

A Study on Implementation of `ICT in Education Training' in Government Primary Schools

Research Report

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TABLE OF CONTENTS

Table of Contents	ii
List of Tables	v
List of Figures	vi
Abstract	vii
Abbreviations	viii
Acknowledgements	ix
Chapter 1: Introduction	1
1.1. <i>Background</i>	1
1.2. <i>Objectives</i>	2
1.3. <i>Research questions</i>	2
1.4. <i>Rationale of the Study</i>	2
1.5. <i>Significance of the study</i>	3
1.6. <i>Limitations of the study</i>	3
1.7. <i>The context: Some key considerations</i>	4
1.7.1. <i>ICT in Education</i>	4
1.7.2. <i>Digital Content</i>	4
1.7.3. <i>Access to Information (a2i)</i>	4
Chapter 2: Review of Literature	5
2.1. <i>Introduction</i>	5
2.2. <i>Global development in primary education</i>	5
2.3. <i>Integration of ICT in developing countries</i>	6
2.4. <i>Development of primary education in Bangladesh</i>	6
2.5. <i>Integration of ICT in primary education in Bangladesh</i>	7
Chapter 3: Methodology	9
3.1. <i>Introduction</i>	9
3.2. <i>Conceptual framework for conducting the study</i>	9
3.3. <i>Research design and method</i>	10
3.3.1. <i>Non-participant classroom observations</i>	10
3.3.2. <i>Semi-structured Interviews and questionnaire</i>	10

3.3.3. Focus group discussion (FGD)	10
3.3.4. Document analysis.....	11
3.4. <i>Tools of research</i>	11
3.5. <i>Schools and participants selection</i>	11
3.5.1. Selection of the schools	11
3.5.2. Selection of research participants.....	12
3.6. <i>Data collection</i>	12
3.7. <i>Data processing</i>	13
3.7.1. Checking, editing and coding.....	13
3.7.2. Data Entry and Cleaning.....	13
3.8. <i>Ethical considerations</i>	13
Chapter4: Data presentation and Analysis	15
4.1. <i>Introduction</i>	15
4.2. <i>ICT in Education training for school teachers</i>	15
4.3. <i>Additional computer training of teachers and other participants</i>	15
4.4. <i>ICT equipment distribution at schools level</i>	16
4.5. <i>Teachers' self-assessment about their ICT skills</i>	21
4.6. <i>Level of using training skills at school by trained teachers</i>	24
4.7. <i>Challenges of implementing ICT training at school</i>	30
4.8. <i>The impact of the training in teaching learning activities</i>	35
4.9. <i>Stakeholders' Suggestions for improving ICT Training</i>	35
4.10. <i>The suggestions for establishing Digital Bangladesh in Education</i>	37
Chapter 5:Findings, Decisions and Recommendations	39
5.1 <i>Findings</i>	39
5.1.1 Teachers' self-assessment about their present ICT skills	39
5.1.2 How much the teachers are using their training skills.....	40
5.1.3 The challenges of implementing ICT training	44
5.1.4: The impact of the training in teaching learning activities	48
5.1.5 Limitation of ICT Training.....	48
5.2: <i>Decisions</i>	49
5.2.1 Teachers' self-assessment about their present ICT skills	49
5.2.2.The level of using their training skills by trained teachers	50
5.2.3. The challenges of implementing ICT training	52

5.2.4. The impact of the training in teaching learning activities	54
5.2.5 Limitation of ICT training	54
5.3 Recommendation	55
5.3.1. For increasing teachers' present skills in ICT related activities:	55
5.3.2. To ensure that the teachers are using their training skills:	55
5.3.3. The challenges of implementing ICT training:	56
5.3.4. Storing of ICT materials, security, user-friendly and availability	56
5.3.5. Suggestions for improving the training:.....	57
Appendices	59
<i>Appendix I: Research tools</i>	<i>59</i>
References	68

LIST OF TABLES

Table 3.1. Participants in this study	13
Table4.1: AdditionalComputer training of the respondents.....	15
Table 4.2: Information about the schools without electricity connection.....	16
Table 4.3: Number of schools got ICT equipment in the sample upazilas	17
Table 4.4: ICT equipment in research schools (32 GPS)	17
Table 4.5: The satisfaction of participants' basis of ICT materials requirement	18
Table 4.6: Availability of laptop and multimedia for use as their requirement time.....	18
Table 4.7: ICT equipment was got the schools after completing the training	19
Table 4.8: The period of ICT equipment wasgot thetrained teachers.....	19
Table 4.9: The ratio of supplied ICT equipment to fulfiltheneeds	20
Table 4.10: The satisfaction about the supplied ICT equipment by the respondents.....	20
Table 4.11: Trained teachers' self-assessment about their present skill on ICT	21
Table 4.12: Observation of trained teachers' skill in their classrooms (%)	24
Table 4.13: The preparation of digital content basedlesson plan by trained teachers	24
Table 4.14: subject based digital content preparation by the trained teachers	25
Table 4.15: Monitoring the digital classroom by the supervisors	26
Table 4.16: Training for monitoring the digital classrooms at schools	26
Table 4.17: Collectingdigital teaching image from the internet by the trained teachers	27
Table 4.18: Rate of account opened by the trained teachers in 'ShikhakBatayon	28
Table 4.19: The downloading digital content by the teachers from ShikhakBatayon	28
Table4.20: Uploading ICT content from 'ShikhakBatayonby the teachers	29
Table 4.21: Trained teachers' followed supervisors' Instruction and plan	29
Table 4.22: The place where the schools keep the ICT materials.....	31
Table 4.23: The ratio of security where ICT materials are kept.....	31
Table 4.24: The level of user friendly of the equipment for regular use	32
Table 4.25: Facing problems in preparing digitalcontentby using power point.....	32
Table 4.26: The problems the respondents' feel in implementing the ICT training'.....	33
Table 4.27: The level of co-operation from their colleagues and level of their satisfaction	34
Table 4.28: The level of cooperation that trained teachers get from their colleagues.....	34
Table 4.29: Usefulness of ICT manual for preparing digital content.....	36
Table: 4.30:The effectiveness of the training preparing and using quality digital content	36

LIST OF FIGURES

Figure 3.1: Conceptual framework for conducting the study	9
Figure 4.1: Computer Training for other Participants	16
Figure 4.2: Skill of computer operating of trained teachers	22
Figure 4.3: ICT based lessons held in research schools	25

ABSTRACT

There is increasing concern among national as well as international development on Information and Communication Technology (ICT) in education. In order to gain deeper insight into the implementing situation of ICT in primary education, there is a need to move beyond the accumulated facts and figures generated by quantitative research and more closely examine reasons for barriers of proper uses of ICT at the school level. To achieve this, the present research is a quantitative study that focuses on the availability of equipment, using digital contents in school classrooms, and teachers' skill and their training. This study specifically focuses on the limitations in achieving proper use of ICT by the teachers of primary schools who received the relevant training.

The objectives of this study are: a) to explore the teachers' self-assessment about their present skills on ICT training; b) to identify how much the teachers are using their training skills; c) to discover the challenges of implementing ICT training for school teachers and d) to find out the impact of the training in teaching learning activities in schools' classrooms.

The major findings of this study are: a) on an average the trained teachers can remember 62 per cent from their training content; b) About 54 per cent respondent teachers think that they are skilled in computer operating. However the classroom observation data show that 42 per cent teachers are skilled, 47 per cent are moderately skilled and only 3 per cent teachers are not skilled in computer operating. c) The highest 48 per cent respondent teachers opined that they are moderately skilled in using power point; similarly, the observation data represent that 46 per cent are moderately skilled. d) 57 per cent respondent teachers think that they are moderately skilled in downloading necessary software for preparing digital contents but it is shown from the observation data that only 20 per cent teachers could successfully do it and 32 per cent teachers are non-skilled in doing this. e) Amongst the respondent teachers 48 per cent opined that they are unskilled in attaching audio file and movie clip by using the internet. f) According to the respondents 39 per cent teachers are unskilled in opening account in 'Shikhak Batayon' and using it. g) ICT sessions were held in the highest 46 per cent sample schools one session per week, and on the other hand in 32 per cent schools ICT sessions were never held. h) Among the ICT trained teachers 48 per cent have Account in 'Shikhak Batayan'. On the other hand, 52 per cent teachers did not do that. i3. In response to the question whether the supplied ICT equipment fulfil the stakeholders' needs 88 per cent head teachers, 95 per cent AUEO and 66 per cent URC Instructors informed that the supplied ICT equipment is not sufficient for their needs.

ABBREVIATIONS, ACRONYMS AND TRANSLATIONS

AUEO	Assistant Upazila Education Officer
C-in-Ed	Certificate in Education
DPE	Directorate of Primary Education
DPEd	Diploma in Primary Education
DPEO	District Primary Education Officer
ESD	Education for Sustainable Development
FGD	Focus Group Discussion
GOB	Government of Bangladesh
HDR	Human Development Resource
ICT	Information and Communication Technology
IER	Institute of Educational Research
MOPME	Ministry of Primary and Mass Education
NAPE	National Academy for Primary Education
NCTB	National Curriculum and Textbook Board
NGO	Non-Government Organization
OECD	Organization of Economic Co-operation and Development
PEDPI	First Primary Education Development Programme
PEDP II	Second Primary Education Development Programme
PEDP III	Third Primary Education Development Programme
PTI	Primary (Teacher) Training Institute
SMC	School Management Committee
UEO	Upazila Education Officer
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNDP	United Nation Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
URC	Upazila Resource Centre

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Researchers

CHAPTER 1: INTRODUCTION

1.1. Background

Education is a complex undertaking and there are numerous factors which affect education policy, management, curriculum development and teaching process. Current global discussions focusing on the use of computer from all sections of the society should have the chance to share effectively in education system. When Information and Communication Technology (ICT) practiced in schools, this system influences children's lives by shaping their perceptions and conceptions, values and ideas and guiding them along the path of cultural development and assisting them to become world citizens. At the end of 20th century, as an effect of enormous acceptance of ICT, the modern education system, its teaching methods, delivering of teaching materials or as a whole, education itself as a discipline has changed rapidly. Nowadays, ICT devices are considered as one of the most universal innovation to harmonize educational system as it is.

However, like many developing countries, Bangladesh has been applying traditional methodology in teaching-learning and ICT related activities which are inadequate to facilitate critical inquiry and knowledge construction. It was noted more than one decade ago that ICT revolution imposes particular challenges on education system in Bangladesh. It is a hopeful issue that recently, under an innovative action plan it has been providing laptops, multimedias and other accessories to some primary schools in each upazila. At the same time, teachers of those schools are also being provided training to use ICT as part of their professional development.

These recent changes that schools have adopted have taken place within the complex educational contexts through introducing ICT with proper adjustments. Education as part of a social system is inextricably related to a number of social factors such as interpersonal interaction and mutual trust among students and teachers (Palinsar, 2005). Some scholars claim the process of global forces that interrelate with local politics—national, sub-national and local level—as a more complex process mediating global trends (Takayama, 2007). At the same time, these forces contribute to and continue to shape a country's education policies and learning from education policies of developed countries which are better able to successfully cater for globalization and development processes. Though international education policies have been historically formed by wealthy nations and agencies led by Western theoretical paradigms (Williams, 2015), many international organizations such as

the United Nations (UN) and its agencies such as ILO, UNESCO and UNICEF also have taken initiatives to integrate local education systems within the broader perspective of globalization.

As a result, donor countries have been seen to engage themselves in collaborating with developing countries to formulate education policies with global perspectives in mind (Williams, 2015). However, in developing countries, this collaboration takes place more with government officials who often lack a deep understanding of the educational needs of their country (Williams, 2015). In developing countries such as Bangladesh, departmental research project can be assisted for understanding the personnel in education systems. The focus of this study is to understand the challenges in addressing proper implementation of ICT in primary education.

1.2. Objectives

- To explore the teachers' self-assessment about their present skills on ICT training.
- To identify how much the teachers are using their training skills
- To discover the challenges of implementing ICT training for school teachers
- To find out the impact of the training in teaching learning activities in schools' classrooms

1.3. Research questions

- How to explore the teachers' self-assessment about their present skills on ICT training?
- How much are the teachers using their training skills?
- What are the challenges of implementing ICT training for school teachers?
- What are the impacts of the training in teaching learning activities in schools' classrooms?

1.4. Rationale of the Study

In a nutshell, the education system in Bangladesh has received relatively little attention to conduct research into various sectors for the way of getting improved guideline for educational policies. Rather, reviews of existing literature show that only some NGOs and donor agencies have conducted a few studies and have a few number of published papers.

Those published papers had recommendation to conduct more studies on the implementation of ICT in education training at school level. Various challenges have already occurred at field level. These challenges can be reduced through conducting new research

study and explore suggestions into different broad areas. Ali (2003, p. 2) identified three areas to conduct further research. The first area is how to do with participation in the information society, the second considers how ICT impacts on access, cost effectiveness and quality of primary education, while the third is to do with the way that ICT changes the education process.

As a research organization, the National Academy for Primary Education (NAPE) in Bangladesh, took part in research activities every year during the last two decades. This, while allowing the researcher an insider's view, also brought to notice that many of the objectives of the PEDPIII undertaken by the government for the development remained unachieved. This phenomenon motivated the researchers to select the ICT regarding topic as an important research area for the organizational research for NAPE.

Moreover, in its' past time, no specific study had been conducted to examine how ICT hardware and software has been used or the monitoring and evaluation mechanism at schools level. Therefore, to check the implementation of ICT equipment is an important research areas for NAPE research faculty. Such situation justifies an inquiry concerning the use of ICT and its pedagogical implications to unearth the actual potential research issue for NAPE 2016-17 fiscal year.

