ICT EDUCATION IN BANGLADESH

SECONDARY AND HIGHER SECONDARY LEVEL

APRIL 19, 2017

INSTITUTE OF INFORMATION ECHNOLOGY

University of Dhaka

SUBMITTED TO

Mr. Md. Iftekharul Amin

Assistant Professor

Institute of Business Administration

University Of Dhaka

SUBMITTED BY

Group 03

Md. Shihab Shahriar Khan (703)

Shuvo Saha (705)

Md. Eusha Kadir (708)

Maliha Nawshin Rahman (713)

Aquib Azmain (718)

BSSE 07 Batch

Institute of Information Technology

University of Dhaka

Date: 19th April, 2017

LETTER OF TRANSMITTAL

Mr. Md. Iftekharul Amin

Assistant Professor

Institute of Business Administration

University Of Dhaka

Subject: Submission of final report on ICT Education in Bangladesh: Secondary and Higher Secondary Level.

Dear Sir,

With due respect, we are pleased to submit the final report on ICT Education in Bangladesh: Secondary and Higher Secondary Level. Although this report may have shortcomings we did try our level best to produce an acceptable report. We would be highly obliged if you overlooked our mistakes and accepted our effort we put in this SRS.

Sincerely yours,

Md. Shihab Shahriar Khan (BSSE 0703)
Shuvo Saha (BSSE 0705)
Md. Eusha Kadir (BSSE 0708)
Maliha Nawshin Rahman (BSSE 0713)
Aquib Azmain (BSSE 0718)

BSSE 7th batch
Institute of Information Technology
University of Dhaka

ACKNOWLEDGEMENT

We are highly indebted for getting such a tremendous opportunity to prepare the report on ICT Education in Bangladesh: Secondary and Higher Secondary Level. We would like to thank whole-heartedly our course teacher, Mr. Md. Iftekharul Amin, Assistant Professor, Institute of Business Administration, University Of Dhaka, for giving us guidelines about how we can prepare this report. In completing this paper we have collected various important data and information from Ministry of Education, Ramna, Dhaka, Udayan School & College, Dhaka, Viqarunnisa Noon School & College and Institute of information Technology, University of Dhaka. We are thankful to all of the works cited.

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EXECUTIVE SUMMARY

ICT has been introduced as a compulsory subject at Secondary and Higher Secondary Level from 2015. With ICT the government aims to help students get familiar with modern day information and communication technology. But according to the teachers most students already know how to use ICT. ICT syllabus is aimed for towards how ICT works and not how to use ICT.

Current ICT syllabus is large, complex and ambiguous as a result many students are afraid of ICT. For most students ICT is an unnecessary burden, since they will not need the knowledge at their higher education.

Lab facilities in most schools is inadequate for teaching ICT.

According to IT Professionals, students do not need to learn ICT at Secondary and Higher Secondary levels to get into technical subjects in higher education. Only elementary knowledge about computers is necessary.

We have some recommendations from the interviews -

- ICT should either be made an optional subject for Science students or its syllabus should be shortened to discard too complex and highly technical topics
- Clearly define syllabus by providing standardized textbooks
- Include all prerequisite topics
- Only include topics which are relevant to all students and teach them soft skills such as working with Microsoft Word, Powerpoint, Excel
- Number of ICT teachers is too low so more qualified teachers should be recruited to teach ICT
- Adequate ICT labs should be constructed fast, to support the large number of students

CHAPTER 1: INTRODUCTION

Information Communication Technology (ICT) is an umbrella term used to encompass all rapidly emerging, evolving and converging computer, software, networking, telecommunications, Internet, programming and information systems technologies. In order to keep pace with the global world as well as present technology based society, students should learn ICT. Hence it was made a compulsory subject for all students of secondary and higher secondary level. According to the vision of building digital Bangladesh, the present government want to ensure students of both urban and rural sides will learn ICT. In SSC or HSC public examinations, all students of science, arts and commerce must pass ICT.

Although learning ICT is hugely emphasized by government, this education still lacks in training teachers, providing syllabus and treating all students equally. Again, students of rural areas and human studies seem reluctant to learning ICT. There is also not enough laboratory and demonstrators to teach students the applications of ICT. These problems can be solved by the policy makers, education board, teachers, parents and students. Our project is about finding the present and future of ICT education, why it is still lagged behind and collect recommendations to solve the problems.

