

Application of ICT at the Tertiary Education: Exploring the Utilization and the Attitudes of Teachers and Students

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Abstract

The university students and teachers of Bangladesh are being gradually exposed to modes of communication which help them to bridge their teaching and learning. This research intends to investigate the application of ICT at the tertiary level and the attitudes of teachers and students towards using ICT on educational grounds at this level. This study was qualitative as well as quantitative. The population of the study was the tertiary-level teachers and students in Dhaka Metropolitan City. A sample of 120 teachers and 403 students from tertiary level was randomly selected to participate in the survey. A purposive sampling was used in conducting interviews and random sampling was used for selecting academic institutes and classroom observations. Total sample sizes for survey, interview and classroom observation were 523, 3 and 30 respectively. Total 31 universities were considered for this study, including 4 public universities and 27 private universities. Multi-instrument analysis techniques based on statistical analysis were used for the analysis of collected quantitative data. The study found that the attitudes towards using ICT in teaching and learning was very much positive among teachers and students, and the usage of ICT in this field was increasing day by day. However, there was still some lacking in the availability of ICT materials especially among students, in the motivation of using ICT in a more effective way, rather than just reading out the online contents, and in the training and skills on ICT tools, programs and services.

Keywords

Bangladesh, Dhaka, ICT, Teaching, Tertiary Education, University education, Utilization and Attitude

I. Introduction

Bangladesh has a mission of representing herself as digital Bangladesh. "Digital Bangladesh" does not only mean the broad use of computers, perhaps it means the modern philosophy of effective and useful use of technology in terms of implementing the promises of education, health, job placement, poverty reduction etc. Therefore, the government underscores a changing attitude, positive thinking and innovative ideas for the success of "Digital Bangladesh" (Mukthi, 2011) [1]. The use of ICT is playing a fundamental role in the 21st century due to globalization. Utilization of ICT is encouraged for adapting with the coming future. The Government of Bangladesh has declared the "Vision 2021" in the election manifesto which targets establishment of a resourceful and modern country by 2021 through effective use of ICT; a form of "Digital Bangladesh"

ICT stands for Information Communications Technology. It refers to any device or system that allows the storage, retrieval, manipulation, transmission and receipt of digital information. Examples of ICT include personal computers, digital television, email, robots etc. (Doyle, 2004) [2]. ICT covers both hardware and software. Computers, scanners, and digital cameras are example of hardware and examples of ICT software are MS

office software, database software, presentation software, graphics software, accounting package and so on. The 'C' in ICT stands for communications, and covers all the communications technologies such as: digital TV, digital radio, e-mail, Internet, networks (wired and wireless), videoconferencing, instant messaging, fax, etc. ICT is a system and a system is a way of doing something. So an ICT system is a way of doing something using ICT. ICT is used in many forms in everyday life, from the diary and organize operations on a mobile phone to the roll call process at a school. All systems involve the three steps of input, processing and output. Businesses need many different ICT systems including systems for paying staff (payroll systems), stock control systems, personnel systems, e-commerce systems, banking systems, etc.

Similar to many developing countries, Bangladesh has also observed extraordinary growth of using Internet. In 2013, Internet users in Bangladesh increased to 33 million (Azad, Retrieved 15 July 2013) [3], whereas the number of Internet subscriptions in Bangladesh was 186,000 in 2000 and 617,300 in 2009 according to the World Bank report on Internet Users in 2011. However, the use of ICT for educational purposes was only 1.49%, the rate of using computer and cell phone in Bangladesh was 33.19% and 63.80% respectively, whereas, the use of internet for educational purposes was 13.21% at the degree level, 17.6% at the master's/equivalent level and 27.35% at the engineering and medical level (Bangladesh Literacy Survey, 2010) [4]. The level of use and the infrastructure of ICT were not satisfactory in all forms of educational institutions, especially in the tertiary level, to meet the contemporary demands of ICT (Bairagi et al., 2011) [5]. Bangladesh government has been focusing more on e-learning. A research on "The Impact of ICT on Tertiary Education: Advances and Promises" by Kurt Larsen and Stephan Vincent-Lancrin argued that e-learning could expand and widen access to tertiary education and training, improve the quality of education and reduce its cost (Kurt Larsen and Stephan Vincent-Lancrin, 2005) [6].

