

Rationale of ICT Syllabus at Different Education Level in Bangladesh

G. M. M. Bashir,¹ Jhuma Rani Dey,² Saifa Khanam Liza,² and Tanjila Salwa²

¹Department of Computer and Communication Engineering, Patuakhali Science and Technology University, Dumki-8602 Patuakhali, Bangladesh

²Faculty of Computer Science and Engineering, Patuakhali Science and Technology University, Dumki-8602 Patuakhali, Bangladesh

* Patuakhali Science and Technology University, Dumki-8602 Patuakhali, Bangladesh

murad98csekuet@yahoo.com, jhuma1510@gmail.com, sliza91@gmail.com, tanjila.salwa@gmail.com

Abstract— ICT is considered as one of the vital issues to make every citizen's life easy and dynamic. For these reasons the government of Bangladesh started ICT education compulsory to higher secondary level as like literature subject. From National Curriculum and Textbook Board of Bangladesh the ICT syllabus has been comprehended to both junior and higher secondary levels. It is a great question about the continuation, perfection and relevance for different level of ICT syllabus. What will be the impact on the tertiary level syllabus for including ICT as compulsory at higher secondary level also should be predicted. Duplicity of any contents of syllabus on different level is not expected and also time wastage for learners. Learners' ability and syllabus contents also should be relevant. This research studies the different level of syllabus and will find out its rationality of the ICT syllabus to different levels.

Keywords — rationale; duplicity; perfectness; impact; relevance

I. INTRODUCTION

At the beginning of the 21st century, computers have made their way into all levels of education. All industrialized nations and many developing nations have equipped classrooms with computers [1] and Internet access. To keep pace with the modern world the government of Bangladesh has taken some initiatives to integrate ICT in the education system and one of these is to digitize the academic books both in junior and higher secondary levels. This initiative ensures primary ICT based knowledge and education for the students and enhances the teaching capacity of the teachers [7].

Information Communication Technology (ICT) plays a significant role in developing human capital through bringing a revolutionary change in education system specially focusing on the development of rural schools by the use of ICT in imparting education to the students of junior and secondary levels. This research studies the different level of syllabus and will find out its rationality of the ICT syllabus at different levels with rapid expansion in information communication technology, the government of Bangladesh started ICT education compulsory to higher secondary level as like literature subject. 2009, the first 'National ICT Roadmap' was drafted by the then' Ministry of Science and ICT'. This roadmap was developed with active support from UK based management consultancy firm government. The report laid out 4 clear visions for Bangladesh over the next 10 years from 2009. These visions approach to upgrade Bangladesh as a middle incoming country, to establish it as a transparent, responsible and accountable country, to ensure social equality and cost effective delivery of citizen services.

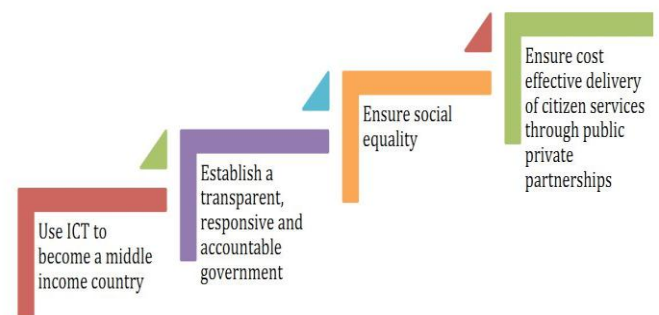


Fig. 1. 4 clear visions for Bangladesh

Bangladesh faces the challenge of becoming a learning society, and ensuring that its citizens are equipped with knowledge of ICT, skills and qualifications they will need in this century.

Urban areas, especially, the capital Dhaka and surrounding areas are significantly different from the rest of the country in terms of power supply and consumption, literacy rate, socio-economic condition and access to ICT. The concept of "Digital Bangladesh" involves ensuring people's democracy, improvement of the daily lifestyle of all people establishing justice and ensuring delivery of government services to the citizens of Bangladesh through maximum use of ICT.

The educational system in Bangladesh is three-tiered and highly subsidized. The government of Bangladesh operates many schools and colleges in the primary, secondary, and higher secondary levels. In Bangladesh, there are about 80,396 primary level institutions[10], 3,459 junior, 14760 secondary schools and 1,186 intermediate colleges respectively[8]. Tertiary education in Bangladesh takes place at 34 governments, 77 private and 3 international universities [9].

II. LITERATURE REVIEW

Recently, the government formulated a National Education Policy in the cabinet, which was endorsed by Parliament. In this Policy, introduction of ICT syllabus at the junior (VII-VIII) and higher secondary level has been included in the implementation period of 2013.

The information and communication technology (ICT) revolution brings particular challenges to education systems around the world.