1.1 BACKGROUND

The challenge Bangladesh currently faces is how to become a learning society and how to ensure that its citizens are equipped with the knowledge, skills and qualifications on information and communication technology (ICT) needed in the next decade.

Computer science was introduced as an optional subject for secondary level students from 1994. About 150 schools were permitted to teach the subject. ICT has been introduced in National Education Policy 2010. Computer education has been an elective subject at secondary level since 1996. At present, 9,000 schools (out of 18,770) and 3,500 madrassas (out of 9,736) continue to

offer this course. The government has also taken several initiatives to modernize and update the computer/ICT related curriculum at secondary and higher secondary level. This will enable SSC students to study using the updated ICT curriculum during the 2009/10 session and HSC students in 2010/11. ICT has been compulsory in SSC since 2015. ICT has been compulsory in HSC since 2015. This project is for analysis the current state of ICT education in HSC and SSC level. Our focus is on the compulsory subject ICT in SSC and HSC. (Access to Information (A2I) Programme, 2011)

The information communication technology has been emerged with the development of technology as well as the speedy spreading of computer literacy. The issue of 'computer in education' started to become popular in education policy making in the early 1980s, when relatively cheap microcomputers became available for the consumer market. In this process, some developed countries started to give the computers in their schools. Later, near at the end of the 1980s, the term 'computer' was replaced by 'IT' (information technology), signifying a shift of focus from computer technology to the capacity to store and retrieve information. This was followed by the introduction of term ICT (information and communication technology) which involves collection, storage, processing, presentation and distribution of information, around 1992, when e-mail started to become available to the general public. Computers, internet and electronic communication are integral parts of ICT.

In the developing countries of the globe, prime areas to apply ICTs applications are in education, health, agriculture, commerce and industry, family planning sector and so on. Similarly Bangladesh has been trying to apply ICTs application in those fields. Among these, in the field of education, ICTs can have a vital role to help overcome the global challenges. Especially at secondary and higher stage, we need to prepare more; since these two stages are the bases to provide skilled human resources through technical education or higher education. That is why, these two stages could be considered as important stages among the existing three broader stages of education system of Bangladesh.

1.2 ORIGIN OF THE REPORT

This report was generated as the output of our project on ICT education in Bangladesh: secondary and higher secondary level. ICT education was introduced in this country to enable future generation cope with technology based daily life. It has been made compulsory for all students though in reality, it lacks in many ways. Our goal was to find out the progress, problems and solutions in this new sector of education. In our report, we have tried to find out these problems through the interviews taken and results found. Hence this report was originated to turn recommendations into solution for ICT education at secondary and higher secondary level in Bangladesh.

1.3 OBJECTIVE

1.3.1 BROAD OBJECTIVE:

Analyze the overall state of ICT Education of Secondary and Higher Secondary level in Bangladesh.

1.3.2 SPECIFIC OBJECTIVES:

This project is for giving a picture of the current state of ICT education in Bangladesh. We also want to find ways to resolve the problems currently faced by educators and students.

1. Analyze the existing status of ICTs education in the mainstream educational institutions of Bangladesh

2. Explore the prospects of ICT education in the said field

3. Identify the problems of ICTs in education sector

4. In particular, this project hopes to answer:

- Is the current ICT syllabus a perfect fit for the stated goals of ICT education?
- Is our material and human resources both qualitatively and quantitatively capable of handling country's huge number of students?

- Are students capable of coping up with the material?
- What are the biggest problems currently faced by our educators and students?
- How should the government's policy and its execution change to reflect the realities on the ground and address those problems?

5. Our objective is to find some way to meet up the following challenges:

1. Slow decision-making process in the government level
2. Uninterrupted electricity and internet connectivity
3. Lack of multimedia contents
4. Lack of trained and potential teachers

1.4 SCOPE

To meet the project objectives, we want to interview students and teachers from secondary schools and colleges. Through the interview process we want to gather their opinion about the current state of ICT Education in Secondary and Higher Secondary Level in Bangladesh, the problems they currently face and solutions they recommend. The schools we will visit will be within Dhaka City.