1.5. Significance of the study

Bangladesh, a developing country with a high density of population, aspires to develop through the use of human resources. To build quality human resources, it is essential to have in place a quality education system. This system should allow use modern technology to all children irrespective of their socio – economic background.

Given that no significant empirical research has so far been conducted to explore and understand the nature of problems use ICT in primary education in Bangladesh, the aim of this study is to explore the situation and current adopting of ICT implementation at schools. This research study has both explorative and evaluative purposes. Moreover, the researcher will recommend policies that will contribute towards improving ICT implementation in primary education.

1.6. Limitations of the study

Considering primary education in a developing country like Bangladesh and its societal and economic impacts, it is a challenge to cover all aspects related to research issues of this research project. Since the research was confined to a few selected schools it was not possible to compare the broader societal context that shapes the lives of children and their

families. It is also difficult due to the available research timeframe to collect possible important data with all types of target groups.

1.7. The context: Some key considerations

1.7.1. ICT in Education

ICT is Information and Communication Technology. "ICT in Education" means "Teaching and Learning with ICT. Worldwide research has shown that ICT can lead to improved student learning and better teaching methods.

1.7.2. Digital Content

Digital content is any content that exists in the form of digital data. Also known as digital media, digital content is stored on digital or analog storage in specific formats. Forms of digital content include information that is digitally broadcast, streamed, or contained in computer files. Viewed narrowly, digital content includes popular media types, while a broader approach considers any type of digital information (e. g. digitally updated weather forecasts, GPS maps, and so on) as digital content.

1.7.3. Access to Information (a2i)

a2i is the Prime Minister's Office of the government's public service innovation program in Bangladesh. This cell services the whole-of-government approach applying behaviour change procedures and leveraging the rapid expansion of technologies to temporary extraordinary transformations that are taking public services to citizens' doorsteps and increasingly within the awards of their hands – the promise of a Digital Bangladesh.

CHAPTER 2: REVIEW OF LITERATURE

2.1. Introduction

It is of critical importance to review existing literature on ICT implementation at primary schools to increase knowledge and understanding of practices while comparing local practices to global practices. Review of existing literature reveals a range of theoretical perspectives and practices that are relevant to this study. This review of literature has also enabled the researchers to understand different approaches of ICT implementation in primary education with special focus on teachers' training and skill in the global context. In the following part of this chapter. This study will discuss the situation of the impact of globalization and development processes on ICT in education and challenging areas for proper incorporation with pedagogical system.

2.2. Global development in primary education

Before World War II (WWII), mostly elite people in Asian countries had the opportunity to attain education (Anuar & Krzys, 1987, p25). After WWII, however, waves of decolonization started to reach the shores of many colonized states across the globe bringing with them the scent of liberty. This bit of history is strongly relevant to universal educational development all over the world. It was this time when most countries adopted an important political agenda of universal primary education (Anuar & Krzys, 1987, p25). This was also the time when the Intellectual Property (IP) framework started to get advertised internationally through media, including issues of teaching techniques with advanced technology for development of children's education. It however, that still remains an issue requiring more attention by educationalists.

UNESCO reports that technology is an important education multiplier (Nielsen 2015). It is also important for the level of integration of technology with teaching learning methods.

Many educationalists have conceptualized the use of ICT in education various ways. For example, research indicates that children keep hold of 20 per cent of what they hear, 40 per cent of what they see and hear and 75 per cent of what they see and do (Kumar and Pasricha 2014). Through the use of ICT in classrooms, the students get scope enjoy videos, audios, graphics, text, images; that's one of the key reasons why the latest educational technology has become essential to impart education (Kumar and Pasricha 2014).

2.3. Integration of ICT in developing countries

Developing countries, most of which had been under foreign domination for some time, face many obstacles in their efforts towards development. For example, when the Renaissance was spreading new ideas and techniques for modernization all over the world, the whole Indian region, including Bangladesh, remained colonized under British rule. Most of the colonized countries neither had any democracy, nor did they have any opportunity to devise social policies to suit their own aspirations.

Although using ICT in an education system is a desirable goal for any society, it has been proved to be quite difficult to achieve. As many academics have argued, educational technology is almost rhetorical and difficult to achieve in practice. This is particularly true in the case of developing countries where implementation of ICT at school levels is still a formidable challenge.

According to Khan, Hasan, and Clement (2012), recently, ICT has conveyed to be an effective educational technology which supports some rapid development in teaching and learning practices. Technologies help students to work more effectively than in the past (Keengwe, et al. 2008).

2.4. Development of primary education in Bangladesh

The present education system of Bangladesh is broadly divided into three major stages: primary, secondary and higher education. The primary education sector is the biggest national enterprise with more than 20 million students attending 78,126 educational institutions served by more than 320,000 teachers (Ministry of Primary and Mass Education 2014). Currently, six years of free primary education has been made compulsory for all children including one year pre-primary education. Most children study in government primary schools especially in rural and remote areas. In urban areas, however, a large portion of children is enrolled in private schools and high schools attached to primary schools. Besides this, English medium, religious education (Madrasah), and non-formal education delivered by Non-Government Organization (NGO)'s for children exist in the country. Generally, 5+ to 10+ age groups of children are studying in the primary schools.

In recent years, the primary education sector has made commendable progress in increasing gross enrolment, excluding some disadvantaged groups of children. This success in quantitative expansion is a result of various government programs. As regards quality of primary education, however, various survey findings provide a discouraging scenario indicating that the quality of primary education is not up to the standard. This,

understandably, has made the government and the donor agencies concerned take steps to reverse the trend through development programs.

As a developing country, Bangladesh has different sector-wise development programs. Since 1997, the Primary education sector has adopted some programs, for instance, the First Primary Education Development Programme (PEDPI) for six years (1997- 2003). The duration of the Second Primary Education Development Programme (PEDPII) was for seven years from 2004 until 2011. Ongoing, the Third Primary Education Development Programme (PEDPIII) has been operating since 2012 and targets to continue its operation until 2016. The main funding authorities of the PEDPs are various development partners and the Bangladesh government. In order to implement the program, the government and development partners have agreed to introduce the principle of sector-wise approach to achieve excellent primary education in future (Directorate of Primary Education, 2011b).

For quality primary education is strongly related to proper school curriculum, teaching materials and competent class teachers in this sector. First of all, the Primary education sector introduced a competency-based curriculum in 1992 and the last revision was made in 2010. The curriculum has specified grade-wise and subject-wise learning outcomes and terminal competencies. Based on curriculum, the National Curriculum and Textbook Board (NCTB) has been producing and distributing textbooks for more than a decade. A single set of approved textbooks by subject and class is published centrally by the NCTB. These textbooks are delivered by NCTB without cost to the students at the beginning of every new year, which is the beginning of the academic year in Bangladesh (Directorate of Primary Education, 2011b).

The Government of Bangladesh has made it compulsory for every primary school teacher to participate in the long term professional development either one-and-a-half-year long Diploma in Primary Education (DPEd) or Certificate in Education (C-in-Ed) programs. This is a professional development course which every teacher has to enroll in and successfully complete within two years after recruitment. Most districts have a Primary Teachers Training Institute (PTI) and every year many newly recruited teachers are enrolled in programs offered at those institutes. Besides this, Upazila Education Office (UEO) and Upazila Resource Centre (URC) arrange short-term professional development courses for school teachers. So far, there is a professional development designed especially for school teachers.

2.5. Integration of ICT in primary education in Bangladesh

At the beginning of 2010s, Bangladesh declared its commitment for establishing developed

ICT-driven governance in all sectors with the slogan of 'Digital Bangladesh', (Hasan 2014). The education sector is one of most important sector where implementing of ICT is essential. As Wang (2008) reported that effective integration of ICT into teaching and learning is becoming an essential competency for teachers.

ICT has the possible ways of developing educational system but developing countries are far from obtaining these welfares because of certain barriers (Hasan and Clement 2012). In an educational context, pedagogy often refers to the teaching strategies, techniques or approaches that teachers use to deliver instruction or facilitate learning (Wang 2008). Hasan (2014) concludes that ICT endeavours require more close supervision and effective coordination across the agencies to establish full-fledged ICT-driven governance in Bangladesh.

CHAPTER 3: METHODOLOGY

3.1. Introduction

This study has considered positivist and survey method approach. It seemed appropriate because of the complexity of issues that are related to understanding the perspectives of how the trained teachers are using their training skills and discovering the challenges of implementing ICT training at school level. The research methodology and justification draw on survey methods for data collection as well as random sampling and selection procedures. The research process is discussed to show how the researchers explored the study area.

3.2. Conceptual framework for conducting the study

In this study, the researchers adopted a conceptual framework drawing on a critical pattern of research based on an understanding that the nature of reality is created from multiple viewpoints, functioning within the status of ICT implementation at schools level. Within this pattern, events are understood at the level of implementation of ICT at study schools.

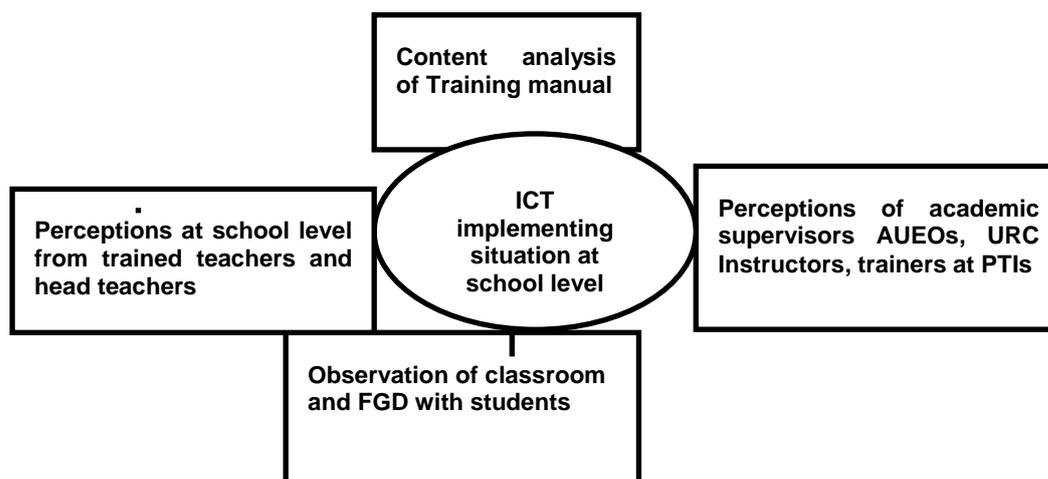


Figure 3.1: Conceptual framework for conducting the study

In this study, knowledge is constructed through observing and sharing of interactions, attitudes and practices at the selected schools. The researchers also explored the process of unlocking their own thinking. It was interesting to observe how the researcher's thinking adopting a flexible approach. In the study, the context and holistic features of participants' experiences are captured by concentrating on interpretations and procedures. Moreover, the researchers analyzed school management roles in favour of implementing ICT in classrooms.

3.3. Research design and method

Survey method is a quantitative research design aimed at exploring of events and situations. The researchers have been inspired by the advantages of survey methods to use the principles of method. They applied a range of techniques e.g. non-participant observation, interview, Focus group discussion and document collection. The use of multiple methods and involvement of participants allows for triangulation to add rigor, breadth and depth. There are two important reasons as indicated by Miles and Huberman (1984, p151) that support triangulation analysis: to enhance the generalizability, and expansion of understanding and explanation for research reporting.

3.3.1. Non-participant classroom observations

The purpose of non-participation observation was to watch how the class teacher and students behaved and related with each other in their natural setting. The researchers followed an observation protocol in this research. In this case, the protocols are: they did not participate in or manipulate the situation or rearrange the setting particularly ICT equipment setting and operating or classroom presentation. They observed the natural settings and the context, uninterrupted. They sat behind students in the class taking detailed notes on their observations.

3.3.2. Semi-structured Interviews and questionnaire

Semi-structured interviews involve subjective responses with objective responses. Therefore, for the semi-structured interviews, I had prepared some questions (Appendix I). Recently, educational researchers have shown an increased interest in semi-structured or unstructured interview, as the entire purpose is to develop more in-depth understanding of the societal condition (Myers & Newman, 2007). There were semi-structured interviews with class teachers who already got ICT training from department, and head teachers of researching schools. Questionnaires were conducted with academic supervisors (AUEOs and URC Instructors) and ICT trainers (PTI Instructors) in the study.

3.3.3. Focus group discussion (FGD)

The focus group discussion was an organized group discussion with participants drawn from the students from observed ICT classrooms. I facilitated the focus group discussion and in this discussion, researchers came up with a set of instructional issues on how frequently they use ICT equipment in their classrooms. They asked the participant students to respond to the issues by using relevant key questions (Appendix II).

They took care to select a quiet place for focus group discussions. The researchers set up ground rules for discussion. For example, all informants would talk in turn and no one should interrupt others. They also wrote some observation points after finishing the FGD.

3.3.4. Document analysis

Before visiting the research area, the researchers collected training manual for ICT training in Education from PTIs and analyzed it. That was helpful for selection of subject matter of data collection areas.

3.4. Tools of research

- Observation schedule: Guided through semi-structure observation schedule.
- Semi-structure of interview schedule :Mixture of close and open questions
- Questionnaire : Mixture of close and open questions
- FGD : Guided through pre-plan guideline
- Document collection : Training papers

3.5. Schools and participants selection

There are eight divisions in Bangladesh. In order to comply with research methods, it was considered representation of all the country. Under random sampling principle, eight districts were selected from eight divisions. In the same way, through purposive sampling, two upazilas were selected from selected districts due to researchers' accommodation, transport and communication.

