

Implementation of Active Learning for ICT Education in Schools

Saikat Goswami¹

Department of Computer Science and Engineering
Jahangirnagar University
Dhaka, Bangladesh

Mohammad Shorif Uddin², Maisha Rowshon Islam³

Department of Computer Science and Engineering
Jahangirnagar University
Dhaka, Bangladesh

Abstract:- This research was aimed to explore the implementation of Information and Communication Technology (ICT) education at Primary and Secondary levels in Bangladesh. The education ministry has added ICT with the national curriculum in Bangladesh. So, goal of the research is i) How to ensure the best implementation of ICT in the education; ii) How to ensure the best use of ICT tools in the class rooms; iii) How to help teachers, students, parents and also all the relevant bodies to cope with the system. To face the challenges in the 21st century if a nation can not adapt the new technology the country can not move forward. Students are the future of a nation if the student stay blind from the new technology the country will lag behind. So, the modern ICT information-based population can play a great role in Bangladesh.

Keywords:- Computer Vision.

I. INTRODUCTION

Information and Communication Technology has brought a robust change in society. It has connected the whole world and has influenced economic and social sectors. ICT has produced a glittering change in both teaching and learning. Bangladesh is a developing and third world country. It is also known as the country of poverty, overpopulation and a persistent gender gap in education and literacy. Information Communication Technology (ICT) in Education in Bangladesh is a multidisciplinary field which has inherent prospects and problems similar to any other innovation. Sufficient evidence demonstrated ICT application benefits in educating disadvantaged communities. In Bangladesh, many educational institutions (primary, secondary, college, university) have taken steps to expand a better shape in their education system by utilization of ICT not only in the urban education system but also in the rural education system. The most effective way to increase student's knowledge is using more technology (internet). ICT has changed for the rural people in our country, the way to communicate, learn and access service and trade. It is offering more effective means of exchanging knowledge and advancing education. In this paper, we have to propose a dynamic software which helps teacher to teach ICT very clearly. In our country lack of trained teachers and not willing to adopt ICT in learning, it is difficult to get proper output from students. To train all teachers are very costly for government.

So only dynamic tools which solves this kind problem and also increases the learning experience of the students.

II. LITERATURE REVIEW

A. Review based on Methods

This approach is considered the best method to use because the instructor interfaces with the students by presenting segments of instruction, questions the students frequently, and provides periodic summaries or logical points of development. Having decided which of the basic formats a lesson will involve, you must next decide which of many instructional techniques would be most appropriate for the particular situation. Issues such as the developmental level of the students, the instructional venue (indoors, outdoors, individual desks, tables and chairs for group work, etc.), and the subject matter to be presented must be considered.

Betty Tonui [22] investigated different case studies for implementing ICT in primary schools and trying to convince teachers to use different ICT tools and also influence the adoption and use of ICT in teaching and learning both from a general perspective and in a technical education context. The author also influence the teachers by showing the benefits of ICT like the author [22] is pictured out the rationale for adopting and using ICT for learning-teaching and the benefits of integrating ICT into teaching-learning. The main benefits of this case study are that ICT offer great potential that can be exploited to enhance teaching-learning processes. But the more awareness needs otherwise teachers and students, but also management, administration will be affected and also need more influence for adaptation of ICT. In Active Learning Environment for achieving Higher-Order Thinking skills in Engineering Education, the author [23] had been proposed a method as think, pair and share is a cooperative learning technique that encourages individual participation and is applicable across all grade levels and class sizes. In the think-pair-share activity the learners take a minute to ponder the previous lesson, later to discuss it with one or more of their peers, finally to share it with the class as part of a formal discussion. It is during this formal discussion that the instructor should clarify misconceptions. And the main advantages of Think-pair-share, which is helpful for the instructor as it enables organizing content and tracking students on where they are relative to the topic being discussed in class, saves time so that he/she can move to other topics, helps to make the class more interactive, provides opportunities for students to interact with each other.

B. Review based on Frameworks

In an Investigation into Implementation of ICT in Primary Schools, in Kenya, in the Light of Free Laptops at Primary One a Case Study of Teachers Implementing ICT into Their Teaching Practice, in this study the author prepared a set of questions to make a descriptive survey and gather information about the implementation of ICT in primary schools. The author [22] also gather information on teachers' perceptions of the extent to which they integrate ICT into teaching-learning. In this survey a sample of 26 teachers were selected to participate from 80 teachers from the district. Teachers was selected based on random selection and also reliability index is obtained by the questionnaire. In this study the author [22] uses random selection of teachers to gather data which is good for collecting good results. On [8] Digital signature and other authentication and integrity associated technologies altered management of digital records. New digital audio and video formats appeared. Electronic recordkeeping technologies related to Records Management Systems (RMS)/ Enterprise Content Management Systems (ECM, ECMS) influenced organizations and supported their abilities to preserve digital records. Storage became portable, designed for massive scalability, and with archival qualities – like SDS (Software Defined Storage), SSA (Solid) Semantic web and graph databases also occurred in the realm of today's records and archive management. These fresh ICT concepts and their effect on archival science are described in this article.