These challenges are in three broad areas. The first has to do with participation in the information society, the second is ICT impact on access, cost-effectiveness and quality of education, while the third is to do with the way that ICT changes the education process.

About 76.90% population living in rural areas [6] being 'disadvantaged', moves the focus of ICT in education towards ICT 'inclusion', rather than 'advancement'.

ICT project for education in secondary and higher secondary level: The government provides laptops and multimedia projectors to 20,500 public and private educational institutions to improve the classroom teaching-learning process.

The main objective of this project is to introduce ICT to the students, make class learning more attractive and bridge the digital divide between rural, suburban and urban students [4]. Education for All: The government of Bangladesh makes a strong commitment to implement the Education for All (EFA) projects through ensuring education to the underprivileged students both in rural, suburban and urban areas [3].

III. THEORETICAL FRAMEWORK

A. Present Approach

To keep pace with the modern world the government of Bangladesh has decided to add the ICT syllabus from junior level (VI-VIII) to higher secondary level. Obviously, It is a great decision, but as a developing country, there are some problems here, which can be a great obstacle to obtaining the actual goal for ICT syllabus. The inclusion of IT courses in junior and higher secondary education has become a challenge in Bangladesh for teaching and learning the IT contents for which sufficient numbers of experienced instructors and appropriate infrastructure are not available in the country.

(1) Defining The Problem Domain:

Bangladesh is a third world country under development in southeast Asia. It has a vision to turn into a digital one through a mass progress in the field of IT and IT education [5].

a) Lacking Holistic Approach:

To implement any national project, several ministries get involved in the implementation process so top level executives in the government body should be more careful about the coordination, which is missing in several ICT enabled

education projects. Sometimes it happens that the budget allocation for a project implementation is very low relative to the demand which causes the lengthier of the project.

b) Lacking ICT Infrastructure:

In many rural school students are not getting proper ICT based education because of lack of ICT infrastructure. The internet connection is not available in the remote areas and the number of computers distributed by the government is very low so government should ensure adequate computers and the Internet connectivity across the country, especially in the rural school to facilitate the contents of the ICT syllabus among rural school students.

c) Teacher's Training Problem:

Another issue identified is the lack of training for instructors, as the ICT syllabus has been included recently. Also, some new teachers in rural schools [6] & teachers who are newly transferred to other schools are not given specific teaching, training and have difficulties fitting into their new roles as teachers in a student oriented system which requires teachers to reposition themselves from instructors to facilitators in the learning process of their students [7].

IV. RESULT AND DISCUSSION

In this time, surveying about approximately 100 people from ICT concerned society. Above 85% endorsed ICT syllabus as perfect for class VI-VIII. Some new ideas have been generated i.e, updating the syllabus with the latest technology advancements, removing high thoughts.

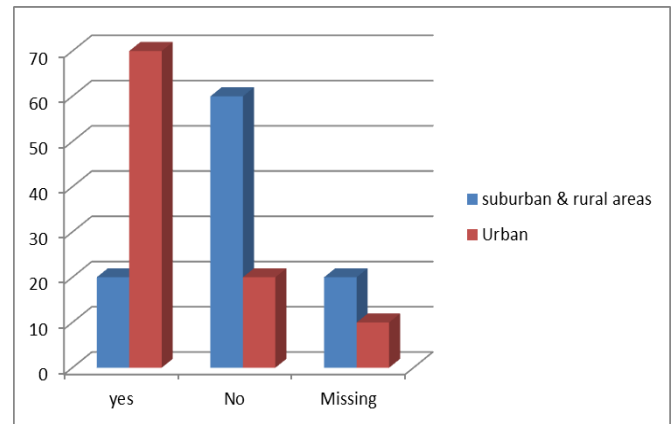


Fig. 2. Survey results for the question : "Do you have sufficient computers in your school?"

Fig. 2 shows the survey for the similar question: "Do you have sufficient computers in your school?" The survey is performed on 100 students in urban, suburban & rural areas. From survey results, about 72% students answered "YES" in urban areas which represents a positive feedback while about 64% students answered "NO" in rural and suburban areas which represents a negative feedback.

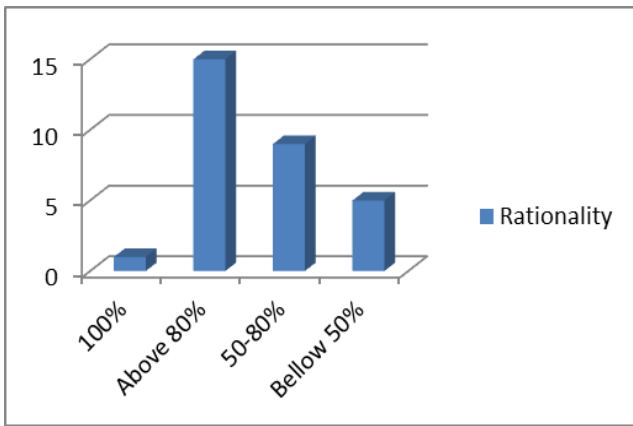


Fig. 3. Survey results for the question : “What’s about the rationality of including ICT syllabus in different education level?”