The purpose of this study is to explore the extent of practical application of ICT at the university level and to assess the attitudes of the teachers and students of the universities.

II. Justification and Context of the Research

To be the citizen of the 21st century, we need 21st century skills. An association that includes Australia, Finland, Portugal, Singapore, the United Kingdom, and the United States, organizes 21st century skills, knowledge, attitudes, values, and ethics into the following four categories; a) Ways of Thinking (creativity and innovation, critical thinking, problem solving, Decision-making, and learning to learn), b) Ways of Working (communication and teamwork), c) Tools for Working (general knowledge and information communication technology) and d) Living in the World (citizenship, life and career, and personal and social responsibility, including cultural awareness and competence)

In 21st century, skill definitions are cross-disciplinary and relevant to many aspects of contemporary life in a complex world. They

do not currently have a specific place in most curricula. Moreover, most lists of 21st century skills are not entirely composed of skills, by any means. They involve aspects of skill and understanding, but many of them emphasize inclinations, such as curiosity, creativity, and collaboration. Some lists emphasize technology, and others stress attitudes and values more. However, most focus on similar types of complex thinking, learning, and communication skills, and all are more demanding to teach and learn than memorization and other types of rote skills. In recent years, education systems worldwide have also developed frameworks with an increased emphasis on developing the skills, knowledge, and attitudes necessary for success in the 21st century (Saavedra & Opfer, 2012) [7]. From the above concepts, the skills, knowledge, and attitudes for ICT are one of the imperative components for success in the 21st century. Today, into the 21st century, we live amidst an unprecedented revolution in the advancement of ICT (Gutterman et al., 2007) [8].

UNESCO through its report "Learning: The Treasure Within" (1996) [9] focused on the four pillars of learning as principal approaches for reshaping educational curriculum. Education throughout life is based on four pillars: learning to know, learning to do, learning to live together and learning to be. In that connection, education must not disregard any aspect of a person's potential: memory, reasoning, aesthetic sense, physical capacities and communication skills. ICT can be an extremely effective tool in efforts to bring positive and sustainable development to the countries' today's Global Education. In addition, it can play a vital role in increasing access to education as well as providing better quality education. International Institute for Communication and Development (IICD) conducted a study which indicated that 80% of its participants were more aware and empowered by their exposure to ICT in education, 60% said that the process of teaching as well as learning were directly and positively affected by the use of ICT (Gutterman et al., 2007) [8].

III. Literature Review

The use of ICT in schools quickly expanded in developed nations like curriculum support, networking, the professional development of teachers and software improvements and this trend started from the mid-nineties. The use and adaptation of ICT has resulted in the globalization of information and knowledge resources (Islam & Islam, 2007) [10]. This changed globalized world demands coping up with the technology for ensuring continuous improvement of the education system.

Within education, ICT has begun to have a presence but the impact has not been as extensive as in other fields. Ron Oliver (2002) [11] argued in his paper, "The role of ICT in higher education for the 21st century: ICT as a change agent for education", on the various impacts of ICT on contemporary higher education and explored potential future developments. He explored the impacts of ICT on what is learned, how students learn, and when and where students learn. He stated that curricula were starting to emphasize capabilities and to be concerned more with how the information could be used rather than the information itself. He also stressed that, competency-based curricula rather than content-centered curricula motivated the movement from teacher-centered forms of delivery to student-centered forms. Through technology-facilitated approaches, contemporary learning settings encouraged students to take responsibility for their own learning. Also, ICT applications provided many options and choices that extend from when students could choose to learn to where they learn. These things were also expanding the pool of teachers as the

role of teachers was changing from content experts to trainers and mentors, expanding the pool of students as a greater opportunity and flexibilities were provided through the use of technology, and reducing the cost of higher education.

