Subject-Based Teacher's Training for Government Polytechnic Institue in Bangladesh: Status, Challenges and the Way Forwards

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DECLARATION

This is to certify that the work presented in this action research is the outcome of the investigation carried by Md. Rakibul Hasan, Cheif Instructor (Tech/RAC), Magura Polytechnic institute, Magura & Md. Abdur Rahaman Cheif Instructor (Tech/Electronics) Kushtia Kpolytechnic institute, Kushtia.

…….. …….

Md. Rakibul Hasan Md. Abdur Rahaman

DEDICATION

DEDICATED TO

OUR WONDERFUL PARENTS

WHO BROUGHT ME IN TO THIS NICE WORLD

AND

OUR FAMILY

WHO SACRIFICE FOR THIS STUDY

ACKNOLEDGEMENT

We especially want to express our extreme honor and gratitude to the participants of this study for sharing their opinions of their careers and experiences as a TVET Polycymaker and polytechnic Principal, Trainer, Teacher and generously volunteered their time to participate in this study. They did so with enthusiasm and commitment, often contributing many suggestions, ideas, and comments to help us gain a better understanding of their career and experiences. We couldn't have done it without them.

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ABSTRACT

Good quality subject-based skill training is needed to create good skill teachers. The skill-based qualifications of teachers and students in technical education are of a fairly high standard due to which technical education in Bangladesh is not reaching a standard place, especially the Diploma in Engineering course from which Bangladeshi mid-level engineers are produced(BTEB,2021).The problem under this study to explore the present status & challanges and strategies to enhance subject-based skill training for government polytechnic teachers in Bangladesh.In this study the targeted Population are the Teachers, Trainers, Polyetchnice and Teachers Traing Institute Principal and Key Informer. The study was carried out mixed metheod survey research design where quantaive and qualative data were collected. Four semi-structured questionnaires and one key informant interview schedule were developed and also pretested was done all the questionnaires. In this study data has been collected from a total of 241 respondents and among them169 Teachers, 51Trainers, 21 Polyetchnice principal and 02 Teachers Traing Institute Principal and 05 Key Informer. For data analycis MS Excell are used. After analyzing the collected data, Status & Challanges and strategies to enhance subject-based skill training are found. The study also identify that subject-based skill training is very essential for governmet polytechnic teachers. There is a shortage of training institutions compared to working teachers, and there is no significant difference between trainee and trainers' qualifications. Teachers have expressed satisfaction with the training of NTVQF certification from normal subject-based training. Unavailabily of training institute; training institute infrustrure problem; lack of technology wise qualified trainer; limited scope of technology wise subjective training; lack of industry-institute linkage are the main challenges of subject-based teacher's training. Strategies to enhance subject-based teachers training are c.g. Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and lab facilities with modern

equipments;The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops;Every technology or subject training opportunity must be insured;Need to set up world class Teachers training institute in every division with all modern facilities;Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training;Organize training and retraining of teachers at regular intervals;An adequate number of subject-wise skilled trainers (training institute) need to be created;Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit;Industries-institutes linkages need to be increased;Adequate funding needs to be allocated in the budget for subject-based training of teachers. The major findings and recommendations will help government, stake holders, institutions leader for future planning and policy making for current and future Subject-based skill training for Government polytechnic teachers in Bangladesh.

Keywords

Diploma in engineering, technical skills, subjective training, Teachers traing

LIST OF ABBREVIATION

BANBAIS:Bangladesh Bureau of Educational Information and Statistics

BBS: Bangladesh Bureau of Statistics.

BMET :Bureau of Manpower Employment and training

BTEB: Bangladesh Technical Education Board.

CBT&A: Competeny Based Training and Assesment

CPTU: Central Procurement Technical Unit

DPP: Development Project Proposal

DTE: Directorate of Technical Education

DMPI: Dhaka Mohila Polytechnic Institue

DPI: Dhaka Polytechnic Institue

HRM: Human Resource Management.

ICT: Information and Communication Technology.

ILO: International Labour Organization

MoU : Memorandum of Understanding.

NGO: Non Government organization's

NSDC: National Skills Development Council

NSDP: National Skills Development Policy 2011

NTVQF: National Technical and Vocational Qualification Framework

PPR: Publice Procurement Rules
SDG: Sustainable Development Goal

TTTC: Technical Teachers Training College.

TVET: Technical and Vocational Education and Training.

UCEP: Under Privileged children's Educational Programs

VTTI: Vocational Teachers Training Institute

DEFINITION OF OPERATIONAL TERMS

Teachers

A **teacher**, also called a formally an educator, is a person who helps students to acquire knowledge, competence or virtue (wikepedia). Teachers are one of the most influential and powerful forces for equity, access and quality in education and key to sustainable global development, (UNESCO). The primary role of the teacher is to provide classroom instruction that helps students learn. To accomplish this, teachers must prepare effective lessons, grade students and give feedback, manage classroom content, navigate the curriculum effectively, and collaborate with other staff(Taack Lanier, Judith-1997).

Instructor

An instructor is a person who instructs you on how to do something. An instructor teaches specific usage skills. He taught practical, not theory. For example, a refrigeration and air conditioning instructor teaches her student a spesific level of skill of refrigeration and air conditioning subject. So it can be said that the position of instructor is like that of a coach. The main responsibility of an instructor is to ensure that students are able to reach a certain level of relevant proficiency skills (https://pediaa.com/).

Training

Systematice practice in the performance of a skill.

Subject-based skill training

Systematice practice in the performance of a specific subject/technology technical skill.

Technical skills

Technical skill means a knowledge or talent to perform mathematics, engineering or science related activities or tasks. Technical skills are an individual's affinity or ability to complete tasks related to a specific science or technology. These skills can cover a broad array of subjects and areas. Relevant areas include Math, Engineering, Science or Computer-Technology. Technically skilled individuals are often an essential part of the economy because they are responsible for the creation of innovation.

Technical vocational education and training (TVET)

Technical vocational education and training is a part of education and training which provides knowledge and skill for employment TVET uses formal, non formal and informal learning. Technical education is a bit different from conventional and mainstream education. Through technical education, students not only learn from their textbooks, but they also get the opportunity to gather practical knowledge of different trades.Vocational and technical programs are shorter, more focused training and educational programs that prepare their students for immediate employment. Although both types of schools are considered trade or career schools, they do vary a bit in their focus. According to the U.S. Department of Education, technical schools teach the theory and science behind the occupation, while vocational schools take a more hands-on approach to teaching the skills needed to do the job successfully, https://education.seattlepi.com/can-double-major-community-college-3012.html, Susan Revermann.

Diploma in Engineering Course

The Diploma in Engineering or Diploma in Technical Education is a program focused on practical and skills-oriented training. It is a technical course that only covers the essentials when ranked with an undergraduate engineering degree. It aims to provide students with industry or job related engineering knowledge, scientific skills, computing and analysis, mathematical techniques, a sound knowledge of English to communicate in the field and ability to apply problem-solving techniques.

Engineering Profession

Engineering is a challenging and rewarding career field that applies mathematics, science and the laws of nature to create what is known as modern civilization. More specifically, as defined by the Engineers Council for Professional Development (1961/1979) and adopted by the Accreditation Board of Engineering and Technology (ABET), “Engineering is the profession in which a knowledge of mathematical and natural sciences, gained by study, experience, and practice, is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of [hu] mankind”.

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INTRODUCTION OF THE STUDY

1.1 Introduction

Bangladesh is a country with one of the largest populations with youths comprising more than one-third. For the sustainable economic development in any country quality technical education is very necessary for building the nation. In recent years, the expansion and promotion of technical education in Bangladesh and its importance has increased tremendously. Quality teachers are needed for quality education. With this in mind, the number of trainings for making subject-based skilled teachers has also increased manifold in recent times. Skills, knowledges and innovations are important driving forces of economic growth and social development in any country, and those countries with higher levels of education and skills, adjust more effectively to challenges and opportunities in the global economy (NSDP, 2011). Therefore, this research study aimed to explore the present status & challanges and strategies to enhance subject-based skill training for government polytechnic teachers in Bangladesh. It includes: the current status of training of diploma level teachers, types of training are conducted for teachers. From this study the challenges of teachers training at the diploma level can be found in detail.Through this study, a set of action plans for the future training of diploma level teachers will be known and hence a short term and long term measure can be taken for effective subject-based training for government poytechnice institutes in Bangladesh.

1.2 Statement of the problem

Teachers are the lifeblood of an educational institution. Teachers are facing many challenges in terms of quality training in TVET institutions. Good quality subject-based training is needed to create good skill teachers. The skill-based qualifications of teachers and students in technical education are of a fairly high standard due to which technical education in Bangladesh is not reaching a standard place, especially the Diploma in Engineering course from which Bangladeshi mid-level engineers are produced, Even teachers are not aware of the NTVQF levels of skills in Bangladesh. For diploma graduates to succeed in the field of work, it is necessary to have the skills of the 21st century such as computer skill, management skill, technology based skill, programming skill, leadership and communication skills specilly English language for real life (BTEB, 2021).

Fig. 1.1 Skill and their components

After independence, no other institute has been set up for the training of TVET (Diploma in engineering) teachers in such a way that various trainings for technical teachers of Bangladesh have been organized at different times apart from these two institutes one is Technical teachers training college (TTTC), Tejgaoan Dhaka (Established-1964) and another is Vocational teachers training college (VTTI) Bogra (Established-1979). Technical education is an education that has to be imparted to the students hands-on and practical knowledge, Can't do it. As we know, technical education creates skilled human resources. Technical education

serves various purposes. For some, it opens the door towards a bright career and ensures employment. Nowadays, many youths are opting for technical education, instead of general education. 'Technical and vocational education and training' (TVET) is understood as comprising education, training and skills development relating to a wide range of occupational fields, production, services and livelihoods.

1.3 Rationale and beneficiary of the study

Bangladesh is an emerging country with big population .She wants to reach the list of super high away of developed countries by implementing the sustainable development goal within 2030. It is the only way to reach this goal by making technically sound person. Education is backbone and technical education is the boneblack of a nation. It is imaginary to develop a nation without education and impossible without technical education. Researchers have done research to identify the challenges and remedies of subject-based teacher's training in government polytechnic institute at home and abroad and have identified many problems and ways to overcome them. But in the case of Bangladesh, there are certain challenges to teacher's subject-based training in technical education and there is a big difference in how those challenges can be overcome. In this research, it was a vital issue to identify the status and challenges of subject-based teacher's training in Bangladesh and solution to overcome these challenges. The results from this study may be useful to Educational institutions, policymakers, stakeholders many other organizations that are involved in TVET who seek to attract and retain talented teachers.The results of the research can be used to create good skilled teachers and the most beneficial will be to make our young generation skilled who will play an important role in building the future of Bangladesh and the economy of Bangladesh will become a sustainable economy.

1.4 Objectives of the study

The main purpose of the research is to explore the status and challenges and the way forward of subject-based training of government polytechnic institute teachers in Bangladesh.The issue of challenges Polytechnice Teachers subject-based training and the sociocultural factors that influence their participation is significant to the population of Teachers. Through a quantitative and qualitative study, participants were asked in general, what are the challenges and remedies of subject-based teachers training in polytechnic institutes in Bangladesh.