The schools for the study were selected with the help of the relevant UEO from selected upazilas considering schools, which got the ICT equipment and also had ICT trained teachers would be the criteria for selection. At the same time, it was considered that one urban school and another would be rural school.

3.5.1. Selection of the schools

At the beginning of my fieldwork, researchers went to Upazila Education Office and had a meeting with the Upazila Education Officer (UEO).The researchers provided him Information sheet and my departmental permission. With the help of an AUEO, researchers made a list of schools where ICT equipment were available. According to the list of schools, under stratified random sampling principle, two schools were selected from that upazila that is one urban and one rural. There were 32 Government Primary Schools in all over Bangladesh were selected for this study. Table 4.1 shows that Schools were suitable for the conduct of the field study.

3.5.2. Selection of research participants

Students, trained class teachers, head teachers, AUEOs, URC Instructors and PTI Instructors were participants in this study.

3.5.2.1. Selection of students, trained class teachers and head teachers

During non-participant classroom observations researchers did not apply any selection procedure for selecting the students in the classrooms; rather they considered all students in those classrooms and their ICT trained class teachers as target participants for this research project. They used a purposive sampling technique for selecting class teachers for interview. Semi-structured interviews were held with those class teachers who were the ICT trained teachers from selected schools. The researchers undertook non-participant observations in those classes taught by those ICT trained teachers.

Towards the end of the lesson researchers selected about 6 students in each school, again according to convenience sampling from those whose consent had been already secured. They selected 6 students from observed classrooms including 3 girl students and 3 boy students. The head teachers of the selected research schools indicated willingness to be research participants for interviews in the study.

3.5.2.2. Selection of AUEO, URC Instructors and PTI Instructors

AUEO who supervised at the study schools consented to be interviewed. For selecting the participants, researchers considered how they have been involved with ICT trained teachers at school. The researchers communicated with him over telephone for setting an interview.

Every URC Instructor was selected on the basis of posting research upazila. In the same way, researchers selected a number of PTI Instructors who were directly worked as trainers at the ICT in education training in PTIs.

3.6. Data collection

Data of this research were collected from 01 April, 2017 to 05 May 2017. The numbers of the data collectors were in total 16 faculty members from NAPE and they are very much skilled in doing this. Moreover, they were given a daylong training to understand the main theme of the research so that they can collect the qualitative data properly. Each data collector went to two schools, made a very good professional relationship with the teachers and the students and then started the work. Thus, they collected the other data from PTIs, URCs and Upazila Education Offices.

Table 3.1. Participants in this study

Divisions	Districts	Upazilas	Schools		Total schools	Participants					
			Urban	Rural		Trainers	Head teachers	AUEO	URC Instructors	Trained teachers	Students
Rangpur	Gaibandha	2	2	2	4	1	4	4	2	4	24
Rajshahi	Serajgonj	2	2	2	4	1	4	2	1	4	24
Mymensingh	Jamalpur	2	2	2	4	3	4	4	2	3	24
Sylhet	Hobigonj	2	2	2	4	3	4	2	2	4	24
Dhaka	Gazipur	2	2	2	4	1	4	2	1	3	24
Khulna	Kushtia	2	2	2	4	4	4	4	2	4	24
Barisal	Patuakhali	2	2	2	4	2	4	3	2	4	24
Chittagong	Bandarban	2	2	2	4	2	4	3	2	4	24
Total	8	16	16	16	32	17	32	24	14	30	192

3.7. Data processing

Data processing was done by checking, editing and coding of the filled in questionnaires and checklists and observation notes. Then entry and scoring of answer script were done by researchers.

3.7.1. Checking, editing and coding

In order to do checking, editing and coding of the field data attention was given particularly to (i) checking identification (ID) number of each questionnaire (ii) checking inconsistency among the questionnaire (iii) coding the open-ended questions of each questionnaire and (iv) sample checking of the questionnaire by the research team members.

3.7.2. Data Entry and Cleaning

Data entry and cleaning was done by the research team. Data entry was done in excel programme. The research team was very much careful about the validity and reliability of the data and information. If there was something wrong they made it correct through discussion with the data collector.

3.8. Ethical considerations

To gain consent of the research participants in this study and to assure them of their rights, and consent forms were prepared and administered according to NAPE research guidelines and protocols.

Besides this, further ethical consideration was in regard to role of primary department as the insight researchers in this study. As researchers, they conducted focus group discussions

with some lower age participants in this study. Therefore, they paid careful attention to be aware of any potentially culturally sensitive, ethical issues which regard to child rights. As required, they informed participants that they were free to withdraw from the study at any time, for any reason.

CHAPTER 4: DATA PRESENTATION AND ANALYSIS

4.1. Introduction

The data analysis was done according to the objectives of the study. The collected data was converted into percentage and the result of the research was presented through different graphical picture like table, bar diagram, pie chart etc by using MS Excel and other software. Besides these all the data and information from different sources were critically checked if there is anything wrong. If it happened so, they tried to find out the real information through cross checking.

4.2. ICT in Education training for school teachers

Every participant (trained teachers) got 12 days for ICT in Education training at their nearest PTIs. This training was practical based and was held in a laboratory setting. Their trainers were PTI Instructors and sometimes URC Instructors. All the trainers had well developed TOT training under a2i supervisions.

4.3. Additional computer training of teachers and other participants

Primary education department arranges ICT in education only for school teachers but the department still did not arrange ICT training for academic supervisors such as AUEOs, URC Instructors. However, their ICT skill is also important for implementing ICT at school level. Including any additional computer training of school teachers, that is helpful for implementing ICT development at schools.

Table4.1: Additional Computer training of the respondents

Type of Respondents	Response Rate (%)		
	Yes	No	Place of training
Trained Teachers (ICT in Education training)	41	59	Jatio Mohila Songstha- HRDP REED Project TTC Youth Development Centre ASA (NGO)

The data of the above table revealed that 59 per cent respondents (Trained teachers) have

Computer related additional training. They received the training from the organization like Jatio Mohila Songstha, HRDP, REED Project (SCI), Teachers' Training College, Youth Development Centre and ASA (NGO).

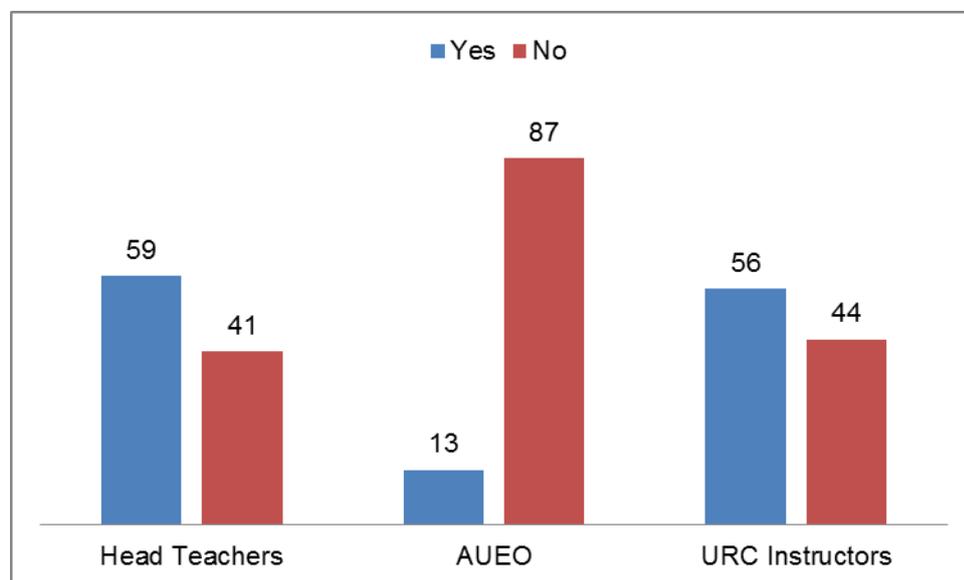


Figure 4.1: Computer Training for other Participants

Figure 4.1 shows that 59 per cent head teachers, 13 per cent AUEOs and 56 per cent URC instructors had computer related training. It is surprising result shows that AUEO is the most important academic supervisors but they had lowest percentage computer training.

4.4. ICT equipment distribution at schools level

Data were collected from 16 upazilas in all over Bangladesh. The researchers collected the information as to how many schools already got electricity connection, ICT equipment from these sample upazilas.

Instructors think that the number of schools with electricity connection is 75 per cent.

Table 4.2: Information about the schools without electricity connection

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
AUEO	83	17	-
URC Instructor	75	25	-

The researchers asked for this information from Assistant Upazila Education Officers

(AUEO) and Upazila Resource Centre Instructors. Table 4.2 shows that that the respondent AUEOs informed that there is electricity in 83 per cent schools and the respondent URC.

In the same way, table 4.3 shows that the total number of schools in sample upazilas is 2694. 818 schools already got ICT equipment that about 30 per cent of total schools in researching upazilas.

Table 4.3: Number of schools got ICT equipment in the sample upazilas

SN	Name of Upazila	Total schools	Schools got ICT materials	
			Number of schools	Percentage (%) schools
1	Polashbari, Gaibandha	213	38	18
2	Gaibandha Sadar	216	66	30
3	Kamarkhand, Sirajgonj	83	83	100
4	Sirajgonj Sadar	250	100	40
5	Melandaha, Jamalpur	159	147	92
6	Jamalpur Sadar	242	45	19
7	Baniachong, Hobigonj	268	62	23
8	Hobigonj Sadar	143	46	32
9	Mirpur, Kustia	143	22	15
10	KustiaSadar	151	38	25
11	Kalapara, Patuakhali	171	48	24
12	Patuakhali Sadar	206	42	20
13	Roangchari, Bandarban	45	02	5
14	Bandarban Sadar	76	18	5
15	Sripur, Gazipur	166	11	7
16	Gazipur Sadar	162	50	31
	Total	2694	818	30

The data of the table 4.4 displays the ICT facilities in different schools. It is shown in the table, that all the sample schools have electric connections.

Table 4.4: ICT equipment in research schools (32 GPS)

SN	The name of ICT materials	Quantity
2	Laptop/Desktop	01 in each school
3	Multimedia projector	01 in each school
4	Display Screen	01 in each school
5	Internet connection/modem	01 modem in each school

There is 01 laptop/desktop in each sample school except only 02 who are using their personal laptops. There is 01 multimedia in each school; however in one school it has been stolen. There is 01 display screen in each sample school except 07. There is 01 modem in each school except one school which is using its own modem. Besides the above equipment there are some other equipments like sound system, pen drive, CD, hand Mike.

Table 4.5: The satisfaction of participants' basis of ICT materials requirement

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	14	83	3
Head Teachers	74	26	-
AUEO	5	95	-
URC Instructor	40	60	-

The table 4.5 displays the stakeholders' level of satisfaction about the supplied ICT materials according to their schools' needs. Only 14 per cent trained teachers, 74 per cent head teachers, 5 per cent AUEOs and 40 per cent URC Instructors are satisfied with the supplied materials as their requirement. On the other hand, 83 per cent Trained teachers, 26 per cent head teachers, 95 per cent AUEOs and 60 per cent URC Instructors are not satisfied with that. It is also mentionable that 3 per cent trained teachers did not give any opinion on the issue.

Moreover, a number of trained teachers' comments of ICT materials are as follows:

- Laptop, multimedia projector, screen are needed.
- Money is needed for repairing the unusable equipments

AUEOs' comments on ICT materials are as follows:

- In most of the schools, supplied ICT equipment are out of order. In this situation it is needed to supply more than one set to every school.
- In some schools, multimedia was supplied but laptop and modem were not supplied, in some other schools laptop was supplied, but multimedia was not supplied. In this case both the materials are useless now.

Table 4.6: Availability of laptop and multimedia for use as their requirement time

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	71	29	-
Head Teachers	19	81	-
AUEO	33	67	-
URC Instructor	50	50	-

Availability of ICT equipments is very important for conducting digital classes. Table 4.6 is providing data about the availability of laptop and multimedia in the school when it is needed. 71 per cent trained teachers, 50 per cent URC instructors, 33 per cent AUEOs and 19 per cent head teachers informed that they got it when it was necessary. On the other hand, 81 per cent head teachers, 67 per cent AUEOs, 50 per cent URC instructors and 29 per cent trained teachers commented 'No'. According to the above data it is clear that ICT equipment was not always available when it was necessary.

The opinion of respondents on the cause of unavailability of the equipment:

- Shortage of equipment
- Sometimes URC borrow it for their training purpose
- UEO office also borrows it for its official purpose
- Sometimes it becomes out of order
- Teachers are not also skilled enough to handle it.
- There is no allotment for its repair, purchasing antivirus and internet expenditure.
- Load shading of electricity is another barrier for its smooth use.
- There is no ICT room in the school.
- ICT equipment is kept in the residence of head teacher, and it is not available for use when it is needed.

Table 4.7: ICT equipment was got the schools after completing the training

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	65	35	-

It is revealed from the information of the table 4.7 that 65 per cent trained teachers got ICT equipment immediately after completing the training and 35 per cent teachers did not get that.

Table 4.8: The period of ICT equipment was got the trained teachers

Type of Respondents	Response Rate (%)			
	Before receiving training	After just finishing training	Two months later	More than two months
Trained Teachers	27	27	26	20

It is evident from the table 4.8 that 27 per cent teachers received ICT equipment before

receiving the training and the same number of teachers got it just after receiving the training, 26 per cent teachers got it two months later and 20 per cent teachers got it more than two months later.