A study was conducted in Ebonyi state, Nigeria, titled "Application of ICT in Teaching and Learning in Tertiary Institutions in Ebonyi State" (S. O. Eze & P. I. Eze, 2013) [12]. The study was conducted on 160 respondents (of which 120 lecturers and 40 technologists/Technicians). A 15 item structured questionnaire was used to collect data from the respondents. The questionnaire had three sections; A, B, and C. Section A was used to collect information on the availability of ICT facilities in the institutions. Section B obtained information on the level of trained personnel to handle ICT facilities in the institutions and section C obtained information on the constraints to the application of ICT in teaching and learning in the institutions. The Questionnaire items had a 4 point response scale of strongly agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with a corresponding value of 4,3,2,1 respectively. Data collected for the study was analyzed using weighted mean and Standard deviation to answer the research questions. The results revealed that there is lack of ICT facilities for effective teaching and learning in Tertiary Institutions in the State, Technologists/Technicians are more competent in the operation of ICT facilities and possess the skill required to operate ICT facilities but that they are inadequate in the Schools, and inadequate ICT Devices, Teachers lack of knowledge and skills, unreliable and inadequate power supply and inadequate funding were identified as major constraints constituting hindrance to the use of ICT in teaching and learning in tertiary institutions in the State.

M. Henderson et al. (2015) [13] conducted a study titled, "What works and why? Student perceptions of 'useful' digital technology in university teaching and learning" on 1658 undergraduate students to explore students' actual experiences of digital technology during their academic studies. He identified 11 distinct digital benefits, e.g. flexibilities of time and place, ease of organizing and managing study tasks through to the ability to replay and revisit teaching materials, and learns in more visual forms etc. His study also suggested that digital technologies were not 'transforming' the nature of university teaching and learning and he thought that university educators were needed enthusiasms to achieve better outputs through technology-enabled learning and to develop better understandings of the realities of students' exposures with digital technology.

Bangladesh is a country which is overpopulated, underdeveloped as well as technologically backward. And backward countries in the world which had higher academic institutions were the pioneer in taking up and applying ICT (Roknuzzaman, 2006) [14]. Universities around the world were developing digital strategies to support education in the 21st century (Bairagi et al., 2011) [5]. ICT as a tool for teaching and learning itself, the medium through which teachers could teach and learners could learn. There were two reasons for which ICT was required to be used in teaching. Firstly, ICT was everywhere and it should be present in the university education also. So the students could enter in their future professional life with the enriched knowledge of ICT. Secondly, ICT could improve the effectiveness of university education (Pedro, 2005) [15]. ICT could solve problems of higher education and promote resource sharing that would lead us towards the access to global resource of knowledge and information (Kunaefi, 2007) [16]. Therefore, ICT is a means for teaching and learning (Jager, 1999) [17]. ICT also could enrich the teaching methods, which ultimately facilitates the learning process (Raji-Oyelade, 2003)

[18]. According to a study (Miyan, 2009) [19], private universities were found making admirable assistance in the development of ICT in Bangladesh. Another study (Huda SSM, 2009) [20] found that, around 40% of the private universities of Bangladesh were using ICT at a large extent for administrative purposes, around 35% of the universities were using ICT for teaching at a large extent, and 55% of the universities were using ICT at a moderate level. Moreover, a study by Ali (2003) [21] indicated that, ICT revolution imposed particular challenges on education systems in Bangladesh.

Another study conducted in Khulna district of Bangladesh (Bairagi et al., 2011) [5] showed that 44% of the institutions had their own web page, 51.60% of the teachers had ICT knowledge, and only 36.43% of the teachers had their e-mail addresses at the university level. On the contrast, 52.97% students had basic ICT knowledge, 21.67% had e-mail addresses, 28.19% had personal computers and 25.72% were used to internet. So, from these statistics it indicated that ICT availability and usage were not satisfactory. To follow the path of 21st century teaching and learning environment, teacher and students both are needed to be prepared with the knowledge and application of ICT.

IV. Research Questions

The research questions that were used for this present study are mentioned below:

1. What is the extent of the utilization of ICT in teaching at the tertiary level?
2. What are the attitudes of teachers and students of the universities towards using ICT in the teaching and learning process?
3. What kind of infrastructural supports are available at the universities for using ICT?
4. How much is ICT being used in classroom teaching and learning?
5. What are the barriers in using ICT in teaching and learning?
6. How much orientation or training the teachers have on ICT?

