MASTER OF SCIENCE IN TECHNICAL EDUCATION
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Thesis

Assessment of public women polytechnic teachers' attitude toward using ICT in teaching engineering courses in Bangladesh

By

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DECLARATION

This project work is authentic and it is an outcome of the investigation carried out by **Md. Abul Kalam Azad** under the supervision of **Dr. Md. Abu Raihan,** in the Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), the Organization of the Islamic Cooperation (OIC) Gazipur, Bangladesh. It is hereby declared that this thesis /report or any part of it has never been submitted elsewhere for the award of any Degree or Diploma. All literature and contributions cited are fully acknowledged.

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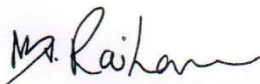
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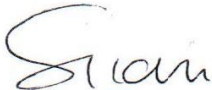
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I am dedicating my thesis work to my beloved parents Alhaj Md.Jobber Ali and Komola khatun and special one in my life Shahnaz Pervin Prity.

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ABBRABEATIONS

BTEB	:	Bangladesh Technical Education Board
BANBEIS	:	Bangladesh Bureau of Educational Information and Statistics
DTE	:	Directorate of Technical Education
GPA	:	Grade Point Average
HSC	:	Higher Secondary Certificate
ICT	:	Information and Communication Technology
ILO	:	International Labour Organization
IT	:	Information Technology
IUT	:	Islamic University of Technology
MoE	:	Ministry of Education
MSc.TE	:	Master of Science in Technical Education
NSDC	:	National Skills Development Council
NSDP	:	National Skills Development Policy
NGO	:	Non-Government Organization
OIC	:	Organization of Islamic Cooperation
SSC	:	Secondary School Certificate
STEP	:	Skills and Training Enhancement Project
SPSS	:	Statistical Packages for Social Science
TSC	:	Technical Schools and College
TTC	:	Teachers Training College
TTC	:	Technical Training Center
TVET	:	Technical and Vocational Education and Training
TVE	:	Technical and Vocational Education
Voc.	:	Vocational

ABSTRACT

Information and communication technology (ICT) have become continuously more important to education system over the past few era. There are outspread of research exists to explore and study the use of ICT in the process of teaching-learning in technical and Vocational Education (TVET). This research evaluated four public women polytechnic teacher's attitude applying in the polytechnic institutes in teaching for the engineering subject in Bangladesh from the perspective of teachers and students. The aim of the study is to identify the level of attitude (excellent, very good, good, moderate, poor) using ICT for the engineering subject in polytechnic institutes, to identify difficulties of using ICTs in the teaching and learning, and to suggest how to improve attitude of the teacher's toward using ICT in teaching for the engineering subject. This is the quantitative research. The study will delimit by only public women Polytechnic institutes. The subject of the research was the teachers, students and the head of the department of computer Technology, Electronics Technology and Architecture Technology. A total number of 4 polytechnic were selected to collect the research data. The research adopted the methods to collect research data by using questionnaires from teachers and the head of the department of Computer Technology, Electronics Technology and Architecture Technology from polytechnic institutes of Bangladesh. Almost 75% to 80% teachers were selected to carry out the research data. Then, the research data have been analyzed by the SPSS software 25.0.The results from the analysis shown that assess female polytechnic teacher's attitude to using ICT during teaching engineering subjects was significant at the difference of 0.05 significance level but it was found that the mean value obtained the public women polytechnic teachers are using very good ICT during teaching in classroom. difficulties faced by teachers of using ICTs in the teaching learning in classroom was not significantly difference but it was found that the mean value obtained the public women polytechnic institutes teachers are faced difficulties when using ICT in classroom and their institutions. In the statement wise Chi-square test it was found majority of teachers were facing difficulties to use ICT in classroom during teaching engineering subject. They were also faced problem with labs, internet equipment's and teaching materials during their study. The findings of the study may provide useful information to the authorities of TVET as well as to polytechnic institutes in order to improve teacher's performance and teachers' technical skills in use of ICT. The study may also help to identify the problems and throw some light on how to overcome the problems related to implementing integrated curriculum and other related institutional facilities.

CHAPTER ONE

INTRODUCTION

1.1 Introduction and background of the study

Development of a nation depends on her education and the quality of education depends on resource, material, environment and the qualify teachers. In 21st century information and communication technology (ICT) becomes a magic blessing in education sectors. Those countries are more rich in technical education they are also richer in the world of best quality of education and quality of education becomes stronger if they use ICT in education. The social, economic and cultural development of any country largely depends upon education, especially technical and vocational education. Bangladesh is progressing from least developing country to mid-level economic country. It has taken different steps to improve quality and to increase the quantity of Technical and Vocational Education and Training (TVET) teachers in Bangladesh.

Information and communication technologies in the educative process have been divided into two broad categories: a. ICTs for Education, b. ICTs in Education. a. ICTs for education refer to the development of information and communication technology specifically for teaching-learning purposes. b. ICTs in education involve the adoption of general components of information and communication technologies in the teaching-learning process. Teachers can use different tools to improve their teaching skills.

Although, teachers from all disciplines have widely integrated Information and Communication Technology (ICT) to improve their teaching style and performance (Liu, 2011; Liu and Velasquezbryant,2003;) (Shamim & Raihan, 2016). Therefore, the effective use of ICT significant contributes to emergence of reforms in teaching and learning processes in all sectors of education (Pulkkinen, 2007; Wood, 1995) (Shamim & Raihan, 2016).

ICT Competency Standards for Teachers project goals to improve teachers' practice of ICT in education. Competent workforce who can compete the Technical and Vocational Education and Training (TVET) systems are expected to produce a new propagate and

better in a rapidly changing environment and improve the country's economy. Teacher trainers and curriculum developers in Bangladesh, Lao, Myanmar, Nepal, Viet Nam and Bhutan need to improve management of technical education and delivery of Technical and Vocational Education & Training (TVET) through the use of ICT each technical institutes. For human resource development (HRD) Bangladesh has an ICT policy that formulated and states the country must prepare itself to compete effectively in the global ICT market all over the world.

Teachers have opportunities to update and upgrade their knowledge and skills (UNESCO, 2002). Ministry of Science and Technology has been renamed on April 2002 as .Ministry of Science and Information and Communication Technology BTRC (Bangladesh Telephone Regulatory Commission) was set up in January, 2002. The application of ICT offers multiple learning pathways and widespread access to TVE, breaking down barriers for learning and teaching connected to distance and location. To get benefit from ICT the educational policy make must ensure the availability of Internet in every Institution both micro and macro level in all programs in Bangladesh.

There are kinds of ICT products available and having relevance to education, such as teleconferencing, email, radio broadcasts, interactive radio counseling, interactive voice audio conferencing, television lessons response system, audiocassettes and CD ROMs, pen drive etc have been used in education for different purposes of education (Bhattacharya and Sharma 2007). In this study ICT means use of multimedia and internet in classroom teaching-Learning. Polytechnic teachers also should have idea about above all teaching learning tools those can make easy to teach and be able to make more qualify teachers.

Honorable Prime Minister of Bangladesh has already declared ICT as the stick sector under Considering the Importance of ICT. Over the last few years, many nations have taken advantage of the opportunities afforded by ICT within design the curriculum, a policy framework, laid down guidelines and preceded with formulation of a national ICT strategy as a part of the overall national Development plan of country. At the same time Asian south pacific Bureau of Adult Education, UNESCO, UNDP and some other international organization has done very impressive work in the field of ICT to improve the overall life style of the people of South Asian Pacific region including Bangladesh

(Ali, 2003). To get its actual benefits polytechnic teachers should use ICTs in a proper way and is a real challenge for Bangladesh and also TVET sector. The polytechnic institutions in the big cities of Bangladesh have the facilities and implications of ICTs in the process of teaching and learning which growth make development of teachers teaching quality, increase the knowledge delivery performance and student understanding level by the bless of ICT in polytechnic institutions. This study is intended to find out the attitude of women polytechnic teachers of using ICT in T-L process in Polytechnic of Bangladesh.

To analyze the current state of affairs of using technology in the government polytechnic Institutes of Bangladesh, Polytechnic institutes require proper integration and utilization of modern technology and introducing to using ICT in classroom to change the old attitudes if teachers. The teachers, administrators and students are point out that the overall quality of technology service offered by the institution. It was exposed that the use of computers and internet were very much limited in polytechnic institutes and the senior teachers are not interested to use ICT tools in their classroom. They have faire to use ICT in teaching learning situations. The policy makers of Bangladesh need proper policy making to overcome the present situation about ICT.

Polytechnic institutes provide the skills persons those have the technical knowledge about many areas. Polytechnic graduates have 60% theory and 40% practical knowledge on their required field. To through lecture more efficiently to students polytechnic teachers need to use ICT in their class that makes more understandable the content of discussion topic. The skilled workers and technicians play a key role in every sector of the economy of Bangladesh. So, the Government of Bangladesh has already emphasized the integration of ICT in all sectors of the country including education. To produce skilled technicians, there are mid-level technical and vocational training systems in the country. Like present government Many Governments have developed plans to intensify their investments regarding technology integration in education. ICT education thereafter gradually extended to the bachelor's degree, higher secondary and secondary school levels and all the levels of Bangladesh. The government made ICT education compulsory at secondary level by 2013 and at primary level by 2021.

All polytechnic institutions, Islamic university of technology (IUT), Vocational Training Institutes (VTI) and Technical Training Centers (TTC) in Bangladesh are offering training the teachers in existing and new skills in line with emerging technologies and demands of the economy (Abdullah-Al-Mamun, 2012).

The teachers of the polytechnic institutes are conscious about the continuous development of technology in education which offers students an inventive approach to experience learning. For today's students to acquire complex problem-solving by using ICT. The number of researchers indicates that teachers should adopt technology in instruction for better teaching day by day. Recent studies proved that technologies allow students to work more productively than in the past, but the teachers' role in technology-rich classrooms is more demanding than ever in south Asia pacific region including Bangladesh.

ICT achievement in the education sector in Bangladesh is still now in the beginning stage. Fragmented government ownership, poor training infrastructure, lack of quality trainers are some of the major issues hindering the effective development of information technology in Technical education infrastructure in Bangladesh (Abdullah-Al-Mamun, 2012). Technology is one of the productive tools which are not effectively introduced in the polytechnic institutes of Bangladesh till now. Therefore need to integration and uses of ICT in polytechnic teachers of Bangladesh. This study examined and discussed highly about these aspects in educational settings of different polytechnic institutes and about the uses the ICT tools in classroom of polytechnic teachers.

