide scope for self

employment and do not suite the emerging needs of the present situation.

c. Employability:

According to the study of technical man power profile 1995 : India and the state conducted by the institute of Applied man power research, New Delhi, 1998, there were still good opportunities of employment existed for diploma holders in civil engineering in the state as 2/3 of them are absorbed with in one year of passing the examination. The following table shows the position of discipline-wise absorption pattern 1992 in Diploma level .

	Discipline	Time Taken 95% absorption Years	Absorption within one Years (percent)
1.	Civil Engineering	2	66.70
2.	Mechanical	3	50.00

This table corresponds with the view expressed by the 92.5% of teachers respondent that the courses are relevant and there is no excess of man power in the diploma level in the state though they feel that this may be critical in the years to come as there may be excess of technically trained personnel in one field or the other if no action is taken by the Government to diversify the courses.

As mention earlier, the courses run by the Shillong Polytechnic are traditional in nature. As such, the student are not equipped with technical skills which will not only make them better suited to the emerging job markets but also do not give them the skills for self employment. According to the opinion of the beneficiaries of Shillong Polytechnic about 85.8% of them were placed in different Government departments where as only 17.5% started their own enterprise.

d. Financial Return:

93.3% of the respondents from the beneficiaries of Shillong Polytechnic highly agreed that the financial return were proportionate to investment in Education. Whereas did not agree to the same. It may be conceived that those who are in the government job enjoyed good salary whereas those who are setting their own enterprise, the rate of return is not consistent. Moreover, there was no financial return for the unemployed trained personnels.

5.5 INFRASTRUCTURES:

Following are the reviews expressed by all categories of respondents on the functioning of Shillong Polytechnic:

i. Building

Shillong Polytechnic has adequate building which includes both administrative and class rooms. This is supported by the responses given by the Principal by the institution.

ii. Laboratory

100% of the respondents both the present and the outgoing students mentioned that the institution has provided laboratory facilities but 80.6% of the respondents from the ongoing students and 88.8% from the beneficiaries expressed that they were not satisfied with the provision made for them. This revealed that the facilities provided are outdated and defected. Therefore, in order to make practical meaningful, facilities should be up to date.

iii. Library

The Principal of the Institution mentioned that the library facilities in the institution are adequate, whereas 81.8% of the existing students and 88.8% of the alumni of Shillong Polytechnic critically disagreed to that statement. So, there was a contradiction of opinions. The students expressed that most of the books available in the library

were out dated and not relevant to the course of study. Therefore, there is an urgent need to improve the library facilities.

iv. Hostel Facilities:

At present, the state government has provided Hostel facilities for boys only but there is no Hostel facilities for girls. In fact, the Hostel building was constructed, but facilities such as electricity, water supply etc. was not provided. Actually, these are the many problems which can be tackled easily but unfortunately, the government do not show much interest to solve these problems.

5.6 PRACTICES FOLLOWED:

a. Courses of Study:

At the beginning, Shillong Polytechnic had only Civil Engineering Discipline with the annual intake of 60 students. In 1978, Mechanical & Electrical Engineering Courses were introduced with the intake of 30 students in each branch. In 1993, Electronics & Telecommunication was also introduced but its academic session began in 1996 with the intake of 30 students.

b. Methods of Teaching:

The methods of teaching generally used by the teachers are depending to the need of the situation. But the most commonly used methods according to the responses from the teachers are lecture methods, discussion methods, demonstration methods, question-answer, field trips etc. In most cases, combination of more than one method was used at a time. Besides, the teachers also employed audio aids, visual aids & Audio-visual aids which were used according to the need of the situation in order to facilitate teaching-learning process.

All the teachers of Shillong Polytechnic which deals with the engineering courses, their educational qualifications were Bachelor of Engineering (B.E.) and above, whereas the lectures in other disciplines such as Humanities, Science and Mathematics

etc. were Masters Degree. Except those Instructors & laboratory staffs were diploma degree holders.