V. Methodology

This study has followed qualitative as well as quantitative approach of research which was conducted from March to June, 2015. The population of the study was all the tertiary level teachers and students in Dhaka Metropolitan City. A sample of 120 teachers and 403 students from university level was randomly selected to participate for the survey. A purposive sampling was used in conducting interviews and random sampling was used for selecting academic institutes and for classroom observations. To collect the raw data we have used three types of tools. These are –Survey Questionnaire for teachers and students, semi-structured interview with selected teachers, experts and researchers and Classroom observation which was used to find out the infrastructural facilities and practical application of ICT in classroom teaching. Total sample sizes for survey, interview and classroom observation were 523, 3 and 30 respectively. A total of 31 universities were considered for this study including 4 public universities and 27 private universities. Three KIIs (Key Informant Interview) have been conducted for generating primary information. One of them is an ICT expert who is involved in teaching in the university level, another one is a government officer related to ICT and the other one is a researcher who worked on a study related to ICT usage in teaching. Multi-instrument analysis technique based on

statistical analysis was used in analyzing and interpreting collected raw data.

VI. Data Analysis

Data collected from 523 respondents were finally used for analysis. Among the respondents, about 71% were male and 29% were female. About 78% of the respondents are from private universities and 23% are from public universities. Among them, 77% are students and 23% are teachers from different public and private universities. Nearly 87% of the respondents had PCs (either desktop or laptop). 78% of the respondents reported that they had regular internet connectivity, only one percent had no internet connectivity and others had few to moderate personal internet connectivity.

A. Extent of ICT Utilization in Teaching at the Tertiary Level

Table 1: Practices ICT in his Teaching and Learning

Degree of practice	Frequency	Percent
Few	7	6.0
Moderately	22	18.8
Regularly	88	75.2
Total	117	100.0

Among the teachers, 75% regularly practice ICT in their teaching and learning (Table 1). Some 77% used ICT for educational purpose regularly. Almost all the teachers (98.3%) had a personal email ID. Some 72.4% used university email, website and e-learning resources. Around 62% of the teachers regularly used Facebook, Twitter, etc. in teaching and learning. 77% of the tertiary teachers used multimedia projector and internet access regularly in classrooms. The use of MS Excel in teaching was comparatively low among the teachers. Some 49% of the teachers reported that they used MS Excel regularly in teaching. Other 51% reported that they used Excel few to moderately. About 71% of the teachers reported that they regularly used MS PowerPoint in class.

It was also found that, female teachers used MS Excel significantly fewer times than the male teachers. The use of MS Word, PowerPoint, Facebook, and Twitter among the teachers of various departments differed significantly. Teachers from the BBA department were tending to use MS Word more and those from the Language and Science departments tend to use MS Word less. On the other hand, teachers from the Science departments tend to use Facebook and twitter more and teachers of the Sociology and Language departments tend to use them less. And finally, the teachers of Sociology tend to use PowerPoint more and teachers from the Language and Science departments tend to use PowerPoint less frequently.

The ideas gathered from the KII also depicted the same with the quantitative results that the uses of ICT were taking place day by day specially at tertiary level teaching, but the concern was raised that how these ICT were being used in teaching. One of the key informants indicated that, teachers did not use internet as a source of information. However, they were usually fond of using readymade PowerPoint slides without making required modification to align the contents with their course syllabus and lesson plans. This causes serious trouble to students who have no other option other than to memorize the PowerPoint slides in the hope that the questions would be formed from there.

B. Attitude of Teachers & Students Towards Using ICT in the Teaching & Learning Process

Eighty seven percent of the respondents believed ICT as a tool for teaching and learning. Eighty five percent of the respondent thought that a personal email ID was essential for today’s communication. Seventy six percent of the respondents thought that social networks could be used as a media of teaching & learning. Seventy nine percent of the respondents thought that university email ID, website and e-learning resources could be useful to be more connected. Seventy four percent of the respondents preferred to engage with ICT training for effective teaching and learning. Seventy eight percent of the respondents felt comfortable to do task by MS Word. Seventy two percent of the respondents thought MS Excel could make their task easy. Seventy seven percent of the respondents thought that MS PowerPoint made their presentation trouble-free. Sixty four percent of the respondents expressed that internet browsing was the first step towards ICT.