We would also like to interview policy makers from the Directorate of Secondary and Higher Education, Bangladesh and ask them about their vision for ICT Education in Secondary and Higher Secondary Level in Bangladesh. We would also like to inform them about the problems, that students and teachers currently face and ask them about what solutions they are working on.

Finally we would like to interview domain experts from the Institute of Information Technology, University of Dhaka, to ask their opinion about the effectiveness of the curriculum and changes they recommend. Opinions collected from Interviewee may be subjected to biases.

1.5 LIMITATIONS

Although we have tried our best to accomplish the goal of this project on ICT education in Bangladesh, there were some limitations we had to face. These are –

Lack of time: For the time limitation we could not gather more information to justify exact condition. The time constraints are limiting factors.

Interview limitations: Because of our limited time and scope, we were unable to take interview of an adequate number of students, teachers and parents. Our interviews were taken only within the Dhaka city, which is one of the biggest limitations we have faced.

Small sample size: The study is limited by the size of the sample. As the sample size is very small, geographical and regional differences could not be included. Here, this report is based on school and college of Dhaka city only. Hence, we were unable to picture the present state of ICT education around the whole country. Rural and less educated side of the country remained out of scope of this report.

Lack of prior research studies on this topic: ICT education is a recent topic of research and study. It was introduced only a few years ago. So this topic lacks prior research from which we could take ideas.

Lack of Knowledge and Experience: As university level students, we lack in the knowledge of how ICT should be taught to secondary and higher secondary levels. We also have limitations of experience as ICT was introduced as a subject, after we have passed our SSC and HSC.

Biasness: We all have biases, whether we are conscience of them or not. Bias is when a person, place, or thing is viewed or shown in a consistently inaccurate way. Bias is usually negative, though one can have a positive bias as well, especially if that bias reflects your reliance on research that only support for your hypothesis. As our area of study was not large enough and people who involved in the interview were urban and modern, some cultural biasness might have occurred as limitations.

CHAPTER 2: METHODOLOGY

Population and unit of analysis - Some schools and colleges of Dhaka city was selected as the unit of analysis. We have collected informed opinion from all stakeholders (teachers, professors and government) on the current state of ICT education. Finally we tried to draw a conclusion over the population. We have collected information from Ministry of Education, Ramna, Dhaka, Bangladesh. We have discussed with professors on this topic.

Data collection techniques - Interview. Interviews are particularly useful for getting the story behind a participant's experiences. We decided to use the interview as data collection techniques for this project.

Interview questions -

Bangladesh Government has taken some initiatives like:

For teacher training in secondary and higher secondary education, 20 computer labs were established for each of the Teachers' Training Institutes in the country (14 Teacher Training Centers/TTC, 5 Higher Secondary Teacher Training Institutes (HSTTI) and 1 Bangladesh Madrassa Teachers' Training Institute (BMTTI) under the Teaching Quality Improvement for Secondary Education Project (TQI-SEP). (Access to Information (A2I, 2011)

Approximately 2,250 teachers received training under this agreement in 2010. (Access to Information (A2I, 2011)

From January 2011 to June 2013, a total of 7000 and 5000 secondary and higher secondary teachers respectively, received training (ICT4E-SHSP)

The government has decided to set up 2,000 computer labs and 64 language training labs in educational institutions across the country. (Government to set up 2000 computer labs, 2017)

Till now, 17,000 PCs have been provided through the MoE for setting up ICT labs. Under the direct supervision of Bangladesh Computer Council (BCC) 128 new computer labs with internet connectivity have been established (64 schools and 4 colleges). BCC is also setting up computer

labs in 3,000 more schools nationwide. In addition, the GoB also distributed approximately 1,400 laptops to 568 schools and 64 colleges. The Directorate of Secondary and Higher Education (DSHE), through its project titled Secondary Education Development Program (SESDP) has established modern ICT laboratories in 20 pilot schools with twenty Computers each, Server, Multimedia Projector and other accessories. Construction of the same in 30 Model Madrassa is in progress. The mobile labs mentioned before for teacher training purpose are also utilized for introducing different ICT delivery medium to the students in remote areas. Each lab is equipped with five laptops, five internet modems, two digital cameras, one multimedia projector, webcams, multifunctional printers, pen drives, interactive board, CDs, speakers, headphones and a generator. (Access to Information (A2I) Programme, 2011)

Question: Are these initiatives enough or not for the progress of ICT education in Bangladesh?