Table 4.9: The ratio of supplied ICT equipment to fulfil the needs

Type of Respondents	Response Rate (%)		
	Sufficient	Not sufficient	Not Respond
Head teachers	12	88	-
AUEOs	5	95	-
URC Instructors	44	66	-

In response to the question whether the supplied ICT equipment to fulfil the stakeholders' needs 88 per cent head teachers, 95 per cent AUEOs and 66 per cent URC Instructors informed that it is not sufficient to fulfil their needs.

The arguments of the respondents in favour of their comments about the supplied ICT equipment are:

- It is insufficient in consideration of demand (quantity of class)
- Four trained teachers but only one set ICT of equipment is not sufficient
- Either Laptop or projector is supplied but a full set is needed.
- For want of proper service most of the time the supplied equipment remains out of order.

Table 4.10: The satisfaction about the supplied ICT equipment by the respondents

Type of Respondents	Response Rate (%)		
	Yes	No	Not Responded
HT	74	26	
AUEO	33	67	-
URC Instructor	50	50	-

The data of the above table displays that 74 per cent head teachers, 33 per cent AUEOs and 50 per cent URC instructors are satisfied about the supplied ICT equipment. On the other hand 26 per cent head teachers, 67 per cent AUEOs and 50 per cent URC instructors are not satisfied about that.

The opinions on behalf of dis-satisfaction about the supplied ICT equipment are:

- Laptop is out of order for a long time
- Multimedia is out of order
- Cannot use the projector because there is no laptop supplied in this school.

- Cannot present digital class because the projector is not supplied.

Some schools did not get any ICT equipment till now. When the teachers were asked about physical infrastructure of their school building they commented that the school building is old. They added that it is not ICT friendly and it is not secured enough to keep the materials over there.

4.5. Teachers' self-assessment about their ICT skills

The information from one's self-assessment is very important to get a real idea about his/her ability for performing something. Teachers were provided ICT training in different times in different phases, but the ICT equipment were not supplied immediately after they received the training. Some teachers got the equipment after a very long time. So they could not get the opportunity of doing practice the knowledge and skills they learnt from the training. Moreover many teachers did not have any idea on ICT before receiving the training. So, they needed more and more practice, otherwise they might forget many things. In this situation it was an important issue to know the trained teachers self-assessment about their present level of expertise on the training they received.

Table 4.11: Trained teachers' self-assessment about their present skill on ICT

Serial no	Area	Unskilled (%)	Moderate skilled (%)	Skilled (%)	Highly Skilled (%)
1	Skill of computer operating of trained teachers	04	28	54	14
2	Skill of multimedia projector setting by trained teachers	0	35	48	17
3	Skill of using power point of trained teachers	11	48	30	11
4	Typing skill of trained teachers using Bangla font	0	39	50	11
5	Typing skill of trained teachers using English font	10	29	51	10
6	Teachers skills of downloading necessary software for preparing digital content	18	57	18	7
7	Teachers skills of attaching audio file and movie clip by using internet	48	38	6	6
8	Skill of operating a-tube catcher for movie cutting or adding movie by trained teachers	52	31	10	7
9	Skill of operating converting file by using a tube catcher	65	23	7	5
10	Skill of opening email account by using Gmail	37	46	14	7
11	Skill of opening account in 'Shikhak Batayan' and using it	39	39	18	4
12	To transfer pictures/image from digital camera to computer/laptop	32	28	34	6
13	To solve any problem related to changing MS word version	57	32	7	4

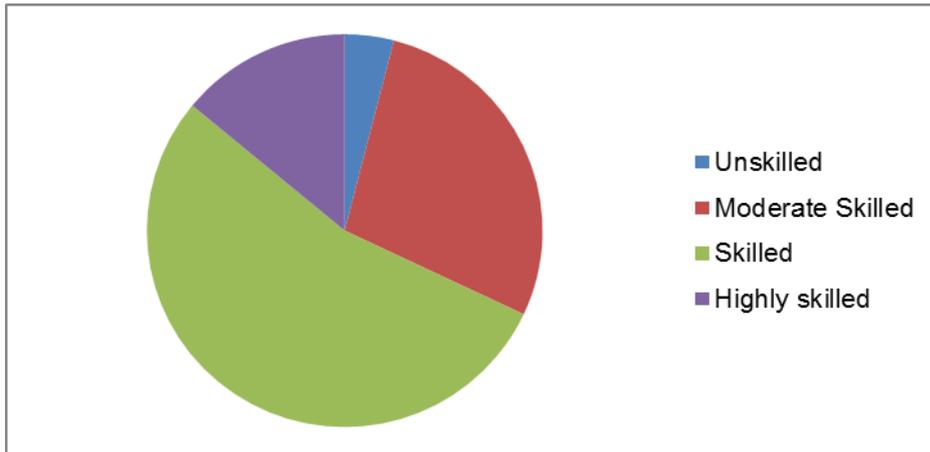


Figure 4.2: Skill of computer operating of trained teachers

In response to the question of how much they can remember from their training content the trained teachers opined that in average they can remember 62% from their training. According to the respondent teachers the cause of forgetting the other training information is as follows:

- Long duration of time for the training received.
- Could not learn properly during training period.
- Want of practice.
- Laptop is not available for practice.
- ICT equipment is out of order.
- They do not get necessary help from others etc.

The data of the table 4.11 shows the respondent teachers' self-assessment about their present skills in ICT related different activities.

- Among the respondent teachers the highest 54 per cent think that they are skilled in computer operating. However the classroom observation data shows that 42 per cent teachers are skilled, 47 per cent are moderate skilled and only 3 per cent teachers are not skilled in computer operating.
- The highest 48 per cent teachers think that they are skilled in multimedia projector setting and at the same time no respondents think that they are non-skilled. However it is revealed from the classroom observation data that 58 per cent teachers are skilled, 27 per cent are moderately skilled and there are no non-skilled teachers in doing this activities.

- In response to the question of skills of using power point of trained teachers the highest 48 per cent respondent teachers opined that they are moderate skilled however it is revealed from the observation data that 42 per cent teachers are skilled and 46 per cent are moderately skilled. Even 4 per cent are non-skilled in doing this.
- The highest 50 per cent respondent teachers think that they are skilled in 'Typing' by using Bangla font and nobody thinks that s/he is non-skilled but the observation data proves that most of the teachers (64 per cent) are moderate skilled in doing this, while there are 4 per cent non-skilled teachers in doing this.
- 51 per cent respondent teachers informed that they are skilled in typing by using English font but the observation data shows that only 38 per cent teachers are skilled, 42 per cent are moderately skilled and 4 per cent are non-skilled.
- Among the respondents 57 per cent thinks that they are moderately skilled in downloading necessary software for preparing digital content. It is shown from the observation data that only 20 per cent teachers are skilled and 32 per cent teachers are non-skilled in doing this.
- 48 per cent respondent teachers opined that they are unskilled in attaching audio file and movie clip by using the internet.
- 52 per cent respondent teachers informed that they are unskilled in operating a-tube catcher for movie cutting or adding movie. On the other hand it is observed that the highest 60 per cent teachers are non-skilled in doing this and only 12 per cent teachers are skilled in doing this.
- Among the respondents 65 per cent stated that they are unskilled in converting file.
- 46 per cent respondents opined that they are moderate skilled of opening email account by using Gmail and on the other hand 37 per cent teachers are unskilled in doing this.
- 39 per cent teachers responded that they are unskilled of opening account in 'Shikhak Batayon' and using it. On the other hand 4 per cent teachers opined that they are highly skilled in doing that.
- 34 per cent respondent teachers opined that they are skilled in transferring pictures/images from digital camera to computer/laptop and on the other hand 32 per cent respondents are unskilled in doing that.
- 57 per cent respondents informed that they are unskilled in solving any problems related to changing MS word version and only 4 per cent are highly skilled in doing that.

4.6. Level of using training skills at school by trained teachers

The effectiveness of any training is dependent on its use. The goal of the training will never be achieved if the teachers only receive the training and do not use it in their classroom. ICT training is a complete package for the teachers. It is expected that the teachers will receive the training properly and use it in their classroom cordially. For this the government will provide necessary support including supplying ICT materials, infrastructural development, proper monitoring and mentoring. If it happens, the objectives of the training will be achieved and the quality of teaching learning will be ensured. On the other hand, if there are gaps anywhere, the objectives will never be achieved. Basically the use of training is dependent on the teachers' awareness, sincerity and the opportunities of using it. Thus it is very important to visit how much the teachers are using their training skill, the opportunities and the barriers of using it. This section will find out the answers of the above questions.

Table 4.12: Observation of trained teachers' skill in their classrooms (%)

Names of instruments	Skills	
	Done by own self (%)	Done by assistance of others (%)
Computer / laptop	88	12
Multimedia projector	73	27
Connection between computer and projector	69	31

The data of the table 4.12 shows the instrument operating skills by the ICT trained teachers in using their classrooms. Among the respondent teachers 88 per cent can operate laptop, 73 per cent can operate multimedia projector and 69 per cent teachers can set the connections between the laptop and the multimedia.

Table 4.13: The preparation of digital content based lesson plan by trained teachers

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained teachers	79	21	-

The data of the table 4.13 provides the information that 79 per cent trained teachers prepare digital content based lesson plan for using in their classrooms.

The data of the table 4.14 displays that during January to May, 2017 the respondent teachers used average 23 digital contents. Among the total used items, on an average 15

were prepared by the teachers themselves and the other 8 digital contents (average) were collected from different sources. They emphasised English, Mathematics and Primary Science subjects for preparing digital content based lesson plan.

Table 4.14: subject based digital content preparation by the trained teachers

SN	Subject	Quantity (Average)	Source		Duration
			Prepare themselves	Collection	
1	Bangla	15	12	3	January to June,17
2	English	35	23	12	January to June,17
3	Maths	31	20	11	January to June,17
4	Primary Science	30	19	11	January to June,17
5	BGS	21	14	07	January to June,17
6	Religion	04	02	02	January to June,17
	Average:	23	15	8	

However, the data from students in those schools present no satisfactory situation. The figure 4.3 provides the information that in the highest 46 per cent sample schools one ICT sessions were held per week, and on the other hand, in 32 per cent schools ICT sessions were never held. Only 8 per cent schools held ICT-base sessions at least one session on every school day.

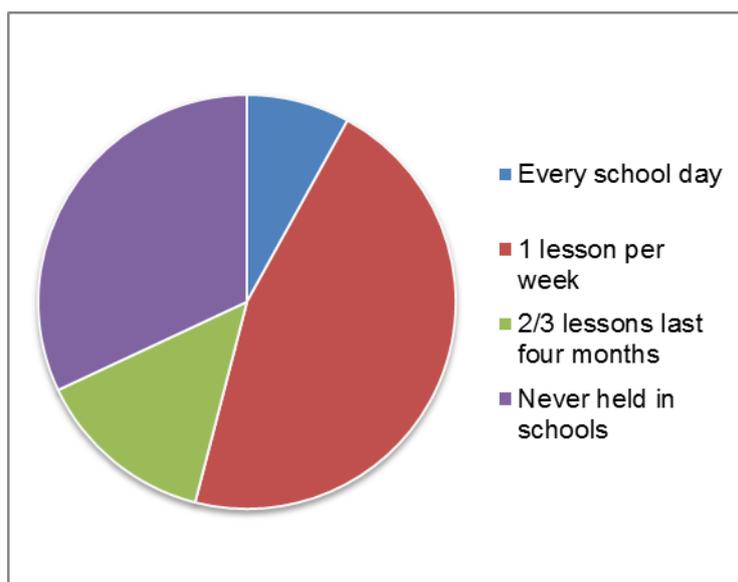


Figure 4.3: ICT based lessons held in research schools

Similarly, information were collected from head teachers, AUEOs and URC Instructors.

Table 4.15: Monitoring the digital classroom by the supervisors

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Head Teachers	41	19	40
AUEO	74	24	2
URC Instructor	62	38	-

The data of the table 4.15 displays the scenario about monitoring the digital classroom by the supervisors. In response to the question whether the supervisors monitor the digital class, the highest 74 per cent AUEOs, 60 per cent URC Instructors and 41 per cent Head teachers responded 'Yes'. On the other hand the highest 38 per cent URC instructors responded 'No'. It is also remarkable that 40 per cent head teachers did not respond to this question.

Table 4.16: Training for monitoring the digital classrooms at schools

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Head Teachers	-	100	-
AUEO	6	94	-
URC Instructor	50	50	-

The data of the above table provide the information that any HT did not get training for visiting digital classroom while 94 per cent AUEO and only 50 per cent URC instructors provided the same information, but it is interesting to note that there was no separate training was arranged for this. It however, some relevant topics might be incorporated with other training they received yet.

It is very interesting that there was no training held on for visiting the digital class. When the respondents were asked how they visited multimedia based classroom teaching learning without training, their response is stated below according to priority:

The responses from the head teachers are:

- Providing help during preparation of lesson plan.
- Observing lessons.
- Discussing in the staff meeting.

The response from the AUEO and the URC Instructors are:

- Sharing with the teachers about their lesson during visiting the school.
- Applying the skills of other training.
- Studying ICT training manual.
- From their own ideas.

By taking ideas from the skilled teachers

When the trained teachers were asked if they faced any problem in typing in English keyboard, the answers were:

- The key board does not work properly
- I cannot do practice as I did not get any laptop.

In response to the answer of the question: It do they solve their problems, the teachers responded as follows:

- Take help from the colleague
- Take help from the training manual

Table 4.17: Collecting digital teaching image from the internet by the trained teachers

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	78	22	-
AUEO	83	17	
URC Instructor	69	31	-

The above data of the table revealed that 78 per cent teachers collect teaching image from the internet. On the other hand 83% AUEOs supported the information and 31 per cent URC Instructors disagreed with this information.