1.2. TVET Scenario in Bangladesh

At present, Bangladesh needs skill human resources to support rapid industrial growth and earnings remittance. TVET is the only source in Bangladesh by which we can have economic developments. We need to make our manpower with having global competitiveness. We need to introduce courses to match industry need and opportunities of demographic dividend to be harnessed. In this regard strategic planning is required to develop TVET system. There are 160 million people live in 147570 square kilometer area of Bangladesh. Among them 4.52 million are found as Higher Secondary aged population (16-17 Years) in 2014 (BANBEIS Report-2014). It has been found in the 'Gross and Net

Enrollment Rate by Gender in Secondary Level of Education, 2014' of Bangladesh Education Statistics-2014, BANBEIS that the Gross Enrollment Rate and Net Enrollment Rate of secondary level education are 69.23% and 62.25% respectively. Similarly, it has also been found in the 'Gross and Net Enrollment Rate in College and Madrasah (11&12 Class), 2014' of Bangladesh Education Statistics-2014, BANBEIS that the Gross Enrollment Rate and Net Enrollment of higher secondary level education are 46.61% and 33.16% respectively in the year 2014.

In addition, it has also been found in the 'Completion Rate, Dropout Rate, Survival Rates and Coefficient of Internal Efficiency by Sex in Higher Secondary Level of College and Madrasah (11+12), 2014' and in 'Dropout and Completion Rate, GER and NER (%) in Secondary Level 2008-2014' of Bangladesh Education Statistics-2014, BANBEIS that the Dropout Rate of secondary and higher secondary level education are 41.59% and 21.37% respectively in the year 2014.

A large number of people of Secondary and Higher secondary Schooling group are out of Schooling. Technical and Vocational Education and Training (TVET) is one and only educational mechanism to convert these population to employable workforce to contribute to develop the national economy of our country. The major targets of expanding TVET in our country as follows-

- Skilled workers to satisfy the growing needs of industry;

- A high level means to facilitate job for unemployed youth and widespread underemployment;

- Competencies need to find employment;

- Match the requirements of the private sector;

- Skills for the job market in line with labor market demands;

- Understand the attitudes expected in the industry area;

- Gain insights into the kind of career;

- Make informed decisions about further training and study;

- Become more employable;

- To be better equipped for business and employment opportunities;

- Aims to improve socio-economic conditions create jobs and alleviate poverty as a key element of any policy initiatives
- Promote industrial linkages in the skill training delivery to produce young skilled workforce for the market needs;

There are mainly two types of TVET in our country, such as-

A. Formal Training (28 curriculum)

B. Informal and Non-Formal Training

1.3 Formal Training under BTEB

1. Short Course

a. Basic Trade Course (360 hours, 95 trades) - Institutes Namely:

i. Govt. Technical School and Colleges;

ii. Govt. Technical Training Centers;

iii. Govt. Polytechnic Institutes;

iv. Private Polytechnic Institutes;

v. Private Training Institutes;

b. CBT&A Course (51 Occupations) - Institutes Namely:

i. Govt. Technical School and Colleges;

ii. Govt. Technical Training Centers;

iii. Govt. Polytechnic Institutes;

iv. Private Polytechnic Institutes;

v. Private Training Institutes;

2. Secondary Level

a. SSC Vocational Course (31 trades) - Institutes Namely:

i. Govt. Technical School and Colleges;

ii. Govt. Textile Vocational Institutes;

iii. Govt. Technical Training Centers;

iv. MPO secondary schools;

v. Non MPO secondary schools;

vi. NGOs;

b. Dakhil (Vocational) offered by Madrasahs

3. Higher Secondary Level

a. HSC (Vocational) Course (14 trades) - Institutes Namely:

i. Govt. Technical School and Colleges;

b. HSC (Business Management) - Institutes Namely:

i. Govt. colleges;

ii. MPO colleges;

iii. Non MPO colleges;

iv. Private Institutes;

c. Diploma in Commerce - Institutes Namely:

i. Private Training Institutes

4. Diploma Level

a. Diploma in Engineering Course (34 technologies) - Institutes Namely:

i. Govt. Polytechnic and Mono-technic Institutes;

ii. Private Polytechnic Institutes;

b. Diploma in Textile Engineering Course (3 technologies) - Institutes Namely:

i. Govt. Textile Institutes;

ii. Private Polytechnic & Textile Institutes;

c. Diploma in Agriculture Course - Institutes Namely:

i. Govt. Agricultural Training Institutes;

ii. Private Agricultural Training Institutes;

d. Diploma in Fisheries Course - Institutes Namely:

i. Govt. Fisheries Training Institute;

ii. Private Agricultural & Fisheries Training Institutes;

e. Diploma in Forestry Course - Institutes Namely:

i. Govt. Forestry Training Institute;

f. Diploma in Medical Technology Course (8 technologies) - Institutes Namely:

i. Private Medical Training Institutes;

5. Others Professional Level Courses - Institutes Namely:

ii. Govt. Institutes;

iii. Private Institutes;

1.4 Informal and Non Formal Training

- 23 ministries are conducting skill training and maximum of those graduates are not certified by BTEB.

- Only SSC (vocational) and other SSC status vocational course conducted by some of those ministries are affiliated with BTEB. Rests are not affiliated with BTEB.

- Industry and Private organization also conduct skill training not affiliated with BTEB.

- Some NGOs are conducting training not affiliated with BTEB.

Initiative has taken for informal and CBT&A courses conducted by other agencies to bring under BTEB certification.

1.5. Enrollment in TVET under BTEB Certification

1. TVET Policies

Technical and Vocational Education and Training (TVET) of 'Outline Perspective Plan of Bangladesh 2010-2021-Making Vision 2021 A Reality' and the namely Education, Training, and Skills Development for Human Capital Formation of 'Perspective Plan of Bangladesh 2010-2021-Making Vision 2021 A Reality' as implementation outcomes that

• all new entrants in the 20-24 age group to the work force are trained formally by 2021 for ensuring full-scale vocational training with adequate practical exposure to enhance their knowledge, skill, and creativity for enhancing productivity.

In addition, it is mentioned in namely 'Strategic Block V: Human Development' of 'Moving Ahead-National Strategy for Accelerated Poverty Reduction II (FY 2009-11), October 2008' and in the namely 'Improving Knowledge Base: Education, Training and Research 'of 'Steps Towards Change-National Strategy for Accelerated Poverty Reduction II (Revised) FY 2009-11, December 2009' that

> • the proportion of participants in TVET need to be increased to 20 percent of the students enrolled in the secondary stage by 2020.

> 'Vocational and Technical Education' of National Education Policy (NEP) emphasis given:

> • to increase competent manpower in diverse sectors including Information and Communication Technology at a fast pace keeping in mind the national and international demands;

> • to build up skilled manpower at a fast pace to create opportunities of economic development and to increase dignity of labor;

> • to create wide-ranging employment opportunities through export of skilled manpower and to enhance foreign currency earnings.

Moreover, the National Skills Development Policy (NSDP)-2011 represents a key commitment to strengthening and further growth of skills development in Bangladesh aligning with the targets of NSAPR-II. It is mentioned in the namely "Future Growth of the Sector" of NSDP-2011 that:

a. TVET students shall comprise 20% of all secondary students;

b. Total enrolment in TVET should increase by 50%;

c. Women's enrolment should increase by 60%.

(Source, BANBEIS-Educational Database, 2016)

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This thesis will appraise and evaluate the level and nature of ICT use in the perspective of polytechnic teachers and student's attitude applying in the polytechnic institutes in teaching for the engineering subject in Bangladesh. It will then consider the new models of interactive teaching being used in many polytechnic in order to integrate ICT interest to teaching engineering subject and then make relate these theories and new ideas to the use of ICT in polytechnic institute and curriculum.

The government vision 2021 the student enrollment in Technical sector will be 30%. Currently student enrollment in technical institutes is 14.6%.The Five Year Plan student enrollment target is 20%.

Even though some polytechnic institutes are wary of introducing to use ICT in teaching into their practice, While there has been some innovation in pedagogical strategy of teaching and including notable successes through the use of ICT there all most polytechnic institutes still have a long way to go because an old teacher-centered paradigm still exists in polytechnic institutes in Bangladesh, as opposed to more modern approaches which focus on student-centered principles effectively. This study aims to prove that embedding ICT into the teaching and learning process in polytechnic institute's teacher's attitude toward using ICT in teaching an engineering subject is extremely valuable.

There is authentication from research that using ICT can help students to learn and teachers to teach more effectively in teaching learning situation. Therefore the article will focus particularly the use of ICTs in the arena of teaching and learning of engineering subjects. The positive impact of ICT does not arise as an automatic consequence of IT adoption in the classroom although make beneficial the teachers and make the positive attitudes towards using ICT in classroom (Raihan & Shamim, 2013).

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ICT is a new conviction in the arena of Technical and Vocational Education. ICT tools had widely used in formal education as well as in non-formal learning institutions with distance mode. The new ICT learning tools such as Laptop, ipad, Notebook, SMART Phone with 3G, 4G, Pocket PC.s, etc. are expanding day by day. The Educationists' and teachers viewed that the arena of teaching-learning will be shifted quickly from the way of "Chalk & Talk" to "Touch & Teach" approaches. As today's learners are rising up with computer in digital societies (Raihan & Shamim, 2013). The teacher's attitudes of polytechnic institutes are also move todays towards using ICT tools for teaching purpose. They are using MMP, Smart phones, internet to getting data and recent information about engineering invention about their taught topic.

It's the encouraging move that will improve the quality of the TVE system in Polytechnic institutions in Bangladesh. The TVET teachers (99.06%) are very much inspired to introduce Information & Communication Technologies ICTs to enhance teaching learning. The majority TVET teachers in Bangladesh are motivated to use ICTs in education now a days (Raihan & Shamim, 2013). They are using ICT to improve their quality to teaching learning situation in polytechnic institutes in Bangladesh.

There are various approaches to research can be found in studies of innovations involving ICT use in TVE system for technical and vocational education in polytechnic institutes. These include studies of some factors associated with success (Raihan & Shamim, 2013).