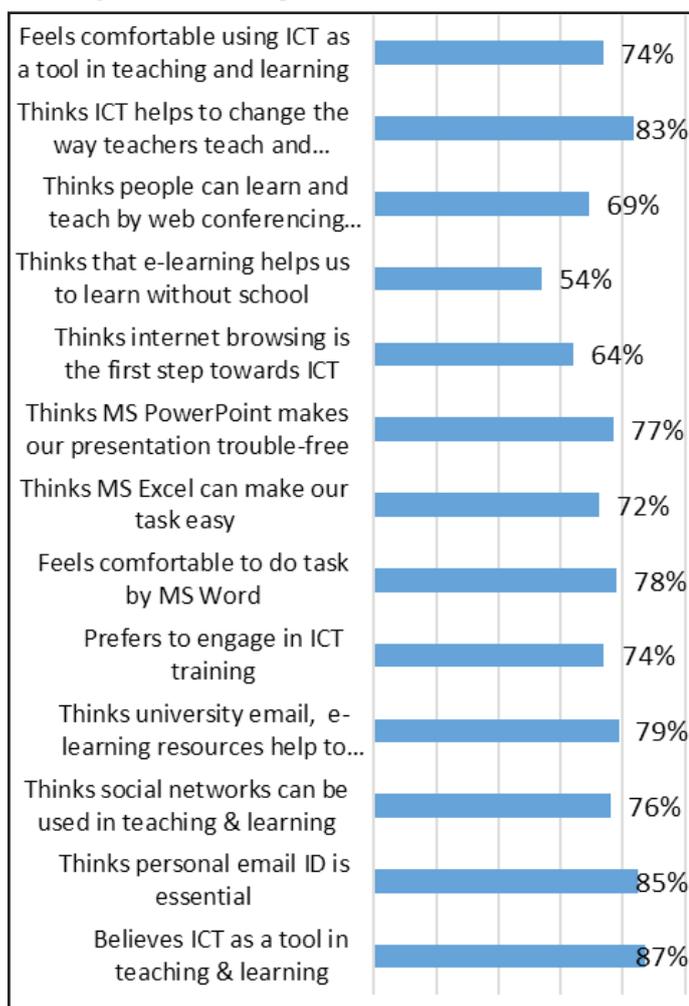


Fig. 1: Attitude Towards Using ICT in Teaching & Learning

Fifty four percent of the respondents thought that e-learning helped them to learn without going to classes. Sixty nine percent of the respondents thought that people could learn and teach by web conferencing method. Eighty three percent of the respondents expressed their ideas that ICT could help to change the way of teaching and learning of the teachers and students. Seventy four percent of the respondents felt comfortable in using ICT in teaching and learning (Figure 1). There was a positive attitude towards using ICT in teaching and learning, though there was still a debate whether e-learning could be useful for learning without going to school.

Some significant differences between teachers and students were revealed regarding their attitude towards e-learning resources, using ICT in Teaching and learning and using MS Word to do tasks. The percentages of teachers (88%, 82.9%, and 88.9% respectively) having a positive attitude towards the above mentioned matters were higher than those of the students (76.8%, 70.9%, and 74.6% respectively).

But the KIIs revealed a bit different picture of the attitude towards ICT usage in tertiary teaching and learning. It was found that, the students were very comfortable and more enthusiastic about using ICT in education. However, most of the senior or elder teachers were not okay with ICT and some of them even insisted that others should not use ICT in teaching learning activities. One of the key informants explained that, students used Facebook and other social media to help each other with notes and suggestions. He complained that, the students also used internet to share assignments, i.e., to take short-cuts as their teachers also did. The proper use of ICT tools for furthering the purpose of learning or research was not understood by the teachers and students.

C. Availability of ICT

Some 58.7% of the respondents reported that the infrastructural support for ICT was provided to them by their surroundings. Seventy eight percent of the respondents had regular internet connectivity. Eighty seven percent of the respondents had their own personal computer either desktop or laptop or both. (Figure 2).