Current HSC ICT Syllabus is given below:

(Information and Communication Technology, HSC, 2012)

অধ্যায়	অধ্যায়ের শিরোনাম
প্রথম	তথ্য ও যোগাযোগ প্রযুক্তি : বিশ্ব ও বাংলাদেশ প্রেক্ষিত
দ্বিতীয়	কমিউনিকেশন সিস্টেমস ও নেটওয়ার্কিং
তৃতীয়	সংখ্যা পদ্ধতি ও ডিজিটাল ডিভাইস
চতুর্থ	ওয়েব ডিজাইন পরিচিতি এবং HTML
পঞ্চম	প্রোগ্রামিং ভাষা
ষষ্ঠ	ডেটাবেজ ম্যানেজমেন্ট সিস্টেম

Figure 1: ICT Syllabus of HSC

Question: Is the content of the syllabus appropriate?

Our focused questions-

1. Are the initiatives of government enough or not for the progress of ICT education in Bangladesh?
2. What is actual need of a compulsory subject like this in SSC and HSC?
3. How many teachers assigned to this subject in a particular school or a college?
4. Will the students be benefitted studying this syllabus of ICT in the long run?
5. Is the content of the present syllabus of ICT appropriate?
6. How can the teachers be more efficient to teach the students?
7. How can we meet up the challenges in this regard?
8. What is the recent future plan of government to develop the progress of the condition of ICT education in HSC and SSC level?

Data Analysis - Finally we have analyzed the information. By this we have concluded a summary of our project in chapter 3. We hope we have found answers of our questions and found some ways to solve the problems of ICT education in Bangladesh.

CHAPTER 3: FINDINGS

3.1. MEETING FINDINGS

3.1.1 Meeting 01:

Interviewee: Dr. Aruna Biswas, Additional Secretary, Ministry Of Education

- ICT has been introduced as a mandatory subject at SSC and HSC level, to ICT has been incorporated as a teaching aid for other subjects as well to provide more engaging, interactive learning through multimedia content
- Teachers upload created lesson content and download content contributed by other teachers through a portal.
- Syllabus will change based on demand. It can be changed according to the changes in technology of the present world.
- Training existing teachers for teaching ICT
- Hire new teachers for teaching ICT
- Trained teachers in turn teach fellow teachers by becoming 'master trainee'
- Students have been achieving expected grades

Goal:

- Equip every school with ICT and multimedia Labs
- Introduce ICT at lower levels as well
- Help students stay up to date with modern technology

3.1.2 Meeting 02:

Interviewee: Dr. Umme Salema Begum, Principal, Udayan School & College, Dhaka

- Students are quite adept in using ICT
- Difficulty in finding appropriate and qualified teacher

- Difficulty in getting students interested in learning ICT
- Subject might be a burden for many students
- Difficulty in motivating students to learn
- 4 MSc. Computer Science Graduate Teacher
- 2 Adequate Lab Facilities
- Recommendations: Make the subject an optional subject

3.1.3 Meeting 03:

Interviewee: Rubina Tasneem, Assistant Professor, Head of ICT department, Viqarunnisa Noon School and College.

- Students are quite adept in using ICT
- Difficulty in setting up adequate lab facilities to support all students (about 1900)
- Difficulty in getting students interested in learning ICT
- Subject might be a burden for many students
- Difficulty in motivating students to learn
- 4 MSc. Physics/Mathematics/Computer Science Graduate Teacher and 1 Demonstrator
- Teachers are trained both externally (by trainers) and internally (by colleagues)
- 2 Labs Inadequate Lab Facilities for supporting 1900 students
- Construction of government funded third lab is slowly underway
- Lab classes take place once every two weeks, breaking continuity
- Syllabus Span not clearly defined
- Learning outcomes are also ambiguous
- No standardized textbook is available
- Different textbooks encompass different topics in different depths
- Burden for students (especially in Commerce and Science)
- Fear of Failure (about 800 of 1900 failed last year in Half Yearly exams)
- Difficulty in motivating students to learn