When the teachers were asked about the cause of not collecting digital teaching aid from the

internet they argued that they-

- don't have any internet facilities
- don't know the use of internet

Some others commented that they forgot the use of internet for want of practice

Table 4.18: Rate of account opened by the trained teachers in 'Shikhak Batayon'

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	48	52	-

The data of the above table show that 48 per cent ICT trained teachers informed that they opened account in 'Shikhak Batayan'. On the other hand, 52 per cent teachers did not do that.

When the teachers were asked the cause of not opening the account in 'Shikhak Batayon' they argued that,

- They have want of internet facilities
- Some said about the want of ICT equipment
- Some others opined that they have want of sufficient skills.

On the other hand the teachers who opened accounts in 'Shikhak Batayon' they argued that the causes of opening the account are:

- For collecting digital content from the internet.
- For maintaining communication with others
- Some others argued that the cause is updating themselves.

Table 4.19: The downloading digital content by the teachers from Shikhak Batayon

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	28	72	-
Head teacher	67	33	-
AUEO	60	40	-
URC Instructor	68	32	-

The data of the above table display that 28 per cent trained teachers download digital contents from the Shikhak Batayon. Among the supervisors 67 per cent HT, 60 per cent AUEOs and 68% URC Instructors supported the information. On the other hand, 72 per cent teachers respond that they do not download digital contents from the Shikhak Batayon.

In this connection, when the respondent supervisors were asked to mention the name of some teachers who download contents from the above mentioned website 'Shikhak Batayon' they mentioned the some names of the teachers from their supervised schools. The supervisors were asked about the quantity of the contents downloaded by the teachers, they also mentioned the name of some teachers who have downloaded on an average 12 lessons.

They downloaded the contents from the internet are:

- Subject based contents (Bangla, English, Maths, BGS, Primary science)
- Math (class one and two)

Table 4. 20: Uploading ICT content from 'Shikhak Batayon' by the teachers

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	24	76	-
AUEO	68	32	-
URC Instructor	60	40	-

It is revealed from the data of the table 4.20 that 24 per cent teachers uploaded digital content into Shikhak Batayon. It however the AUEOs opined that the number of such teachers is 68 per cent and URC instructors think that the number of the teachers is 60 per cent.

Table 4.21: Trained teachers' followed supervisors' Instruction and plan

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	74	26	-
AUEOs	75	25	-
URC Instructors	56	44	-

According to the URC instructors the teachers downloaded 33 on an average. According to AUEO the teachers uploaded 7 contents on an average, and at the same time the teachers mentioned that they uploaded 5 contents on an average.

The data of the table 4.21 display that 74 per cent teachers, 75 per cent AUEOs and the 56 per cent URC instructors had plans for using the trained teachers' ICT training skills. Academic supervisors had orally instructed their ICT trained teachers.

The plan taken by the teachers are as follows:

- A teacher mentioned that he has a plan to conduct a multimedia based class in every week.
- I shall practice at least one multimedia based class daily from now.
- I will practice a lot and apply in the class.
- I will personally make an internet connection in my residence for being enriched in ICT.
- The Plan of URC Instructors:
 - Day long training for the teachers after every three months.
 - Will discuss the matter in monthly coordination meeting.
 - Will merge the ICT training with different training made by URC.
 - Will set the target for the teachers to present 5 classes through power point in every week.
 - Will monitor the matter regularly.

The Plan of AUEO:

- Will train the weaker user teachers by the advanced teachers.
- Will arrange ICT related refresher training in URC.
- Will arrange competition on Multimedia based class presentation in May 2017 in every year.

4.7. Challenges of implementing ICT training at school

There are a low of challenges and limitations were raised by respondents for properly implement ICT in education training at school level. First of all, getting and storing are important limitations of this programme.

Table 4.22: The place where the schools keep the ICT materials

Type of Response	Response Rate				
	Office room	Head Teachers' Residence	SMC chairman	ICT Trained teachers	Observation
HT	85	15	-	-	
AUEO	67	25	8	8	
URC	69	25	-	6	

The table 4.22 displays the information about the location where the teachers keep their ICT equipment. Most of the respondents (85 per cent HT, 67 per cent AUEOs and 69 per cent URC Instructors) informed that they keep it in the office room. The other places where they keep it is the head teachers' residence, SMC Chairman's' residence and ICT trained teachers' residence.

The researchers asked whether current storing system was secure or not. The table 4.23 informs that 89 per cent trained teachers, 82 per cent head teachers, 50 per cent AUEOs and 38 per cent URC Instructors think that the place where they keep the ICT materials were secure. On the other hand, 62 per cent AUEOs and 62 per cent URC Instructors thought that it was not secure. In this connection it is important to note that a laptop was stolen which was kept in a sample school.

Table 4.23: The ratio of security where ICT materials are kept

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	89	11	-
Head Teachers	82	22	-
AUEO	50	50	-
URC Instructor	38	62	-

In this connection the observers' comment is that in some schools the security is needed to increase. The data of the table 2.24 shows the level of user friendly for regular use of ICT equipment in consideration of where it is reserved. The highest 76 per cent trained teachers, 71 per cent AUEOs and 57 per cent URC instructors opined that it is moderately user-friendly.

Table 4.24: The level of user friendly of the equipment for regular use

Type of Response		Response Rate		
		Helpful	Moderate	Not Helpful
1	Teachers	12	76	12
2	Head Teachers	40	30	30
3	AUEO	08	71	21
4	URC Instructor	-	57	43

At the same time 12 per cent teachers, 40 per cent head teachers and 8 per cent AUEOs comment that it is helpful. On the other hand, 12 per cent teachers, 30 per cent head teachers, 21 per cent AUEOs and 43 per cent AUEOs think that it is not helpful for necessary use.

Table 4.25: Facing problems in preparing digital content by using power point

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	44	56	-

According to the data of the table 44 per cent teachers face problems in preparing digital content by using power point and on the other hand, 56 per cent teachers informed that they do not face problems.

When they were asked about the problems they face they mentioned some problems which are as follows:

- There was no practice in last two years because of in availability of laptop.
- Some others informed that they could not learn the contents properly during their ICT training.
- Some trained teacher comments, “I could not learn the ‘Animation’, motion path and this type of concepts properly. I am not also satisfied which the session delivery modality by the trainers”.

The respondents gave some suggestions to overcome this problem:

- Through visiting the training manual again and again.
- Some teachers said that they take help from their colleagues/
- Some trained teacher comments, “I share the problem with the computer instructor over mobile phone, besides this I also try to take help from the skilled ICT users around me”.

Table 4.26: The problems the respondents' feel in implementing the ICT training'

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	68	32	-
Head Teachers	85	15	-
AUEO	75	25	-
URC Instructor	78	22	-
Trainer	100	-	-

It is revealed from the data of above table that 68 per cent trained teachers, 85 per cent head teachers, 75 per cent AUEO, 78 per cent URC Instructor, 100 per cent trainers opined that they feel problems in implementing the ICT training.

The stakeholders' arguments on behalf of their opinion are as follows:

- All the teachers do not have training.
- ICT equipment is partially supplied in many schools
- Many teachers are not skilled enough to maintain properly specially internet.
- Many equipment are out of order. Sufficient money is not allotted to repair it.
- Some teachers are not sincere in implementing ICT training
- There is shortage of maintenance money.
- Many head teachers are not trained and they cannot do proper help to the teachers.
- Want of internet access.
- The length of training was not long enough to learn all the ideas properly.
- The classroom is not ICT user friendly.
- I cannot do practice for overload of work.
- Forgot many contents for want of practice.
- Want of proper cooperation from the authority.
- There is no refresher training held on.
- Internet speed is very slow.
- Have to conduct 7/8 sessions daily.
- Some teachers complain that they cannot get enough support from the head teachers.

The respondents' suggestions for solving the problems are mentioned below:

- Refresher training is essential
- Allocation is needed to buy and repair ICT equipment
- It is needed to build ICT friendly classroom.
- Filling up the vacant posts.
- To reduce classes from the teachers
- It is needed to provide laptops to all the teachers
- To ensure the full time supply of electricity and internet facilities
- Increasing the length of training by least one month.
- The teachers need to increase their sincerity.

Table 4.27: The level of co-operation from their colleagues and level of their satisfaction

Type of Respondents	Response Rate (%)			
	Ratio of co-operation from colleagues		Ratio of their satisfaction	
	Yes	No	Yes	No
Trained Teachers	78	22	69	31

The data of the table shows that 78 per cent trained teachers get co-operation from their colleagues. On the other hand, 22 per cent teachers do not get it. It is also revealed that 69 per cent teachers are satisfied with the help they get from the colleague and on the other hand 31 per cent teachers are not satisfied with that.

Table 4.28: The level of cooperation that trained teachers get from their colleagues

Very good	moderate	Do not get co-operation
17	57	26

The data of the table shows that 17 per cent head teachers opined that the trained teachers get very good help and 57 per cent head teachers think it is moderate help from their colleagues. On the other hand 26 per cent head teachers think that the teachers do not get help from their colleague on the ICT issue.

In response to the question about the possibility of making the lesson learner-centred by using ITC almost half of the teachers opined that it is possible to make the lesson 50 per cent learner-centred, Other one fifth teachers opined that it is possible to make the lesson 80

per cent learner centred, and the rest of teachers commented that it is possible to make the lesson fully learner-centred.

4.8. The impact of the training in teaching learning activities

According to the respondents the impact of ICT training on the teaching-learning environment in the classroom are as follows:

- It has a very positive impact on teaching learning.
- The learners get pleasure
- They grow attentive.
- The subject matter is clearer to the learner.
- The attendance is increased.
- The learning is more sustainable to the learner.
- The teacher get relaxed and get more time for other work.
- Instead of abstract things real things could be presented.
- The learners can use more organs to learn the lesson.

In response to the question of how much opportunity the teachers are getting for using Sikkhok Batayon, the respondents said this. *“It is helping the teachers to share ideas with each other. They can download good quality of content and use it in their class. Time is consumed. The teachers don’t need to do extra thinking.”*

The teachers were asked their opinion about role of ICT based teaching-learning for achieving the ‘Teacher’ competency’, they opined that it has increased the teachers’ professional development through practicing ICT.

4.9. Stakeholders’ Suggestions for improving ICT Training

It is revealed from the information of the table 4.29 that the highest 79 per cent head teachers and the same number of instructors, and 78 per cent trainers think that ICT manual is helpful enough for preparing digital content. On the other hand the highest 36 per cent trained teachers, 30 per cent AUEOs and 22 per cent trainers opined that the manual is not helpful enough for preparing digital content.

Table 4.29: Usefulness of ICT manual for preparing digital content

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	64	36	-
Head Teachers	79	21	-
AUEO	58	30	12
URC Instructor	79	21	
Trainer	78	22	

Those who opined that the ICT training manual is not helpful enough for preparing digital content were asked which other things are needed to include making it more effective, the dissatisfied teachers suggested to include the following:

- It is not helpful enough to many teachers as they shared with me, however I did not get enough time to visit in the manual.
- It is needed to present the matters very easily and elaborately as the teachers can understand it properly
- It is needed to include relevant pictures and videos with description
- It is needed to arrange demonstration sessions in PTIs.
- It is needed to include pre and post-tests with the training.

Table: 4.30: The effectiveness of the training preparing and using quality digital content

Type of Respondents	Response Rate (%)		
	Yes	No	Not Respond
Trained Teachers	17	83	
Head Teachers	44	56	

The data of the above table displays that most of the trained teachers (83 per cent) and the head teachers (56 per cent) think that ICT training is not effective enough to ensure preparing and using quality digital content.

In response to the question, 'What other things are needed to include' the respondents opined that it is needed to include more content on –

- Internet use
- Hard ware and software based problem solving
- Lesson related video

- More practice to be done by the trainee teachers
- To include more design on animation
- More practice the MS office programme
- Using of excel for preparing result sheet
- Session relevant picture

When the teachers were asked, if any content of the training is needed to reduced; all the teachers opined 'No'.

The stakeholders' suggestions for implementing ICT in education training:

- It is needed to provide ICT materials to everybody.
- It is needed to provide training to everybody
- To extend the duration of training.
- Refresher training is needed.
- It is needed to ensure electricity supply for full time.
- Infrastructural development is needed to improve.
- All the teachers should be provided ICT training
- It is needed to strengthening monitoring

4.10. The suggestions for establishing Digital Bangladesh in Education

- It is needed to ensure applying the training
- It is also needed to ensure proper help from the authority
- To ensure electric connection in all the schools and to ensure full time electric supply
- To ensure training for all the teachers. Training should be compulsory.
- To establish ICT lab in all the schools with full equipment
- To ensure supplying multimedia in every classes
- It is needed to strengthening monitoring
- To provide laptop, modem, pen-drive to all the schools
- Infrastructural development is needed to improve.
- To allot money for maintaining the equipment
- To arrange refresher training in every year.
- To ensure night guard in all the schools.
- To fill-up all the vacant posts
- It is needed to establish ICT based classroom.
- To ensure internet connection/modem in free of cost.
- It is very important to establish ICT repairing center in all the districts. It should have

a sub Centre in all the upazila.

- It is needed to include ICT text books in class three to class five.
- Teachers and the trainers need to share ideas with the neighboring countries.
- It is needed to enrich the ICT lab of PTIs.

CHAPTER 5: FINDINGS, DECISIONS AND RECOMMENDATIONS

5.1 Findings

The result of the study which was to find out through analyzing the data is presented below under five sub headlines according to the sequence.