1.5 Conceptual framework of the study

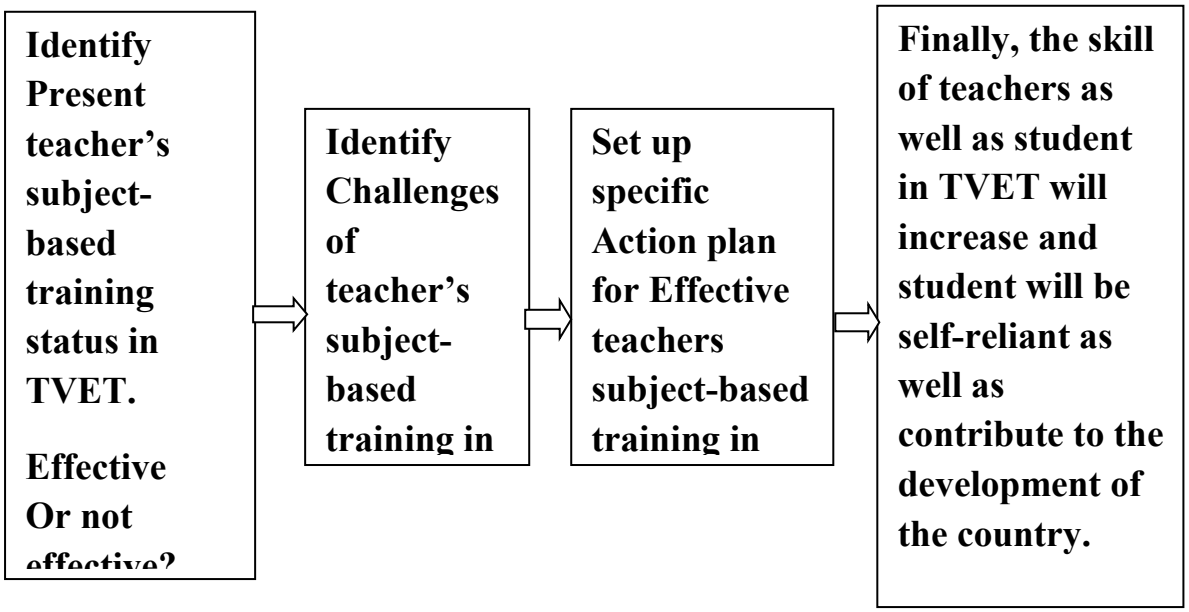

Fig.1.2Conceptual framework

Education is a big factor for the development of any nation. The rate of technical education is much higher in all the countries of the world that have reached the peak of development, so it can be said that technical education is the main tool for development. Through technical education, students not only learn from their textbooks, but they also get the opportunity to gather practical knowledge of different trades. Determining the current state of training of teachers working in the current TV sector in Bangladesh, especially at the diploma-in-engineering level and identifying the obstacles in the training, then creating a set of action plans to overcome the obstacles.

1.6 Scope and limitaion of the study

At present there are 54028 teachers working in various TVET institutes in Bangladesh out of which 10915 are female teachers. Among them the total number of teachers of Diploma in Engineering is 12022 and the number of female teachers is 2071(17.23%), at present the ratio of teachers to students in technical education institutions1:31 (BANBAIS-2020). These teachers were selected from 49 Government polytechnic institutes in the different districts of Bangladesh. This study has been done on the teachers who have participated in one or the other training in the last three years, be it in the country or abroad. This study will include teachers from government polytechnic institutes as well as maintain the representation of the gender perspective statistically. This study provides information where respondents have given their feedback on previous, and current subjective training issues and also provides a clear idea of the challenges of training and provide information on how to make future training sustainable in the light of 21st-century skills, including a set of action plans. The study also provides the present status of TVET (diploma in engineering) teachers' subject-based training in technical and vocational education and training and the barriers to this participation and how to overcome these barriers, although not in detail, the issues have come up briefly. Finally, a bunch of proposals has been put forward for those involved in technical education. This study only provides information on the subject-based training of teachers working at the diploma-in-engineering level.

1.7 Research Questions of the study

The following research questionnaires have been set to fully meet the research objectives .More precisely, the research questions prompting this study are as follows:

RQ1.What is the present status of subject-based teacher's training for Government polytechnic institutes in Bangladesh?

RQ2. What are the challenges of subject-based teacher's training for Government polytechnic institutes in Bangladesh?

RQ3. What strategies can be taken for effective subject-based teacher's training for Government polytechnic institutes in Bangladesh?

1.8 Visible impact on TVET

In today's speedy and competitive world, it is very much important for polytechnic teachers to contribute to national development to reach sustainable development goals. The policymakers are expected to use the information to review policies in teacher's Subject-based training. The outputs of the research will be published on the existing situation, remedies, and several causes affecting subject-based teacher training in government polytechnic institutes. This research will enable the government and other stakeholders to tackle the issue of subject-based teacher training. It is an academic exercise and will serve as a reference point for future training planners and researchers.

1.9 Outline of the Report

This research paper consists of five chapters which are described below

In the first chapter, it was sorted based on the entire study to the introduction of the study, statement of the problem, purpose and research questions of the study, rationale of the study, significance of the study, and scope of the study, and outline of the Report. The results of previous researchers' research have been linked to various international reports and policies on teachers' training in technical education.

The second chapter analyzes the results and reports of various research papers at home and abroad on status and challenges of subject-based Teachers training in home and abroad and solution to overcome these challenges.

Chapter Three describes the area of the research, the research questions, the research design, the target population, sampling procedures; sample size, and research instruments as well as data collection procedures and analysis are described.

Chapter Four analyzes the results of research questionaries of primary and secondary data related to current status and challenges of government polytechnice teachers subject-based training and how to overcome these challenges

Chapter five which is the last chapter, the key findings of this study are related to the current literature and specific conclusions are drawn. Finally, the limitations, implications, and recommendations of the study were presented.

CHAPTER TWO

Literature review

2.1. Introduction

Training is an important issue for teacher development. The most important input in the education system is a teacher. He designs how to make the raw materials (student) into a quality product or output (Efficient student). So a teacher has to be qualified and updated with modern technology to create efficient human resources from raw materials. Training in this situation makes a teacher suitable for nation-building with modern knowledge (THECLA, 2016). Teacher learning or training is a continuous never-ending process that promotes teachers' teaching skills, master novel knowledge; develop better or newer proficiency, which in return assists in improving students' learning. Research and some studies have shown when teachers are good at class management students show much more interest in the classes and have better education outcomes compared to the situation when the teacher is not so good at classroom management. Teacher training refers to the policies, procedures, and provisions to prepare teachers with the knowledge, skills, and attitude required while dealing with the students effectively in a classroom, school, and wider community. The ones who provide teacher training are called as teacher trainers (**Vinod Kakumanu, 2018).**

2.2. TVET Teachers training Scenario in Bangladesh

Before the war of independence of Bangladesh, there was only one TVET Teachers traing institute in the Teggaoan, Dhaka. Technical Teachers training college was established in the year 1964. After the liberation, another institute was set up in Bogra in 1979 for the training of Bangladesh technical and vocational teachers. Apart from technical education, some institutes in Bangladesh provide basic training of teachers as well as office management training and also some in-house training of teachers in their respective institutes. Currently the number of teachers working in technical education is 54028, (BANBAIS-2020). Although the number of teachers has multiplied, the desired quality teacher training institutes have not been established since then, but teacher training is very important for quality education, especially as technical education is very practical oriented. These institutional database and data from training division in director of technical education shows that although there is some training system for teachers working in government institutions, it is to say that non-government organizations do not have such training. There is a need for more subjective training which is far less than the need due to which the desired quality teachers are not available to deal with the skills of the 21st century skills. But as the importance of technical education has increased, and the participation of students and educational institutions has increased, the expected technical education has not yet attracted all walks of people.

2.3. Challenges of polytechnics teacher's subject-based training

Despite the geographical, political, economic, and socio-cultural, and linguistic differences, the challenges identified for the government polytechnic teacher's subject-based training are quite similar. Many past studies in the country and abroad have found out the challenges of polytechniceteachers subject-based training,such as state/government challenges, education institutional challenges etc**.**TVET teachers training is facing multifarious problems and challenges which need to set priorities to alleviate these problems for proceeding towards a sustainable way forward.Lack of sufficient teacher training facilityto face the challenges of the TVET system and identify the basic concepts of improving the quality (Islam,2014).

Lack of Efficent Trainers

The professional development of trainers according to the needs of employers and the application of modified technology is a big concern in the field of technical education (Islam, 2014).

Lack of latest and modern equipment

Regularly purchasing modern equipment is a big challenge in the case of public and private training institutions. Establishment of appropriate training infrastructure, upgrading of training resources and proper equipment are essential for teacher training. (Islam, 2014).

Lack of Regular updating curricula and training program

Training curriculum regularly updated is a big challenge for teacher training; Curriculum needs to be updated as per the demand of the market subject to discussion with various stakeholders (Islam, 2014).

Lack Enough Financing in TVET

The budget is a big challenge to bring the quality of training up to a standard level like in developed countries. Good quality budget is needed to fulfill all the criteria of teachers' training. (Islam, 2014).

Teachers' Lack of Time

Several studies reported that lack of time is another teacher related obstacle which hinders the use technology in TVET teaching (Bingimlas, 2009 Due to the shortage of teachers, teachers are required to take classes as well as do administrative work , Teacher shortage is a big challenge for quality training (Khan Pt e all, 2017)

2.4 Strategies for enhancing quality subjet-based training of teachers

Government and other private sectors should come forward to allocate required fund by realizing the importance and the potentials of updating TVET sectors. International donor agencies could be invited to invest their fund for improving TVET sectors in Bangladesh (Khan, 2014)**.** Inadequate budget is one of the foremost constraints of TVET which becomes the primary issue in procuring modern equipment, regular upgrading of these equipment, employing sufficiently proficient trainers, qualified assessors, support them in updating their skills, purchase most appropriate training facilities, aids and technology for practical training, etc. Application of the modern training methodologies involves sufficient budget also (Nurul, 2014).Professional developmental program (teacher-training) should be organized based on the constraints encountered by the teachers. This kind of training also needs to be focused on changing teachers' attitude and conceptions towards using technology in teaching and learning contexts. Both pre-service and in-service training are required to overcome teacher related barriers and hence we recommend the following professional developmental model.

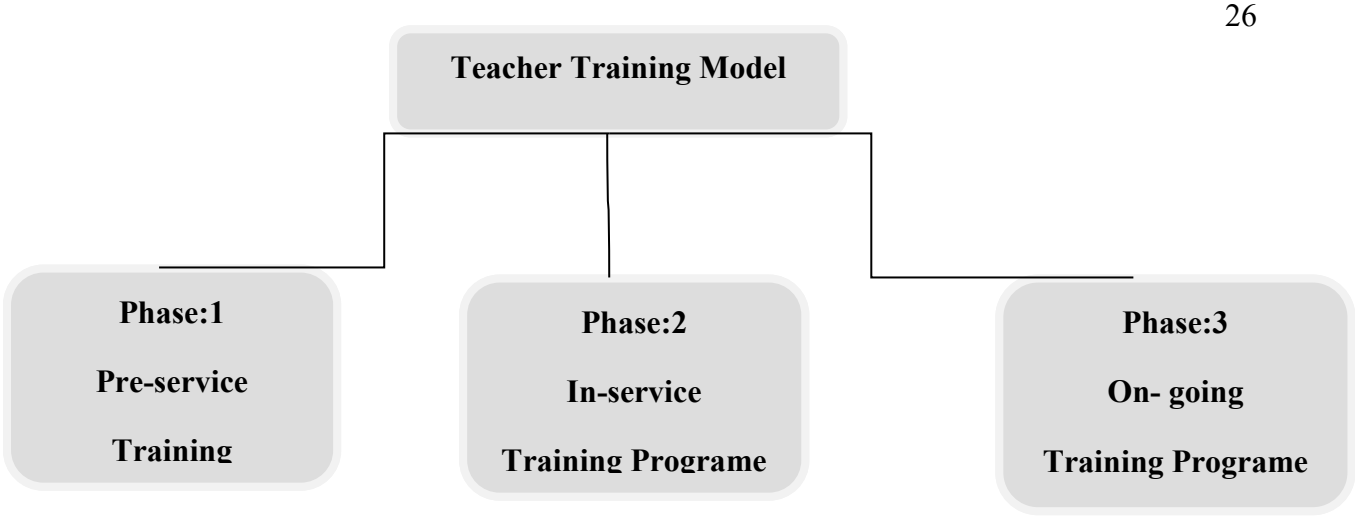

Fig: Professional developmental Model for TVET sectors in Banglades
(Khan, 2014)

Industry-Demanded Training

A continuous upgradation in training is highly required in order to meet the present and the future needs of the industry. The skill development process will only be sustainable once there is continuous assessment of training. In order to be responsive to present and future needs, the skill development system of Bangladesh is moving forward to implement a competency based training and assessment (CBT&A) system.The CBT&A system is more focused on demand-driven training than the traditional training. Specific demands are being initiated from the industry and CBT&A is fulfilling the demand by providing the specific skills. CBT&A is shifting from the traditional theory based approaches to delivery and assessment approaches by placing greater emphasis on the achievement and demonstration of practical skills required to perform at a specified standard demanded by industry. The CBT&A system in Bangladesh is based on the following principles (NSDP, 2011), Progression through a competency-based training program will be determined by whether the student has met the set standards, and not by the time spent in training.