Fig. 3 shows the survey result for the question: “What about the rationality of including ICT syllabus in different education level?” Based on a survey of the intellectual people, ICT syllabus of junior level can be reported as perfect above 80%. The syllabus is co-ordinated with introducing the latest technology and communication advancements. The course contents are explained with rational ideas and become easy to understand for the students. It is an acceptable rate for urban areas. On the other hand, the percentage of the rural students are much lower for having limitations in comparison to the urban students.

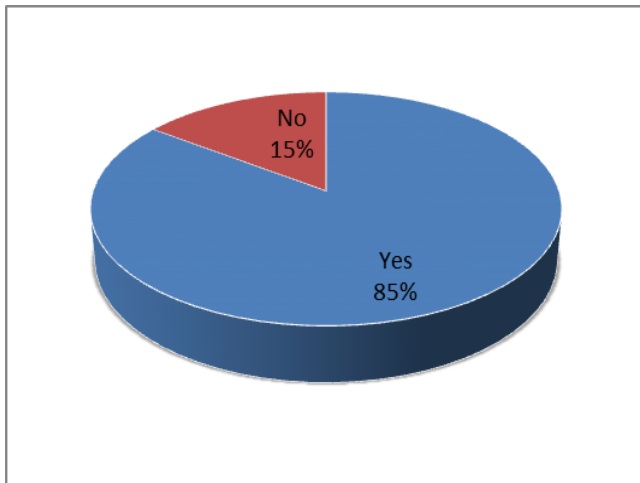


Fig. 4. Survey results for the question : “Do you recommend necessity of increasing training program for ICT course teachers?”

Fig. 4 shows the survey result for the question : “Do you recommend necessity of increasing training program for ICT course teachers?” As can be seen, the answers of “YES” are 85% and the percentage of “NO” are 15%. From the survey result, it can be seen that the necessity of increasing training program for ICT syllabus is so much important. Although arranging enough equipment for a developing country such as Bangladesh is a great challenge.

To facilitate the problem originated by the lack of efficient instructors in rural, suburban and urban areas, it is recommended to increase the training program with ICT updates.

A. A Strategic Plan For Junior Level

- Equipping schools with sufficient computers and internet
- Proper training for instructors
- Including latest technology

B. Recommended Proposal

- Including initial concepts about computer and technology in primary level (class I-V) in a sequential process. Thus, the students may achieve the adaptability with ICT advancements in different levels.

In secondary education level (IX-X) ICT syllabus isn’t included still now. There is a proposal from the government of Bangladesh to include it from the year of 2015. It is expected to have rationality in secondary ICT syllabus also. All secondary levels of education, there is provision for imparting both theoretical and practical lessons in ICT syllabus. All institutions are supposed to have both computer laboratories and a sufficient number of qualified teachers. The reality is that, in cities and towns, most schools are well equipped and student can learn about computer. But in rural areas where most schools do not have sufficient numbers of computers and qualified teachers and most students do not have any scope to learn about computer at home [8].

Including ICT syllabus in higher secondary level is seemed to have the sequential progress of junior level. This syllabus is upgraded with more technological advancements. The course contents are co-ordinated with tertiary level syllabus i.e. Programming Language, Introduction to web design, Communication and Computer networks, Database Management System, Number System and Digital Device and other latest technology based topics like Virtual reality, Artificial intelligence, Robotics, Biometrics, Nano Technology etc. This brings a huge possibility of a greater revolution in Bangladesh.

With the advancements of course contents in higher secondary level a challenging impact has been noticed.

Most of the people emphasize that ICT in education has a multiplier effect throughout the education system, by enhancing learning and providing students with new sets of skills; by reaching students with poor or no access (especially those in rural and remote regions); by facilitating and improving the training of teachers; and by minimizing costs associated with the delivery of traditional instruction.

TABLE I

Duplicity of Structured programming Language

H.S.C	PSTU	BUET
*Concept of Program	*Programming Concepts	*Programming Concepts
*Programming Language	*Structured Programming Language	*Structured Programming Language
*C Programming Language	*Data types	*Types of data
*Types of data	*Constant	*Constant
*Constant	*Variables	*Variables
*Variables	*Keyword	*Keyword
*Keyword	*Expressions	*Expressions
*Expression	*Functions	*Function
*Function	*Loop Statement	*Loop Statement
*Loop Statement	*Conditional Statements	*Conditional Statements
*Conditional Statement	*Arrays	*Arrays
*Array	*Multidimensional Array	*Multidimensional Array
*Multidimensional Array	*Input and Output	*Input and Output
*Input Output		

TABLE I shows the duplicity of several contents of the programming languages between ICT syllabus in higher secondary level and the CSE syllabus of tertiary level in two reputed public universities of Bangladesh. Introduction of structured programming language with C has been discussed in higher secondary level, i.e. Concept of C program, constants, variables, data types, keyword, expression, function, loop statement, conditional statement, I/O statements, array etc. which has similarity with the initial stage of C language in the tertiary level that makes duplicity between the tertiary level and higher secondary level. These duplicity founds only in the initial stages of tertiary level.