5.1.1 Teachers' self-assessment about their present ICT skills

- On an average the trained teachers can remember 62 per cent from their training content. According to them the cause of forgetting the other training information is as follows:
 - Long period of time during which they received the training. Could not learn properly during training period. Want of practice. Laptop is not available for practice. ICT equipment is out of order. They do not get necessary help from others etc.
 - The highest 54 per cent respondent teachers think that they are skilled in computer operating. However the classroom observation data show that 42 per cent teachers are skilled, 47 per cent are moderately skilled and only 3 per cent teachers are not skilled in computer operating.
 - The highest 48 per cent teachers think that they are skilled in multimedia projector setting and on the same issue no respondents think that they are non-skilled. However it is revealed from the classroom observation data that 58 per cent teachers could successfully operate it and the observers commented the other 27 per cent are moderately skilled and there are no non-skilled teachers in doing this activities.
 - The highest 48 per cent respondent teachers opined that they are moderately skilled of using power point however it is revealed from the observation data that 42 per cent teachers are skilled and 46 per cent are moderately skilled. Even 4 per cent are non-skilled in doing this.
 - The highest 50 per cent respondent teachers think that they are skilled in 'Typing' by using Bangla font and nobody thinks that s/he is non-skilled but the observation data proves that most of the teachers (64 per cent) are moderately skilled in doing this, while there are also 4 per cent non-skilled teachers in doing this.
 - Among the respondent teachers 51 per cent informed that they are skilled in typing by using English font but the observation data shows that only 38 per cent teachers are skilled, 42 per cent are moderately skilled and 4 per cent are non-skilled in doing this.

- 57 per cent respondent teachers think that they are moderately skilled in downloading necessary software for preparing digital contents but it is shown from the observation data that only 20 per cent teachers could successfully do it and 32 per cent teachers are non-skilled in doing this.
- Amongst the respondent teachers 48 per cent opined that they are unskilled in attaching audio file and movie clip by using the internet.
- 52 per cent respondent teachers informed that they are unskilled in operating a-tube catcher for movie cutting or adding movie. On the other hand it is observed that the highest 60 per cent teachers are non-skilled in doing this and only 12 per cent teachers are skilled in doing this.
- Among the respondents 65 per cent are unskilled in converting file.
- Among the respondents 46 per cent trained teachers are moderately skilled in opening email account by using Gmail and on the other hand 37 per cent teachers are unskilled in doing this.
- According to the respondents 39 per cent teachers are unskilled in opening account in 'Shikhak Batayon' and using it. On the other hand only 4 per cent teachers opined that they are highly skilled in doing that.
- Only 34 per cent respondent teachers are skilled in transferring pictures/images from digital camera to computer/laptop and on the other hand 32 per cent respondents are unskilled in doing that.
- Among the respondent teachers 57 per cent are unskilled in solving any problems related to changing MS word version and only 4 per cent are highly skilled in doing that.
- From the observation it is proved that among the sample teachers 88 per cent can operate laptop, 73 per cent can operate multimedia projector and 69 per cent teachers can set the connections between the laptop and the multimedia.

5.1.2 How much the teachers are using their training skills

5.1.2.1 Using Digital Content

- Among the respondent teachers 79 per cent teachers prepare lesson plan by using digital content on the other hand 21 per cent teachers do not do that.
- Between January to May, 2017 the respondent teachers used average 23 digital contents. Among the total used items, average 15 were prepared by the teachers themselves and the other 8 digital contents (average) were collected from different sources.
- ICT sessions were held in the highest 46% sample schools between 1-2 per week, and on the other hand in 32% schools ICT sessions were never held in. It is also important to mention that in 7% sample schools there were at least one ICT session was held regularly.

5.1.2.2 Monitoring Digital Classroom

- The highest 74 per cent AUEOs, 60 per cent URC Instructors and 41 per cent Head teachers responded that the supervisors monitor the digital class. On the other hand the highest 38 per cent URC instructors responded the supervisors do not monitor the digital. It is also remarkable that 40 per cent head teachers did not respond to this question.
- There was no training held for visiting the digital class, however 6 per cent AUEO and 50 per cent URC Instructors got some ICT based training from the other source.
- When the respondents were asked how they visit multimedia based classroom teaching learning activities without training, their response is stated below according to priority:

The responses from the HT are:

- By providing help during preparation of lesson plan.
- Through observing lesson and personal experience.
- By discussing in the staff meeting.

The response from the AUEO and the URC Instructors are:

- Sharing with the teachers about their lesson during visiting the school.
- Applying the skills of other training.
- Through studying ICT training manual.
- From their own ideas.
- By taking ideas from the skilled teachers

5.1.2.3 The ways of solving of typing problems for trained teachers

When the trained teachers were asked if they face any problem in typing in English keyboard, the answers were:

- The key board does not work properly
- I cannot do practice as I did not get any laptop.

In response to the answer of the question 'how they solve their problems, the teachers respond as follows:

- Take help from the colleague
- Take help from the training manual

5.1.2.4 Collecting Teaching Aids, Uploading, Downloading Information

Among the respondent teachers 78 per cent informed that they collect teaching aids from the internet. On the other hand, 83 per cent AUEOs supported the information and 31 per cent URC Instructors disagreed with this information.

When the teachers were asked about the cause of not collecting digital teaching aids from the internet they argued that they-

- don't have any internet facilities
- don't know the use of internet
- Some others commented that they forgot the use of internet for want of practice

Opening account in 'Shikhak Batayan' by the trained teachers

Among the ICT trained teachers 48 Opened account in 'Shikhak Batayan' by the trained teachers. On the other hand, 52 per cent teachers did not do that. When the teachers were asked the cause of not opening the account in 'Shikhak Batayan' they argued that,

- They have want of internet facilities
- Some said about the want of ICT equipment
- Some others opined that they have want of sufficient skill.

On the other hand, the teachers who opened accounts in 'Shikhak Batayan' they argued that the causes of opening the account are:

- For collecting digital content from the internet.
- For maintaining communication with others
- Some others argued that the cause is updating them.

Only 28 per cent trained teachers could download digital contents from the Shikhak Batayan. Among the supervisors 67 per cent HT, 60 per cent AUEOs and 68 per cent URC Instructors supported the information.

When the respondent supervisors were asked to mention the name of some teachers who could download contents from the above mentioned website 'Shikhak Batayan' they mentioned the names of some teachers. The supervisors were asked about the quantity of the contents downloaded by the teachers, they also mentioned the name of some teachers. ,

The downloaded contents from the internet are:

- Subject Based Contents (Bangla, English, Maths, BGS, Primary Science)
- Math (class one and two)

Only 24 per cent teachers uploaded digital content into Shikhak Batayan. It however, the AUEOs opined that the number of such teachers is 68 per cent and URC instructors think that the number of the teachers is 60 per cent.

According to the URC instructor the teachers downloaded 33 digital contents on an average, according to AUEO the teachers uploaded 7 contents on an average, at the same time the teachers mentioned that they uploaded 5 contents on an average.

5.1.2.5 Planning for the use of the trained teachers' skills

Among the respondents 74 per cent teachers, 75 per cent AUEOs and the 56 per cent URC instructors have made plans for using the trained teachers' ICT in education training skills.

The plan taken by the teachers are as follows:

- A teacher mentioned that he has a plan to conduct a multimedia based class in every week.
- "I shall practice at least one multimedia based class daily from now".
- "I will practice a lot and apply in the class."
- "I will personally make an internet connection in my residence for being enriched in ICT".

The Plan of URC Instructors:

- Day long ICT training for the teachers at every three months interval.
- Will discuss the matter in monthly coordination meeting.
- Will merge the ICT training with different training made by URC.
- Will set the target for the teachers to present 5 classes in power point every week.
- Will monitor the matter regularly.

The Plan of AUEO:

- Will train the weaker user teachers by the advanced teachers.
- Will arrange ICT related refresher training in URC.
- Will arrange competition on Multimedia based class presentation on May 2017 every year.

5.1.3 The challenges of implementing ICT training

5.1.3.1 Situation of ICT facilities in different schools

- Among the trained teachers 65 per cent got ICT equipment immediately after completing the training and 35 per cent teachers did not get that.

- Among the respondent teachers 27 per cent received ICT equipment before receiving the training and the same number of teachers got it just after receiving the training, 26 per cent teachers got it two months later and the rest 20 per cent teachers got it more than two months later.

- In response to the question whether the supplied ICT equipment fulfil the stakeholders' needs 88 per cent head teachers, 95 per cent AUEO and 66 per cent URC Instructors informed that the supplied ICT equipment is not sufficient to fulfil their needs.

The arguments of the respondents on behalf of their comments about the supplied ICT equipment are:

- It is insufficient in consideration of demand (quantity of class)
- For trained teachers only one set of ICT equipment is not sufficient
- Either a laptop or projector is supplied but a full set is needed.
- For want of proper service most of the time the supplied equipment remains out of order.

- On the question of ICT facilities in different schools it is true that all the sample schools has the electric connections. There is 01 laptop/desktop in each sample schools except only 02 who are using their personal laptops. There are 01 multimedia in each school, however in one school it has been stolen. There is 01 display screen in each sample school except 07. There is 01 modem in each school except one school which is using its own modem. Besides the above equipments there are some other equipments like Sound system, Pen drive, CD, Hand Mike.

- In the question of satisfaction about the supplied materials only 14 per cent trained teachers, 74 per cent head teachers, 33 per cent AUEOs and 40 per cent URC instructors are satisfied about the supplied ICT equipment.

The opinions on behalf of dis-satisfaction about the supplied ICT equipment are:

- Sufficient equipment is not supplied to the schools.
- Laptop is out of order for long time but money was not supplied to repair that.
- Multimedia is out of order. Similarly money was not supplied to repair that.
- In some schools, multimedia is supplied but laptop and modem are not supplied, to some other schools laptop is supplied, but multimedia is not supplied. In this case both materials are useless.

Some schools did not get any ICT equipment till now. When the teachers were asked about their opinion about physical infrastructure of their school building they commented that the school building is old. They added that it is not ICT friendly and it is not secured enough to keep the materials over there.

6. The respondent AUEOs informed that there is electricity connection only in 83% schools and the respondent URC Instructors think that the number of schools with electricity connection is 75 per cent.

5.1.3.2 Preservation of ICT materials, security, user-friendly and availability

- Most of the respondents (85% HT, 67% AUEOs and 69% URC Instructors) informed that they keep the laptop and multimedia in the school office room. The other places where they keep it is the head teachers' residence, SMC Chairmans' residence and ICT trained teachers' residence.
- On the question of security 82 per cent head teachers, 50 per cent AUEOs and 38 per cent URC Instructors think that the place where they keep the ICT materials are secured and on the other hand 62 per cent AUEOs and 50 per cent AUEOs think that it is not secured. In this connection it is important to note that a laptop was stolen when it was kept in a sample school. In this connection the observers' comment is in some schools the security is needed to increase.
- On the question of user friendly for regular use of ICT equipment in consideration of where it is reserved the highest 76 per cent teachers, 71 per cent AUEOs and 57 per cent URC instructors opined that it is moderately user-friendly and in the same issue 12 per cent teachers, 40 per cent head teachers and 8 per cent AUEOs comment that it is helpful. On the other hand 12 per cent teachers, 30 per cent head teachers, 21 per cent AUEOs and 43 per cent AUEOs think that it is not helpful for necessary use.

- On the question of the availability of laptop and multimedia at school when it is needed 71 per cent trained teachers, 50 per cent URC instructors, 33 per cent AUEOs and 19 per cent head teachers informed that they get it when it is necessary. On the other hand 81 per cent head teachers, 67 per cent AUEOs, 50 per cent URC instructors and 29 per cent trained teachers commented 'No'. According to the above data it is clear that ICT equipment is not always available when it is necessary.

The causes of in availability of the equipment according to the respondents are:

- Shortage of equipment,
- Many times URC borrow it for their training purpose
- UEO office also borrow it for its official purpose.
- Sometimes it is out of order.
- Teachers are not also skilled enough to handle it.
- There is no allotment for its repair, purchasing antivirus and internet expenditure.
- Load shading of electricity is another barrier for its smooth use.
- There is no ICT room in the school.
- ICT equipment is kept in the residence of head teacher, and it is not available for use when it is needed.

5.1.3.3 Co-operation in using ICT equipments

- Most of the trained teachers (78 per cent) get co-operation from their colleagues in using ICT equipments. On the other hand 22 per cent teachers do not get it. It is also revealed that 69 per cent teachers are satisfied with the help they get from colleagues and on the other hand 31 per cent teachers are not satisfied with that.
- Among the respondents 17 per cent head teachers opined that the trained teachers get very good help and 57 per cent head teachers think it is moderately help from their colleagues. On the other hand 26 per cent head teachers think that the teachers do not get help from their colleague on the ICT issue.

5.1.3.4 The Challenges of implementing ICT training

.Among the respondent teachers 44 per cent face problems in preparing digital content by using power point and on the other hand, 56% teachers informed that they do not face problems. When they were asked about the problems they face they mentioned about some problems which is as follows:

- There was no practice in the last two years because of unavailability of laptop.
- Some others informed that they could not learn the contents properly during their training period.
- Some trained teacher comments, “I could not learn the ‘Animation’, motion path and this type of concepts properly. I am not also satisfied with the session delivery modality by the trainers”.

The respondents mentioned some ways they used to overcome this problem:

- Through visiting the training manual again and again.
- Some teachers said that they take help from their colleagues.
- Some trained teacher comments, “I share the problem with the computer instructor over mobile phone, besides this I also try to take help from the skilled ICT users around me”.

On the question of problems in implementing the ICT training 68 per cent trained teachers, 85 per cent head teachers, 75 per cent AUEO, 78 per cent URC Instructor, 100 per cent trainers opined that they feel problems in implementing the ICT training.