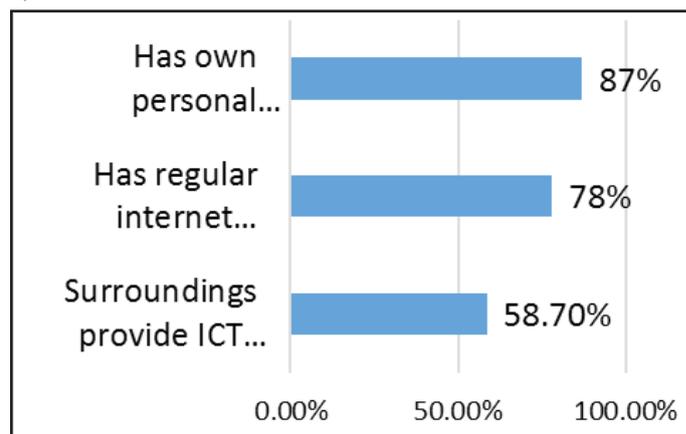


Fig. 2: Status of ICT Available

There were some significant differences between teachers and students regarding the availability of ICT in their surroundings, ownership of PC, and internet connectivity. A higher percentage of teachers (68.4%, 95.7%, and 91.5% respectively) had ICT availability than the students (55.9%, 84.5%, and 74.1% respectively).

Respondents from private universities had significantly higher percentage of PC ownership (89.1%) than the respondents from public universities (80%).

The KIIs revealed that in general, computers and projectors were available in almost all classrooms but generally they were not updated on a regular basis. Universities provided PCs to the teachers and some universities also provided laptops to their students and free Wi-Fi facilities on the university premises.

D. Usage of ICT in Classroom Teaching & Learning

Most of the respondents (either teachers or students) used MSWord and PowerPoint regularly (65.3% and 57.8% respectively). Most of them (68.4%) reported that, multimedia projector and internet

access were used in classes regularly. The use of MS Excel was rather less frequent among the teachers and students (47.7%). Again, the use of MS Excel was less common among the females than the males (whether teachers or students). It was found that, the use of university email ID, website and e-learning resources as well as the use of PowerPoint was significantly lower in public universities than private universities. Also, students were significantly less likely to use university email ID, website and e-learning resources than the teachers.

In an observational study, it was found that, out of ten randomly selected classrooms of two private universities, eight classrooms had no internet connection, nine classrooms had projectors and computers, and six classrooms had audio systems. In one of those classrooms, the teacher was using both video and PowerPoint presentation. And in other two of those classrooms, the teachers were using either video or PowerPoint. In none of the classrooms did the teachers use Audio or MS Word or any ICT based assignments. On the other hand, out of ten randomly selected classrooms of a public university, it was found that, seven classrooms had internet connection, nine classrooms had projectors, eight classrooms had computers and sound systems. One of those classrooms had no such facilities and seven classrooms had all of those facilities. Among these, the teachers were using video in three classrooms, audio in four classrooms and PowerPoint in five classrooms. In two of the classrooms, almost all the available facilities were being used. However, in one classroom no facilities were being used. One of the key informants indicated that the use of ICT at the university level was in progress mostly after 2013-2014. It is also exposed by the KII survey that in classroom teaching, teachers largely just read out the sentences from the projector screen and they were unable to use smart board, when available. Many of the teachers did not have email address on the university domain.

E. Barriers in Using ICT

As per the KII survey, the barriers found in using ICT for teaching and learning were- the improper use of ICT, availability of all proper ICT components, lack of ICT literacy of the teachers and students, lack of awareness of the university authority, lack of quality maintenance, lack of motivation of the teachers and students in getting out from their comfort zone of the traditional teaching learning system.

F. ICT Training Status

Table 2: ICT Training Status

Has ICT Training	Percent
No	63.1
Yes	36.9
Total	100.0

It was found that only 36.9% of the respondents had training in ICT. (Table 2). There was a significant difference between teachers and students in this regard. The percentage of students who had ICT training (32.6%) was comparatively lower than the percentage of teachers (52.3%). There was also a significant difference between the participants who had PC and those who had not. Respondents who were possessing PC had a higher prevalence of ICT training (38.7%) than the respondents who did not have PC (25.4%).

The KIIs also portrayed the similar results regarding the ICT training. It was found that though there was sufficient number of training programs on ICT, the percentage of ICT trained teachers and students were very poor.