A statistical report from Technical Education Prosperous Bangladesh of Directorate of Technical Education published in 2016-2017. The results of analysis make a database about TVET institutes: Technical Teachers Training College (TTTC)- 01, Vocational Teachers Training Institute (VTTI)- 01,
Government Polytechnic Institute- 49, Technical School and College (TSC) - 64, Non-Government Diploma Institute- 1161, Non-Government Diploma Institute- 1161.

The Enrollment Information (2016-17): Diploma in engineering course: male students 315770, female students 31230, % of female students 9%, Total students 347000. Basic Trade course: male students 170411, female students 80193, % of female students 32%, Total students 250604.

TVET in Higher Education (2016-17): B.Sc. engineering course: male students 978, female students 186, % of female students 15.97%, Total students 1164. B.Sc in Technical Education: male students 36, female students 11, % of female students 23.40%, Total students 47. Diploma in Technical Education: male students 80, female students 21% of female students 20.79%, Total students 101 (Source: www.techedu.gov.bd).

From this study of teachers and ICT current use and future needs findings there were the majority of 37% secondary teachers and 18% primary school teachers. This sample was representative of a wide range of teachers across subjects and levels, who did not use computers or who were very low level users. Respondents were given the task of talking through how they would respond in particular situations (for example, providing advice to a student teacher on using ICT in the classroom), thereby highlighting not only their current knowledge of ICT but also their perception of the facts which help them to using ICT (Williams, Coles, Wilson, Richardson, & Tuson, 2000). It is notable from a study on the use of ICT in Teaching in Secondary Schools in Kuwait that the level of using ICT and its applications by teachers in the teaching process at school was low, with an overall arithmetic mean of 2.26 and standard deviation of 0.858. Since the standard deviation is relatively low and less than integer one, it indicates a convergence among teachers at this level. The results also show that the highest rated skill or application of teachers in the usage of ICT in the teaching process at school was the use of information contained on the hard drive or compact disc" where the arithmetic mean was 2.91 and the standard deviation 1.350, which highlights a significant disparity among teachers in their use (Alharbi, 2014).

It is a common misconception that access to technology on its own motivates teachers to apply it in their teaching. The biggest barriers to the use of computers identified by teachers participating in the 1998-1999 survey assessing the World Links schools programme were the lack of time available in classes, and in their own schedules for planning; and the lack of a national policy on the use of computers in schools (Kozma, McGhee, Quellmalz, & Zalles, 2004). Relatively few teachers identified infrastructure problems, such as the lack of computers in working condition, unreliable electricity or lack of access to the internet, although these varied by country. As less technologically advanced countries joined the programme in 1999-2000, the major barriers to ICT classroom use became the lack of computer hardware (60%), software (56%) and reliable internet connections (52%), particularly in African countries such as Mauritania, Ghana

and Zimbabwe. Lack of access to technology is inevitably a major barrier in its application, but availability does not necessarily translate into use. However, in the study of Nigerian secondary school teachers by Tella et al (2007), a lack of technical support in the schools, and teachers" lack of expertise in using ICT, were the prominent factors hindering teachers" readiness and confidence in using ICT (Hennessy, Harrison, & Wamakote, 2010).

2.2 ICT and Education in Bangladesh:

In Bangladesh the Sixth Plan envisaged restructuring the education system to make it more attuned with the technologically evolving global landscape. More specifically, the Sixth Plan sought to enhance the role of ICT in boosting the quality of education and to narrow the ICT skills between urban and rural people in Bangladesh. The Perspective Plan calls for making ICT education mandatory at the secondary level by 2013 and establishment of computer labs at the primary level by 2021 also. Whilst the first target has been met, significant progress has been registered with regard to the latter. The human resource development component of ICT consists of four parts: (a) building e-learning infrastructure, i.e., one school, one computer lab, smart class room with e-learning facilities; (b) ICT education; (c) ICT-based education; and, (d) vocational ICT training facilities for the youth.

2.3 Building e-learning infrastructure in Bangladesh:

A model is being implemented meeting two interrelated objectives: (a) creation of smart/multimedia classrooms; and, (b) training teachers to create digital contents for their use in classrooms. The Ministry of Education (MoE) and Ministry of Primary and Mass Education (MoPME) undertook two initiatives multimedia classroom (MMC) and Teacher-led Digital Content Development after successful prototypes. Two separate projects under MoE and MoPME are currently underway aimed at establishing 20,500 and 7,000 MMCs at the secondary and primary level respectively.

The Bangladesh Computer Council (BCC) has set up computer labs in 3,544 educational institutions in order to expand ICT education at the grassroots level. For increasing the usage of internet by educational institutions, it is provided free of cost. Bangladesh Research and Education Network (BREN) have been established in 6 universities and

gradually, all universities will be brought under this network. BREN is connected to the Trans Eurasian Information Network (TEIN-3).

2.4 ICT Education:

With regard to the second area, progress is more limited. ICT courses for grade VI-XII have been introduced besides e-book conversion of 325 textbooks. An electronic teaching Programme for students (e-learning) has been introduced. The Bangladesh National Library Modernization Project is working in the following areas: digital library infrastructure, collect materials for full-text digitization, permanent store, create digital data storage, online data transfer, automatic binding and conservation measures to scientific and research. ICT literacy evaluation as part of Public Service entrance exams has been introduced, but it needs to be extended in terms of depth of questions regarding the usage of ICTs for good governance in the delivery of public provisions.

Remarkable achievement has been made in areas such as online registration, payment of admission fees and publication of results in enrolment of university students and to some extent at primary and secondary education.

2.5 ICT-based education:

Bangladesh has made some progress in this third area. Secondary and Higher Secondary ICT based Education project has established 20,000 Multimedia MMCs comprising of 13,700 school, 5,200 madrasas and 1,600 colleges. Each MMC has at least one internet connectivity, one laptop and one multimedia. The Basic ICT Skills Transfer up-to-Upazila-level has set up computer labs at 192 educational institutions. It has provided training to 7,890 teachers as master trainers and to 112,189 students. In addition, 12,500 teachers have been trained to create multimedia content. These teachers are creating and sharing multimedia contents through a Teacher's Portal (https://www.teachers.gov.bd/), which is a central repository for e-learning content for teacher training and for all students. Incentives, through public recognition of best contents, are being awarded to encourage teachers' participation. Digital World (international), Digital Innovation Fair (district and sub-district level), Education Leaders' Conference (international), and Teachers' Conference (national) are being organized in Bangladesh.

2.6 Vocational ICT Training:

Finally, in terms of spurring ICT related vocational training, 4 MMCs have been set up in each of the 64 technical teachers training institutes some polytechnic institutes. Bangladesh Open University (BoU) has undertaken an initiative to launch e-learning/online Programme for its target audiences. Bureau of Manpower, Employment and Training (BMET) is also set to launch e-learning courses for migrant workers.

Bangladesh has witnessed significant progress in the area of Digital Government, although the latest e- Government Development Index (e-GDI) ranking, prepared by UNDESA, positioned the country low at 148. In 2012, in spite of Bangladesh's low 150th rank, the country got placed alongside the US, China, India, Brazil, Japan and other giant economies (countries with populations larger than 100 million) that succeeded in making a special effort to improve service delivery to their populations. Also, ITU's ICT for Development Index (IDI) acknowledged Bangladesh as one of the three most dynamic countries in Asia- Pacific, alongside Australia and Mongolia.

2.7 Enhance Education Quality through ICT:

The strategy here will build on the progress made in the Sixth Plan. The vision is to establish a system where ultimately every student will be equipped to face the challenges of the globalized 21st century through (a) reforming curriculum, pedagogy and teacher's capacity building to ensure quality education for all; (b) ensuring transparency, efficiency and effectiveness at all levels of educational administration; (c) securing accountability to the students and parents to enable stakeholders' participation in policymaking and decisions.

(a)Interactive multimedia classrooms in every school: Every primary and secondary school will establish a multimedia classroom with a power-saving internet-connected laptop, projector/large-screen-TV and teachers professionally trained to use multimedia content for general subjects. Teachers will use digital content in the classroom for collaborative, problem solving sessions.

(b) Incentives for teachers based on performance and innovation: Salary increments, bonuses and professional advancement for teachers will be instituted over time based on

innovation and educational outcomes. Non-fiscal incentives will be designed in terms of recognition and opportunities for leadership in different levels. Some awards have been introduced but more incentives will need to be explored to make the system more competitive.

(c) ICT literacy for students in tertiary education: ICT literacy will be mandatorily impart at the tertiary level to prepare students for the job market which increasingly demands ICT skills. For tertiary education, and partially for secondary education, the internet's capacity for two-way interaction offers the greatest promise for improving access and affordability and for providing flexibility to combine work with further study. Specialized education in ICTs may be encouraged to feed the burgeoning IT industry.

(d) Wave TV or Education TV: The almost unused second terrestrial channel of the government may be turned into an education TV channel after the broadcast of parliamentary sessions. As many as sixteen ministries have already shown interest for producing educational content for this TV channel. HDTV work is underway.

(e) Loans and scholarships for ICT education: Special initiatives are needed to prevent brain drain and to encourage the meritorious and young IT graduates. In this regard, special education loan scheme and scholarship programs will be introduced for suburban and rural meritorious students who are comparatively less likely to move abroad. This will facilitate their admission in universities in IT related subjects. The Government will consider providing long term loan facilities (at least 4 year grace period and maximum 4 per cent interest) via commercial banks to create opportunities for IT education for the poor but meritorious students. They will be entitled to repay the loans after getting jobs on completion of graduation.

(f) Establishing a National Certifying Authority using ICT: A National Certifying Authority would be established immediately for ensuring uniformity in the quality of IT students graduating from different public and private universities. The Authority could begin its work by launching its own massive open online courses (MOOCs) targeting fresh university graduates to groom them into a world class IT manpower.

(g) Establishing Virtual University using ICT: Initiative will be taken to set up an ICT focused virtual university having campuses throughout the country. This will not only accelerate decentralization of quality ICT education but also ensure efficient utilization of available resources (Commission, 2015).