Training of Trainers

Continuous training is also required for trainers as well so that they can develop and implement CBT&A program to their respective institutions. Government should also invest more funding to upgrade the equipment and other facilities so that the training outcome can meet the demand of the industry. The key to a sustainable skill development project is a well-trained cadre of instructors and trainers who will be responsible to produce skilled workforce in the formal and informal sectors. A new certification system for the instructors and trainers has been adopted to deliver a more strategic approach to the development of training workforce. This new system ensures that the same standard, programs and qualifications is applied for all instructors and trainers working in public and private sectors and these qualifications are also recognized by the new NTVQF. A number of certified trainers are essential to disseminate the skillsthrough the country. This new system ensures an upward future trend of skilled professional workforce by imposing the following conditions (Ministry of Education, 2011, pp. 28, 29).

1. All government instructors are being trained and certified under the new system.

2. A national network of instructor training centers is established that integrates existing instructor training facilities separately managed by different government Ministries and agencies.

3. A pool of certified national Master Trainers be created to implement the new instructor training programs, which will also include a separate group of master trainers for the disabled.To update the knowledge of the trainers, government set a mechanism with the industries called 'return to industry'program that allows current instructors and trainers to update their technical skills in the workplace.

To establish an equal access to professional development, female trainers are given priority in the CBT&A system. Government has taken initiative to employ the female instructors in the new vacant posts with a view that women are better represented as instructors and trainers in the skills system.Private training sectors occupy the major portion of the skill development area in Bangladesh. So, trainers from non-government training organizations are encouraged to join the mainstream nationalskill development program by participating in professional development programs to improve the overall quality of skill training delivered to students (Khan et all-2017)

Collaboration between educational institutions and industries is to be increased (Raihan, 2014) and Governments should encourage industrial organizations to participate in TVET through providing incentives, subsidizing apprenticeship wages and assisting the stipend program (Islam, 2014). Infrastructural development of educational institutions needs to be done, such as hostel facilities, sanitary facilities, modern equipment (Islam, 2014).

Collaboration of TVET with Higher Education

In overcoming the challenges of TVET for establishment of sustainable TVET, cooperation with Higher Education and TVET may be bonded in some areas. These may be in i) Development of TVET Packages (Curriculum & TrainingProgram), ii) Training of TVET Trainers, iii) Research and Study for sustainable Development of TVET and iv) Development of resources and pedagogy to promote and encourage sustainability in TVET (Islam,2014).

Linkage with employer

Links between training and the employment sectors is of prime importance in establishing agreeable environment and win-win situation for the demand and supply position for the training graduates and the employers. The market requirements are changing specially the case with trainingcurricula, trainers' skills, market linkages, etc. In order to promote employment with appropriate and needed skills, engagement of employers and enterprises (industry) to be significant players in TVET should be emphasized (Islam ,2014). Industry - institution relationship plays a vital role in the demand and supply approach (Raihan, 2014).

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This section consists of research method, research design, research instrument/tools, population and sampling procedure, data collection and analysis techniqueetc. to fulfill the target objectives of the research.

3.2. Research Design

The study combines qualitative and quantitative methods to explore the current status of TVET (Diploma in engineering) teachers' training, Challenges of quality teachers training, opportunities and benefits of quality teachers training, training course content updates, etc. It was also consideration has been given to what kind of training plans can be made for teachers to tackle 21st-century skills. Quantitative Data has been collected from TVET teachers and trainers and qualitative data collected from polyetechnice prinncipal, TVET training expert and from TVET Training document reveiwes. The study addressed with "Convergent Parallel Design'(Creswell, 2015)". A convergent parallel design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyzes the two components independently, and interprets the results together (Creswell & Pablo-Clark, 2011)

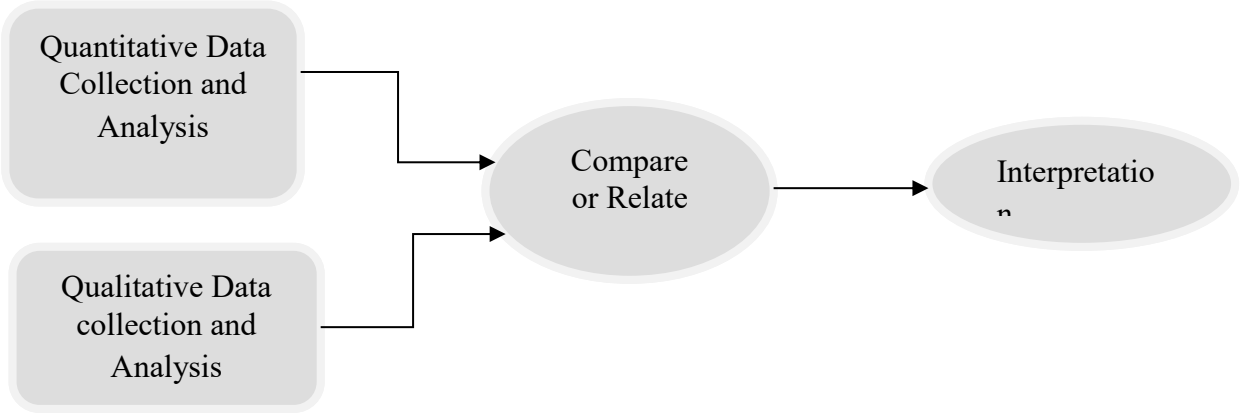

Fig: 4.1 convergent parralal research design

3.3. Strategy of Inquiry

Table 3.1: Research inquiry strategy

Research Questions	Strategy of Inquiry	Overall Strategy of Inquiry
RQ1.What is the present status of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	Quantitative+Qualatitive	Mixed method(survey research design)
RQ2. What are the challenges of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	Quantitative+Qualatitive	
RQ3. What strategies can be taken for effective Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	Quantitative+Qualatitive	

This research will be the conducted through the mixed method of survey research design. For quantitative research survey questionnaires were used for collection both primary and secondary data for depth knowledge by sharing participation previous knowledge, experience, opinions, observation also to get details present status of of TVET teachers training a desktop review is perform by the help of BTEB, BANBAIS and every institutional record database in Bangladesh. This research study aimed to explore the present status & challanges of TVET (Diploma in engineeing) teachers training in Bangladesh.

3.4. Source of data

Table: 3.2. Data collection sources

Research Questions	Data Source
RQ1.What is the present status of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	• Principals of TVET(Diploma in Engineering) institutions • TVET Teachers((Diploma in Engineering) • TVET Trainers • TVET Policy makers,Training expert and Personnel of BTEB and DTE • Document reveiwes
RQ2. What are the challenges of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	• Principals of TVET(Diploma in Engineering) institutions • TVET Teachers((Diploma in Engineering) • TVET Trainers • TVET Policy makers,Training expert and Personnel of BTEB and DTE
RQ3. What strategies can be taken for effective Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?	• Principals of TVET(Diploma in Engineering) institutions • TVET Teachers((Diploma in Engineering) • TVET Trainers • TVET Policy makers,Training expert and Personnel of BTEB and DTE

To meet up with the objectives of the first research question" RQ1.What is the present status of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh? The researchers collected data from the review of TVET institute of Bangladesh, home and abroad TVET training related recorded and a combination of four types of the data source such as

- Principals of TVET(Diploma in Engineering) institutions
- TVET Teachers((Diploma in Engineering)

- TVET Trainers
- TVET Policy makers,Training expert and Personnel of BTEB and DTE
- Document reveiwes

To run into the objectives of the second research question" RQ2. What are the challenges of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh? The researchers collected data from the combination of four types of data source, such as

- Principals of TVET(Diploma in Engineering) institutions
- TVET Teachers((Diploma in Engineering)
- TVET Trainers
- TVET Policy makers,Training expert and Personnel of BTEB and DTE

To fulfill the objectives of the fourth research question" RQ3. What strategies can be taken for effective Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh? The researchers collected data from the combination of four types of data source, such as-

- Principals of TVET (Diploma in Engineering) institutions
- TVET Teachers (Diploma in Engineering)
- TVET Trainers
- TVET Policy makers,Training expert and Personnel of BTEB and DTE

3.5. Population, Sample and Sampling

To meet the objectives of the research the targeted populations are

- Principals of TVET(Diploma in Engineering) institutions
- TVET Teachers (Diploma in Engineering)
- TVET Trainers
- TVET Policy makers,
- TVET Training expert and
- Personnel of BTEB and DTE

Because of different types of courses are conducted in TVET, due to time constraint we consider only Diploma in engineering program, Rndom and Purposive Sampling has been used as per the research study demand.

3.5.1. TVET Teachers Sample and selection procedure

The following formula is used to calculate the size of the research required sample for definite population:

$n=[Z^2*p(1-p)/e^2]/[1+(z^2*(1-p)/(e^2*N))]$ (Dannial WWW,1999)

Here, Z= the standard normal deviate, usually set at 1.96 which corresponds to 95% confidence level, P= estimated value of the parameter; the proportion in the target population estimated to have a particular characteristic. Here the value of 'p' is considered .4,

Population, N=8000.

e= error margin usually set at ±.07

According to the sample estimation formula, the sample size was 184 for TVET Teachers graduates. The TVET Teachers were selected using random sampling strategy.

3.5.2. Other respondents and sample selection procedure

Table: 3.3. Sample size and sampling

Data Source	Sample Size	Sampling
• Principals of TVET(Diploma in Engineering) institutions	27	Purposive sampling
• TVET Trainers	68	Purposive sampling
• TVET Teachers	184	Simple Random sampling
• TVET Expert,	5	Purposive sampling
• TVET Training expert	5	Purposive sampling

Appropriate sampling technique is done to perform the studies. The sample size is as like as

A total of 27 Principals of TVET (Diploma in Engineering) institutions are selected by purposive sampling method from Principals of TVET (Diploma in Engineering) institutions from entire disrict in Bangladesh.

A total of 68 TVET Trainers are selected by purposive sampling method from TVET Trainers of TVET (Diploma in Engineering) institutions from entire disrict in Bangladesh.

A total of 5 TVET Expert and TVET Training expert are selected by purposive sampling method from BTEB, DTE, BMET, TMET and so on.

3.6. Research instruments/tools

The research was carried out by the help of the instruments that used were survey questionnaires, semi- structured questionnaires, and documentary reviews; all the questionnaires are developed for survey research design by reviewing previous literature related to TVET teachers training by the researcher.

Table: 3.4. Tools /Instruments of Data Collection

Data Source	Data Collection Tools
• Principals of TVET(Diploma in Engineering) institutions	interviewed with Semi stuctured questionnaires
• TVET Trainers	structured questionnaires
• TVET Expert,	interviewed with Semi stuctured questionnaires
• TVET Training expert	interviewed with Semi stuctured questionnaires

3.7. Data collection techniques

After pre-testing all the research questionnaires, the data will be collected after the approval of the review panel of the research and knowledge management cell. Google Forms, Email, Direct Interview Method will be used for data collection and other questions answers will be collected following the research rules. A data collector will be appointed for data collection and appropriate training will be provided regarding data collection

3.8. Data analysis techniques

Quantitative data will be entered through computer Microsoft excell software and qualilative data will be analyzed manually and quantitative and qualitative data will be combined and published by analyzing the proceesed results. If necessary, the data will be analyzed using a combination of both quantitative and qualitative methods. Quantitative data will be analyzed through descriptive statistics and descriptive data will be analyzed qualitatively centering on the themes and concepts derived from the research objectives and field data.

3.9. Research region

Technical education or training is conducted by 22 ministries and various departments, including the Directorate of Technical and Madrasa Education under the Ministry of Education, the Department of Technical Education and the Board of Technical Education under the Diploma-in-Engineering level training of teachers. The study covers the current status of training of teachers working in polytechnic institutes located in different districts and cities of the country and the challenges of training and what opportunities will be created in Bangladesh for training teachers and what are the benefits and future training will be conducted through an action plan will be recommended.