- Some students are not as interested in learning as they are about other compulsory subjects (Physics, Chemistry, Biology)
- Syllabus is an overkill for Government's goals of familiarizing students with technology
- Technology awareness is inevitable
- Significant difference between learning to use ICT and learning about ICT
- Syllabus is not appropriate for all students (eg: circuit design is not necessary for business students)
- Not all students have access to ICT devices outside of school (disadvantaged families)
- "Lack of qualified teachers in government schools and most other schools outside of Dhaka"
- "Labs are inadequate to support enormous number of students and may not even be available in most schools"

Recommendation:

- Syllabus needs to be more specific and clearly defined
- Drop more technical topics from syllabus
- Fix inconsistencies in the syllabus (prerequisites of some topics need to be added)
- Remove irrelevant information
- Hire more ICT teachers and build more labs
- Change the syllabus to be more appropriate for students of all background or make the subject optional

3.1.4 Meeting 04:

Interviewee: Sheikh Mohammad Arif, Senior Lecturer, Notre Dame College, Dhaka

- ICT is a natural evolution of a previously optional subject, computer studies
- Two new teachers recruited to ICT department after the government decided to make the subject optional, to support the additional students
- Inadequate Lab Space

- Most science students are very interested in ICT; some even participate in programming and app development competitions
- But don't take ICT as seriously as they take other compulsory subjects such as Physics and Mathematics
- Most arts and commerce students are afraid of ICT
- Contents of ICT syllabus is too large and complex for a compulsory subject and a burden to Art and Commerce students
- Currently the syllabus is designed to cover a wide array of topics in low detail, as a result, students are unable to properly understand all the topics and resort to memorizing
- This tendency is especially more rampant among arts and commerce students
- Many students are just cramming to get their desired grade, defeating the purpose of learning ICT

3.1.5 Meeting 05:

Interviewee: Dr. Zerina Begum, Professor, Institute of Information Technology, University of Dhaka

- ICT syllabus is not appropriate for SSC and HSC level.
- Only elementary education on computer should be enough for the students of class 9 and 10.
- The syllabus should be updated according to the current state of ICT.
- The syllabus of HSC level is quite complicated but the students have a short period of time to cover the syllabus.
- The students will be frustrated. So the syllabus should be revised and well defined.
- Some chapters like number theory, digital system must be shortened.
- The teachers need to be trained properly. Government should arrange more training program for teachers of ICT.

3.2 SUMMARY OF FINDINGS

Viewpoint of Government Personnel:

Through the introduction of ICT as a mandatory subject the Ministry of Education aims to familiarize every student with modern day technology. To serve this purpose, the government aims to continue investing in setting up multimedia labs in all schools across the nation and adequately training teachers. Changes in the syllabus will be 'demand-driven' that is reflect the changes in available technology. The government also plans to set ICT as a mandatory subject as at lower levels such as Primary level as well.