Based from the interview with the Principal Shillong Polytechnic, there was an irregular deputation of teachers to the Technical Teachers Training Institute (TTTI), Calcutta, that's why the teachers also have suggested that untrained teachers should be deputed to the Technical Teachers Training Institute.

c. System of Examination:

Based from the records available in Shillong Polytechnic and the interview with the Principal of that institution, it was found that since its inception till late 1970's the institution followed the annual system of examination. But since 1978 onwards, it followed the semester system of examination. It was only in 1992 that the annual system was again introduced which is in force presently.

d. Guest Lecturer:

100% of the respondents both the existing and the outgoing students indicated that there was no itinerant or resource persons that come and deliver lecture in the institution because as mentioned earlier, the state has no collaboration with the industrial set up in or outside the state.

e. Industry-Institute Interaction:

Industry-Institute collaboration is one of the most important aspect of technical education i.e. to link the theoretical knowledge and practical application. But it was found that was no arrangement for the Shillong Polytechnic to have such an interaction with any industry or factory. This was revealed from 100% of the respondents both teachers and students that there was no provision for industry-institute collaboration.

f. Inspection and Supervision:

On account of response obtained from the Principal Shillong Polytechnic, inspection & supervision in the institution is conducted by the All India Council for Technical Education, Eastern Region, Government of India, at least once in two years. This showed that inspection was very irregular.

5.6 FUTURE PLANS IN TECHNICAL EDUCATION

(I) Keeping in view the current needs , in technical education, the Education Department was informed that the Ministry of Human Resource Development (HRD), Government of India, has included the State of Meghalaya in the Third Technician Project of the World Bank. This project aims at developing the youths to make them better suited to the emerging job markets and to give them the skills for self employment. The plan of the project as proposed by the State Government are :

(a) Starting three years diploma courses in Computer Engineering and two years diploma courses in Information Technology with the intake of 30 and 20 students respectively.

(b) To set up Tura Polytechnic and to introduce these courses:

Computer Applications	-	40 intake capacity
Food Processing and Preservation	-	40 intake capacity
Medical Electronics	-	40 intake capacity

(c) To set up Jowai Polytechnic and to introduce the following courses:

Architectural Assistantship	-	40 intake capacity
Automobile Engineering	-	40 intake capacity
Costume Design and Garment Technology (only for girls)	-	40 intake capacity

(ii) The Meghalaya State Council has also proposed that the first phase of workshop for revision of the existing curricula and preparation of new ones of various levels at

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5.7 FUTURE PLAN IN TECHNICAL EDUCATION

The contribution of Shillong Polytechnic is remarkable in the field of Technical Education in the state, Yet as mentioned earlier the need for Technical Education hardly needs emphasis in the minds of students who are undergoing general courses especially in liberal arts the department of Education feels that there should be a major thrust towards promoting Technical Education.

The Education Department was informed that the Ministry of Human Resource Development (HRD) Govt of India has included the state of Meghalaya along with other North Eastern States in the third Technician Project of the World Bank. Meghalaya is the only state which is not only enlisted for upgrading its existing Polytechnic at Shillong but also creating two more Polytechnics at Tura and Jowai. This project aims at equiping the youth with technical skills which will not only make them better suited to thge emerging job markets but also give them the skills for self-employment in the informal sector. The detailed plan of the project proposed by the State Government is as below.

5.8. Polytechnics and Courses are as follows:-

(a) **Shillong Polytechnic** :-

(i) Modernisation of Laboratories & Workshop with new equipment.

(ii) Repair and renovation of existing building including boys and girls hostel.

(iii) Starting of three years diploma course in Computer Engineering - 30 intake capacity.

(iv) Starting of two years post diploma course in information Technology - 20 intake capacity. AICTE to be moved for obtaining approval for new courses.

(b) **Tura Polytechnic** :-

(i) Courses to be introduced in the new Polytechnic at Tura are :-

Computer Application	-	40 intake capacity
Food processing & preservation	-	40 intake capacity
Medical Electronics	-	40 intake

(ii) AICTE approval has been obtained for setting up of new Polytechnic at Tura with two courses - Computer Application & Food Preservation. For medical Electronics AICTE approval is to be obtained.