3.10. Ethical Consideration

The researcher keeps the personal information of the participants especially the social and family positions of the person confidential and takes into account the physical and mental condition of the individual when collecting research data, and another thing that is confidential is the information obtained from the study participants. Participants are informed about the research goals and objectives at the time of taking data so that they can provide information spontaneously and the research objectives and goals are achieved. In view of the fact that it is important for the study participants to obtain permission to collect data, the researchers have taken an official order from their own institutes Jashore polytechnic institute. The matter is clear to the head of selected Institutions for research and there is no impediment for the participants to provide information on the research work.in order to gain access to the schools, participants, and official document that facilitates the study. A copy of an official order was given to the Heads of the selected Institutions for clarity.

CHAPTER FOUR

ANALYSIS AND INTERPRETATION DATA

4.1. Introduction

This chapter analyzes the received data and presents the data in the light of Research Questions, such as the existing status of Subject-based teachers training in Bangladesh, and Challenges of teachers training, and remedies to overcome the challenges of teachers training in Bangladesh.

4.2. Status Of Subject Based Skill Training Of Government Polytechince Teachers In Bangladesh.

This section analyzes the received primary and secondary data and presents the data addressing Research Questions, the existing status of subject-based training of government polytechnic teachers in Bangladesh. To find out the present status of teacher subject-based training in Government polytechince institute a desk review was performed by the help of DTE, BTEB, BANBAIS and every institutional recorded data base. The Number of different training received by Teachers, NTVQF Certification status of trainers and teachers, educatin qualification of trainers, Training experience of trainers, respondent's opinion on satisfaction on subject-based training, trainers special degree on teacher training, scope on subject-based training with industry, etc. had to take into consideration in a few structured questionnaires for data analysis.

4.2.1. Teacher and training institute status of polytechnic in Bangladesh.

To find out the present Teacher and training institues status of Polytechnice in Bangladesh a desk review for secondary data collection was performed by the help of data provided by Polytecnice Institute, DTE, BTEB, BANBAIS . Analyzed and summarized the data for representation.

Table: 4.1 Numbr and percentage of Teacher and training insitute

Total teacher	No of female teacher (%)	No of male teacher (%)	Total no of gov.polytechnice institute	Total no of training institute
1425	270 (19%)	1155 (81%)	49	02

The Table: 4.1 indicates that there are 49 Government polytechince institutes loacated of different district in Bangladesh and about 1425 teachers which of them Male teachers (1155) and female (270) by 81% and 19% respectively are working in these instiutues (Appendix-F, BANBAIS: 2020). The table also shows there are 02 Government teachers training institutes loacated in two district in Bangladesh. Among the one is Technical teachers training college in Tejgaon, Dhaka and another is Vocational Teachers Training College, Bogra. Among the training instututes Table4.2 indicates that the two institues provide various types of training such as subject-based training, foundation training, procurement training etc.

Table: 4.2 Types of training for the teacher and venue

SL NO	Subject of training	Duration of Training	Training Venu
01	Basic training	60 Days	BIAM
02	Basic training	30 Days	TTTC
03	Subjective training	7 Days	TTTC+VTTI
04	Subjective training	30 Days	DPI+VTTI
05	Subjective training	60 Days	TTTC+VTTI+ DPI+DMPI
06	Project management training	10 Days	ILO
07	Innovation in Public Service Training	7Days	ILO
08	Basic office management training	7Days	BIM
09	E-GP training	3 Days	Dohatech New media
10	PPR + Project Management training	14 Days	
11	PPR training	21 Days	CPTU
12	Cyber Security and Ethics training	7 Days	IUT,Gazipur

Source: DTE

4.2.2. Number of different training received by Teacher

The questionnaires were provided for the verification of Number of training received by the respondent teachers of the polytechnic institutes. In total there were 169 resspondents. The fig4.1 indicates that about half (49%) of the teahers received five to ten training and 39% received one to five training. It is important to note that 9% of the teahers did not receive any training.

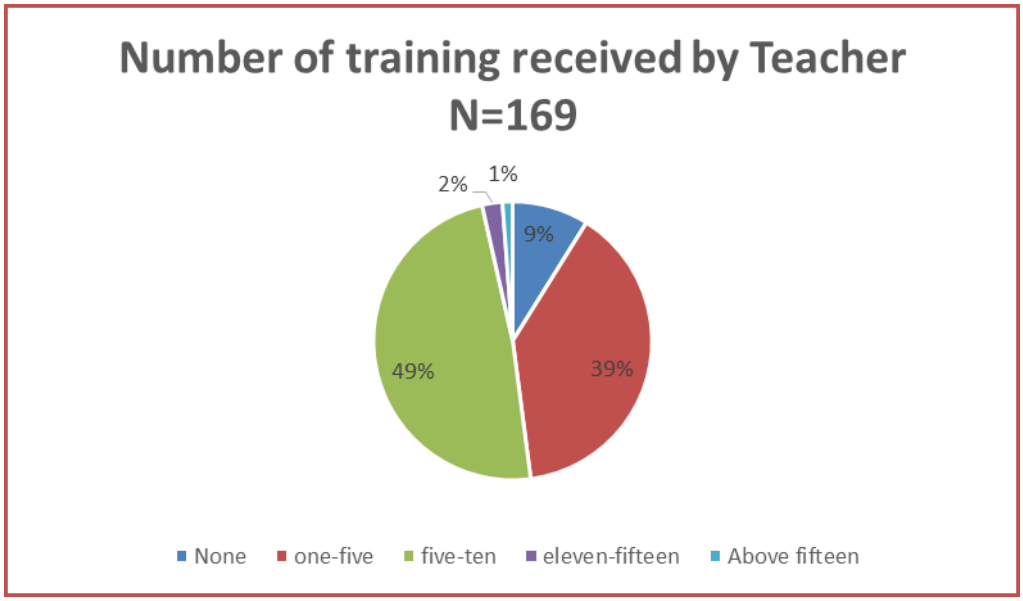

Fig. 4.1 Number of different training received by teacher

4.2.3. NTVQF Certification status of trainers and teachers

The respondents (n=220, teacher=169, trainer=51)opinions was taken for considered NTVQF level certification status of tainer and teacher and also considered which level of certification they were received.Respondents were given their opinion that suit them.The following decession have been made in the case of data analysis and result.

Table 4.3 NTVQF Certification status of trainers and teachers

				Certificate gained	
SL No	Evaluation topics	Respondent	Frequency(N)	Yes(N)	No(N)
1	**At least one NTVQF Certificate Achievment**	**Teacher**	**169**	**54(32%)**	**115(58%)**
		Trainer	**51**	**34(67%)**	**17(33%)**

The table 4.3 summarized result indicates that among the teachers only 32% teachers gained at least one NTVQF Certificate and 58% did not recived any NTVQF Certificate and also shows that among the trainer only 67% gained at least one NTVQF Certificate and 33% did not recived any NTVQF Certificate.

Table 4.4 NTVQF Level Certification status of trainer and teacher

Respondent	Level-1	Level-2	Level-3	Level-4	Level-5	Level-6	Total
Teacher	43	0	2	9	0	0	54
	80%	0%	4%	17%	0%	0%	100%
Trainer	**6**	**1**	**1**	**24**	**2**	**0**	**34**
	18%	**3%**	**3%**	**71%**	**6%**	**0%**	**100%**

Table 4.4 presents that among the teachers and trainers who recived at least one NTVQF Certifate. Only 17% teachers gained up to Level-4 NTVQF Certificate, 80% recived NTVQF Level-1 certificate and 4% Level-3 certificate. Among the trainer about 71% trainer gained up to Level-4 NTVQF certificate and 18% recived NTVQF Level-1 Certificate and 3% gained Level-2 and Level-3 certificate.

4.2.4. Educatin qualification of trainer

Data on the educational qualifications of the trainers participating in the study have been collected.The number of trainer was 51. The fig 4.2 indicates that about half (49%) of the trainer education qualification were BSc in Engineering and 41% were BSc in Technical Edcation and 8% were Msc in Engineering. It is important to note that not a single teacher with a PhD degree has been found.

N=51

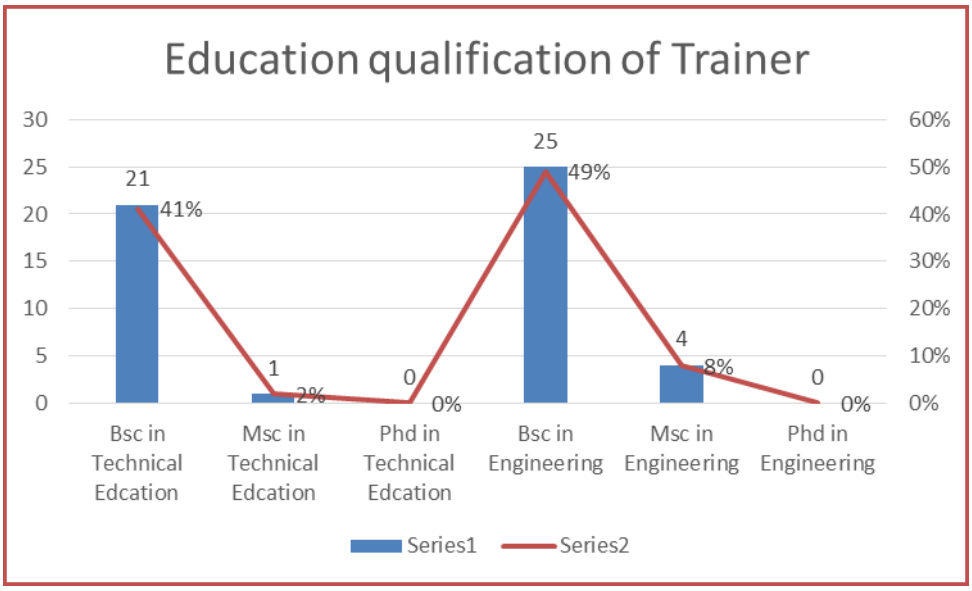

Fig.4.2 Trainer education qulification

4.2.5. Training experience of trainer

The questionnaires were provided for the justification of Training experience of trainer of the training institutes .There were 51 resspondents .All the respondents were the trainer of government Training and polytechnic institute located in various districts in Bangladesh..The fig4.3 indicates that about 47% of the trainers training experience were less than five years and 29% were eleven-fifteen years and 20% were five to ten years and it is important to note that 4% of the trainer training experience were above 15years.

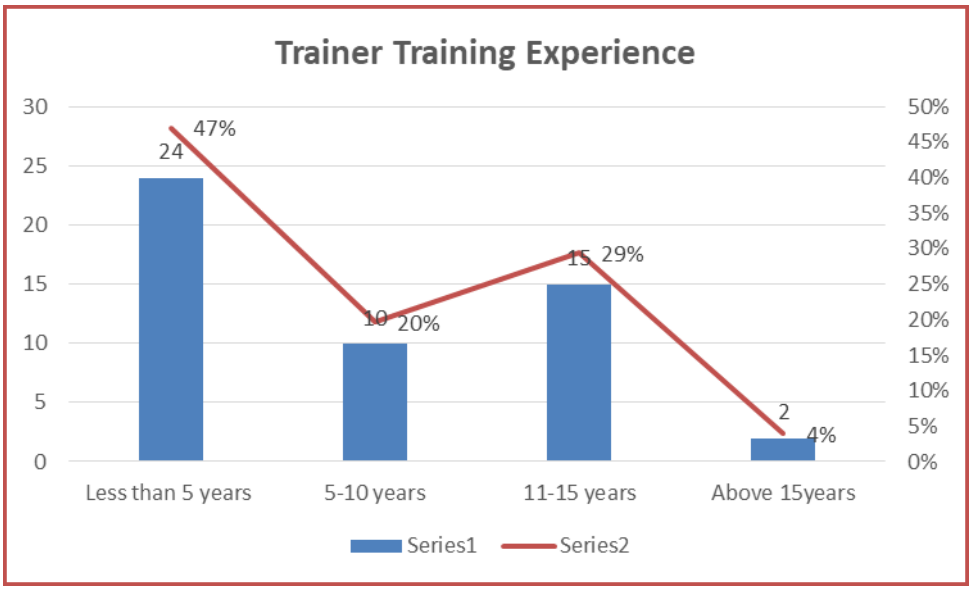

Fig. 4.3 Trainer training experience

4.2.6. Respondents opinion on satisfaction on subject-base training

The questionnaires were provided for the opinion on satisfaction on subject-based training provided by the various training institute. There were 169 resspondents .All the respondents were the teachers of government polytechnic institutes located in various districts in Bangladesh..