TABLE II

Duplicity of Digital logic Design

H.S.C	PSTU	BUET
*Binary Number	*Binary Number	*Boolean Algebra
*Number Base Conversion	*Number Base Conversion	*De Morgan's theorems
*Complements	*Complements	*Logic Gates and their Truth Tables
*Boolean Algebra	*Boolean Algebra	*Combinational Logic Circuits
*Boolean theorems	*Boolean theorems	*Counters
*Logic Gates	*Logic Gates	*Decoders
*Simplification of Logic function	*Simplification of Boolean function	*Encoders
*Combinational logic(half adder, full adder)	*Combinational logic(half adder, full adder)	*Flip Flops
*Registers	*Shift Registers	
*Using Ripple Counter	*Binary Ripple Counter	
*Decoder	*Decoders	
*Encoder	*Encoders	
*Flip Flop	*Basic Flip Flop Circuits	

TABLE II represents the duplicity of several contents of Digital Logic Design (DLD) between ICT syllabus in the higher secondary level and the CSE syllabus of tertiary level. Initial concepts, i.e. binary number, number base conversion, complements, Boolean algebra, Boolean theorems, logic gates, simplification of logic circuits, combinational logic, decoder, encoder, flip flop etc. are similar to DLD course contents in BUET and PSTU.

In comparison with the syllabus of CSE in tertiary level and ICT of higher secondary level duplicity in several courses are found. Repeated similar course contents in two different levels of education cause a wastage of time and energy which isn't expected at all.

Concerned people recommend some modification in the tertiary CSE syllabus that may be done to avoid this unexpected duplicity. For this reason, it could be a good decision to modify the syllabus of tertiary level. It is suggested to design the tertiary syllabus removing the repeated course contents which are studied by these students in higher secondary ICT syllabus. Hopefully, this may be an effective way to avoid such wastage of time and energy.

V. CONCLUSIONS

Expansion of ICT syllabus in junior and higher secondary level is a great decision by the government of Bangladesh and this syllabus is perfect and rational according to the survey of ICT concerned people. Some challenges have been found in different education level. Lack of experienced instructors and well equipped computer lab is creating problems in junior level for rural and suburban areas. The secondary ICT syllabus is still work in progress which is supposed to be included earlier. ICT syllabus in higher secondary level is dynamic and much upgraded while several similar course contents of the ICT syllabus in higher secondary level and CSE syllabus in tertiary level causes duplicity which is unexpected. This research expresses out the rationality, problems and impact of ICT syllabus in Bangladesh. It also proposes some suggestions seemed to be effective have been recommended by the intellectual people. By applying suggested approaches the limitations can be fixed and the government of Bangladesh may achieve its desired result to get Digital Bangladesh.

ACKNOWLEDGEMENT

First of all, we would like to thank the Almighty, who gives the ability and strength to complete this research paper. Then, we would like to convey our gratitude to the authority of communication.

REFERENCES

- [1] Kuan-Cheng Lin..*Online Interactive Game-Based Learning in High School History Education: Impact on Educational Effectiveness and Student Motivation*. 2011 IEEE
- [2] *IT Education Using SmartPhone: an e-learning Approach*, MoHCI 2014.
- [3] *NCTB*.[http://www.nctb.gov.bd/article.php? cat=9 & subcat=26](http://www.nctb.gov.bd/article.php?cat=9&subcat=26), 2009. K.Elissa, "Title of paper if known," unpublished.

- [4] *DigitalBangladesh*, Blogpost <http://www.ghior.com/2013/02/digital-bangladesh.html>
- [5] Bismillah Khatoon bt Abdul Kader, "Malaysia's Experience in Training Teachers to Use ICT. In E. Meleisea (Ed.)," *ICT in Teacher Education: Case Studies from the Asia-Pacific Region*, Bangkok: UNESCO, pp 10-22, 2008
- [6] *The Impact of ICT on Education: A Study on Rural Schools*, Aug. 2013, Vol. 3 Iss. 8, PP. 367-373.
- [7] *Editorial, thefinancial Express* <http://www.thefinancialexpress-bd.com/2014/01/06/12420>
- [8] www.moedu.gov.bd/index.php?option=com_content&task=view&id=500&Itemid=400
- [9] www.ugc.gov.bd/university
- [10] www.moedu.gov.bd/old/edu_statistics.php