C. Review based on Experimental Evaluation

After examining all the data I got some positive and also some negative results like most of the teachers around 80% disagree that training that are given to the teachers which are not adequate to adopt all the tools so well and we also found that ICT tools that are given by the government which are most desirable because teachers can at least show ICT tools to students to encourage students in their studies etc. For implementing ICT in education course [1] they had made a survey based on a different questionnaire on the usage of ICT in education sector and home and result found that the maximum mean result was “they have access to a computer at home.” And lowest mean result was “they were taught in the classroom which was equipped with a digital camera.” This result was based on Response of students and their practical experience regarding the use of ICT [1]. And use of ICT with examples and use of video for professional development were very rare in the classroom. It was found that using ict tools was rare in almost every institute that video recording was played for their professional development. Muhammad Iqbal Majoka*, ShawanaFazal**, Muhammad Saeed Khan*** Implementation of Information and Communication Technologies (ICT) in Education Course found various aspects in implementing of ICTs by examined all question reviewed.

D. Observations

The primary schools from class one to class five does not have any ICT syllabus. ICT has been introduced in secondary schools from class six and so on. The ICT book consist of 5 chapters. They are introduced to ICT, ICT tools, ICT and safety, word processing and Introduction to the internet. This is the only peace of code in the ICT books in secondary level. And after the image there is no instruction how the programming works or why computer doesn't understand the basic language. After seeing this image students have to Wait 4 years to get familiar with any kind of software development of coding. But in building a logical view in a student they need to be familiar with simple logic and basic coding concepts from the beginnings.

III. RESEARCH METHODOLOGY

Information and Communication technology (ICT) is one of the most important books for a student in this modern era. In this chapter I have presented the Methodology are on lesson study of the digital learning application which will help the teachers in the classroom for ICT lesson study. When developing a framework, I thought of the most important problem that the lack of teachers in the schools. And also creating good lesson study with covering the entire book of ICT of class with the easiness that students and teachers can understand easily. Analyzing Current ICT Syllabus in Bangladesh. Analyzing various articles on ICT implementation in education in around the world. Gone for field work in the schools both in rural and the urban areas in the country to see the problems and discuss the solution with the teachers and students. See Documentations and read blogs about the same type of software solutions. The thing is to make a group discussed solution in each chapter by chapter for the lesson contents. The model teacher uses both audio, video and Image contents to clear each topic of the ICT syllabus. The images were collected both from the book of ICT class six and also from open source mediums.

A. Framework

I conducted experiments and field works on some schools and find out the difficulties that the school teachers are facing taking the ICT class specially in the class 6 because in this class the ICT subject has been introduced to the students. I evaluated the method which the teachers are both in rural areas and the urban areas are teaching in the ICT classes. I use Audio recorders to re-code the problems pointed by the teachers. The main problems are the lack of qualified teaches in the particular subject not only class 6 but also from 6 to 10. So, the framework of the application as designed like that so the teachers can take the classes with out or with a minimal ICT training and can maintain the quality of the ICT in the school and cope up with the national curriculum. The framework has been designed into many parts. First Part is Observation in this part the current class has to monitor for the current situation for the real story. Then the Study materials creation part that contains the Analysis, Plan, Do and See. Then the application development part and finally the real feedback part for the really effectiveness ofthe application.

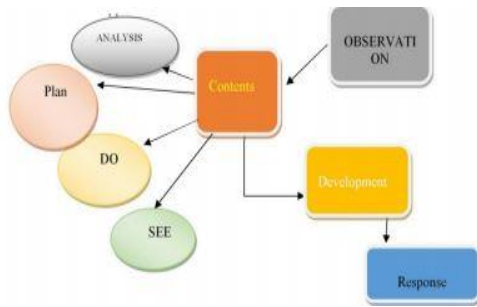


Fig 1:- Flowchart of Entire Framework

➤ *Observation*

In the First stage I have gone to the field works in the schools in the rural and the urban areas in the country to see the current stage of the ICT also gather knowledge about how the system that the both areas teachers use to teach in the classes to get a view of the idea of the content type. The key points I have done is this stage are:

- Analyzing Current ICT Syllabus.
- Analyzing various articles on ICT implementation in education in around the world.
- Gone for field work in the schools both in rural and the urban areas in the country to see the problems and discuss the solution with the teachers and students.
- See Documentations and read blogs about same type of software solutions.