2.8 Teachers' attitudes and beliefs on ICT

Polytechnic institutes is an important sectors of all TVET sectors where one of TVET sectors predominantly depends on teachers' attitudes towards technology and the diverse possibilities of using it in teaching-learning contexts in the educational institutions in Bangladesh Mumtaz (2000). Where said that teachers' beliefs about teaching and learning with ICT are central to integration. To be successful in computer use and integration, teachers need ''to engage in conceptual change regarding their beliefs about the nature of learning, the role of the student, and their role as teachers''. Research found that teachers, who possess positive attitudes towards ICT, require less training to teach the skills necessary for the implementation of ICT in their teaching and thereby providing active students' learning (Khan, Hasan, & Clement, 2012). Harrison and Rainer Jr (1992) found that participants with negative teachers attitudes of computer teachers attitudes were less skilled in computer use and were therefore less likely to accept technology than with positive attitudes. Therefore, teachers' negative attitudes and their reluctance in using technology in teaching and learning hinder all initiatives towards integration of technology in TVET sectors in Bangladesh. Guskey (2000) further argued that changing teachers' beliefs and attitudes makes results in subsequent changes in their practices, which in turn will lead to better student outcomes in teaching learning situation in TVET institutes in Bangladesh. Therefore teachers should believe that the usefulness of using technology in polytechnic sectors of Bangladesh.

2.9 Teachers' lack of knowledge and skills of ICT

Teachers' lack of knowledge and skills is one of the main barriers to the use of ICT in educational institutes, both for the developed and underdeveloped countries (Khan et al., 2012). For example, Balanskat, Blamire, and Kefala (2006) have shown that "in Denmark many teachers still chose not to use ICT and media in teaching situations because of their lack of ICT skills rather than for pedagogical/didactics reasons" while "in the Netherlands

teachers' ICT knowledge and skills is not regarded any more as the main barrier to ICT use". Therefore integrating technology in the TVET systems requires subjects' contents knowledge and an understanding of how students learn these contents and a level of technical expertise to use different sorts of technology in teaching learning situations in polytechnic institutes. The given process requires proper link with technology, contents and meaningful teaching what comes from proper knowledge of ICT. Thus, technology could be for improvement the teaching and learning experience of polytechnic students. However, teachers without sufficient knowledge and skills of technology integration will face problem to teach, which will result negative attitudes towards using technology in their teaching. Therefore, due to lack of knowledge regarding the use of technology and lack of skill on ICT tools and software, the use of technology in teaching and learning situation in polytechnic institutions in Bangladesh has been limited because of lack knowledge and skills about ICT.

2.10 Teachers' lack of time

Bangladesh has a shortage of teachers in polytechnic institutes. Teachers may have necessary skills and confidence in using technology in the classroom, but they still could not use technology fully because they feel that using technology in their teaching requires extra time. Polytechnic institutions in Bangladesh have a shortage of teachers and they have overload on class and therefore they need to take extra teaching load along with heavy administrative workload. Most of the polytechnic institutions have started two regular shifts (morning and evening), without increasing the number of teachers which compels existing teachers to conduct classes in both the shifts. In this situation, the hard-pressed teachers might not manage extra time to plan for class, not have scope to make practices on their topic more. So the lack of time is one of the largest constraints to the integration of ICT into the polytechnic institutes. Teachers need time to learn how to use the hardware and software and technological devices, time to plan, and time to collaborate with other teachers using ICT in teaching learning situation. Time is also needed to improve their curriculum by using technology which will make more easier to use ICT and influence polytechnic teachers towards ICT application in the classroom (Parvin, 2013).

2.11 Number of Technical and Vocational Institutions, Teachers and Enrolment by Management and Gender 2014-2016:

Year in 2014: Public institutes: 248, Total Teachers: 4945, Female Teachers: 686, % of Female Teachers: 13.87, Total Enrollment: 177527, Girls Enrollment: 29058, % of Girls Enrollment: 16.37.

Private institutes: 3766, Total Teachers: 23853, Female Teachers: 5215, % of Female Teachers: 21.86, Total Enrollment: 512136, Girls Enrollment: 160116, % of Girls Enrollment: 31.26.

Year in 2015: Public institutes: 252, Total Teachers: 4957, Female Teachers: 687, % of Female Teachers: 13.86, Total Enrollment: 178085, Girls Enrollment: 29674, % of Girls Enrollment: 16.66.

Private institutes: 5538, Total Teachers: 25946, Female Teachers: 5557, % of Female Teachers: 21.42, Total Enrollment: 694573, Girls Enrollment: 179200, % of Girls Enrollment: 25.80.

Year in 2016: Public institutes: 288, Total Teachers: 4973, Female Teachers: 694, % of Female Teachers: 13.96, Total Enrollment: 180592, Girls Enrollment: 30041, % of Girls Enrollment: 16.63.

Private institutes: 5609, Total Teachers: 27406, Female Teachers: 6075, % of Female Teachers: 22.17, Total Enrollment: 694678, Girls Enrollment: 179615, % of Girls Enrollment: 25.86.

(Source, BANBEIS-Educational Database, 2016)

Table 2.1: Number of Institution, Teacher and Enrolment by Type 2016

Type of Institutes	No. of Institutes	Total Teachers	Female Teachers	% of Female Teachers	Total Students	Female Students	% of girl Students
Polytechnic Institute	439	6251	1043	16.69	203810	29076	14.27
Technical School & College	172	2312	423	18.30	64940	13758	21.19
Technical Training Centre	164	1309	203	15.51	33890	11973	35.33

Basic Trade (360hrs) 1980 institutes with trainees 173670 are excluded in the above table.

(Source, BANBEIS-Educational Database, 2016)

Table 2.2: Number of Institution, Teacher and Enrolment by Type, Management and Gender 2016.

Type of Institutes	Management	No. of Institutes	Total Teachers	Female Teachers	% of Female Teachers	Total Students	Female Students	% of girl Students
Polytechnic Institute	Public	52	1492	175	11.73	92612	11522	12.44
	Private	387	4759	868	18.24	111198	17554	15.79
Technical School & College	Public	64	1144	128	11.19	36426	4912	13.48
	Private	108	1168	295	25.26	28514	8846	31.02
Technical Training Centre	Public	68	1126	183	16.25	21122	7061	33.43
	Private	96	183	20	10.93	12768	4912	38.47

Table 2.3: Number of Institution by Type, Management and Division 2016:

Type of Institutes	Management	Dhaka	Barisal	Chittagong	Khulna	Rajshahi	Rangpur	Sylhet	Total Institutes
Polytechnic Institute	Public	12	4	12	8	8	5	3	52
	Private	132	34	42	54	64	48	13	387
Technical School & College	Public	18	6	9	10	52	11	2	64
	Private	20	4	19	20	58	20	7	108
Technical Training Centre	Public	20	7	10	11	9	8	3	68
	Private	19	5	5	28	28	7	4	96

Table 2.4: Number of Teacher by Type, Management and Division 2016:

Type of Institutes	Management	Dhaka	Barisal	Chittagong	Khulna	Rajshahi	Rangpur	Sylhet	Total Teachers
Polytechnic Institute	Public	458	107	284	206	212	174	51	1492
	Private	1475	343	635	743	1044	475	44	4759
Technical School & College	Public	362	108	176	186	116	132	64	1144
	Private	166	12	95	92	623	170	10	1168
Technical Training Centre	Public	306	98	262	138	160	114	48	1126
	Private	44	5	20	63	38	10	3	183
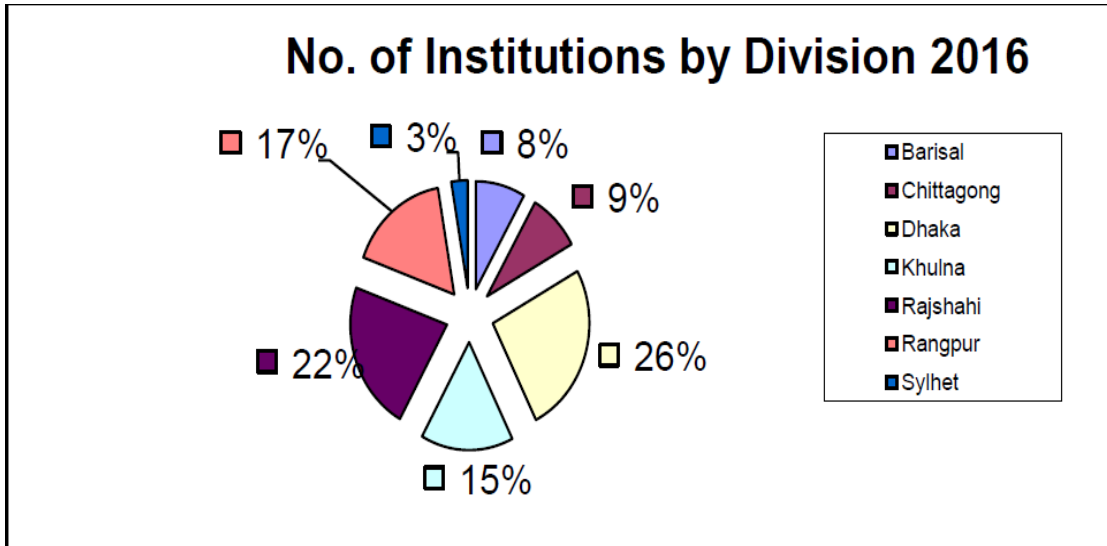
Fig: 2.1: No of institution by division 2016
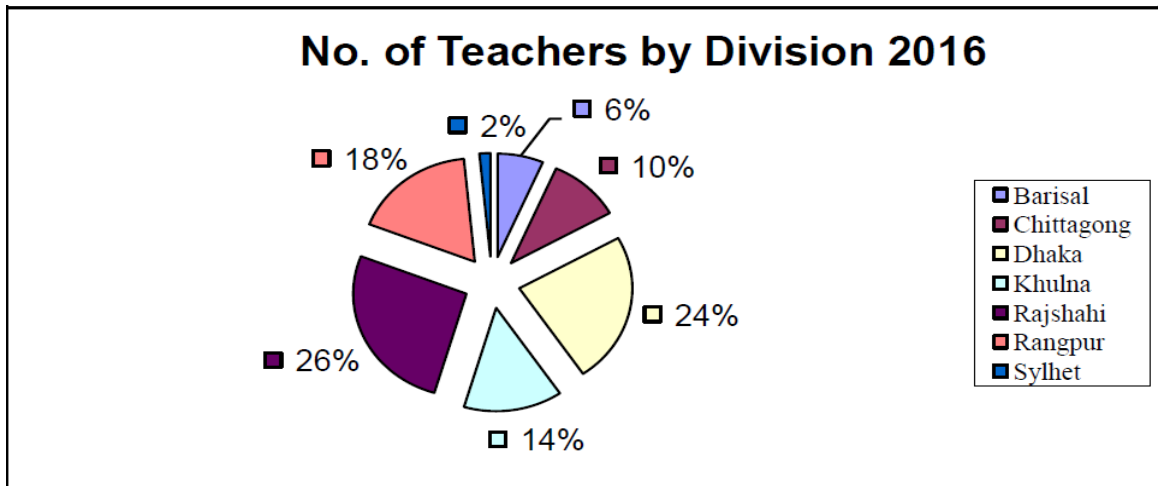
Fig: 2.2: No of teachers by division 2016