(c) **Jowai Polytechnic:-**

(i) Courses to be introduced in the new Polytechnics at Jowai are :-

Agricultural Assistantship	-	40 intake capacity
Automobile Engineering	-	40 intake capacity

Costume Design & Garment Technology (only for girls) - 40 intake capacity.

(ii) AICTE approval has to be obtained for the new Polytechnic at Jowai and its courses.

(iii) Vacant land of Kiang Nongbah Govt. College, Jowai has been identified for setting up of the new Polytechnic.

The Meghalaya State Council had also fixed that the first phasse of work-shop for revision of the existing curricula and preparation of new ones of various diploma level courses will be held from 3-9 May 2000 with the experts to be drown from Technical Teachers Training Institute (TTTI) Calcutta and resource person from different department the joint effort from the faculty members of Shillong Polytechnic.

Besides, the State Government has also pleaded the Government of India to allot more seats to the students of Meghalaya in Modern Engineering Degree Courses like Leather Technology, Polymer Science & Technology, Food Processing & Preservation, Fashion Technology and Information Technology, But only one seat is only alloted i.e, Leather Technology.

diploma courses will be held from 3-9 May, 2000, with the experts to be drawn from TTTI, Calcutta; resource persons from different departments and the faculty of Shillong Polytechnic.

(iii) The government of Meghalaya has also pleaded the Government of India to allot more seats to the students of Meghalaya in the Engineering Degree courses like Food Processing and Preservation, Fashion Technology and Polymer Science and Technology, Leather Technology and Information Technology. But only one seat is allotted, i.e., Leather Technology.

5.9 Problems

1) Ever since the creation of the State of Meghalaya the state has not been able to set up any Polytechnic though the state has been contemplating setting up a Polytechnic at Tura. This was due to paucity of resources. The state is eking out an assistance with limited number of courses in conventional discipline in one and only Shillong Polytechnic.

2. Under the scheme of Govt. of India 'Reservation of Seats .....' upto 1994 - 95 session, the Government of India used to reserve engineering seats (degree and diploma) State - wise, Institution - wise and discipline - wise. The State Govt. could satisfactorily nominate the students in order of merit to the selected colleges knowing their status and facilities available particularly the availability of hostels for both girls and boys. Since 1995 - 96 session the system has revised by the 6/9 seats have been reserved state-wise and branch-wise. Donor state have been given option to offer seats in the institution of their choice. The system created great inconvenience to nominate the students in order of merits and discipline due to the fact that many donor state do not confirm the name of the institution and student were nominated to the authority of the concerned state for allotting colleges from their end.

3. Today the major problem in Technical Education in the State is the lack of proper industrial atmosphere in the Technical Institutions for which the students do not get proper acclimatisation to the actual field of the Industry. Lack of Industry-Institute interaction make the students more theoretical centred rather than theoretical cum practical centred.

4. Another technical education problem in the state is that at present there is no separate Directorate for Technical Education because the existing Directorate of Technical Education is grouped together with Higher Education. Besides, there is a shortage of staffs and lack of adequate finance and other infrastructural facilities in the State.

5. Shillong Polytechnic is the only Technical Institute in the State for providing diploma courses. Students have to travel long distances to avail of the facilities of the Polytechnic. There is, therefore, an element of inconveniences and regional imbalance.

6. The problems faced by the students and the Teachers of Shillong Polytechnic are as follows :-

(a) No hostel facilities for girls.

(b) Inadequate textbook and library facilities.

(c) Inadequate practical equipment and workshop facilities.

(d) Shortage of water supply.

(e) Inadequate Sports facilities.

(f) Lack of transport facilities.