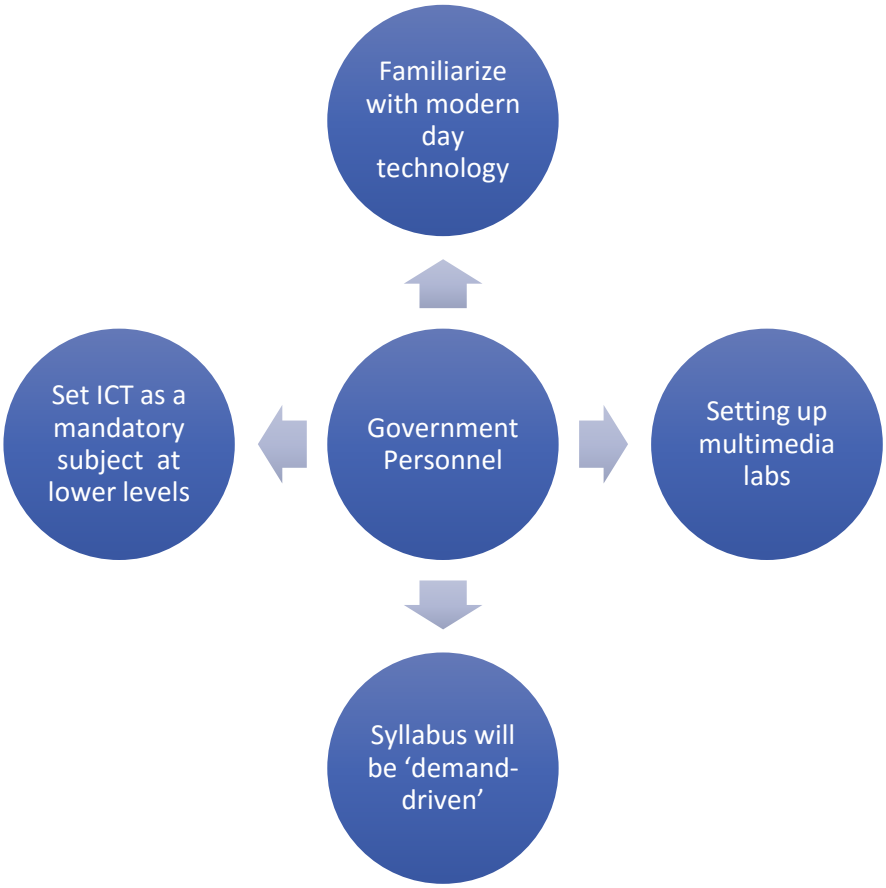

Figure 2: Viewpoint of Government Personnel

Government Policy:

The government is planning to eradicate the curse of illiteracy through proactive use of ICT. The new National Education Policy emphasizes the use of ICT to improve educational quality. The policy aims to integrate ICT in the technical and vocational education. The government plans to make ICT education compulsory at secondary level by 2013 and at primary level by 2021. 53 out of 306 action items, which amounts to 17%, of ICT Policy 2009 focus on human resource development. The Skills Development Policy being prepared by the Ministry of Labor and Employment identifies ICT as a 'market skill'. The National Strategy for Accelerated Poverty Reduction (NSAPR II) also recognizes the need of improving country's knowledge base using education, training and research, and emphasizes on the importance of ICT as an invaluable enabler towards achieving this objective. Moreover, there are initiatives in place to facilitate national ICT examination to enable the general population to join the mainstream ICT workforce. The government also wants to use "proficiency in ICT applications" as one of the key benchmarks for employment in both public and private sectors. Some steps taken by them like -

1) Teacher-led content development: Teachers in primary and secondary schools will develop multimedia content for general subjects for classroom use. Teachers will share content across the country using various ICT mechanisms such as portals and mobile platforms.
2) Accelerating BdREN: The Bangladesh Research and Education Network to connect all universities and research institutions with high-speed connectivity and access to international publications and researchers will be accelerated to ensure that our sizeable tertiary education population has collaborative access to the best and brightest minds. Such unprecedented access has been made possible by advancements and rapid proliferation of high-speed networks and rich content around the world.
3) Incentives for teachers based on performance and innovation: Salary increments, bonuses and career movement for teachers may be instituted over time based on innovation and educational outcomes. Non-fiscal incentives may be designed in terms of recognition and opportunities for leadership in different levels. (Access to Information (A2I) Programme, 2011)

Viewpoint of Teachers:

Most students are already quite familiar with modern day Information and Communication Technology, i.e. they already know how to use ICT. Current ICT syllabus is geared more towards how ICT works and not how to use ICT, hence defeating the government's purpose of familiarizing students with ICT. The syllabus is very large, complex and ambiguous. Discrepancies between learning outcome and syllabus content, makes teaching ICT even more difficult. Many topics are currently included without equipping students with the prerequisite information needed to understand the aforementioned topics.

Government is not building enough labs to support the students. The lab construction process is also very slow and expensive. Lab facilities in most schools are inadequate to support to the very large number of students, making ICT compulsory has created.

Not all students need to learn ICT. For most students ICT, especially the more technical topics such as Digital logic and Circuit design, is a burden. Arts and Commerce students are not being benefitted from learning ICT, since they do not get to apply this knowledge in their higher education. Lack of detail in many topics leave students with more questions than answers, leading them to memorize the content instead of understanding it; this further increases their frustration towards ICT.

Many science students are quite interested to learn ICT. Some even participate in ICT Olympiads, Programming Contests and Application Development competitions. But most science students do not take ICT as seriously as they take other compulsory subjects such as Physics and Mathematics.