Table 2.5: Average Teacher and Enrolment by Type 2016:

Type of Institute	Management	Average Teacher per Institution	Average Student per Institution	Total Teachers	Total Students
Polytechnic Institute	Public	29	1781	14	464
	Private	12	287		
Technical School & College	Public	18	569	13	391
	Private	11	279		
Technical Training Centre	Public	17	311	8	207
	Private	2	133		

Table 2:6 Teacher-Student Ratio by Type (independent) 2016:

Type of Institute	Management	Teacher-Student Ratio	Total Ratio
Polytechnic Institute	Public	1:62	1:33
	Private	1:23	
Technical School & College	Public	1:32	1:28
	Private	1:24	
Technical Training Centre	Public	1:19	1:26
	Private	1:70	

(Source, BANBEIS-Educational Database, 2016)

CHAPTER THREE

METHODOLOGY AND PROCEDURES

3.1 Introduction

The purpose of this study was to identify difficulties faced by teachers of using ICTs in the teaching learning in classroom and assess female polytechnic teacher's attitude to using ICT during teaching engineering subjects which was very much important to improve their performance and teachers' ICT skills motivation of study, academic self-perception and exams result achievement. This chapter describes methods used to data collect, analyze, and interpret data. A quantitative method was used in this research examination. It includes a design of the study, area of the study, population, sample and work schedule.

3.2 Design of the study

1. Research field: The study was taken on department of "Computer Technology, Electronics Technology and Architecture Technology" of four public women Polytechnic institutes in Bangladesh. List was like as Dhaka Mohila Polytechnic Institute, Chittagong Mohila Polytechnic Institute, Khulna Mohila Polytechnic Institute and Rajshahi Mohila Polytechnic Institute.

Why the researcher choose public women polytechnic Institutes?

The nature of woman polytechnic and male polytechnic is expected quite different and diverse. For instance, only female students are taught in women polytechnic in Bangladesh. Therefore, this study particularly interested on considering woman polytechnic to investigate the problem very intensely. Besides, considering both types of institutes (male and female) may provide diverse results, which may hinder the main purpose of this study.

2. Population: The study was conducted on the teachers of public women polytechnic institutes. Department of "Computer Technology, Electronics Technology and Architecture Technology" teachers are involved for institutional information especially Chief instructor, instructor, junior instructor, Head/Principal those who are closely involved with teaching of students of respective department and institutions.

3. Sampling: Field of the research is specific, and also the populations of this research were small. Conducting the research to a quantitative method it was followed the purposive sampling population as sample of the research. To make the sampling process convenient, four out of 4 female public polytechnic in Bangladesh are considered as a sample of the research. Specifically department of "Computer Technology, Electronics Technology and Architecture Technology" trade teachers from those four public polytechnic institutes have been selected to collect the research data. Purposive sampling is used throughout the study.

All the teachers of the female polytechnic institute considered as the population of the study. The sample from the populations taken on bellow:

Table 3.1: Sample

Name of women polytechnic institute in Bangladesh	Population (Number of teachers in the Computer Technology)	Sample	Sampling Technique
1. Dhaka Mohila Polytechnic Institute	9	7	Purposive
2. Chittagong Mohila Polytechnic Institute	7	5	
3. Khulna Mohila Polytechnic Institute	4	3	
4. Rajshahi Mohila Polytechnic Institute	6	5	
	Total: 20		

Name of women polytechnic institute in Bangladesh	Population (Number of teachers in the Electronics Technology)	Sample	Sampling Technique
1. Dhaka Mohila Polytechnic Institute	8	7	Purposive
2. Chittagong Mohila Polytechnic Institute	8	5	
3. Khulna Mohila Polytechnic Institute	6	3	
4. Rajshahi Mohila Polytechnic Institute	7	5	
	Total: 20		

Name of women polytechnic institute in Bangladesh	Population (Number of teachers in the Architecture Technology)	Sample	Sampling Technique
1. Dhaka Mohila Polytechnic Institute	10	7	
2. Chittagong Mohila Polytechnic Institute	6	5	
3. Khulna Mohila Polytechnic Institute	5	3	Purposive
4. Rajshahi Mohila Polytechnic Institute	6	5	
	Total: 20		

Teacher sample:

1.   Department: Computer Technology, Electronics Technology and Architecture Technology
2.   Teacher's experience: Less than 2 years to above 15 years
3.   Age: 24 to 50 years

3.3 Data collection tools

Questionnaire was considered as one of the primary media for gathering data or information in education and social science research. In this study structured form of questionnaire was used as data collection tool. In consultation with supervisors, the researcher had been prepared appropriate questionnaires to collect data from teachers of the selected four public polytechnic institutions of Bangladesh.

The questionnaire consists of fill up the appropriate place, short answer type and statement wise opinion given the tick within the five-point likert scale. These items were supplemented by few open ended textual opinion was provided on the best aspects of participants' educational experience and problems faced by them at their respective institutions. Statement wise data format were designed on 5 point rating scale.

5 point rating (likert) scale was used for teachers of the selected four women polytechnic institutions in Bangladesh.

1. Excellent   (E)
2. Very good (VG)
3. Good   (G)

4. Moderate (Mo)
5. Poor   (P)

The researcher himself printed the hardcopy distributed of the questionnaire. In this regard, all selected institutes data were collected by researchers himself from the selected four women public polytechnic institutions in Bangladesh.

3.4 Data collection procedures

The data collection procedures are given below:

1. List of the institute and mobile number of institute were collected by researcher himself through www.moe.gov.bd website and requesting with head of the institute and relative trade teachers as well as according to their own schedule and willingness. Then researcher went to actual field and questionnaires distribute among them and data were collected.
2. Among 60 teachers sample researcher himself were collect the data.
3. Among the all delivered questionnaires 100% were returned rate, so researcher himself fulfilled that targeted 60 sample.
4. Sample respondents were realized and understood the questionnaires statement and gave their opinion as a rate of likert scale. Researcher help to them for realized the demand of questionnaire.
5. After compiling all data gathered and received then the researcher gone through for data interpretation and analysis.

A total of sixty (60) respondents were sampled and questionnaires were distributed to them. Total of sixty (60), (100%) questionnaires were returned without missing questions as statistically illustrated in table given below;

Table 3.2: Statement wise respondents Case Processing Summary

	Cases		
	Valid	Missing	Total

	N	Percent	N	Percent	N	Percent
A1. Uses of ICT in classroom feels	60	100%	0	0%	60	100%
A2. ICT improvement you feel in your teaching	60	100%	0	0%	60	100%
A3. The result of using ICT for teaching a large number of students	60	100%	0	0%	60	100%
A4. Improvement of your confident level after using ICT in teaching	60	100%	0	0%	60	100%
A5. Idea of working with students in digital environment	60	100%	0	0%	60	100%
A6. Favour to using ICT in teaching of engineering subjects	60	100%	0	0%	60	100%
A7. Using ICT makes the classroom management	60	100%	0	0%	60	100%
A8. Improvement you evaluate on your student after you start to use ICT in teaching learning	60	100%	0	0%	60	100%
B1. Rate the encouragement of using ICT in teaching learning your institutes	60	100%	0	0%	60	100%
B2. Quality of ICT resources in government women polytechnic	60	100%	0	0%	60	100%
B3. Using ICT in teaching	60	100%	0	0%	60	100%
B4.Attitude of institute to modernize the ICT technology	60	100%	0	0%	60	100%

Statement						
B5. Access of ICT for each classes in institutes in engineering subjects	60	100%	0	0%	60	100%
B6. Students attitude in using ICT for learning in classroom environment	60	100%	0	0%	60	100%
B7. Access of internet for teaching learning inside and outside of classroom at institutes	60	100%	0	0%	60	100%
B8. Administrative support for using of ICT	60	100%	0	0%	60	100%
B9.Student improvement in teaching learning process in engineering subjects to using ICT is	60	100%	0	0%	60	100%

3.5 Tools and technique of data analysis

After data collection, the information was tabulated in the Statistical Package for Social Science (SPSS) software version 25.0 was used for analyzing and interpreting the data obtained. The frequency distribution, percentage, weighted average, Chi-square, mean, standard deviation, standard error calculated and the significant value was compared with the critical value of 0.05 significance level was calculated as well. The statement-wise percentage is just the ratio of number of participants from a particular responded to one of the 5-rating scale (E/VG/G/M/P) of a statement and the total number of respondents for the same statement multiplied by 100.

The weighted average of the opinion of each statement is calculated by using the following formula:

Weighted Average, W. A. $= \dfrac{N_1 + 2N_2 + 3N_3 + 4N_4 + 5N_5}{N_1 + N_2 + N_3 + N_4 + N_5}$ where N_5, N_4, N_3, N_2 and N_1 are the number of respondents who supported "Excellent", "Very good", "Good", "Moderate" and "Poor" respectively.

Table 3.3: The five point rating scale

Excellent	Very good	Good	Moderate	Poor
5	4	3	2	1

The weighted average (WA) is interpreted as:

- $5 \geq WA > 4.5$ is "Excellent"
- $4.5 \geq WA > 3.5$ is "Very good".
- $3.5 \geq WA > 2.5$ is "Good"
- $2.5 \geq WA > 1.5$ is "Moderate" and
- $1.5 \geq WA > 0$ is "Poor".

3.6 Ethical consideration

Before starting any data collection, the researcher was seeking required permission from the selected four public women polytechnic institutions authority or administrative body. To make the process systematic an invitation letter signed by the supervisor, Department of Technical and Vocational Education, Islamic University of Technology (IUT), had been forwarded to the appropriate authorities of the participating institutions. Each and every participant was given a questionnaire and required time was given to fill the questionnaire voluntarily. All the participants' information were used and kept confidential with serious care.