5.10 CONCLUSION & SUGGESTIONS:

Inspite of the, great emphasis on the importance of Technical Education at the national level there has been not much expansion of technical facilities in the state. Technical Education in the State has been neglected for a very long time. Shillong Polytechnic, the only institution of its kind in Meghalaya was established way back in

1965 under the composite state of Assam. The Institution is conducting Diploma courses in traditional courses in Civil, Electrical and Mechanical Engineering. Proposals for establishment of two new Polytechnic at Tura and Jowai were submitted to the All India Council for Technical Education with copies of curriculum and syllabi of courses to be followed in the proposed polytechnics other than the traditional courses. Till today there is no provision of diversified courses & no additions of courses except Electronics. Engineering being the latest which was approved in 1993 and commenced from the academic year 1996 with an intake capacity of 30 students.

Some of Selected Indicators 1991, 1995 as projected in the study on Technical Manpower Profile 1995: India and the states, 1998, gives a picture of the position of Technical education in the state in comparison to national level.

Table 5

Parameter	1991			1995		
	Meghalaya	India	% to India	Meghalaya	India	% to India
1. Population (thousand)	1775	846313	.21	1945	91766	0.21
2. No. of Diploma Instn.	1	843	0.11	1	1322	.07
3. Intake (Sanctioned)	120	133433	0.09	150	175190	.08
4. Outturn	105	65152	0.16	84	90734	.08
5. Stock of Diploma Holder	1690	859250	0.20	1800	1079090	0.17
6. Teacher student Ratio	1.8	1.16				
7. Shortage of teachers	14%	18%				

This table reveals the fact that there was an increase of diploma institution at the all India level but in Meghalaya the position remains the same even after 28 years of its creation. The intake of students at all India level is significant where as there is slight increase of intake capacity in Meghalaya and percentage in India decreased in 1995. The Students teacher ratio is also high at all India level. However, Shortage of

teacher is less in the state of Meghalaya compare to India level.

1. Taking into consideration the problems faced by the state government in matters of reservation of seats, it is suggested that the government of India should revert its present system of reservation of seats to the previous one where seats are reserved state-wise, institution-wise and discipline-wise.

2. For the smooth functioning of Technical Education in the State, there is an urgent need to create a separate Directorate for Technical Education.

3. Industry-Institute collaboration has been the theme of numerous studies, discussions, seminars and conferences in India. Industry-Institute interaction needs to be promoted in a big way in the state through apprenticeship opportunities, consultancy and sponsored research. There is a need to encourage and strengthen mobility and exchange of faculty between the academic institution-institutions, national laboratories and industrial development.

Since, the state of Meghalaya is industrially backward, it creates another problem to arrange Industry-Institute interaction programme. But this can be done by collaborating with the neighbouring states such as Assam which have many industries and factories.

4. Co-ordinated and concerted efforts are needed to be made to upgrade the infrastructural facilities in technical Education in the State with special reference to Shillong Polytechnic. The facilities such as availability of equipment, water supply, hostel facilities, library, transport and other facilities need to be provided by the Government. Outdated equipments in the laboratory & workshops should be replaced with new ones and defective tools to be repaired. Books available in the library also should be up-to-date and relevant to the courses of study. Besides, journal, encyclopaedia etc. should be in plenty to enrich the knowledge of the students.

5. Regional imbalances in the State can be solved immediately as the Government have proposed to set up two more Polytechnics in the State, i.e., one at Tura and the other at Jowai, with diversified courses.

6. For the smooth functioning and in maintaining the standard and discipline of the institution, inspection & supervision should be conducted regularly.

7. Hundred percent of the respondents strongly suggested that Shillong Polytechnic should be upgraded to a full-fledged Engineering College. But the emergence of Shillong Engineering and Management College, Dental and Medical College in the State poses another problem if Shillong Polytechnic is also upgraded to a full-fledged Engineering College, because a small State like ours cannot absorb the students that will come out from these Colleges either in Government jobs or in private entrepreneurs. Even though Shillong Engineering and Management College is not functioning till now, but after some time courses will be started as soon as possible. Even though there is all round pressure to upgrade Shillong Polytechnic, yet, the matter is to be considered by the State Government.