ICT syllabus should be more clearly defined with standardized textbooks. If the current syllabus is maintained, ICT should not be kept a compulsory subject, instead it should be kept as an optional subject for Science students. If ICT is kept as a compulsory subject, its syllabus should be shortened, such that only topics that could potentially benefit all students are kept. More technical topics such as Digital logic design and circuit design should be removed from the syllabus.

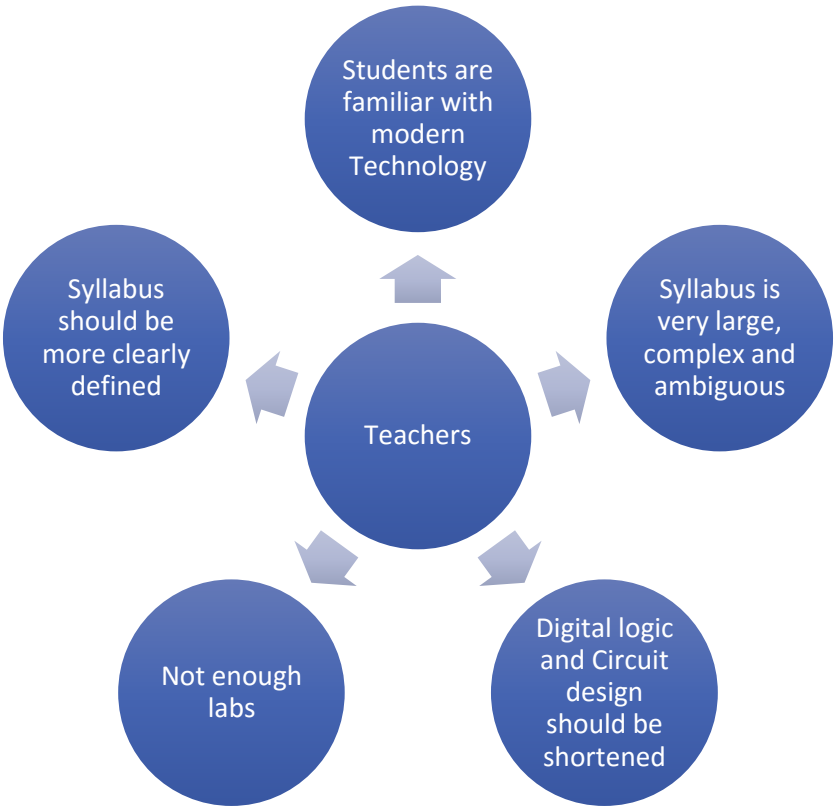

Figure 3: Viewpoint of Teachers

Viewpoint of IT Professionals:

At its current state the ICT syllabus if too advanced and complicated for students. Existing knowledge of ICT from Secondary and Higher Secondary levels is not required for Higher Education in technical subjects. Only elementary knowledge about computers should be taught at Secondary levels. The syllabus should be updated to include modern topics which are more relevant to the students. Number of ICT teachers is too low to teach all the students, so the government should recruit and train more teachers to teach ICT.