Table 4.5 Respondent's opinion on satisfaction on subject-based training by training institute wise

SL No	Trainig institute	Frequency(N)		Very Satisfied	Satisfied	Neutral	Dissatisfaction	Very Dissatisfacti	weight mean	mean2	Std.Deviation
1	Subject -based training of TTTC	152	f	10	112	26	4	0	3.8	15.08	3.35
			%	7%	74%	17%	3%	0%			
2	Subject -based training of VTTI	105	f	12	69	22	2	0	3.9	15.33	3.39
			%	11%	66%	21%	2%	0%			
3	Subject -based training of DPI	77	f	4	50	13	4	6	3.5	13.49	3.15
			%	5%	65%	17%	5%	8%			
4	Subject -based training of DMPI	56	f	3	45	5	2	1	3.8	15.16	3.36
			%	5%	80%	9%	4%	2%			
5	Subject -based training from other institute	18	f	2	8	2	5	1	3.3	12.06	2.96
			%	11%	44%	11%	28%	6%			
6	NTVQF level subject based training of TTTC	26	f	7	13	4	2	0	4.0	16.42	3.53
			%	27%	50%	15%	8%	0%			
7	NTVQF level subject based training of VTTI	20	f	9	11	0	0	0	4.5	20.05	3.95
			%	45%	55%	0%	0%	0%			
8	NTVQF level subject based training from other institute	13	f	2	5	6	0	0	3.7	14.15	3.23
			%	15%	38%	46%	0%	0%			
9	In house subject -based training(Own Institute)	114	f	18	83	13	0	0	4.0	16.62	3.55
			%	16%	73%	11%	0%	0%			

The table 4.5 reveals that in all the training institiute training satisfaction level is between Neutral to Satisfied and it is a significant matter is that the NTVQF training quality is above satisfaction level. From this it can be concluded that the training of NTVQF method brings good results in the subjet-based skills of teachers.

4.3. Challenges of subject based training of government polytechince teachers in Bangladesh

This chapter analyzes the received primary data and presents the data addressing the Research question" What are the challenges of Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?"

4.3.1. Challenges of subject-based training

The respondents (N=241) opinions was taken for considered eleven liker items statement related to institutional, government challenges of subject-based skill training for government polytechnic teachers in Bangladesh e.g, insufficient infrastructural facilities such as classroom & hostel; insufficient workshop facilities such as training materials, machines and equipment; insufficient ICT facilities for teachers training, training curriculum not matching industries demands; Technology/subject wise limited training scope; unavailability of teachers training institute; lack of training facilities for female teachers; lack of sufficient number of subject-wise trainers; lack of industries experience of Training institute subjective trainer; insufficient funding of training programs; lack of planning and adequate monitoring and management of teachers training. Response range was coded namely strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Respondents were given their best opinions that suit them. The following decisions have been made in the case of data analysis and results.

Strongly Agree=4.50 to 5.00

Agree= 3.50 to 4.49

Disagree 2.00 to3.49

Strongly Disagree 1.00 to 1.99

Table: 4.7Summary of participant's opinion for the challenges of subject-based skill training for government polytechnic teachers in Bangladesh

SL No	Evaluation topics	Respondent N=241		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	weight mean	mean2	Std.Deviation	Result
1	Insufficient infrastructural facilities such as classroom & hostel	Teacher(169)	f	1	4	4	134	26	**4.1**	**16.85**	3.58	Agree
			%	1%	2%	2%	79%	15%				
		Trainer(51)	f	0	1	1	31	18	**4.3**	**18.80**	3.81	Agree
			%	0%	2%	2%	61%	35%				
		Principal(21)	f	**1**	**1**	**1**	**11**	**7**	**4.0**	**17.38**	3.65	Agree
			%	6%	16%	6%	60%	12%				
2	Insufficient workshop facilities such as training materials, machines and equipment	Teacher(169)	f	0	35	13	104	17	**3.6**	**13.88**	3.21	Agree
			%	0%	21%	8%	62%	10%				
		Trainer(51)	f	**0**	**0**	**5**	**30**	**16**	**4.2**	**18.14**	3.73	Agree
			%	0%	0%	10%	59%	31%				
		Principal(21)	f	0	2	8	9	2	**3.5**	**13.05**	3.09	Agree
			%	0%	10%	38%	43%	10%				
3	Insufficient ICT facilities for Teachers Training	Teacher(169)	f	**0**	**9**	**16**	**121**	**23**	**3.9**	**15.92**	3.46	Agree
			%	0%	5%	9%	72%	14%				
		Trainer(51)	f	1	2	7	28	13	**4.0**	**16.57**	3.55	Agree
			%	2%	4%	14%	55%	25%				
		Principal(21)	f	**0**	**6**	**12**	**3**	**0**	**2.9**	**8.57**	2.39	**Disagree**
			%	0%	29%	57%	14%	0%				
4	Training curriculum not matching Industries demand	Teacher(169)	f	1	16	12	128	12	**3.8**	**14.92**	3.34	Agree
			%	1%	1%	1%	1%	1%				
		Trainer(51)	f	**1**	**5**	**4**	**32**	**9**	**3.8**	**15.57**	3.42	Agree
			%	2%	10%	8%	63%	18%				
		Principal(21)	f	0	8	10	3	0	**2.8**	**8.10**	2.31	**Disagree**
			%	0%	38%	48%	14%	0%				
5	Technology/subject wise training scope is limited	Teacher(169)	f	**0**	**8**	**4**	**131**	**26**	**4.0**	**16.65**	3.55	Agree
			%	0%	5%	2%	78%	15%				
		Trainer(51)	f	0	2	5	38	6	**3.9**	**15.90**	3.46	Agree
			%	0%	4%	10%	75%	12%				
		Principal(21)	f	**0**	**2**	**2**	**16**	**1**	**3.8**	**14.62**	3.30	Agree
			%	**0%**	**10%**	**10%**	**76%**	**5%**				

SL No	Evaluation topics	Respondent N=241		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	weight mean	mean2	Std.Deviation	Result
6	Teachers training institute is not available	Teacher(169)	f	1	3	7	120	38	**4.1**	**17.43**	3.65	Agree
			%	1%	2%	4%	71%	22%				
		Trainer(51)	f	1	6	2	31	11	**3.9**	**15.96**	3.48	Agree
			%	2%	12%	4%	61%	22%				
		Principal(21)	f	**0**	**2**	**4**	**13**	**2**	**3.7**	**14.38**	3.27	Agree
			%	0%	10%	19%	62%	10%				
7	Lack of training facilities for female teachers	Teacher(169)	f	1	4	4	90	70	**4.3**	**19.19**	3.86	Agree
			%	1%	2%	2%	53%	41%				
		Trainer(51)	f	**1**	**1**	**5**	**31**	**13**	**4.1**	**17.08**	3.61	Agree
			%	2%	2%	10%	61%	25%				
		Principal(21)	f	0	0	3	11	7	**4.2**	**18.00**	3.72	Agree
			%	0%	0%	14%	52%	33%				
8	Lack of sufficient number of subject-wise trainers who can teach theoretical and practical work completely	Teacher(169)	f	**0**	**4**	**10**	**124**	**31**	**4.1**	**16.95**	3.59	Agree
			%	0%	2%	6%	73%	18%				
		Trainer(51)	f	1	2	1	29	18	**4.2**	**18.27**	3.75	Agree
			%	4%	29%	3%	56%	9%				
		Principal(21)	f	**0**	**1**	**2**	**17**	**1**	**3.9**	**15.19**	3.37	Agree
			%	0%	5%	10%	81%	5%				
9	Lack of industries experience of Training institute subjective trainer	Teacher(169)	f	0	4	7	116	42	**4.2**	**17.66**	3.67	Agree
			%	0%	2%	4%	69%	25%				
		Trainer(51)	f	**0**	**0**	**1**	**33**	**17**	**4.3**	**18.86**	3.81	Agree
			%	0%	0%	2%	65%	33%				
		Principal(21)	f	0	1	1	16	3	**4.0**	**16.38**	3.52	Agree
			%	0%	5%	5%	76%	14%				
10	Insufficient funding of training programs	Teacher(169)	f	**1**	**15**	**11**	**113**	**29**	**3.9**	**15.93**	3.47	Agree
			%	1%	9%	7%	67%	17%				
		Trainer(51)	f	0	3	2	35	11	**4.1**	**16.96**	3.59	Agree
			%	0%	6%	4%	69%	22%				
		Principal(21)	f	**0**	**2**	**12**	**7**	**0**	**3.2**	**10.86**	2.76	**Disagree**
			%	**0%**	**10%**	**57%**	**33%**	**0%**				
11	Lack of planning and adequate monitoring and management of Teacher Training	Teacher(169)	f	**0**	**4**	**13**	**124**	**28**	**4.0**	**16.67**	3.55	Agree
			%	0%	2%	8%	73%	17%				
		Trainer(51)	f	0	3	2	39	7	**4.0**	**16.25**	3.50	Agree
			%	0%	6%	4%	76%	14%				
		Principal(21)	f	**0**	**3**	**14**	**3**	**1**	**3.1**	**10.05**	2.64	**Disagree**
			%	**0%**	**14%**	**67%**	**14%**	**5%**				

The above table4.7 reveals that participants agreed with that with the exception of Serial Nos.3, 4,10 and 11, the rest were considered for the challenges of subject-based skill training for government polytechnic teacher in Bangladesh and those with mean values between 2.8 and 4.3 Another important point is that the standard division's difference in values is very close, indicating that the participants' opinions were fairly close. The standard division's range was 2.39 to 3.86.

4.4. Strategies of enhance subject based skill training of government polytechince teachers in Bangladesh

This chapter analyzes the received primary data and presents the data addressing the Research question" What strategies can be taken for effective Subject-based Teacher's Training for Government Polytechnic institutes in Bangladesh?"

4.4.1. Strategies to enhance subject based training

The respondents (N=241) opinions was taken for considered thirteen liker items statement related to institutional and government challenges of subject-based training for Government polytechnic teacher in Bangladesh e.g, must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops; The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops; There should be workshop facilities with modern equipment to enhance practical training; Every technology or subject training opportunity must be insured; Need to set up world class Teachers training institute in every division with all modern facilities; Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training, Organize training and retraining of teachers at regular intervals; Training Curriculum needs to be subject-oriented; An adequate number of subject-wise skilled trainers (training institute) need to be created ;Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit;Adequate funding needs to be allocated in the budget for subject-based training of teachers; Need to maintain planning and adequate monitoring of teacher training; Research on teacher training needs to be continued on a regular basis to create quality teachers.Response range was coded namely strongly disagree(1), disagree(2), neutral(3), agree(4) and strongly agree(5). Respondents were given their best opinions that suit them. The following decisions have been made in the case of data analysis and results.Strongly Agree=4.50 to 5.00, Agree= 3.50 to 4.49, Disagree 2.00 to 3.49, Strongly Disagree 1.00 to 1.99

Table: 4.8 Summary of Participants opinion strategies to enhance subject based training of government polytechince teachers in Bangladesh