3.7 Critical Overview

This chapter has presented an explanation of the research's theoretical framework, the approach and the plan of the study. It has also presented a detailed account of how the research plan was carried out and progressed. Methodology, methods and research instruments have also been explained. This includes the design and application of research's instruments. This chapter has also presented the data collection process, including sampling and the analysis procedures. Finally, it presented validity and reliability and the ethical issues related to the study. The next chapter focuses on an analysis of the findings of the data collected from questionnaires. The questionnaires were analyzed using SPSS.

CHAPTER FOUR

ANALYSIS AND INTERPRETATION OF DATA

In this section, statistical procedures are presented that were used to analyze both the continuous and categorical data collected from four public women polytechnic institutes teachers of Bangladesh. In order to investigate objectives 1 to 2, frequency distributions were conducted on continuous data to adjust the percentages based on missing values. Whereas statement-wise percentage, weighted average and chi-square were conducted on the responses collected using 5-point rating scale from the in order to examine two objectives. The subsequent sections of the chapter present a brief description of the used statistical tests, their rationale followed to step by step process of computing test statistic with interpretation.

4.1 Attitude of teaching using ICT

4.1: Objective-1 chi square value

N= 60

S/N	Description	5 (E)	4 (VG)	3 (G)	2 (M)	1 (P)	W.A	S.V	Remarks
01	Uses of ICT in classroom feels	37 (61.7%)	13 (21.7%)	10 (16.7%)	0 (0%)	0 (0%)	4.45	0.252	Very good
02	ICT improvement you feel in your teaching	18 (30.0%)	27 (45.0%)	5 (25.0%)	0 (0%)	0 (0%)	4.05	0.049	Very good
03	The result of using ICT for teaching a large number of students	4 (6.7%)	27 (45.0%)	21 (35.0%)	8 (13.3%)	0 (0%)	3.45	0.015	Good

04	Improvement of your confident level after using ICT in teaching	23 (38.3%)	25 (41.7%)	12 (20.0%)	0 (0%)	0 (0%)	**4.18**	0.389	Very good
05	Idea of working with students in digital environment	24 (40.0%)	20 (33.3%)	12 (20.0%)	4 (6.7%)	0 (0%)	4.07	0.115	Very good
06	Favour to using ICT in teaching of engineering subjects	29 (48.3%)	15 (25.0%)	16 (26.7%)	0 (0%)	0 (0%)	**4.22**	0.577	Very good
07	Using ICT makes the classroom management	25 (41.7%)	18 (30.0%)	15 (25.0%)	2 (3.3%)	0 (0%)	4.10	0.079	Very good
08	Improvement you evaluate on your student after you start to use ICT in teaching learning	36 (60.0%)	17 (28.3%)	5 (8.3%)	2 (3.3%)	0 (0%)	4.45	0.166	Very good

The first objective was to assess female polytechnic teacher's attitude to using ICT during teaching engineering subjects. A structured questionnaire was administered to the teachers of selected women public polytechnic institutes in Bangladesh. The data obtained from the respondents were tabulated in SPSS version 25.0. The questionnaire was carefully formulated in order to elicit opinion of the teachers regarding subject matter, practical using ICT in classroom and institutional resources and about requirements. It comprised of eight statements for teachers inviting responses on five-point rating scale i.e. excellent to poor. Frequency distributions percentage, weighted average and chi-square test were conducted on the responses of each statement of the questionnaire to check whether responses on the statement vary between teachers or not.

Likert questionnaires are widely used in survey research, but it is unclear whether the item data should be investigated by means of parametric or nonparametric procedures.

According to (De Winter, Zadpoor, & Dodou, 2014) the chi-square test does not use the ordinal information and treats the different values as nominal groups, which do not have a natural ordering, such as bitter, sweet or sour. 5-point rating scale or Likert data is basically ordinal data, which means it has a natural ordering of values, but yet differences between the levels don't necessarily represent equal intervals. By using the chi-square test in these cases, one would be losing ordinal information and probably statistical power to detect the differences between groups (De Winter et al., 2014). The statement-wise percentage is just the ratio of number of participants from a particular group responded to one of the 5-rating scale (E/VG/G/M/P) of a statement. The weighted average of the opinion of each statement is calculated by using the following formula:

Weighted Average, W. A. $= \dfrac{N_1 + 2N_2 + 3N_3 + 4N_4 + 5N_5}{N_1 + N_2 + N_3 + N_4 + N_5}$ where N_5, N_4, N_3, N_2 and N_1 are the number of respondents who supported "Excellent", "Very good", "Good", "Moderate" and "Poor" respectively.

Table 4.2: The five point rating scale is as follows:

Excellent	Very good	Good	Moderate	Poor
5	4	3	2	1

The weighted average (WA) is interpreted as:
- $5 \geq WA > 4.5$ is "Excellent"
- $4.5 \geq WA > 3.5$ is "Very good".
- $3.5 \geq WA > 2.5$ is "Good"
- $2.5 \geq WA > 1.5$ is "Moderate" and
- $1.5 \geq WA > 0$ is "Poor".

To examine the hypothesis for weighted average, chi-square test can run the non-parametric test under 'Legacy Dialogs'. If the sig. value is larger than 0.05, it can be concluded that there is no significant difference in terms of responses to a particular statement.

Statement A1: Uses of ICT in classroom feels

Regarding to the above statement, 61.7% excellent, 21.7% very good, 16.7% good, 0% moderate and 0% poor. The W.A is 4.45 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.252 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. This means that there is no use of ICT in the class.

Statement A2: ICT improvement you feel in your teaching

Regarding to the above statement, 30.0% excellent, 45.0% very good, 25.0% good, 0% moderate and 0% poor. The W.A is 4.05 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.049 which is less than the alpha value of 0.05 (P<0.05). Which shows that there is significance and the null hypotheses is not accepted and the opinion of the respondents accepted. Which conclude that there is improvement of teaching using ICT.

Bar chart

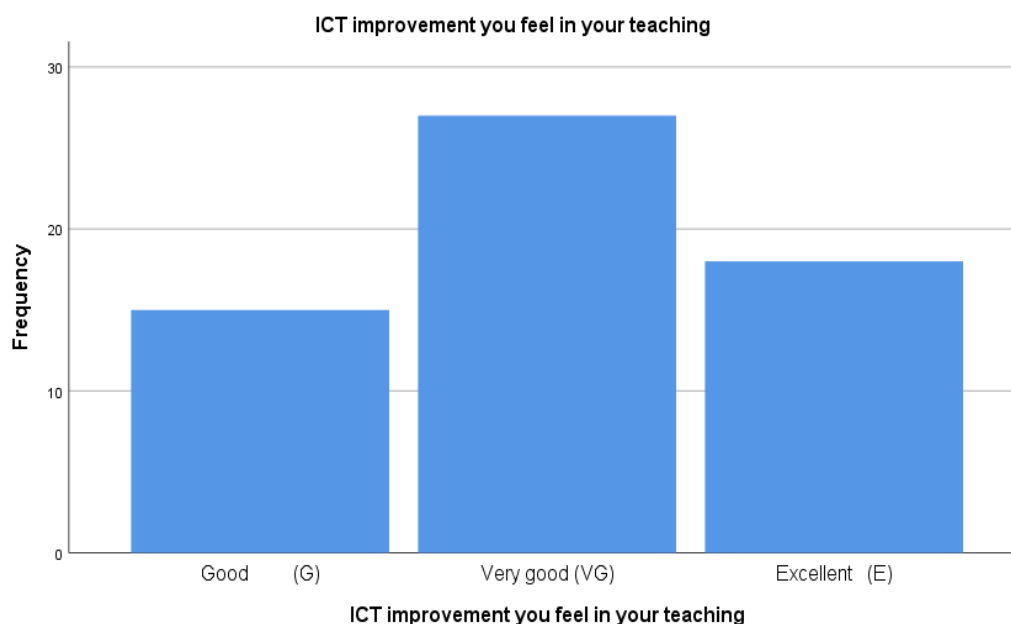**Fig: 4.1: ICT improvement you feel in your teaching**

Statement A3: The result of using ICT for teaching a large number of students

Regarding to the above statement, 6.7% excellent, 45.0% very good, 35.0% good, 13.3% moderate and 0% poor. The W.A is 3.45 which is between 2.5 to 3.5, that the respondents said "Good" and the chi-square value of 0.015 which is less than the alpha value of 0.05

(P<0.05). Which indicates that there is significance and the null hypotheses is not accepted and the opinion of the respondents not rejected. Which conclude that there is using of ICT for teaching a large number of students is preferable.

Statement A4: Improvement of your confident level after using ICT in teaching

Regarding to the above statement, 38.3% excellent, 41.7% very good, 20.0% good, 0% moderate and 0% poor. The W.A is 4.18 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.389 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. Which conclude that no improved the teachers confident level after using ICT in teaching.

Statement A5: Idea of working with students in digital environment

Regarding to the above statement, 40.0% excellent, 33.3% very good, 20.0% good, 6.7% moderate and 0% poor. The W.A is 4.07 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.111 which is greater than the alpha value of 0.05 (P>0.05). Which shows that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. Which conclude that no ICT working with students in digital environment.

Statement A6: Favour to using ICT in teaching of engineering subjects

Regarding to the above statement, 48.3% excellent, 25.0% very good, 26.7% good, 0% moderate and 0% poor. The W.A is 4.22 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.577 which is greater than the alpha value of 0.05 (P>0.05). Which shows that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. Which conclude that the teachers are not preferred to use ICT in teaching of engineering subjects.

Statement A7: Using ICT makes the classroom management

Regarding to the above statement, 41.7% excellent, 30.0% very good, 25.0% good, 3.3% moderate and 0% poor. The W.A is 4.10 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.079 which is greater than the alpha value of 0.05 (P>0.05). Which shows that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. Which conclude that the using ICT is not makes the classroom management.

Statement A8: Improvement you evaluate on your student after you start to use ICT in teaching learning

Regarding to the above statement, 60.0% excellent, 28.3% very good, 8.3% good, 3.3% moderate and 0% poor. The W.A is 4.45 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.166 which is greater than the alpha value

of 0.05 (P>0.05). Which shows that there is no significance and the null hypotheses is failed to reject and the opinion of the respondents rejected. Which conclude that there is no improvement teachers evaluate on their student after they start use ICT in teaching learning.

4.3 identify difficulties faced by teachers of using ICTs in classroom in the teaching learning.