5.11 SUGGESTIONS FOR FURTHER RESEARCH:

In the present study, the investigator brings out some solutions, yet, inspite of the efforts made by the investigator, there are several aspects which could not be included in the present study. Therefore, further researches are suggested and recommended in the following areas.

(1) An investigation of the attitudes of the society towards Technical Education in the State.

(2) A comparative study of Shillong Polytechnic with other polytechnics in North-East India.

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APPENDIX-I

Interview Schedule for the Officers of the Directorate of Higher and Technical Education, Government of Meghalaya.

Personal data of the respondent:

(a) Name:

(b) Sex:

(c) Academic Qualification:

(d) Designation:

(e) Experience:

Government policies.

1. What are the government policies in general for technical education in the State like

   (i) Upgradation of Shillong Polytechnic?

   (ii) Opening of more polytechnic institutions in the state?

   (iii) Any other, please specify.

2. What steps have been taken by the government to improve technical education in the State?

Facilities:

3. What are the facilities provided to students of the State in technical education? Please tick (√) against the correct statement.

   (i) Provision of more diploma course ( )

   (ii) Operation of Community Polytechnic in the State ( )

   (iii) Opening of Women Polytechnic in the State ( )

   (iv) Opening of Women Polytechnic within Shillong Polytechnic ( )

4(a) What are the arrangements made by the State to provide technical education in degree and Higher technical?

(i) Sending students outside the State in the Engineering Colleges?

(ii) Sending students outside the State for diploma course?

(b) How many seats are offered to students every year in Engineering Colleges outside the State?

(c) How many seats are earmarked for Meghalaya in Diploma Course outside North -Eastern States?

(d) How many seats are allotted for students of the State in N.E.R.I.S.T.?

5. What is your vision that Shillong Polytechnic should be in the near future?

Financial Provision:

6(a) What is the total financial outlay provided for technical education within and outside the State during 1999-2000?

(b) Is the amount allotted sufficient to meet the requirements of the Institution? Yes/No.

If No, please give your suggestion.

(c) What is the annual financial provision to students of technical education in and outside the State?

7. According to you is there any access in manpower in some fields? Yes/No.

8. What are the problems of the Shillong Polytechnic in providing technical education in the State? What steps are thought to be done to remedy them? Please give your suggestions.

9. Is the government planning to upgrade Shillong Polytechnic to a fullfledged Engineering College? Please give your suggestion.

APPENDIX - II

An Interview Schedule for the Principal of Shillong Polytechnic.

Personal data of the respondent:

(a) Name:

(b) Sex:

(c) Address:

(d) Academic Qualification:

(e) Experience:

The Historical Background:

1(a) When was Shillong Polytechnic established?

(b) Who is (are) the founder(s) of this institution?

2. What was the purpose for setting up of Shillong Polytechnic?

3. What were the objectives when the institution first established?

4. Who looks after the management of this institution?

5 (a) What are the different courses offered by Shillong Polytechnic?

(b) Who develops the courses of study?

6. According to you are man-power needs taken into consideration while planning the course of studies? Yes/No.

If No, why?

7. Are the courses of studies offered by the institution helpful to solve the manpower needs in the State? Yes/No.

If No, what is your suggestions to meet these needs?

Teachers:

8(a) What is the total number of teachers in the Shillong Polytechnic?

(b) How many of them are in each course?

(c) What are the prerequisites for the appointment of teachers? Please tick (√)

against the correct statement.

(i) Post Graduate ( )

(ii) Graduate ( )

(iii) A minimum work experience of 5 years ( )

9. What are the other roles of a teacher besides teaching? Please tick(√) the correct one.

(i) Research Work ( )

(ii) Extension Work ( )

(iii) Development of Curriculum ( )

(iv) Any other, (please specify).

10. Is there any provision for improving the teachers' competency? Please tick (√) against the following.

(i) Training ( )

(ii) Specialisation ( )

(iii) Any other, please specify.