SL No	Evaluation topics	Respondent N=241		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	weight mean	mean2	Std.Deviation	Result
1	Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.	Teacher(169)	f	0	1	0	116	52	**4.3**	**18.70**	3.80	Agree
			%	0%	1%	0%	69%	31%				
		Trainer(51)	f	0	0	0	21	30	**4.6**	**21.29**	4.09	Agree
			%	0%	0%	0%	41%	59%				
		Principal(21)	f	**0**	**0**	**1**	**14**	**6**	**4.2**	**18.24**	3.74	Agree
			%	0%	0%	5%	67%	29%				
2	The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops	Teacher(169)	f	0	3	1	115	50	**4.3**	**18.41**	3.76	Agree
			%	0%	2%	1%	68%	30%				
		Trainer(51)	f	**0**	**0**	**2**	**14**	**35**	**4.6**	**21.90**	4.15	Agree
			%	0%	0%	4%	27%	69%				
		Principal(21)	f	0	2	0	18	1	**3.9**	**15.29**	3.38	Agree
			%	0%	10%	0%	86%	5%				
3	There should be workshop facilities with modern equipment to enhance practical training	Teacher(169)	f	**0**	**1**	**4**	**112**	**52**	**4.3**	**18.53**	3.78	Agree
			%	0%	1%	2%	66%	31%				
		Trainer(51)	f	0	0	5	21	25	**4.4**	**19.73**	3.92	Agree
			%	0%	0%	10%	41%	49%				
		Principal(21)	f	**0**	**0**	**0**	**16**	**5**	**4.2**	**18.14**	3.73	Agree
			%	0%	0%	0%	76%	24%				
4	Every technology or subject training opportunity must be insured	Teacher(169)	f	0	1	0	114	54	**4.3**	**18.80**	3.81	Agree
			%	0%	1%	0%	67%	32%				
		Trainer(51)	f	**0**	**0**	**2**	**35**	**14**	**4.2**	**18.20**	3.74	Agree
			%	0%	0%	4%	69%	27%				
		Principal(21)	f	0	0	1	13	7	**4.3**	**18.67**	3.79	Agree
			%	0%	0%	5%	62%	33%				
5	Need to set up world class Teachers training institute in every division with all modern facilities	Teacher(169)	f	**0**	**1**	**3**	**110**	**55**	**4.3**	**18.73**	3.80	Agree
			%	0%	1%	2%	65%	33%				
		Trainer(51)	f	1	0	1	33	16	**4.2**	**18.39**	3.76	Agree
			%	2%	0%	2%	65%	31%				
		Principal(21)	f	**0**	**0**	**0**	**13**	**8**	**4.4**	**19.43**	3.88	Agree
			%	**0%**	**0%**	**0%**	**62%**	**38%**				
6	Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training	Teacher(169)	f	**0**	**0**	**1**	**109**	**59**	**4.3**	**19.10**	3.84	Agree
			%	0%	0%	1%	64%	35%				
		Trainer(51)	f	0	0	2	35	14	**4.2**	**18.20**	3.74	Agree
			%	0%	0%	4%	69%	27%				
		Principal(21)	f	**0**	**1**	**0**	**13**	**7**	**4.2**	**18.43**	3.77	Agree
			%	**0%**	**5%**	**0%**	**62%**	**33%**				

SL No	Evaluation topics	Respondent N=241		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	weight mean	mean2	Std.Deviation	Result
7	Organize training and retraining of teachers at regular intervals	Teacher(169)	f	0	1	4	117	47	**4.2**	**18.27**	3.74	Agree
			%	0%	1%	2%	69%	28%				
		Trainer(51)	f	0	0	2	32	17	**4.3**	**18.73**	3.80	Agree
			%	0%	0%	4%	63%	33%				
		Principal(21)	f	**0**	**0**	**0**	**14**	**7**	**4.3**	**19.00**	3.83	Agree
			%	0%	0%	0%	67%	33%				
8	Training Curriculum needs to be subject-oriented	Teacher(169)	f	0	0	3	109	57	**4.3**	**18.91**	3.82	Agree
			%	0%	0%	2%	64%	34%				
		Trainer(51)	f	**0**	**0**	**5**	**23**	**23**	**4.4**	**19.37**	3.88	Agree
			%	0%	0%	10%	45%	45%				
		Principal(21)	f	0	0	0	14	7	**4.3**	**19.00**	3.83	Agree
			%	0%	0%	0%	67%	33%				
9	An adequate number of subject-wise skilled trainers (training institute) need to be created who can teach theoretical and practical work	Teacher(169)	f	**0**	**2**	**4**	**107**	**56**	**4.3**	**18.67**	3.79	Agree
			%	0%	1%	2%	63%	33%				
		Trainer(51)	f	0	0	11	17	23	**4.2**	**18.55**	3.78	Agree
			%	0%	0%	22%	33%	45%				
		Principal(21)	f	**0**	**0**	**0**	**16**	**5**	**4.2**	**18.14**	3.73	Agree
			%	0%	0%	0%	76%	24%				
10	Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit	Teacher(169)	f	1	4	2	132	30	**4.1**	**17.14**	3.61	Agree
			%	1%	2%	1%	78%	18%				
		Trainer(51)	f	**0**	**2**	**2**	**19**	**28**	**4.4**	**20.20**	3.97	Agree
			%	0%	4%	4%	37%	55%				
		Principal(21)	f	0	1	1	18	1	**3.9**	**15.52**	3.41	Agree
			%	0%	5%	5%	86%	5%				
11	Adequate funding needs to be allocated in the budget for subject-based training of teachers	Teacher(169)	f	**0**	**1**	**3**	**118**	**47**	**4.2**	**18.31**	3.75	Agree
			%	0%	1%	2%	70%	28%				
		Trainer(51)	f	0	0	1	38	12	**4.2**	**17.98**	3.71	Agree
			%	0%	0%	2%	75%	24%				
		Principal(21)	f	**0**	**0**	**0**	**18**	**3**	**4.1**	**17.29**	3.63	Agree
			%	**0%**	**0%**	**0%**	**86%**	**14%**				
12	Need to maintain planning and adequate monitoring of teacher training.	Teacher(169)	f	**0**	**1**	**5**	**122**	**41**	**4.2**	**17.91**	3.70	Agree
			%	0%	1%	3%	72%	24%				
		Trainer(51)	f	0	0	8	36	14	**4.7**	**19.57**	3.86	Agree
			%	0%	0%	14%	62%	24%				
		Principal(21)	f	**0**	**0**	**1**	**15**	**5**	**4.2**	**17.81**	3.69	Agree
			%	**0%**	**0%**	**5%**	**71%**	**24%**				
13	Research on teacher training needs to be continued on a regular basis to create quality teachers	Teacher(169)	f	**1**	**0**	**6**	**122**	**40**	**4.2**	**17.79**	3.69	Agree
			%	1%	0%	4%	72%	24%				
		Trainer(51)	f	0	0	3	30	18	**4.3**	**18.76**	3.80	Agree
			%	0%	0%	6%	59%	35%				
		Principal(21)	f	**0**	**0**	**0**	**16**	**5**	**4.2**	**18.14**	3.73	Agree
			%	**0%**	**0%**	**0%**	**76%**	**24%**				

The above table4.8 Study participant's agreed with the strategie to enhance subject based training of government polytechince teachers in Bangladesh and those with mean values between 3.9 and 4.7. It is important to note that there is no significant difference among the

participation opinions.Another important point is that the standard division's difference in values is very close, indicating that the participants' opinions were fairly close. The standard division's range was 3.61-4.09.

4.4.2. Respondents opinion on on teachers need attachment to the industry and NTVQF level of certification

The respondents (n=241, Teacher=169, trainer=51, Principal=21) opinions were taken for the analysis of Scopes of teachers training through attachment through the industry and Possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification Respondents were given their opinions that fit them. The following decisions have been made in the case of data analysis and results.

Table: 4.9 Summary of Participants opinion on Teachers industrial attachment and NTVQF level of certification

SL No	Evaluation topics	Respondent	Frequency	Yes(N)	No(N)
1	**Teachers need subject-based training through attachment to the industry**	Teacher	169	168(99%)	1(1%)
		Trainer	**51**	**51(100%)**	**0(0%)**
		Principal	**21**	**21(100%)**	**0(0%)**
2	**Possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification**	Teacher	169	164(97%)	5(3%)
		Trainer	**51**	**51(100%)**	**0(0%)**
		Principal	**21**	**21(100%)**	**0(0%)**

The table4.9 result shows that majority of the respondent think that Teachers need subject-based training through attachment to the industry and it is possible to make the teachers properly subject-based training through the NTVQF level of certification. Most of our key informants have also inline about the importance of teachers in industrial integration and NTVQF level of certification.Subject-based training will enable teachers to become proficient if they can be trained for a certain period of time through industrial attachment.

CHAPTER FIVE

DISCUSSIONS OF RESULTS, IMPLICATIONS AND CONCLUSIONS

5.1. Introduction

This chapter discusses the results obtained from the three research questions of the study and analyzes the opinions of previous researchers according to their literature reviews. This chapter also discusses the Recommendation, Further Recommendation, and Limitations of the study, and the conclusion.

5.2. Status of Subject-based Training of Government Polytechince Teachers in Bangladesh

The current state of Subject-based training of government polytechnic teachers in Bangladesh ,and the number of different training received by Teachers, NTVQF Certification status of trainers and teachers, education qualification of trainers, Training experience of trainers, respondent's opinion on satisfaction on subject-based training, etc. results discussed here.

5.2.1. Teacher and training institute status of polytechnic in Bangladesh.

Bangladesh has 49 polytechnics and considering the number of working teachers there are only 2 teacher training institutes. An important issue is that there is currently no specific training institute for Bangladesh Polytechnic teachers. There is a shortage of teacher training institutes in Bangladesh considering number of polytechnic teachers.

5.2.2. Number of different training received by Teacher

Respondent teachers who participated in the study said that they received various types of training and a small number of teachers did not receive any training. One thing to note here is that this training includes different types of training including subject based training. Another important point here is that some technology teachers do not have subject-based training at all. There is a considerable shortage of subject based training in Bangladesh Polytechnic teachers.

5.2.3. NTVQF Certification status of trainers and teachers

A large portion of the teachers participating in the study have not yet achieved NTVQF certification and another significant factor was that a significant portion of those who work as a trainer does not have NTVQF certification. There is not much difference in the qualifications of teachers and trainers.

5.2.4. Training experience of trainer

Most of the trainer training experience below five years. The most interesting thing is that very few trainer were training experience above ten years. There is a dearth of experienced trainers of the desired quality in teacher training

5.2.5. Respondent’s opinion on satisfaction on subject-based training by training institute

Respondent teachers who participated in the study said that all the training institutes' training satisfaction level is between Neutral to Satisfied and it is a significant matter is that the NTVQF training quality is above the satisfaction level. From this, it can be concluded that the training of the NTVQF method brings good results in the subjet-based skills of teachers. One can conclude that there is not yet a standard institution for subject based training of Bangladesh Polytechnic teachers.

5.3. Challenges of subject based training of government polytechince teachers in Bangladesh

There are some government, educational institutions, teachers, and trainers challenges to subject-based training of government polytechnic institutes in Bangladesh. Most of the participants in the study opinioned the following challenges as the challenges of subject-based training of government polytechnic institutes in Bangladesh.

- Insufficient infrastructural facilities such as classroom & hostel.
- Insufficient workshop facilities such as training materials, machines and equipment.
- Technology/subject wise training scope is limited,
- Unavilability of Teachers training institute,
- Lack of sufficient number of subject-wise trainers who can teach theoretical and practical work completely,
- Lack of industries experience of Training institute subjective trainer.
- Insufficient funding of training programs.
- Insufficient ICT facilities for Teachers Training.
- Lack of training facilities for female teachers.
- Training curriculum not matching Industries demand.
- Lack of planning and adequate monitoring and management of Teacher Training,
- Teachers are not interested in learning as there is no obligation in the job

Among the respondents, the key informants and training institute principal disagreed with the challenges e.g. Insufficient funding of training programs; Insufficient ICT facilities for Teachers Training; Lack of training facilities for female teachers; Training curriculum not matching Industries demand; Lack of planning and adequate monitoring and management of Teacher Training; Teachers are not interested in learning as there is no obligation in the job.

The above findings established with that Infrastructural problems especially hostel facilities, Sanitary facilities (Sakawat, 2015, and Nurul, 2104 and Jane Oviawe & Oluniyi Adelakun-2015, and Poor facilities: machines, tools, and equipment (ane Oviawe & Oluniyi Adelakun-2015), and training materials (Sakawat, BKTTC, 2015) are main institutional challenges of teachers training. Lack of qualified trainer one of the main problems of traing institutions (Sakawat, 2015, and Jane Oviawe & Oluniyi Adelakun-2015). And another main problem is an industry-institute linkage (Sakawat, 2015).

The above findings also in line with that there is many state or governmental challenges to subject-based teachers training. Although these challenges are somewhat different due to geographical, political, and economic reasons, their main points were almost the same. Ayonmike et al. (2014) identified some of the major challenges poor provision of infrastructural facilities such as a library, classroom blocks, workshops, laboratories, and recreational facilities; poor provision of consumable materials such as wood nails, wires, rods, glues, etc for student's practical's; poor provision of qualified technical education lecturers; and poor funding of technical education.