VII. Findings and Discussion

The study revealed many aspects of ICT application in education. Most interestingly, it proved that people were getting ICT friendly. More than three quarters of the teachers were found practicing and using ICT in teaching. The most common usages were MS Word, PowerPoint and Social media, while the percentages differed according to gender and departments. The usage of multimedia projector and internet access in the classroom were also satisfactory. The alarming issue, which was explored through qualitative approach, was that teachers were using internet as a resource to get readymade PowerPoint slides and possible examination questions. Moreover, they were using those materials without making required modification and without aligning them to the syllabuses of their classes. This practice encouraged students to memorize the PowerPoint slides rather than using text books for their courses. However, it is a good indication that ICT opens door for a wider arena of education. But ensuring effective utilization of ICT in teaching and learning is still a challenge. Figure -1 shows an overall positive attitude towards using ICT tools, services and programs in teaching and learning, though a debate still remained whether e-learning could help learning without attending schools or classes. This finding released scope to conduct further research on the impact of online education and virtual or face to face education. Findings from the survey indicated that a higher percentage of teachers had positive attitude towards using ICT in teaching, especially using e-learning resources and MS Word, whereas the KIIs revealed the students are very comfortable and more enthusiastic about using ICT in education. Especially, the senior or elder teachers were not comfortable with ICT. Lack of ICT literacy or motivation could be the reasons behind this. Furthermore, availability of ICT (computer and projectors) was significantly higher in private universities than public universities even though they were not updated regularly with the changing technology. This scenario ensured a positive possibility to apply ICT in education system. Moreover, the KII indicated that the use of ICT at the university level was triggered in Bangladesh mostly after 2013-2014, when classes could not take place because of political turmoil. They have also mentioned that in classroom teaching teachers usually just readout the sentences from the projector screen and they were unable to use smart board, when available. Even, there were many teachers and students who did not have their university email ID. Usage of ICT in classroom teaching and learning was not that much satisfactory. The study also found the barriers in using ICT in teaching and learning and they were- improper use of ICT, availability of all proper ICT components, lack of quality maintenance, lack of ICT literacy, lack of awareness and lack of motivation of the teachers and students. Out of these six barriers, most of them (improper use of ICT, lack of quality maintenance, lack of ICT literacy, lack of awareness and lack of motivation) could be addressed and solved by ICT training. But, the study found that the situation of ICT training was very disappointing. The percentage of the ICT trained teachers and students were very poor and a significant difference between teachers and students in this regard was identified. Therefore, the study suggests for providing effective ICT training support and motivating tertiary level teachers and students. The availability of ICT was overall satisfactory and the attitude of using ICT was highly positive. These facts lead that proper ICT training could assure possibility of qualitative ICT based teaching and learning. To apply ICT in teaching and learning process, teachers play the vital role. In classroom teaching, ICT based teaching and learning mainly mold according to teachers’

role. So, creating enthusiasms among university level teachers and university authorities about using ICT tools in teaching and learning might improve the situation.

VIII. Conclusion

In order to conclude, the results provided by both the quantitative and qualitative analysis of the study will be exposed especially regarding those aspects which are related to ICTs for Tertiary Education, basically on what are the teachers' and students' thinking and what are they doing. ICT for university education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICT in education involves the adoption of general components of information and communication technologies in the teaching learning process. This literature review has sought to explore the role of ICT in university education as we progress into the 21st century. In particular, ICT have impacted on educational practice in tertiary education in quite small ways up to now but that the impact will grow considerably in years to come and ICT will become a strong agent for a change among many educational practices. Extrapolating current activities and practices, the continued use and development of ICTs within education will have a strong impact on ICT and teaching learning process, quality and accessibility of education, learning motivation, learning environment, ICT usage and academic performance. The adoption and use of ICT in education have a positive impact on teaching, learning, and research. ICT can affect the delivery of education and enable wider access to the same. In addition, it will increase flexibility so that learners can access the education regardless of time and geographical barriers. It can influence the way students are taught and how they learn. It would provide a rich environment as well as motivation for teaching learning process and it seems to have a profound impact on the process of learning in education by offering new possibilities for learners and teachers. These possibilities can have an impact on students' performance and achievement. Similarly, the wider availability of best practices and best course material in education, which can be shared by means of ICT, can foster better teaching and improved academic achievement of students. The overall literature suggests having successful ICT integration in tertiary education. The findings of this study could play an effective role in this case.

IX. Ethical Consideration

Issues of ethics were strongly maintained during the field work. Permission was taken from every institution and respondent for collecting data, classroom observation and interview. Before starting the process with respondents, the purpose of this study was disclosed to them. They have been assured that their information would be used anonymously only in academic research. While conducting interview, every respondent had full right not to answer any question or to withdraw her/him during interview process if s/he preferred so.

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