Infrastructure:

11. Does the institution have the following infrastructure? Please tick (√) against the correct statement.

(i) Adequate Classroom ( )

(ii) Teaching Aids ( )

(iii) Library ( )

(iv) Practical Laboratory ( )

12. Are there adequate facilities in the workshop/laboratory? Yes/No.

If No, what is your suggestion.

13. Does the institution provide adequate library facilities in respect of the following. Please tick.

(i) Books ( )

(ii) Journals ( )

(iii) Reference Materials ( )

(iv) Any other, please specify.

14. Is there any need to improve the library service? Yes/No.

If Yes, please give your suggestion.

Placement, Arrangement, Exam, Results, etc:

15(a) What is the annual intake capacity of Shillong Polytechnic?

(b) Is administration to the institution

(i) open to all

(ii) Based on Scheduled Castes/Scheduled Tribes.

(iii) Based on Socio-Economic background.

(c) What admission procedure does the institution follow? Please tick (√) against the right statement.

(i) Written Test only ( )

(ii) Personal Interview only ( )

(iii) Both (i) and (ii) ( )

(iv) Any other, (please specify).

16(a) Is the required percentage for admission based on merit? Yes/No.

If No, please specify.

(b) Does the percentage of marks in Science and Mathematics considered as the only criteria for admission? Yes/No.

17. What system is followed in your institution? Please tick (√) against the correct response.

(i) Semester System ( )

(ii) Annual System ( )

18. How are the students assessed or evaluated? Please tick (√)

    (i) Internally ( )

    (ii) Externally ( )

    (iii) Both (i) and (ii) ( )

    If internally evaluated, what are the different internal assessment?

    (i) Weekly tests/monthly tests ( )

    (ii) Mid semester/annual exam ( )

    (iii) Assignment ( )

    (iv) All of the above ( )

    (v) Any other, please specify.

19. Do all the students usually clear the papers within the prescribed time? Yes/No.

    If no, is there any arrangement for them to repeat those subjects in which they have not cleared in one sitting?

20. Who conducts the final examination in your institution?

21(a) Is there any inspection and supervision in the institution? Yes/No.

(b) If Yes, who generally conducts the inspection and supervision?

(c) How often was the inspection and supervision done?

    (i) Regularly ( )

    (ii) Irregular ( )

22. What, according to you, are the present strengths and weaknesses of Shillong Polytechnic? Please mention

23. Is the financial provision made by the government sufficient to meet the needs and requirements of the institution? Yes/No.

    If No, please give your suggestions.

APPENDIX - III

QUESTIONNAIRE FOR STUDENTS POLYTECHNIC.

GENERAL INSTRUCTION :

You are requested to read the questions carefully and feel free to give your answer accordingly. Your responses will be kept as strictly confidential and will be used solely for the research purpose only.

Please do not leave any item unanswered in order to make the sample useful. Please give your true response and your honest completion of the piece of information is very important in so far this research work is concerned.

Personal data of the respondent

a) Name and address :

b) Sex :

c) Name of the course :

d) Academic Qualification :

1. In which course of study are you enrolled ? Please tick (✓) against the right one:

   i) Civil Engineering ( )

   ii) Mechanical Engineering ( )

   iii) Electrical Engineering ( )

   iv) Electronics Engineering ( )

2. Do you find any problem (s) relating to your courses ? Please tick (✓) against the correct statement.

   1) The course is not relevant to the needs of the students ( )

   2) Teachers are not adequate in numbers ( )

   3) Time is too short for completing the course ( )

   4) The course is not helping to get job ( )

   5) Books are not easily available ( )

6) The course is too tough for the students ( )

7) Any other problems please specify ( )

3. Are the facilities available in the library satisfactory ? Yes / No.

If no, kindly give suggestion.

4. If there any facilities provided for practical work ? Yes / No.

If Yes, are you satisfied with the provision made ? Yes / No.

If No, what according to you should be done to make practical meaningful ?