According to previous researchers (Islam,2014), due to insufficient budget, there is a shortage of skilled trainer and modern equipment was another important reason for weak subject-based teachers training that is established with our findings.

According to the respondent's opinion and previous research data, we can conclude that the challenges of subject-based training of polytechnic teachers in Bangladesh e.g Insufficient infrastructural facilities such as classrooms & hostels; Insufficient workshop facilities such as training materials, machines, and equipment; Technology/subject wise training scope is limited; Unavailability of Teachers training institute; Lack of a sufficient number of subject-wise trainers ; Lack of industries experience of Training institute subjective trainer.

5.4. Strategie to enhance subject based training of government polytechince teachers in Bangladesh

Participants in the study opined that strategies to enhance subject-based training of government polytechnic teachers in Bangladesh, emphasis should be placed on increasing government, and institutional. As per the opinion of the research participants, some of these issues are agreed to be most important. The most important strategies are-

- Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops
- There should be workshop facilities with modern equipment to enhance practical training
- The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops
- Every technology or subject training opportunity must be insured
- Need to set up world class Teachers training institute in every division with all modern facilities
- Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training
- Organize training and retraining of teachers at regular intervals
- An adequate number of subject-wise skilled trainers (training institute) need to be created who can teach theoretical and practical work completely
- Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit
- Industries-institutes linkages need to be increased
- Adequate funding needs to be allocated in the budget for subject-based training of teachers

- Research on teacher training needs to be continued on a regular basis to create quality teachers

The above findings agreed with previous researchers who say that in keeping with the technology, the curriculum should be made suitable for industries and factories on a regular basis (Islam, 2014)

Collaboration between educational institutions and industries is to be increased(Raihan- 2014) and Governments should encourage industrial organizations to participate in TVET through providing incentives, subsidizing apprenticeship wages and assisting the stipend program(Islam, 2014).Infrastructural development of educational institutions needs to be done, such as hostel facilities, sanitary facilities, modern equipment (Islam, 2014).

5.5. Recommendation

Based on the findings of this study the following recommendations to prospective government/state, training institutes, teachers, educators and policy makers.

Therefore my recommend are as follows:

1. Traing institute capacity needs to be enhanced especially accommodation/ hostel facilities, sanitary facilities, and classroom, and workshop facilities.
2. Collaboration between educational institutions and industries is to be increased and Governments need to encourage industrial organizations to participate in subject-based training through providing incentives, subsidizing apprenticeship wages, and assisting the stipend program.
3. Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.

4. The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops
5. There should be workshop facilities with modern equipment to enhance practical training
6. Every technology or subject training opportunity must be insured
7. Need to set up world class Teachers training institute in every division with all modern facilities
8. Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training
9. Organize training and retraining of teachers at regular intervals
10. An adequate number of subject-wise skilled trainers (training institute) need to be created who can teach theoretical and practical work completely
11. Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit
12. Adequate funding needs to be allocated in the budget for subject-based training of teachers
13. Research on teacher training needs to be continued on a regular basis to create quality teachers

5.6. Implications of the findings of the study

Considering the challenges of subjective teacher training in polytechnic institutes in Bangladesh, specific action plans need to adopt by the government, stakeholders, and training institutions. To the socio-economic condition of Bangladesh, The strategies and recommendations obtained from the study will be a milestone in the subject-based training of Polytechnic teachers if stakeholders implement them.

5.7. Conclusion

The study was carried out to the present status of subject-based training for Government polytechnic teachers in Bangladesh, and the barriers to this training and how to overcome these barriers, although not in detail, the issues have come up briefly. Finally, a bunch of proposals has been put forward for those subject-based training that will increase quality of teacher's subject-based training to some extent.

5.8. Limitations of the study

The study has been conducted in diploma in engineering with considering all technology. if only specific technology such as Civil, Mechanical and many others can be done separately, Then it will be possible to know the current status and difficulties of the subject-based skill training for Government polytechnic teachers in Bangladesh and how to overcome the specific difficulties. It has been not been able to paint a true picture of the whole Diploma in engineering programs. And other limitations were the lack of proper data management systems in the TVET organizations and the lack of research participants' perceptions of the research and in a short time but more work.

5.9. Recommendation for further research

1. The study was conducted on the current status of subject-based training for Government polytechnic teachers in Bangladesh including challenges teachers face and how to overcome the difficulties.In the future, this study will be conducted in other courses and even across Private polytechnic teachers in Bangladesh on the status of subject-based training and at the same time what are the difficulties in participation and how to overcome those difficulties.

2. Further investigation can be done on what kind of precise attractive facilities can be increased to automatically increase quality of subjective training of polytechince teachers by considering others TVET Depoloment countries.

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APPENDIX – A

Questionnaires for the research ‘Subject-Based Teacher’s Training for Government Polytechnic Institue in Bangladesh: Status, Challenges and the Way Forwards’’

Teacher=A SET

This research is carried out by the help of Research & Knowledge Management Cell. Directorate of Technical Education, Agargaon, Dhaka. To find out the challenges of Teachers training and how to overcome these challenges in technical education this research is very important.
As a Teacher of technical education Cordial cooperation is expected in this data collection.

- The information you provide will not be used for any purpose other than research work
- The information you provide will not be disclosed to any other person or organization

Time: 30 Minutes

1. Name of the teacher:

2. Gender: Male ☐ Female ☐

3. Name of the polytechnic institute:

4. Name of technology:
5. Age group:
   - ☐ Less than 30 years
   - ☐ 30-40 years
   - ☐ 41-50 years
   - ☐ Above 50years

6. Education Qualification:

SL no	Name of the Degree	Please Tick mark
01	Diploma in Engineering	
02	Bsc in Technical Edcation	
03	Msc in Technical Edcation	
04	Phd in Technical Edcation	
05	Bsc in Engineering	
06	Msc in Engineering	
07	Phd in Engineering	
08		
09		

7. Teaching Experience

   - ☐ Less than 5 years
   - ☐ 5-10 years
   - ☐ 11-15 years
   - ☐ Above 15years

8. How much subject- based training have you received so far?

   - ☐ None
   - ☐ 1- 5
   - ☐ 5-10
   - ☐ 11-15
   - ☐ Above 15

9. Ranking satisfaction level of the subject-based training courses that you have received from different training institutes that have helped you in the field of practical teaching work of students.

SL no	Name of training courses	Please Tick mark				
		Very satisfied	Satisfied	Neutral	Dissatisfaction	Very dissatisfaction
01	**Subject -based training of TTC**					
02	**Subject -based training of VTTI**					
03	**Subject -based training of DPI**					
04	**Subject -based training of DMPI**					
05	**Subject -based training from other institute**					
06	**NTVQF level subject based training of TTC**					
07	**NTVQF level subject based training of VTTI**					
08	**NTVQF level subject based training from other institute**					
09	**In house subject -based training(Own Institute)**					

10 . Do you think teachers need subject based training through attachment to the industry?

☐ Yes ☐ No

11. Do teachers have any scope of subject-based training through attachment to the industry?

☐ Yes ☐ No

12 . Challenges of subject-based teachers training. Please give your opinion by Tick Mark.

Sl. No	Challenges of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Insufficient infrastructural facilities such as classroom & hostel					
2	Poor workshop facilities such as skill man, latest training materials, machines and equipment					
3	Insufficient ICT facilities for Teachers Training					

4	Training curriculum not matching industries demand.					
5	Technology/subject wise training scope is limited					
6	Teachers training institute is not available					
7	There is no separate training institute for female teachers					
8	Lack of sufficient number of up-to-date Technology/subject-wise trainers who can teach theoretical and practical work completely					
9	Lack of industries experience of trainer					
10	Poor funding of vocational technical education training programs.					
11	Lack of planning and adequate monitoring and management of Teacher Training.					

13. What other Challenges of subject-based teachers training do you think of Polytechnic teachers? Write three

1.....

2.....

3.....

14. What steps do you think can be taken to train polytechnic teachers for effective subject-based training? Please give your opinion by Tick Mark.

Sl. No	Strategies of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.					
2	The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops					
3	There should be workshop facilities with modern equipment to enhance practical training					
4	Every technology or subject training opportunity must be insured					
5	Need to set up world class Teachers training institute in every division with all modern facilities					
6	Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training					
7	Organize training and retraining of teachers at regular intervals					

8	Training Curriculum needs to be technology/subject-oriented					
9	An adequate number of Technology/subject-wise trainers need to be created who can teach theoretical and practical work completely					
10	Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit					
11	Adequate funding needs to be allocated in the budget for subject-based training of teachers					
12	Need to maintain planning and adequate monitoring of teacher training.					
13	Research on teacher training needs to be continued on a regular basis to create quality teachers					

15.Do you know about NTVQF?

☐ Yes ☐ No

16. Which level of NTVQF certification have you received?

SL no	Level	Please Tick mark
01	Level -1	
02	Level-2	
03	Level -3	
04	Level -4	
05	Level -5	
06	Level -6	

17. Whether it is possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification?

☐ Yes ☐ No

18. As a TVET Teacher What other steps do you think can be taken for effective subject-based training of Polytechnic teachers? Write three

1.....
2.....
3.....

19. What kind of subject based training does a TVET teacher need? Mention three(03)training topics:

1.....
2.....
3.....

END

Thank you for your co-operation

APPENDX – B

Questionnaires for the research ‘Subject-Based Teacher’s Training for Government Polytechnic Institue in Bangladesh: Status, Challenges and the Way Forwards’’

TVET Trainer=B SET

This research is carried out by the help of Research & Knowledge Management Cell. Directorate of Technical Education, Agargaon, Dhaka. To find out the challenges of TVET Teachers training and how to overcome these challenges in technical education this research is very important.
As a TVET Trainer of technical education Cordial cooperation is expected in this data collection.

- The information you provide will not be used for any purpose other than research work
- The information you provide will not be disclosed to any other person or organization

. **Time: 30 Minutes**

1.Name of the Trainer:
2. Gender: Male ☐ Female ☐
3. Designation:
4. Address:
5. Name of Training Technology:
6. Age group:
   - ☐ Less than 30 years
   - ☐ 30-40 years
   - ☐ 41-50 years
   - ☐ Above 50years

7. Training Experience

   - ☐ Less than 5 years
   - ☐ 5-10 years
   - ☐ 11-15 years
   - ☐ Above 15 years

8. Trainer Education Qualification:

SL no	Name of the Degree	Please Tick mark
01	Diploma in Engineering	
02	Bsc in Technical Edcation	
03	Msc in Technical Edcation	
04	Phd in Technical Edcation	
05	Bsc in Engineering	
06	Msc in Engineering	
07	Phd in Engineering	
08		

9.Whether there is a special degree/certification you on teacher training?

A. Yes
B. No

If yes please specify

SL no	Name of the Degree/certification	Name of the training insitute	Duration	Loction Home/Abroad
01				
02				
03				
04				

10 . Do you think teachers need subject based training through attachment to the industry?

☐Yes ☐No

11. Do teachers have any scope of subject-based training through attachment to the industry?

☐Yes ☐No

12.Do you know about NTVQF?

☐Yes ☐No

13. Which level of NTVQF certification have you received?

SL no	Level	Please Tick mark
01	Level -1	
02	Level-2	
03	Level -3	
04	Level -4	
05	Level -5	
06	Level -6	

14. Whether it is possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification?

☐Yes ☐No

15 . Challenges of subject-based teachers training. Please give your opinion by Tick Mark.

Sl. No	Challenges of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Insufficient infrastructural facilities such as classroom & hostel					
2	Poor workshop facilities such as skill man, latest training materials, machines and equipment					
3	Insufficient ICT facilities for Teachers Training					

4	Poor training curriculum not matching subject topics.					
5	Technology/subject wise training scope is limited					
6	Teachers training institute is not available					
7	There is no separate training institute for female teachers					
8	Lack of sufficient number of up-to-date Technology/subject-wise trainers who can teach theoretical and practical work completely					
9	Lack of industries experience of trainer					
10	Poor funding of vocational technical education training programs.					
11	Lack of planning and adequate monitoring and management of Teacher Training.					
12	Teachers are not interested in learning as there is no obligation in the job					

16. What other Challenges of subject-based teachers training do you think of Polytechnic teachers? Write three

1.....