4.3 Objective 2 chi square value
N= 60

S/N	Description	5 (E)	4 (VG)	3 (G)	2 (M)	1 (P)	W.A	S.V	Remarks
01	Rate the encouragement of using ICT in teaching learning in your institute	28 (46.7%)	26 (43.3%)	6 (10%)	0 (0%)	0 (0%)	**4.37**	**0.049**	Very good
02	Quality of ICT resources in government women polytechnic	9 (15.0%)	21 (35.0%)	24 (40.0%)	3 (5.0%)	3 (5.0%)	3.50	**0.027**	Good
03	Using ICT in teaching	24 (40.0%)	22 (36.7%)	14 (23.3%)	0 (0%)	0 (0%)	4.17	0.523	Very good
04	Attitude of institute to modernize the ICT technology	9 (15.0%)	21 (35.0%)	27 (45.0%)	3 (5.0%)	0 (0%)	3.60	**0.046**	Very good
05	Access of ICT for each classes in institutes in engineering subjects	30 (50.0%)	13 (21.7%)	14 (23.3%)	3 (5.0%)	0 (0%)	4.17	0.148	Very good
06	Students attitude in using ICT for learning	15 (25.0%)	33 (55.0%)	12 (20.0%)	0 (0%)	0 (0%)	4.05	0.116	Very good

							W.A	chi	
	in classroom environment								
07	Access of internet for teaching learning inside and outside of classroom at institutes	12 (20.0%)	21 (35.0%)	30 (18.0%)	9 (15.0%)	0 (0%)	3.60	0.570	Very good
08	Administrative support for using of ICT	9 (15.0%)	21 (35.0%)	15 (25.0%)	12 (20.0%)	3 (5.0%)	**3.35**	0.288	Good
09	Student improvement in teaching learning process in engineering subjects to using ICT is	38 (63.3%)	12 (20.0%)	8 (13.3%)	2 (3.3%)	0 (0%)	**4.43**	**0.012**	Very good

Statement B1: Rate the encouragement of using ICT in teaching learning in your institute

Regarding to the above statement, 46.7% excellent, 43.3% very good, 10.0% good, 0% moderate and 0% poor. The W.A is 4.37 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.049 which is less than the alpha value of 0.05 ($P<0.05$). Which indicates that there is significance and the null hypotheses is not accepted and the opinion of the respondents is not rejected. Which conclude that there is enough encouragement of using ICT in teaching learning in their institute.
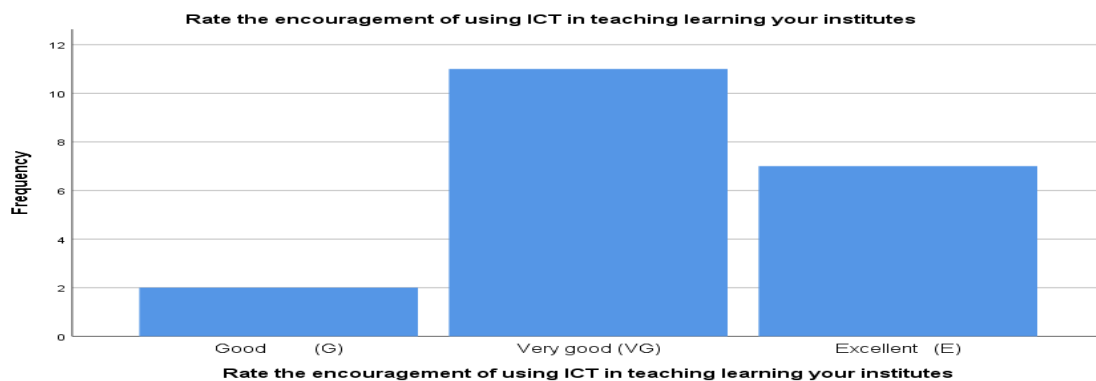
Bar chart

Fig: 4.2 Rate the encouragement of using ICT in teaching learning your institutes

Statement B2: Quality of ICT resources in government women polytechnic

Regarding to the above statement, 15.0% excellent, 35.0% very good, 40.0% good, 5.0% moderate and 5.0% poor. The W.A is 3.50 which is between 2.5 to 3.5, that the respondents said "Good" and the chi-square value of 0.027 which is less than the alpha value of 0.05 (P<0.05). Which indicates that there is significance and the null hypotheses is not accepted and the opinion of the respondents is accepted. Which conclude that there is good quality of ICT resources in government women polytechnic.

Statement B3: Using ICT in teaching

Regarding to the above statement, 40.0% excellent, 36.7% very good, 23.3% good, 0% moderate and 0% poor. The W.A is 4.17 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.523 which is greater than the alpha value of 0.05 (P>0.05). Which shows that there is no significance and the null hypotheses is failed to reject and the opinion of the respondents rejected. Which conclude that there is no using ICT in teaching.

Statement B4: Attitude of institute to modernize the ICT technology

Regarding to the above statement, 15.0% excellent, 35.0% very good, 45.0% good, 5.0% moderate and 0% poor. The W.A is 3.60 which is between 3.5 to 4.5, that the respondents said "Very good" and the chi-square value of 0.046 which is less than the alpha value of 0.05 (P<0.05). Which shows that there is significance and the null hypotheses is not accepted and the opinion of the respondents is accepted. Which conclude that there is good attitude of institute to modernize the ICT technology.

Statement B5: Access of ICT for each class in institutes in engineering subjects

Regarding to the above statement, 50.0% excellent, 21.7% very good, 23.3% good, 5.0% moderate and 0% poor. The W.A is 4.17 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.148 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is failed to reject and the opinion of the respondents rejected. Which conclude that there is no access of ICT for each class in institutes in engineering subjects.

Statement B6: Students attitude in using ICT for learning in classroom environment

Regarding to the above statement, 25.0% excellent, 55.0% very good, 20.0% good, 0% moderate and 0% poor. The W.A is 4.05 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.116 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is failed to reject and the opinion of the respondents rejected. Which conclude that the students' attitude is not support in using ICT for learning in classroom environment.

Statement B7: Access of internet for teaching learning inside and outside of classroom at institutes

Regarding to the above statement, 20.0% excellent, 35.0% very good, 30.0% good, 15.0% moderate and 0% poor. The W.A is 3.60 which is between 3.5 to 4.5, that the respondents said "very good" and the chi-square value of 0.570 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is failed to reject and the opinion of the respondents rejected. Which conclude that there is no access of internet for teaching learning inside and outside of classroom at institutes.

Statement B8: Administrative support for using of ICT

Regarding to the above statement, 15.0% excellent, 35.0% very good, 25.0% good, 20.0% moderate and 5.0% poor. The W.A is 3.35 which is between 2.5 to 3.5, that the respondents said "Good" and the chi-square value of 0.288 which is greater than the alpha value of 0.05 (P>0.05). Which indicates that there is no significance and the null hypotheses is accepted and the opinion of the respondents rejected. Which conclude that there is no administrative support for using of ICT.

Statement B9: Student improvement in teaching learning process in engineering subjects to using ICT is

Regarding to the above statement, 63.3% excellent, 20.0% very good, 13.3% good, 3.3% moderate and 0% poor. The W.A is 4.43 which is between 3.5 to 4.5, that the respondents said "Very good" and the chi-square value of 0.012 which is less than the alpha value of 0.05 (P<0.05). Which indicates that there is significance and the null hypotheses is not accepted and the opinion of the respondents is accepted. Which conclude that the students improved in teaching learning process in engineering subjects to using ICT.

In the first objective there were eight statements on female polytechnic teacher's attitude to using ICT during teaching engineering subjects. Researcher found statement 2 and 3 is significant and statement 1, 4, 5,6,7,8 is not significant. In the 2nd objective there were nine statements about difficulties faced by teachers of using ICTs in the teaching learning in classroom. Researcher found statement 1, 2, 4 and 9 is significant and statement 3, 5,6,7,8 is not significant.

CHAPTER FIVE

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The purpose of the study was to "Assessment of public women polytechnic teachers' attitude toward using ICT in teaching engineering courses in Bangladesh".

The study was carried out on the basis of the following objectives;

a) assess female polytechnic teacher's attitude to using ICT during teaching engineering subjects.

b) identify difficulties faced by teachers of using ICTs in the teaching learning in classroom.

The pupolation target was the teachers of public women polytechnic institutes of Bangladesh who were currently teaching in class in the respectve institutes. Teachers were chosen from Depertment of "Computer Technology, Electronics Technology and Artichecture technology ". These were included both male and female teachers. In Bangladesh there are 49 polytechnic institutes operating diploma in engineering program. However, the study was delaminated to four public women polytechnic institutes for the convenience of data collection of this study. A mimeograph was designed to collect the teachers openion results from four public women polytechnic institutes. The total sample size according to the data collected totaled up to 60 teachers were selected for data analysis and there were 45% female and 55% male teachers taken sample of respectives institutes.

As a part of the study data collected from four public women polytechnic institutes male-female teachers were indicated by the respective institutes and out of four institutes researcher went to the four institutes by himself. Out of the 17 statement wise questionnaires, 17 of them had collected and received, 100 percent targeted data were collected. From the collected copy of the questionnaires the returned data were generated, analyzed using statistical packages for social science (SPSS) software version 25.0. To

find the attitude of teaching using on ICT teachers academic performance, several of information was drawn through using teacher's sample of frequency distribution, percentage and weighted average and chi-square test was designed. For the statement wise opinion respondent, responses on five-point rating scale i.e. Excellent to Poor. Percentage, weighted average and chi-square were conducted on the responses of each statement of the questionnaire to check whether a response on the statement varies between teachers or not. The data were highly analyzed with higher weighted average and chi- square. All the separate table and graph have been automatically generated by the different parts of the questionnaire data analysis. Purpose of decision making, collected data statistically analyzed through mean, standard deviation, percentage and significance level used as the level of significant $\alpha = 0.05$. The result of the study may be helpful to develop the teacher's attitudes on using ICT in women public polytechnic institutes in Bangladesh.