5. (a) Do you get any scholarship or stipends from the Goverment or from any other sources? Yes / No.

If Yes, please mention from which source ?

(b) Are these scholarship or stipends connected with employment opportunity ? Yes / No.

6. (a) Do you have hostel facilities in your institution ? Yes / No.

(b) Do you apply for hostel accommodation ? Yes / No.

If Yes, please tick (✓)

i) Do you get a single room ( )

ii) Do you get a share hostel room ( )

iii) Not at all ( )

If No, why are you not getting ?

7. Do the Institution provide transport facilities ? Yes / No.

8. Are there adequate sports facilities in your institution ? Yes / No.

If Yes, what are the facilities provided ? please tick (✓)

i) Playground ( )

ii) Common room ( )

iii) Different sports materials ( )

iv) All of the above ( )

v) Any other, please specify ( )

9. Are you satisfied with the methods of teaching used by the teachers ?

Please (✓) against the right one.

i) To a great extent ( )

ii) To some extent ( )

iii) Not at all ( )

10. Is there any guest lecturer who come and deliver lectures in your Institution ?

Yes / No

If Yes, where were they generally come from ?

11. What are the problems generally experienced by you in the Institution ?

12. As you know Shillong Polytechnic offers Diploma course only. According to your view, is there any requirement to upgrade Shillong polytechnic to a fullfledeged Engineering College ?

Yes / No

If Yes, please state the reason why ?

APPENDIX - IV

Questionnaire for the beneficiaries (passed out students) of Shillong Polytechnic, Shillong

Instructions to respondents:

Please read the questions carefully and give your response in the space provided. There are both opened and closed ended questions. Please feel free to give your frank responses. The information will be kept as strictly confidential and will be used solely for the research purpose. Please do not leave any item unanswered. Your honest completion of the piece of information is yet another important factor in so far this work is concerened.

Personal data of the respondent

a) Name and address :

b) Sex :

c) Academic Qualification :

d) Name of Office/Enterprise:

e) Designation:

f) Experience:

1. Which year did you enroll in Shillong Polytechnic?
2. Which course of study are you enrolled?

3.a) How many teachers were teaching your course of study?

b) What were their Qualifications? Please tick Please tick (✓) one :

i) Post Graduate ( )

ii) Degree holders ( )

iii) Any other, please specify

4. What were the methods of teaching generally used by the teachers?

Please tick (✓) against the right one :

i) Lecture method ( )

ii) Demonstration method ( )

iii) Discussion method ( )

iv) Question-Answer method ( )

v) Field trip method ( )

vi) Combination of different methods at a time ( )

5. Are you satisfied with the methods of teaching? Yes/No.

If No, what is your suggestion?

6. Was there any itenerant (guest lecturer) who comes and deliver lectures in the institution during your time? Yes/No.

If Yes, where were they generally come from?

7. How satisfactory were the facilities provided by the institution? Please tick.

		Highly Satisfactory	Satisfactory	Not Satisfactory
(i)	Classroom	( )	( )	( )
(ii)	Laboratory/Workshop	( )	( )	( )
(iii)	Hostel	( )	( )	( )
(iv)	Library	( )	( )	( )
(v)	Co-Curricular activities	( )	( )	( )
(vi)	Playground	( )	( )	( )

8. Was the course of study in accordance with your expectations?Yes/No.

If no, why was it not according to your expectations? Please give reasons.

9. Was the course relevant to the work you associate with? Yes/No.

10. Was there any contact with the Industrial/Public sector? Yes/No.

If yes, have you been benefitted?