The stakeholders’ arguments on behalf of their opinion are as follows:

- ICT equipment is partially supplied to many schools
- Many teachers are not skilled enough use ICT properly specially internet using.
- Many equipments are out of order. Sufficient money is not allotted to repair it.
- Some teachers are not sincere in implementing ICT training
- There is shortage of maintenance money.
- Many head teachers are not trained and they cannot do proper help to the teachers.
- Want of internet access.
- The length of training were not long enough to learn all the ideas properly.
- The classroom is not ICT user friendly.
- Some teachers said that they do practice for overload of work.
- Many teachers said they forgot many contents for want of practice.
- There is no refresher training.
- Internet speed is very slow.
- Teachers have to conduct 7/8 sessions daily.
- Some teachers complain that they cannot get enough support from the head teachers and the authority.

In response to the question about the possibility of making the lesson learner centred by using ITC almost half of the teachers opined that it is possible to make the lesson 50 per

cent learner centred, Other one fifth teachers opined that it is possible to make the lesson 80 per cent learner-centred, and the rest of teachers commented that it is possible to make the lesson fully learner-centred.

5.1.4: The impact of the training in teaching learning activities

1. According to the respondents the impact of ICT training on the teaching-learning environment in the classroom are as follows:

- It has a very positive impact on teaching learning.
- The learners get pleasure
- They grow attentive.
- The subject matter is clearer to the learner.
- Attendance is increased.
- Learning is more sustainable to the learner.
- The teacher get relaxed and get more time for other work.
- Instead of abstract things real things could be presented.

In response to the question of how much the teachers are getting the opportunities of using Sikkhok Batayan, the respondents view is as follows: “It is helping the teachers to share ideas with each-other. They can download good quality of content and use it in their class. Time is consumed. The teachers don’t need to do extra thinking.” The teachers were asked about their opinion about role of ICT based teaching-learning for achieving the ‘Teacher’ competency’, they opined that it increased the teachers’ professional development through practicing ICT.

5.1.5: Limitation of ICT Training

The data of the above table displays that most of the trained teachers (83%) and the head teachers (56%) think that ICT training is not effective enough to ensure preparing and using quality digital content.

In response to the question, ‘What other things are needed to include’ the respondents opined that it is needed to include more content on –

- Internet use,
- Hard ware and software based problem solving
- Lesson related video
- More practice to be done by the trainee teachers

- To include more design on animation
- More practice of the MS office programme
- Using of excel for preparing result sheet
- Session relevant picture

When the teachers were asked if any content from the training manual is needed to be reduced all the teachers opined 'No'. In response to the question 'How much the information of ICT manual is helpful for preparing digital content the highest 79 per cent head teachers and the same number of instructors, and 78 per cent trainers think that ICT manual is helpful enough for preparing digital content. On the other hand, the highest 36 per cent trained teachers, 30 per cent AUEOs and 22 per cent trainers opined the manual is not helpful enough for preparing digital content.

5.2: Decisions

After discussing thoroughly the following decision can be taken:

5.2.1: Teachers' self-assessment about their present ICT skills

On an average the trained teachers can remember 62 per cent from their training content.

The cause of forgetting the training knowledge is:

- Long duration of time during which they received the training.
- Could not learn properly during training period.
- Want of practice.
- Laptop is not available for practice.
- ICT equipment is out of order.
- They do not get necessary help from others etc.
- The highest 54 per cent respondent teachers think that they are skilled in computer operating. However the classroom observation data shows that 42 per cent teachers are skilled.
- The highest 48 per cent teachers think that they are skilled in multimedia projector setting but 58 per cent teachers could successfully operate it and the other 27 per cent are moderately skilled in doing this.
- The highest 48 per cent respondent teachers opined that they are moderately skilled of using power point.
- The highest 50 per cent respondent teachers think that they are skilled in 'Typing' by using Bangla font.

- Among the respondent teachers 51 per cent informed that they are skilled in typing by using English font.
- 57 per cent respondent teachers think that they are moderately skilled in downloading necessary software for preparing digital contents.
- Amongst the respondent teachers 48 per cent opined that they are unskilled in attaching audio file and movie clip by using the internet.
- 52 per cent respondent teachers informed that they are unskilled in operating a-tube catcher for movie cutting or adding movie.
- Among the respondents 65 per cent are unskilled in converting file.
- 46 per cent trained teachers are moderate skilled in opening email account by using Gmail and on the other hand 37 per cent teachers are unskilled in doing this.
- According to the respondents 39 per cent teachers are unskilled in opening account in 'Shikhak Batayan' and using it.
- Only 34 per cent respondent teachers are skilled in transferring pictures/images from digital camera to computer/laptop and on the other hand 32 per cent respondents are unskilled in doing that.
- Among the respondent teachers 57 per cent are unskilled in solving any problems related to changing MS word version.
- From the observation it is proved that among the sample teachers 88 per cent can operate laptop, 73 per cent can operate multimedia projector and 69 per cent teachers can set the connections between the laptop and the multimedia.

5.2.2: The level of using their training skills by trained teachers

Using Digital Content:

- Among the respondent teachers 79 per cent teachers prepare lesson plan for using digital content.
- Between January to May, 2017 the respondent teachers used average 23 digital contents.
- ICT sessions were held in the highest 46 per cent sample schools between 1-2 per week and on the other hand in 32 per cent schools ICT sessions were never held.

Monitoring Digital Classroom:

- The highest 74 per cent AUEOs, 60 per cent URC Instructors and 41 per cent Head teachers responded that the supervisors monitor the digital class.
- There was no training held on for visiting the digital class. The supervisors visit multimedia based classroom teaching learning activities through:

- Sharing with the teachers about their lesson during visiting the school.
- Applying the skills of other training.
- Through studying ICT training manual.
- From their own ideas.
- By taking ideas from the skilled teachers

The ways of trained teachers to solve the typing problems

1. The trained teachers solve their typing problems by taking help from the colleague and using the training manual.

Collecting Teaching Aids, Uploading, Downloading Information and Opening Account in 'Shikhak Batayan' by the trained teachers:

- Most of the teachers (78%) collect teaching aids from the internet.
- The cause of not collecting digital teaching aids from the internet by the other teachers are:
 - They don't have any internet facilities
 - They don't know the use of internet
 - Some others comment that they forgot the use of internet for want of practice.

Among the ICT trained teachers 48 per cent opened account in 'Shikhak Batayan'.

The cause of not opening the account in 'Shikhak Batayan' is:

- They have want of internet facilities
- Some said about the want of ICT equipment
- Some others opined that they have want of sufficient skills.
- Only 28 per cent trained teachers download digital contents from the 'Shikhak Batayan'.
- On an average the teachers downloaded 13 digital contents in first 5 months of the year.
- Only 24 per cent teachers uploaded digital content into 'Shikhak Batayan'.

Planning for proper use of the trained teachers' skills made by the teachers themselves and the supervisors

Among the respondents 74 per cent teachers, 75 per cent AUEOs and the 56 per cent URC instructors have made plans for using the trained teachers' ICT training skills.

The plans taken by the respondents are as follows:

- To conduct at least a multimedia based class in every week by a teacher.
- At least one multimedia based class daily in each school.
- To make personal internet connection in residence for being enriched in ICT.
- Day long training in URC for the teachers after every three months.
- Discussing about ICT use in monthly coordination meeting.
- To merge the ICT training with different training made by URC.
- To set the target for the teachers to present 5 classes in power point in every week by the URC.
- To monitor the matter regularly.
- To train the weaker user teachers by the advanced teachers.
- To arrange ICT related refresher training in URC.
- To arrange competition on Multimedia based class presentation on May 2017 in every year.

5.2.3. The challenges of implementing ICT training

Situation of ICT facilities in different schools:

- Among the trained teachers 65 per cent got ICT equipment immediately after completing the training.
- Among the respondent teachers 26 per cent got ICT equipment two months later after receiving the training and 20% teachers got it more than two months later.
- 88 per cent head teachers, 95 per cent AUEO and 66% URC Instructors informed that the supplied ICT equipment is not sufficient to fulfil their needs. The arguments of the respondents on behalf of their comments are:
 - It is insufficient in consideration of demand (quantity of class)
 - For trained teachers only one set of ICT equipment is not sufficient
 - Either Laptop or projector is supplied but a full set is needed.
 - For want of proper service most of the time the supplied equipment remains out of order.
 - All the sample schools have the electric connections. There are 01 laptop/desktop, 01 multimedia, 01 display screen, 01 modem in each school. Besides the above equipment there are some other equipment like Sound system, Data traveller (Pen drive), CD, Hand Mike etc.
- Only 14 per cent trained teachers, 74 per cent head teachers, 33 per cent AUEOs and 40 per cent URC instructors are satisfied with the supplied ICT equipment.
- The opinion on behalf of dis-satisfaction about the supplied ICT equipment are:

- Sufficient equipment is not supplied to the schools.
- Laptop is out of order for a long time but money was not supplied to repair that.
- Multimedia is out of order. Similarly money was not supplied to repair that.
- In some schools, multimedia is supplied but laptop and modem are not supplied, in some other schools laptop is supplied, but multimedia is not supplied. In this case both materials are useless.
- Some school did not get any ICT equipment till now.
- Around 20 per cent schools are not still connected with electricity.

5.1.3.2 Preservation of ICT materials, security, user-friendly and availability:

- With some exception the laptop and multimedia are preserved in the school office room.
- Most of the respondents opined that the place where they keep the ICT materials are secured, however the observers comment that in some schools the security is needed to be increased.
- Most of the respondents think that the place where the ICT equipment is kept is moderately user-friendly.
- Most of the trained teachers (71%) informed that they get the ICT equipment when it is necessary but Most of the head teachers commented that it is not available at all the time.

According to them the causes of in availability of the equipment according to the respondents are:

- Shortage of equipment,
- Many times URC borrow it for their training purpose
- UEO office also borrows it for its official purpose.
- Sometimes it is out of order.
- Teachers are not also skilled enough to handle it.
- There is no allotment for its repair, purchasing antivirus and internet expenditure.
- Load shading of electricity is another barrier for its smooth use.
- There is no ICT room in the school.
- ICT equipment is kept in the residence of head teacher, and it is not available for use when it is needed.

Co-operation in Using ICT Equipment:

- Most of the trained teachers (78%) get co-operation from their colleagues in using ICT equipment. Among them 69 per cent teachers are satisfied with the help they get from the colleague.
- Among the respondents 57 per cent head teachers think that they get moderate help from their colleagues on the ICT issue.

The Challenges of Implementing ICT Training:

- Among the respondent teachers 44 per cent face problems in preparing digital content by using power point.
- 68 per cent trained teachers, 85 per cent head teachers, 75 per cent AUEO, 78 per cent URC Instructor, 100 per cent trainers opined that they feel problems in implementing the ICT training.
- In response to the question about the possibility of making the lesson learner-centered by using ITC almost half of the teachers opined that it is possible to make the lesson 50 per cent learner-centred, The one half of the teachers opined that it is possible to make the lesson 80 per cent learner-centred, and the rest of teachers commented that it is possible to make the lesson fully learner-centred.

5.2.4. The impact of the training in teaching learning activities

According to the respondents the impact of ICT training on the teaching-learning environment in the classroom is as follows:

- It has a very positive impact on teaching learning.
- The learners get pleasure
- They grow attentive.
- The subject matter is clearer to the learner.
- Attendance is increased.
- The learning is more sustainable to the learner.
- The teacher get relaxed and get more time for other work.
- Instead of abstract things real things could be presented.

Teachers' professional development has been increased through practicing ICT.

5.2.5 Limitation of ICT training

- Most of the trained teachers (83%) and the head teachers (56%) think that ICT training is not effective enough to ensure preparing and using quality digital content.
- The respondents opined that it is needed to include more content.

- All the teachers opined that any content of the training is not needed to reduce.
- 79% head teachers and the same number of instructors, and 78% trainers think that ICT manual is helpful enough for preparing digital content.

5.3 Recommendation

5.3.1. For increasing teachers' present skills in ICT related activities:

- To perform successfully the technical things like ICT the teachers need to learn everything properly. For this it is needed to-
- Arrange refresher training for all the ICT trained teachers.
- During training period it is needed to ensure that everybody learnt everything properly.
- It is needed to supply necessary ICT equipment in all the schools as the teachers can get enough opportunities to practice and use it when they need to do.
- It is needed to provide money for repairing the materials and other services.
- It is needed to train all the supervisors as they can provide necessary help to the teachers.
- Opening account in 'Shikhak Batayan' and using it should be made compulsory for every trained teacher.
- Only 34 per cent respondent teachers are skilled in transferring pictures/images from digital camera to computer/laptop and on the other hand 32 per cent respondents are unskilled in doing that.
- URC should provide training time for the teachers on solving any problems related to changing MS word version.

5.3.2. To ensure that the teachers are using their training skills:

Using Digital Content

- It is needed to make compulsory that all the teachers prepare lesson plan by using digital content.
- The authority should make the circular that all the ICT trained teachers prepare and use at least one session every day. For this necessary support should be provided.

Monitoring Digital Classroom

- Monitoring and mentoring activities is needed to increase for ensuring that the teachers are conducting the ICT classes according to the circular.
- The supervisors (Head teachers, AUEO, URC Instructors and UEOs) should provide necessary training for visiting the digital class.

Solving the typing and other ICT problems:

- Every school should create a positive environment as the colleagues help each other in solving any problem including ICT related problem like typing, the use of internet, downloading and uploading teaching-learning materials cutting and editing video, opening account in 'Shikhak Batayan'.
- It is needed to motivate the teachers to upload at least one digital content in a week into 'Shikhak Batayan'. The best ten up loader should be awarded by the upazila in each month.