5.2 Findings

Through the sample selected which comprised of teachers and analyzed the data related to the objectives to assess the teacher's attitudes towards using ICT and difficulties faced by teachers using ICT in public women polytechnic institutes in Bangladesh, the findings include the following as stated below:

a) *Objective I:* The results from table 4.1 shown at height weighted average, WA is 4.45 that majority of the responses very good that the teachers uses of ICT in classroom feels very good and also after start to using ICT in classroom the students are improved. The table 4.1 also shown second height weighted average, WA is 4.22 that majority of the responses very good that the teachers are favour to using ICT in teaching of engineering subject is very good and also shown lowest weighted average, WA is 3.45 that majority of the responses good that the result of using ICT for teaching a large number of students is good and not excellent that there using of ICT for teaching a large number of student is not always suit.

b) *Objective II:* The results from table 4.3 shown at height weighted average, WA is 4.43 that majority of the responses very good that the student improvement in

teaching learning process in engineering subjects to using ICT is very good. The table 4.3 also shown second height weighted average, WA is 4.37 that majority of the responses very good that rate of encouragement of using ICT in teaching learning in the institute is very good and also shown lowest weighted average, WA is 3.35 that majority of the responses good that the administrative support for using of ICT is good and not excellent that there have to increase more administrative support for using of ICT in public women polytechnic institutes.

5.3 Discussions on findings

1. The results from table 4.1 shown at height weighted average, WA is 4.45 that majority of the responses very good that the teachers uses of ICT in classroom feels very good. The table 4.1 also shown second height weighted average, WA is 4.22 that majority of the responses very good that the improvement of teachers confident level after using ICT in teaching is very good and also shown lowest weighted average, WA is 3.45 that majority of the responses good that the result of using ICT for teaching a large number of students is good and not excellent that there using of ICT for teaching a large number of student is not always suit. This finding is related to the findings of (Williams et al., 2000) it was found that a survey of primary and secondary teachers provided basic data on the current levels of ICT use in schools, teachers' experience of ICT training to date, and their perceptions of their ICT knowledge and skills needs. From this study findings it was also revealed that majority of there were 37% secondary teachers and 18% primary school teachers. This sample was representative of a wide range of teachers across subjects and levels, who did not use computers or who were very low level users. Respondents were given the task of talking through how they would respond in particular situations (for example, providing advice to a student teacher on using ICT in the classroom), thereby highlighting not only their current knowledge of ICT but also their perception of the facts which help them to using ICT. It is notable from a study on the use of ICT in Teaching in Secondary Schools in Kuwait that the level of using ICT and its applications by teachers in the teaching process at school was low, with an overall arithmetic mean of 2.26 and standard deviation of 0.858. Since the standard deviation is relatively low and less than integer one, it indicates a convergence among teachers at this level. The results also show that the highest rated skill or application of teachers in the usage of ICT in the teaching process at school was the use of information contained on the hard drive or compact disc"

where the arithmetic mean was 2.91 and the standard deviation 1.350, which highlights a significant disparity among teachers in their use (Alharbi, 2014).

2. The results from table 4.3 shown at height weighted average, WA is 4.43 that majority of the responses very good that the student improvement in teaching learning process in engineering subjects to using ICT is very good. The table 4.3 also shown second height weighted average, WA is 4.37 that majority of the responses very good that rate of encouragement of using ICT in teaching learning in the institute is very good and also shown lowest weighted average, WA is 3.35 that majority of the responses good that the administrative support for using of ICT is good and not excellent that there have to increase more administrative support for using of ICT in public women polytechnic institutes. This finding is related to the findings of(Hennessy et al., 2010) it was found that the teacher factors influencing classroom use of ICT in Sub-Saharan Africa. From this study findings the majority of there were the biggest barriers to the use of computers identified by teachers participating in the 1998-1999 survey assessing the World Links schools programme were the lack of time available in classes, and in their own schedules for planning; and the lack of a national policy on the use of computers in schools. Relatively few teachers identified infrastructure problems, such as the lack of computers in working condition, unreliable electricity or lack of access to the internet, although these varied by country. The major barriers to use of technical support in the schools, and teachers" lack of expertise in using ICT, were the prominent factors hindering teachers" readiness and confidence in using ICT.

5.4 Conclusions

The aim of the study was to assessment public women polytechnic teachers' attitude toward using ICT in teaching engineering courses in Bangladesh**.** On the basis of the findings the following conclusions can be drawn:

- There is significant difference to assess female polytechnic teacher's attitude to using ICT during teaching engineering subjects when it was seen that the public women polytechnic teachers are using very good ICT during teaching in classroom.

- There is no significant difference of difficulties faced by teachers of using ICTs in the teaching learning in classroom when it was found that the public women polytechnic institutes teachers are faced difficulties when using ICT in classroom and their institutions.

Since shortage of teachers, lack of internet, MMP and raw materials, quality of resources, to modernize the technology and classroom environment, accessibility of equipment have been found to be a critical component for ICT skill integration in respective institutes. For effective developing students competent and teachers' professional development, sufficient internet facility and MMP, proper training and technical support need to provided teachers and government support to institutions is needed in order run diploma in engineering program effectively and efficiently in the public women polytechnic institutes respectively. Actually no component and system itself having above mentioned lacking's to produce good teaching-learning environment and made the teachers skill hand. After a long consideration of the teacher's performances in public women polytechnic institutes program, that it was realized that teachers performed generally better. This difference could be traced to the fact that many teachers (though willing to be competent) and even many of the do not have enough resource and facilities for making them skilled. However, the majority of the teachers themselves should be blamed for their poor academic environment (as availability of internet, MMP, resources and materials) for their less academic performance. The researcher carefully observed that four public women polytechnic institutes "Computer Technology, Electronics Technology and Architecture Technology" trade teachers were not available in the institutes and the quantity also very less. Some cases it was seen that teachers who has been taking their class actually they were appointed for the several training program and engaged with different responsibilities for fulfilling the institute's curriculum.

5.5 Recommendations and Further Study

This study investigated public women polytechnic teacher's attitudes towards using CIT in classroom in diploma in engineering program However, due to time and resource constraint the department of "Computer Technology, Electronics Technology and Architecture Technology" trade of four investigated public women polytechnic institutes

were taken as sample. It would be better if the four institutions could be increased more trade teachers in order to generalize the results. Other observations are:

1. From the data collection percentage, it was deeply observed that teachers are four public polytechnic institutions were in favour of ICT. In this regard, there should be address the issue on the need for facility of ICT available and easier for the teachers in classroom environment and also inside and outside of institutes.

2. Government, policy maker and the relevant authorities should find a means to motivate and counsel all teachers on the need to have equal chance to do well in ICT as institutions. Because teachers are the media to introduce and motivate the students using ICT in classroom which researchers' respective study.

3. Ministry of Education and the Government should organize capacity building development, training and workshops periodically in area of teaching, emphasis on ICT skills development of teachers in public women polytechnic institutes in Bangladesh. Furthermore, teachers performance on ICT depends on many factors such as teachers prior-knowledge, teaching-learning environment, quality and interest on ICT of teachers, ICT facilities in institutes etc. It is often reported that the four public women polytechnic institutes have relatively inferior classroom set-up and less experienced and practically not-trained and lower ICT skill teachers. The Government and respective authority should try to improve these awkward or incompatible situations.

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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

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RESEARCH QUESTIONNAIRE

Dear Sir/ Madam

As a student of TVE department in M.Sc.TE of Islamic University of Technology (IUT), I conducted a research in the area of women polytechnic teacher's attitude titled by "Assessment of public women polytechnic teachers' attitude toward using ICT in teaching engineering courses in Bangladesh". Field of data collection for the study in public women polytechnic in Bangladesh with the aim of identification the difficulties faced by teachers to using ICT in classroom in the teaching learning.

Your response will be used only for this study purposes and your name and identity will always be kept confidential.

Terminologies Used

TVE: Technical and Vocational Education.
TVET: Technical and Vocational Education Training

Section A: General Information

Please choose the best answer matched with to you and draw a mark on the letter (A, B, C, D or E)

1. Name (Optional):
   …………………………………………………………………………………...
2. Institute:
   A. Dhaka Mohila Polytechnic Institute
   B. Chittagong Mohila Polytechnic Institute
   C. Khulna Mohila Polytechnic Institute
   D. Rajshahi Mohila Polytechnic Institute

3. Your present designation

    A. Chief Instructor
    B. Instructor
    C. Junior Instructor
    D. Head/Principal
    E. Other (Please write here):
        …………………………………………………………………..

4. Department:

    A. Computer Technology
    B. Electronics Technology
    C. Architecture Technology

5. Gender?
    A. Male
    B. Female

6. Your experience in TVET Sector

    A. 15 years or above
    B. Above 10 years
    C. Bellow 10 years
    D. Less than 2 years

7. Email: ………………………..   Cell: ………………………………..

Section B: Research questions

Scale:
6. Excellent (E)
7. Very good (VG)
8. Good (G)
9. Moderate (Mo)
10. Poor (P)

You use ICT resources in teaching learning
    A. Every class/Each class
    B. Only ICT related topic/Engineering topic
    C. Very offensive
    D. Never use ICT

a) **THEME 1:** Attitude of teaching using ICT

[Excellent (E), Very good (VG), Good (G), Moderate (Mo), Poor (P)]

S/No	ITEMS	E	VG	G	Mo	P
1	Uses of ICT in classroom feels					
2	ICT improvement you feel in your teaching					
3	The result of using ICT for teaching a large number of students					
4	Improvement of your confident level after using ICT in teaching					
5	Idea of working with students in digital environment					
6	Improvement you evaluate on your student after you start to use ICT in teaching learning					
7	Using ICT makes the classroom management					
8	Favour to using ICT in teaching of engineering subjects					

Your opinion about using ICT in public women polytechnic institutes in Bangladesh?
(Use an extra sheet if you have a lot to share)
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………

b) **THEME 2:** identify difficulties faced by teachers of using ICTs in classroom in the teaching learning.

[Excellent (E), Very good (VG), Good (G), Moderate (Mo), Poor (P)]

S/No	ITEMS	E	VG	G	Mo	P
1	Rate the encouragement of using ICT in teaching learning in your institute					
2	Quality of ICT resources in government women polytechnic					
3	Using ICT in teaching					
4	Attitude of institute to modernize the ICT technology					
5	Access of ICT for each classes in institutes in engineering subjects					
6	Students attitude in using ICT for learning in classroom environment					
7	Access of internet for teaching learning inside and outside of classroom at institutes					
8	Administrative support for using of ICT					
9	Student improvement in teaching learning process in engineering subjects to using ICT is					

Any more difficulties you face of using ICT in teaching for the engineering subject in your institutes

……………………………………………………………………………………………………

……………………………………………………………………………………………………

Thanks for your maximum cooperation,
Kind Regards

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