2.....

3.....

17. What steps do you think can be taken to train polytechnic teachers for effective subject-based training? Please give your opinion by Tick Mark.

Sl. No	Strategies of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.					
2	The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops					
3	There should be workshop facilities with modern equipment to enhance practical training					

4	Every technology or subject training opportunity must be insured					
5	Need to set up world class Teachers training institute in every division with all modern facilities					
6	Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training					
7	Organize training and retraining of teachers at regular intervals					
8	Training Curriculum needs to be technology/subject-oriented					
9	An adequate number of Technology/subject-wise trainers need to be created who can teach theoretical and practical work completely					
10	Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit					
11	Adequate funding needs to be allocated in the budget for subject-based training of teachers					
12	Need to maintain planning and adequate monitoring of teacher training.					
13	Research on teacher training needs to be continued on a regular basis to create quality teachers					

18. As a TVET trainer what other steps do you think can be taken for effective subject-based training of Polytechnic teachers? Write three

1.....

2.....

3.....

19. What kind of subject basesd training does a TVET teacher need? Mention three (03) training topics:
1.....

2.....

3.....

END

Thank you for your co-operation

APPENDIX – C

Questionnaires for the research 'Subject-Based Teacher's Training for Government Polytechnic Institue in Bangladesh: Status, Challenges and the Way Forwards''

Polytechnic Principal =C Set

This research is carried out by the help of Research & Knowledge Management Cell. Directorate of Technical Education, Agargaon, Dhaka. To find out the challenges of TVET Teachers training and how to overcome these challenges in technical education this research is very important.
As a TVET Principal of technical education Cordial cooperation is expected in this data collection.

- The information you provide will not be used for any purpose other than research work
- The information you provide will not be disclosed to any other person or organization

.

Time: 30 Minutes

1. Name of the respondent:

2. Gender Male ☐ Female ☐

3. Institute name and address:

4 . Do you think teachers need subject based training through attachment to the industry?
☐ Yes ☐ No

5. Do teachers have any scope of subject-based training through attachment to the industry?
☐ Yes ☐ No

6.Do you know about NTVQF?

☐ Yes ☐ No

7. Whether it is possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification?
☐ Yes ☐ No

8 . Challenges of subject-based teachers training. Please give your opinion by Tick Mark.

Sl. No	Challenges of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Insufficient infrastructural facilities such as classroom & hostel					

2	Poor workshop facilities such as skill man, latest training materials, machines and equipment					
3	Insufficient ICT facilities for Teachers Training					
4	Poor training curriculum not matching subject topics.					
5	Technology/subject wise training scope is limited					
6	Teachers training institute is not available					
7	There is no separate training institute for female teachers					
8	Lack of sufficient number of up-to-date Technology/subject-wise trainers who can teach theoretical and practical work completely					
9	Lack of industries experience of trainer					
10	Poor funding of vocational technical education training programs.					
11	Lack of planning and adequate monitoring and management of Teacher Training.					
12	Teachers are not interested in learning as there is no obligation in the job					

9. As a TVET training institute principal what other Challenges of subject-based teachers training do you think of Polytechnic teachers? Write three

1.....

2.....

3.....

10. What steps do you think can be taken to train polytechnic teachers for effective subject-based training? Please give your opinion by Tick Mark.

Sl. No	Strategies of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.					
2	The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops					

3	There should be workshop facilities with modern equipment to enhance practical training					
4	Every technology or subject training opportunity must be insured					
5	Need to set up world class Teachers training institute in every division with all modern facilities					
6	Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training					
7	Organize training and retraining of teachers at regular intervals					
8	Training Curriculum needs to be technology/subject-oriented					
9	An adequate number of Technology/subject-wise trainers need to be created who can teach theoretical and practical work completely					
10	Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit					
11	Adequate funding needs to be allocated in the budget for subject-based training of teachers					
12	Need to maintain planning and adequate monitoring of teacher training.					
13	Research on teacher training needs to be continued on a regular basis to create quality teachers					

11. As a TVET institute principal what other steps do you think can be taken for effective subject-based training of Polytechnic teachers? Write three

1.....

2.....

3.....

12. What kind of subject based training does a TVET teacher need? Mention three (03)training topics:

1.....

2.....

3.....

END

Thank you for your co-operation

APPENDIX – D

Questionnaires for the research 'Subject-Based Teacher's Training for Government Polytechnic Institue in Bangladesh: Status, Challenges and the Way Forwards''

TVET Principal (Training institute) =D Set

This research is carried out by the help of Research & Knowledge Management Cell. Directorate of Technical Education, Agargaon, Dhaka. To find out the challenges of TVET Teachers training and how to overcome these challenges in technical education this research is very important.
As a TVET Principal of technical education Cordial cooperation is expected in this data collection.

- The information you provide will not be used for any purpose other than research work
- The information you provide will not be disclosed to any other person or organization

. **Time: 30 Minutes**

1. Name of the respondent:

2. Gender Male ☐ Female ☐

3. Institute name and address:

4. Trainee Accommodation Capacity:

5. Do you think teachers need subject based training through attachment to the industry?
☐Yes ☐No

If 'No' please give your opinion

6. Do teachers have any scope of subject-based training through attachment to the industry?
☐Yes ☐No

If 'No' please give your opinion

7. Do you know about NTVQF?

☐Yes ☐No

8. Whether it is possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification?
☐Yes ☐No

9. Please complete the following training related table

SL No	Name of the technology	Teahers training capacity(By subject-Based)			Maxmum Trainee eatch batch	Number of Trainer	Number of Lab
		Fully	Partilly	None			
01	Automobile						
02	Architecture						
03	Architecture & Interior Design						
04	Chemical						
05	Civil						
06	Civil (Wood)						
07	Computer						
08	Computer Science & Technology						
09	Construction						
10	Data Telecommunication & Networking						
11	Electrical						
12	Electro Medical						
13	Electronics						
14	Environmental						
15	Food						
16	Glass						
17	Graphics Design						
18	Instrumentation & Process Control						
19	Mecatronics						
20	Mechanical						
21	Mining & Mine Survey						
22	Power						
23	Refrigeration & Air Conditioning						
24	Telecommunication						

10 . Challenges of subject-based teachers training. Please give your opinion by Tick Mark.

Sl. No	Challenges of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Insufficient infrastructural facilities such as classroom & hostel					
2	Insufficient workshop facilities such as training materials, machines and equipment					

3	Insufficient ICT facilities for Teachers Training					
4	Training curriculum not matching Industries demand					
5	Technology/subject wise training scope is limited					
6	Teachers training institute is not available					
7	Lack of training facilities for female teachers					
8	Lack of sufficient number of subject-wise trainers who can teach theoretical and practical work completely					
9	Lack of industries experience of Training institute subjective trainer					
10	Insufficient funding of training programs.					
11	Lack of planning and adequate monitoring and management of Teacher Training.					
12	Teachers are not interested in learning as there is no obligation in the job					

11. As a TVET training institute principal what other Challenges of subject-based teachers training do you think of Polytechnic teachers? Write three

1.....

2.....

3.....

12. What steps do you think can be taken to train polytechnic teachers for effective subject-based training? Please give your opinion by Tick Mark.

Sl. No	Strategies of teachers training	opinion				
		Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
1	Must have sufficient infrastructural facilities such as ICT based classrooms, hostels, and workshops.					
2	The number of trainees needs to be nominated according to the facilities of trainers, classrooms, and workshops					
3	There should be workshop facilities with modern equipment to enhance practical training					
4	Every technology or subject training opportunity must be insured					

5	Need to set up world class Teachers training institute in every division with all modern facilities					
6	Organizing Problem-Based Learning (PBL), Work-Based Learning (WBL), and Project-Based Learning (PBL) training					
7	Organize training and retraining of teachers at regular intervals					
8	Training Curriculum needs to be subject-oriented					
9	An adequate number of subject-wise skilled trainers (training institute) need to be created who can teach theoretical and practical work completely					
10	Subject-based training can be made compulsory for every teacher up to a certain NTVQF level/limit					
11	Adequate funding needs to be allocated in the budget for subject-based training of teachers					
12	Need to maintain planning and adequate monitoring of teacher training.					
13	Research on teacher training needs to be continued on a regular basis to create quality teachers					

13. As a TVET training institute principal what other steps do you think can be taken for effective subject-based training of Polytechnic teachers? Write three

1.....

2.....

3.....

14. What kind of subject based training does a TVET teacher need? Mention three(03)training topics:

1.....

2.....

3.....

END

Thank you for your co-operation

APPENDIX – E

This research is carried out by the help of Research & Knowledge Management Cell. Directorate of Technical Education, Agargaon, Dhaka. To find out the challenges of TVET Teachers training and how to overcome these challenges in technical education this research is very important. As a **TVET Policy maker/Training expert** of technical education Cordial cooperation is expected in this data collection.

- The information you provide will not be used for any purpose other than research work
- The information you provide will not be disclosed to any other person or organization

Key Informant Interview No……

Key Informant: ……

Place:……., Date:……

Presentation and General Discussion on the research **(Subject-based training for government polytechnic teachers in Bangladesh: Status, Challenges, and the Way forwards).**

Notes:

Discussion on "Challenges of teacher's subject-based skill training"

Notes:

Discussion on" teacher's subject based training through attachment to the industry"

Note:

Whether it is possible to make the teachers properly subject-based skilled in training through the NTVQF level of certification?

Discussion on" Strategies of enhance teachers subject based skill training"

Notes

***This table is only key informer (Principal) of VTTI and TTTC Only**

SL No	Name of the technology	Teahers training capacity(By subject-Based)			Maxmum Trainee eatch batch	Number of Trainer	Number of Lab
		Fully	Partilly	None			
01	Automobile						
02	Architecture						
03	Architecture & Interior Design						
04	Chemical						
05	Civil						
06	Civil (Wood)						
07	Computer						
08	Computer Science & Technology						
09	Construction						
10	Data Telecommunication & Networking						
11	Electrical						
12	Electro Medical						
13	Electronics						
14	Environmental						
15	Food						
16	Glass						
17	Graphics Design						
18	Instrumentation & Process Control						
19	Mecatronics						
20	Mechanical						
21	Mining & Mine Survey						
22	Power						
23	Refrigeration & Air Conditioning						
24	Telecommunication						

Acknowledgment of information provider		Acknowledgment of information Collector	
Name		Name	
Position		Position	
Organization		Organization	
The information given is very true & authentic. I fill up this form willingly & consciously.		I have collected the information willingly & consciously.	
Signature with Date		Signature with Date	

APPENDIX – F

Number of Institute by Type, Teacher and student

Type of Institute	No. of Inst.	Teachers			Students		
		Total	Female	% of female	Total	Female	% of girl
Polytechnic Institute	439	12022	2071	17.23	252755	42249	16.72
Technical School & College	216	4234	1065	25.15	105019	22316	21.25
Glass & Ceramic Institute	1	29	4	13.79	1284	48	3.74
Graphic Arts Institute	1	46	5	10.87	1463	208	14.22
Survey Institute	4	70	13	18.57	1306	101	7.73
Technical Training Centre	166	2054	356	17.33	38902	13388	34.41
Textile Institute	33	541	100	18.48	11815	1041	8.81
Textile Vocational	51	546	106	19.41	10758	2529	23.51
Agriculture Training Institute	183	1551	296	19.08	30444	8043	26.42
Marine Technology	1	121	13	10.74	780	45	5.77
S.S.C Vocational (Independent)	222	2721	558	20.51	38775	11892	30.67
HSC Voc/B. Management (Independent)	840	11524	2116	18.36	184150	58601	31.82
Medical Technology	108	1347	233	17.30	14860	5638	37.94
Medical Assistant Training School (MATS)	209	676	221	32.69	26608	11199	42.09
SSC Vocational (attached)	2753	9141	2039	22.31	230083	76973	33.45
HSC Voc/B. Management (attached)	2032	7405	1719	23.21	169332	50411	29.77
Total	7259	54028	10915	20.20	1118334	304682	27.24

- Basic Trade (360hrs) 3223institutes with trainees 279720 is excluded in the above table.

SOURCE: BANBAIS-2020