Planning for proper use of the trained teachers' skills:

- Teachers should take plans for their professional development in using ICT, preparing digital class, conducting it in the classroom, uploading it in the 'Shikhak Batayan'.
- Head teachers, AUEOs and URC Instructors should have plan for proper supervision and using their assistant teachers' ICT skills properly.

5.3.3. The challenges of implementing ICT training:

Increasing ICT facilities in all schools:

- All the schools should be connected with electricity line immediately.
- Sufficient and balanced ICT equipment should be supplied in each school.
- Necessary money should be provided in the schools to repair the ICT materials which goes out of order.
- ICT materials should be supplied immediately after completing the training by the teachers so that they can continue practice and may not forget their training skill.

5.3.4. Storing of ICT materials, security, user-friendly and availability

- ICT materials is needed to preserve strictly in the school building in a user friendly environment so that the teachers can get it to use at any time they need.
- The security of the schools is needed to increase so that the valuable ICT materials can never be stolen.
- Higher office should never borrow ICT materials from any school so that the school may not sufferer.
- ICT room/ICT friendly room should be established in each school stage by stage.
- Internet facilities should be ensured in every school by the authority.

- Government should ensure full time electricity supply.

5.3.5. Suggestions for improving the training:

Some steps are needed to improve the training manual:

- It is needed to provide ICT training and materials to everybody.
- To extend the duration of training.
- It is needed to ensure full time electricity supply.
- Infrastructural development is needed to improve.
- Refresher training is needed for all the teachers who received training earlier.
- It is needed to strengthening monitoring
- It is needed to provide training to all the supervisors on supervising digital class.
- It is needed to present the matters very easily and elaborately as the teachers can understand it properly
- It is needed to include relevant pictures and videos with description
- It is needed to arrange demonstration sessions in PTIs.
- It is needed to include pre and post-tests with the training.
- To update the manual immediately.

It is needed to include more content in training manual on –

- Internet use
- Hard ware and software based problem solving
- Lesson related video
- More practice to be done by the trainee teachers
- To include more design on animation
- More practice of the MS office programme
- Using of excel for preparing result sheet
- Session relevant picture
- All the contents of present manual should exist.

The suggestions of the stakeholders for establishing digital Bangladesh in Education:

- It is needed to ensure applying the training knowledge and skills.
- It is also needed to ensure proper help from the authority.
- To ensure electric connection in all the schools and to ensure full time electric supply.
- To ensure training for all the teachers. Training should be compulsory.
- To establish ICT lab in all the schools with full equipment
- To ensure supplying multimedia in every class.

- It is needed to strengthen monitoring.
- To provide laptop, modem, pen-drive to all the schools
- Infrastructural development is needed to improve.
- To allot money for maintaining the equipment.
- To arrange refresher training every year.
- To ensure night guard in all the schools.
- To fill-up all the vacant posts
- It is needed to establish ICT based classroom.
- To ensure internet connection/modem free of cost.
- It is very important to establish ICT repairing centre in all the districts. It should have a sub-centre in all the upazilas.
- It is needed to include ICT text books from class three to class five.
- It is needed to enrich the ICT lab of PTIs.

APPENDICES

Appendix I: Research tools

Interview schedule for trained teachers

Name and designation:

Name of school:

Address:

1. Experience of teacher ship
2. Information on ICT training:
 - Place of training:
 - Time of training:
 - Period of training:
3. Extra experience on ICT :
4. Have any extra ICT training except ICT training at PTI – yes / no
If yes, describe that.
5. Have remembered all learning skills from this training in this time? – yes / no.
If no – explain for forgetting skills.
6. Please cite your skill from following statement after taking the training

SN	skill areas	Skill			
		Unable	normal	good	very good
1.	Skill of connection of multimedia projector				
2.	Skill of computer operating				
3.	Skill of operating power point windows				
4.	Skill of general problem solving of computer				
5.	Skill of typing Bangla font using Unicode key board				
6.	Skill of English font typing				
7.	skill of downloading and installation required software for digital contents				
8.	Skill of power point use				
9.	Skill of attachment ability between audio-file and movie clip through internet				
10	Skill of power point slide preparation using u-tube				
11	Skill of video cut and attachment through using a - tube catcher				
12	Skill of downloading of video and document using u - tube				
13	Skill of file converting using u -tube				
14	Skill of opening an e-mail				
15	Skill of an opening account in at Shikkok Batayon				
16	Skill of image transfer from mobile to computer or laptop				
17	Skill of easy problem solving of MS word version				

7. Is this training enough for preparing digital content and its' uses? yes/ no.
Explain your opinion.
8. Do you think anything more needs to be included in this training?
9. Do you think anything needs to be excluded from this training?
10. Did you get the equipment at school after just finishing the ICT training? yes / no.
If no- when did you get equipment after getting your training?
11. Have any difficulties for using of ICT equipment?
12. Present situation of ICT at your schools
13. Have any electricity connection at your school – yes /no
14. Have any internet connection – yes/ no

Name of equipment	Number
Laptop	
Multimedia projector	
Screen	

15. Is equipment enough for your school? - yes / no If no- explain it?
16. Do you get regular laptop and projector when they are needed at school? yes /no/ n
If answer is no – explain it?
17. Have you own laptop? Yes/no. If answer is yes- can you use it in classrooms?
18. Do you prepare digital content based lesson plans?– yes /no
19. Do you think these lessons plans are student-centred?
20. Information on digital content-based lesson preparation and uses in classrooms?

Subject	number	Source	
		prepare own self	Collection
Bangla			
English			
Mathematics			
Primary science			
Bangladesh and Global Studies			
Religion and Moral Education			

21. Can you type Bangla font using Avro or Unicode. Have any problem in this process?
22. Can you type English font using Avro or Unicode. Have any problem in this process?
23. Can you operate a tube catcher for video cutting and adding? yes/no.
24. Can you use power point for presenting digital content? yes/ no.
25. Did you open your shikkhok Batayon account? yes/ no
26. Did you ever any upload digital content at shikkhok Batayon? yes/ no. If answer is yes- specify number of upload?

27. Did you ever download any digital content from shikkhok Batayon? yes/ no . If answer is yes- specify number of download?
28. Will you describe plan for implementing your ICT training?
29. Describe the students' response in ICT- based classrooms?
30. How is teaching being strengthened of through using ICT in classrooms?
31. How is teachers' competency being improved by using ICT at classrooms?
32. Where are ICT equipment stored at your school? Are this storing secured? Is this system helpful for daily use?

Interview Schedule for head teachers

Name and designation:

Name of school:

Address:

1. Information on ICT training:
2. Experience of head teacher ship
3. ICT training:
Place of training:
Time of training:
Period of training:
4. Experience of ICT
5. How many teachers did ICT training from your school?
Duration of this training
Did you get this training? yes/ no.
6. Is this training enough for conducting ICT- based classrooms? yes / no. Explain your opinion?
7. Have enough skills of trained teachers for organizing ICT- based classrooms?
8. Have enough skills for preparing slide for presenting slide presentation?
9. Do the trained teachers prepare digital content-based lesson plans?– yes /no
10. Do they present digital content- based lesson plans at their regular classrooms?
11. Did trained teachers have ever any upload experience of digital content at shikkhok Batayon? yes/ no. If answer is yes- specify number of upload?
12. Are supplied equipment enough for operating digital content-based classrooms? yes/ no.
13. Have you monitoring system for organizing digital content based lessons?
14. Will you describe plan for implementing of your ICT training?
15. Where are ICT equipment stored at your school? Are this storing secured? Is this system helpful for daily use?
16. Have any difficulties for using ICT equipment at your school?
17. Is instruction of the guidebook enough for preparing digital content and its' uses ?yes/ no. Explain your opinion.
18. Have you any recommendation for improvement of ICT implementation in primary education?

Signature of data collector and date

Signature of participant and date

Questionnaire for AUEO / URC Instructors

Name and designation:

Name of school:

Address:

1. Experience

2. Experience of ICT

If answer is yes, please describe that?

3. Please fill up the table according to your opinion about trained teacher at research school

SN	skill areas	Skill			
		Unable	normal	good	very good
1	Skill of connection of multimedia projector				
2	Skill of computer operating				
3	Skill of operating power point windows				
4	Skill of general problem solving of computer				
5	Skill of typing Bangla font using Unicode key board				
6	Skill of English font typing				
7	skill of downloading and installation required software for digital contents				
8	Skill of power point use				
9	Skill of attachment ability between audio-file and movie clip through internet				
10	Skill of power point slide preparation using u-tube				
11	Skill of video cut and attachment through using a -tube catcher				
12	Skill of downloading of video and document using u - tube				
13	Skill of file converting using u -tube				
14	Skill of opening an e-mail				
15	Skill of an opening account in at Shikkok Batayon				
16	Skill of image transfer from mobile to computer or laptop				
17	Skill of easy problem solving of MS word version				

4. Do you think training is enough for implementation of ICT in education? yes/ no.

Explain your opinion?

5. What facilities are needed at schools to implementing this training?

6. Have you monitoring system for organizing digital content based lessons?

7. What is the reaction of students in the ICT based classrooms?

8. How is training being strengthened through using ICT in classrooms?

9. Have any instruction for storing the ICT equipment in schools?

10. Please remark, is it student-centred classroom through using ICT slide.

11. Have you any recommendation for improvement of ICT implementation in primary education?

Questionnaire for trainers

Name and designation:

Name of school:

Address:

1. Experience
2. Fill up table based on your TOT training for ICT in education

Name of training	Time of training	Period of training	Content of training

3. Experience of ICT
4. Have any ICT training except this TOT training? yes/ no.
If answer is yes, please describe that?
5. Please fill up the table according to your opinion about trained teachers at research school

SN	skill areas	Skill			
		Unable	normal	good	very good
1	Skill of connection of multimedia projector				
2	Skill of computer operating				
3	Skill of operating power point windows				
4	Skill of general problem solving of computer				
5	Skill of typing Bangla font using Unicode key board				
6	Skill of English font typing				
7	skill of downloading and installation required software for digital contents				
8	Skill of power point use				
9	Skill of attachment ability between audio-file and movie clip through internet				
10	Skill of power point slide preparation using u-tube				
11	Skill of video cut and attachment through using a - tube catcher				
12	Skill of downloading of video and document using u - tube				
13	Skill of file converting using u -tube				
14	Skill of opening an e-mail				
15	Skill of an opening account in at Shikkok Batayon				
16	Skill of image transfer from mobile to computer or laptop				
17	Skill of easy problem solving of MS word version				

6. Have any scope of organizing brain storming through slide show in classrooms? yes/ no
7. Do you think it is enough training for implementation of ICT in education? yes/ no.
Explain your opinion?

8. Which of the training subjects did you exercise at your training sessions:

Bangla
English
Mathematics
Primary science
Bangladesh and Global Studies
Religion and Moral Education

9. What facilities are needed at schools to implement this training?

10. Have you monitoring system for organizing digital content -based lessons?

11. What are the reactions of students in the ICT -based classrooms?

12. How is teaching being strengthened through using ICT in classrooms?

13. How are helpful to acquire teachers' competency using ICT in DPED classrooms?

14. Have any instruction for storing the ICT equipment in the training?

15. Have any difficulties for using ICT training for trained teachers? What is your opinion?

16. Is instruction of the guide book enough for preparing digital content and its' uses ?yes/ no. Explain your opinion.

17. Please comment on whether it is it student-centred classroom through using ICT slide.

18. Have you any recommendation for improvement of ICT implementation in primary education?

Signature of data collector and date

Signature of participant and date

Observation schedule

(To be filled up by data collector)

1. Information of preservation /storage of ICT equipments:

Storage at schools/ Residence at head teachers/ Residence at SMC president /Other places

2. Skill of observation of trained teachers on ICT equipment using

- a) Opening of laptop

Can do by himself / Cando by other help/ Cannot do himself

- b) Setting of multimedia projector

Can do by himself / Can do by other help / Cannot do himself

- c) Preparation digital contents

Can do by himself / Can do by other help / Cannot do himself

- d) Connection of laptop and multimedia projector

Can do by himself / Cando by other help/ Cannot do himself

3. Observation of ICT- based classroom activities of trained teachers

SN	skill areas	Skill			
		Unable	normal	good	very good
1	Skill of connection of multimedia projector				
2	Skill of computer operating				
3	Skill of operating power point windows				
4	Skill of general problem solving of computer				
5	Skill of typing Bangla font using Unicode key board				
6	Skill of English font typing				
7	skill of downloading and installation required software for digital contents				
8	Skill of power point use				
9	Skill of attachment ability between audio-file and movie clip through internet				
10	Skill of power point slide preparation using u-tube				
11	Skill of video cut and attachment through using a -tube catcher				
12	Skill of downloading of video and document using u -tube				
13	Skill of file converting using u -tube				
14	Skill of opening an e-mail				
15	Skill of an opening account in at Shikkok Batayon				
16	Skill of image transfer from mobile to computer or laptop				
17	Skill of easy problem solving of MS word version				

Observing of browsing of trained teachers

Focus Group Discussion (For Students)

Guided questions for FGD

(Researchers select 8-10 students from observing classroom according to guideline)

When and how did they see computer/ laptop and multimedia projector?

Which teachers do these uses at their schools?

How often digital content-based lesson take place in a week?

Which subjects were held through digital content-based lesson last month?

Bangla, English, Mathematics, Primary Science, Bangladesh and Global Studies

How much time do teachers use multimedia projectors during digital content-based lessons?

How much do they enjoy digital content-based classrooms?

What are the causes of enjoyment of those lessons?

Have any problem to understand those lessons?

Is it possible to finish digital content-based classes within time frame?

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