B. Content Designing

In this stage the study contents are designed for the students. There is a model teacher who teaches the students the chapter of the book by the videos, audios and pictures. The Section has been deigning in four parts:

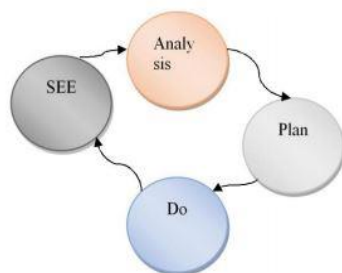


Fig 2: Content Designing

➤ *Analysis*

The first stage is analysis. In this stage flow the class room study seen for the particular lesson. Divide the particular chapter in some parts and discussed among them about the contents development and which content needs to be specify like what.

➤ *Plan*

The second stage is Plan. In this stage, develop teaching and learning design based on students’ needs and their learning demand. This stage is the most important part of the section. In this stage the plans are developed how the videos and audios are going to be taken and in what sequence and how the chapter will be represented in the application.

➤ *Do*

The third stage is Do. In this stage, a teacher from the group is appointed to be a model teacher to implement the planned lesson. Usually, the activity is conducted in the form of open lesson where the model teacher teaches in a classroom and the other team members observe the lesson. And also as the demand of the content the various audios and videos has to be take also and relevant pictures and labels are also collected to.

➤ *See*

The Forth stage is Reflection or See. In this stage, model teacher and observer is conducted soon after the open lesson. Led by a moderator, the discussion is primarily held to share the evidence resulted from observation, to map identified learning problems, and to find alternative solutions for the future lesson improvement.

C. Application Development

The Application is a desktop form application the applications specifications are :

- .net Framework(4.0)
- Bunifuui
- MySQL server

The first phase of the Application is starts with a from that welcome to everyone



Fig 3:- First Phase of Application

This phase or screen has one button to enter in the main software. The second phase has the choose option for the class only class six has been activated. And the noticeable point is that the entire Application has been made in Bengali for the easiness of the students and the teachers.

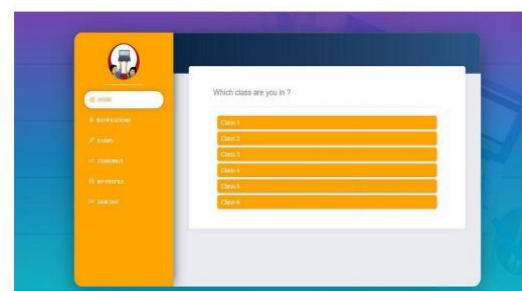


Fig 4:- Main Window

Then after selecting the class six there is the Introduction to class six book also all the chapters And all chapter contains all the videos and audios and the tutorials and two extra MCQ quiz system and one phase for group work for the students team work.



Fig-5: Content



Fig 6: MCQ Exam System



Fig 7: Group Work System

IV. EXPERIMENTAL RESULTS AND ANALYSIS

To demonstrate my main purpose to support active learning for ICT courses in High School by using Dynamic Software Tool, I had been developed a learning software which aims to help teachers for learning ICT course more easily and also help students to learn ICT courses by Dynamic Software tool. After developing Dynamic software tool for class six, I have made up survey questionnaires to cover all the things related to our developed software. The survey questionnaires are divided into three section and each section has ten questions. To get feedback from teachers and students, I have divided questionnaires into three part like

- Justification for “Visuals in lecture clearly explained the concepts”
- Cooperative learning environments that encourage student collaboration
- Application Infrastructure

The students and teachers feedback results are shown visually in below:

Justification for “Visuals in lecture clearly explained the concepts”: In this section I have ten questions where first six questions have four options like Excellent, Good, Okay and Disappointing and other four questions are two options

like Yes and No. After calculating all the survey papers have obtained 53.32% Excellent, 47.324% Good and the percentage of okay and disappointing are 0%. And from other four questions, have got 94.165% Yes and 5.8325% No. This feedback values are shown in Graph and Pie charts in below:

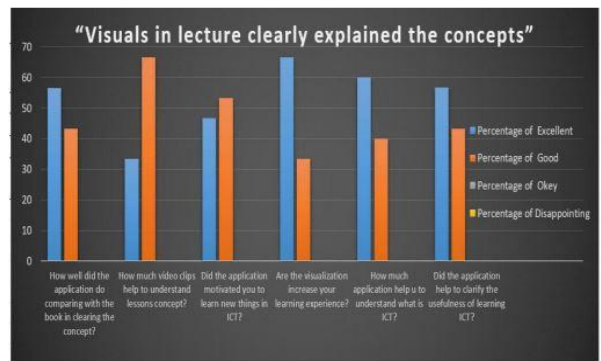


Fig 8:- Percentage of Excellent, Good, Okay and Disappoint

Cooperative learning environments that encourage student collaboration: In this section I have made ten questions where five questions have options Excellent, Good, okay and Disappointing and other five questions have Yes and No. From first five questions, I have got average percentage of 63.996% Excellent, 35.328% Good and others 3.33% Okay and 0% disappointing. And from last five questions I have got 79.462% Yes and 20.53%No. This survey data are shown in below visually:

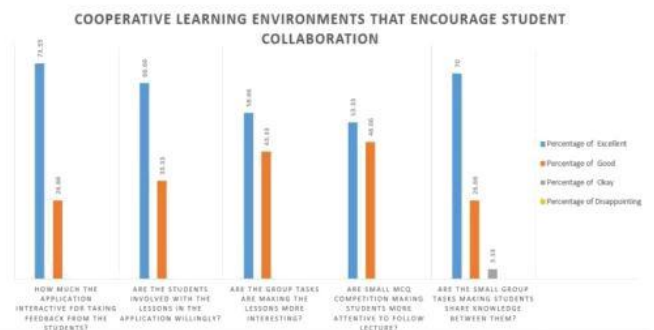


Fig 9:- Percentage of Excellent, Good, Okay and Disappoint

Justification of Application Infrastructure: In this section I have made nine questions. From the survey questions I have got average percentage of 72.59% Yes and 27.51% No. This survey data is shown in bellow visually:

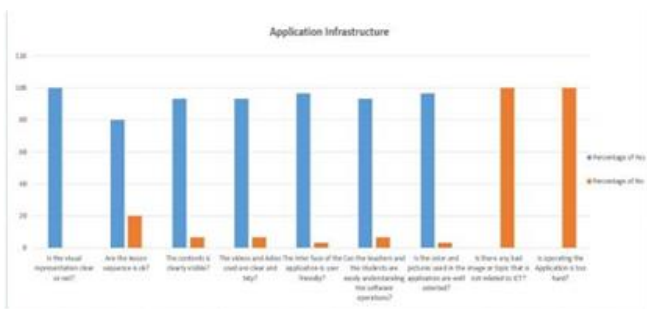


Fig 10:- Percentage of Excellent, Good, Okay and Disappoint

V. CONCLUSIONS

In vision 2021 government has taken many steps to make Bangladesh Digital Bangladesh. And it can't be achieved without modernization in the education system. The interest and good review by the teachers and the student prove that they are ready to adopt the new technology and adopting it. To remove the lack of learning opportunity in the rural areas in our country, for a better Bangladesh. That's why I named the application **Let's learn**.

REFERENCES

- [1]. Rana, Rizwan, and Nasir Mahmood. "The relationship between test anxiety and academic achievement." *Bulletin of Education and Research* 32.2 (2010): 63-74.
- [2]. Goktas, Yuksel, Nuray Gedik, and Ozlem Baydas. "Enablers and barriers to the use of ICT in primary schools in Turkey: A comparative study of 2005–2011." *Computers & Education* 68 (2013): 211-222.
- [3]. M. Young, *The Technical Writer's Handbook*. Mill Valley, CA: University Science, 1989.
- [4]. Van Es, Elizabeth A. "Examining the development of a teacher learning community: The case of a video club." *Teaching and teacher education* 28.2(2012): 182-192.
- [5]. Stančić, Hrvoje, Arian Rajh, and Mario Jamić. "Impact of ICT on archival practice from the 2000s onwards and the necessary changes of archival science curricula." 2017 40th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO). IEEE, 2017.
- [6]. Fan, Fulan, et al. "Exploring the Relationship between Teachers' ICT Competency and Usage of ICT in Elementary and Secondary Teaching Practice." 2016 International Conference on Educational Innovation through Technology (EITT). IEEE, 2016.

- [7]. Pujiyono, Wahyu, Yana Hendriana, and Istiqomah Dwi Susanti. "Interactive learning media based on RPP ICT." 2016 International Conference on Information Technology Systems and Innovation (ICITSI). IEEE, 2016.
- [8]. Zhou, Peng, et al. "Factors Analysis on Differences of Teachers' ICT Usage Between Urban and Rural Region." 2017 International Symposium on Educational Technology (ISET). IEEE, 2017.
- [9]. Pauliina, and Harri Alamäki. "Mobile learning in teacher training." *Journal of assisted learning* 19.3 (2003): 330-335.
- [10]. Khirwadkar, Anjali. "Integration of ICT in education: pedagogical issues." *Education* (2007): 85-104.
- [11]. Ismail, S. A. A., Almekhlafi, A. G. & Al-Mekhlafy, M. H. (2010)