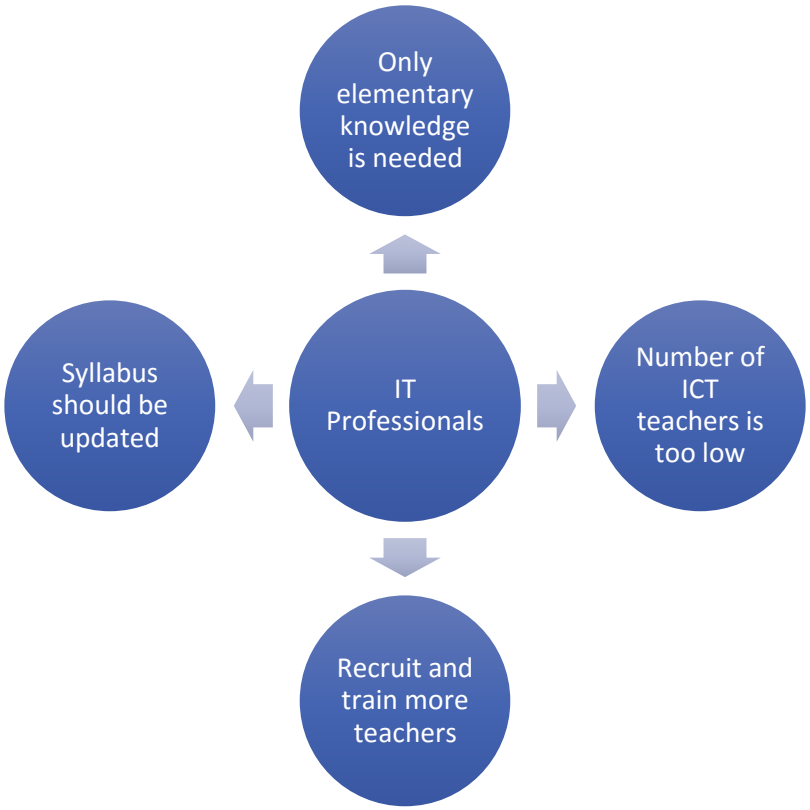

Figure 4: Viewpoints of IT Professionals

3.3 CONCLUSION

About two centuries ago, civilization took a radical turn on the wake of industrial revolution. Change is again taking place in the 21st century because of ICT revolution. By becoming a part of this revolution, Bangladesh, as a developing country, has found remarkable opportunities to alleviate poverty. Proper use of information technology can lead to the achievement of expected skills. Technology can play a vital role in the eradication of corruption by bringing in transparency in the state machinery. More attention will be given to prospective areas of export such as software, data processing or call center services industry including supply of skilled manpower in information technology.

Although learning ICT is hugely emphasized by government, this education still lacks in training teachers, providing syllabus and treating all students equally. Again, students of rural areas and human studies seem reluctant to learning ICT. There is also not enough laboratory and demonstrators to teach students the applications of ICT. These problems can be solved by the policy makers, education board, teachers, parents and students.

3.4 RECOMMENDATION

- ICT should either be made an optional subject for Science students or its syllabus should be shortened to discard too complex and highly technical topics
- Clearly define syllabus by providing standardized textbooks
- Include all prerequisite topics
- Only include topics which are relevant to all students and teach them soft skills such as working with Microsoft Word, Powerpoint, Excel
- Number of ICT teachers is too low so more qualified teachers should be recruited to teach ICT
- Adequate ICT labs should be constructed fast, to support the large number of students

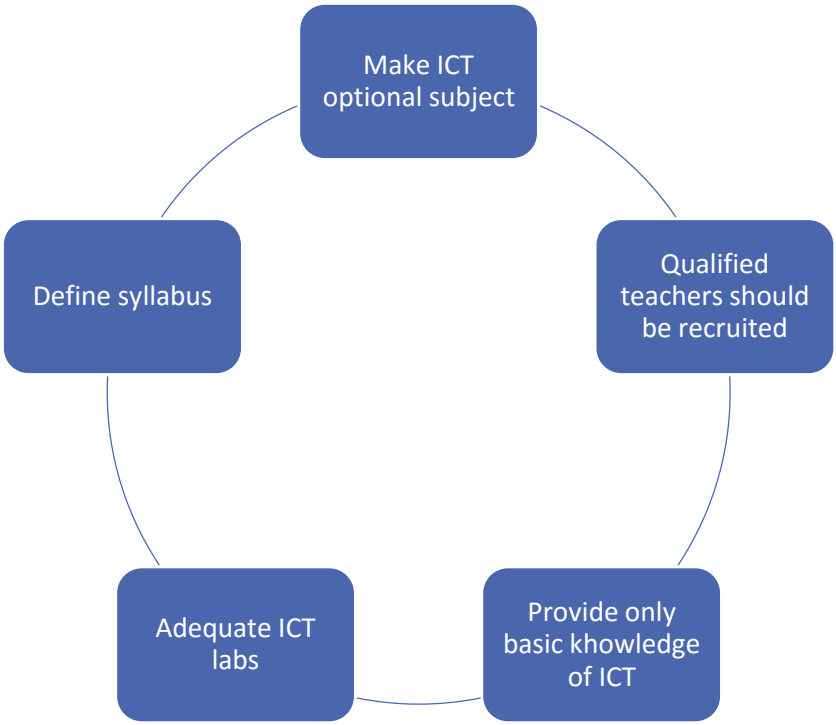

Figure 5: Recommendations

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