11. During your time, what system was followed in the institution? please tick (✓)

i) Semester system ( )

ii) Annual system ( )

12. What was the scheme of evaluation followed in the institution?please tick (✓) against the right response.

i) Internal ( )

ii) External ( )

iii) Both (i) and (ii) ( )

13. Are you satisfied with the scheme of evaluation? Please (✓) against the right one.

i) To a great extent ( )

ii) To some extent ( )

iii) Not at all ( )

14. After completion of the course, how long it took for getting job?

15. What type of work did you get after completion of your course ? Please tick (✓)

i) Government job ( )

ii) Public sector ( )

iii) Private enterprise ( )

16. Do you find that the financial returns were proportionate to investment in education? Yes/No.

17. According to you, how far the Shillong Polytechnic has contributed in equipping man-power in the State? Please give your opinion.

18. Did you see that there is any access of man-power in some field? Yes/No. If yes, what should be done to bring a balance of man-power in Shillong Polytechnic?

19. According to you what were the problems encountered during your execution of the course in Shillong Polytechnic?

20. According to you is there any requirement to upgrade Shillong Polytechnic to a fullfledged Engineering College? Yes/No.

If yes, please give your opinion why there is need?

If no, why there is no need for it?

APPENDIX - V

Questionnaire for the teachers of Shillong Polytechnic.

General Instructions :

Please read the questions carefully and answer them in the space provided.. There are both open and closed ended questions. Please feel free to give your frank responses. They will be kept as strictly confidential and will be used solely for the research purpose only.

Please do not leave any item unanswered in order to make the sample useful. Please give your true and frank response and your honest completion of the piece of information is yet another important factor in so far this research work is concerned.

Personal data of the respondent:

a) Name and address :

b) Sex :

c) Educational Qualification :

d) Designation :

e) Experience :

f) Course (branch of study) you are teaching :

1.(a) Is the number of students enrolled in the Class manageable for the effective transaction of the course? Yes/No.

(b) What according to you should be the teacher-pupil ratio for suitable and effective teaching ?

2. How many of you are sharing the course?

3.(a) How many hours do you have at your disposal for completing the course?

(b) Do you find the time allotted to you enough to finish the course?

4. What are the component parts of the course ? Please tick (√)

(i) Theory only ( )

(ii) Practical only ( )

(iii) Both (i) and (ii) ( )

(iv) Any other (Please specify)

5. (a) Are you involved in developing the course of study? Yes/No.

(b) Is the course of study emphasis on any of the following? Please tick (√)

(i) Knowledge ( )

(ii) Skills ( )

(iii) Practicals ( )

(iv) Attitudes ( )

(v) Any other, Please mention.

6. Do you feel that the students' needs and aspiration are met by the course ? Please tick (√)

(i) To a great extent ( )

(ii) To some extent ( )

(iii) Not at all ( )

7. Are the course of study in your Institution related to job opportunity in the State? Please tick (√) against the right statement.

(i) Very much ( )

(ii) To some extent ( )

(iii) Not at all ( )

8. According to you is there any requirement for improving the present curriculum? Please give your suggestion.

9. What is (are) the method(s) of teaching generally used by you ?Please tick (√) against the right one.

   (i) Lecture method ( )

   (ii) Discussion method ( )

   (iii) Demonstration method ( )

   (iv) Field study method ( )

   (v) Question answer method ( )

   (vi) Combination of different methods at a time ( )

10. Is there any arrangement for constant interaction between the students and the industrial sector or job-giving agencies?

11. What type of teaching aids generally used by you to facilitate your teaching? Please tick (√) against the correct statement.

   (i) Audio aids ( )

   (ii) Visual aids ( )

   (iii) Audio-visual aids ( )

   (iv) All of the above ( )

12. According to your view is there any man-power excess in some fields? Yes/No.

13. Is there a link between man-power needs and provision of facilities in technical education in the State? Please comment.

14. According to your view, what are the steps necessary to be taken for improving of technical education in the state?

15. Do you feel that the present strength of teaching staff in the institution is adequate? Yes/No.

   If no, what is your suggestion.

16. What are the problems encountered by you in the institution? If any, please mention.

17. Shillong Polytechnic is the only institution which offers diploma course in technical education in the State. According to you is there any requirement to upgrade Shillong Polytechnic to a full-fledged Engineering College? Yes/No.

If yes, please give reasons.