

## **ENHANCED CLASS ROOM LEARNING**

**A Thesis**

**Submitted to the Department of Computer Science and  
Engineering**

**Of**

**BRAC University**

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## DECLARATION

We hereby declare that this thesis is based on the results found by ourselves. Materials of work found by other researchers are mentioned by reference. This thesis, neither in whole nor in part, has been previously submitted for any degree.

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Signature of Supervisor

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Signature of Author 1

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Signature of Author 2

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Signature of Author 3

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## **ABSTRACT**

Usually, in a classroom the number of students is quite large, so as a result classroom participation, which is a key factor for learning becomes very low. Only the interested students participate and due to time constraint, the teacher cannot evaluate each student individually in the class. To cope with this problem we are trying to introduce a system where the teacher can offer multiple-choice questions during class time. In the classroom, there will be a wireless device for each student. All students will answer a particular question with the help of those wireless devices. There will be a software running on a pc that will process the answers given by the students and show the results as a graph. With the help of the graph the teacher would know about the students' performance in the class and will be able to evaluate the entire body of students. Moreover, by seeing the graph, students will get immediate feedback on their learning and this practice will in turn further motivate them to gain more knowledge about their subject.

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## **CHAPTER 1**

### **INTRODUCTION**



## **1.1 BACKGROUND**

In a traditional university class room lectures are delivered by the teacher and the only student response the teacher gets is by taking quizzes, exams, or by asking questions between the lectures. When the teacher asks a question in class, only the very interested students respond and the rest of them stay silent and these very interested students comprise of only 5% of the entire student body. So the teacher during class cannot evaluate all the students or we can say he/she cannot be sure that the students have grasped the lecture's ideas or not. Targeting this specific problem, we are trying to introduce a new method for effective classroom learning.

In this new method the students' class participation will increase and the teacher will be able to evaluate all of them at once. We plan to achieve this by using a small electronic device which will be present in front of every student in the class, through which they will respond to the questions asked by the teacher. These devices would be connected with a computer in the class room and after the students respond to the question their responses will be shown as a graph on the projector. Moreover, as the students would be actually participating and seeing immediate results in the class room their learning would be more enhanced compared to their usual 'sit and hear' type of class room learning.

## **1.2 OBJECTIVES**

The objective of our thesis topic "enhanced classroom learning" is to introduce a new system where learning within the classroom will be more effective. In a classroom there are two major entities the teacher and the student. In a classroom, the teacher's responsibility is not only giving lecture but also ensuring that students are learning. To make sure that the students learn properly teachers need to evaluate the students' performance within the classroom.

## **CHAPTER 2**

### **METHODOLOGY**

Primary Contribution

By

Farhana Mahbub Fabin

## 2.1 ANALYSIS

In a classroom, countless questions might arise in a student's mind regarding a lecture. In a classroom there are two types of learner: *active* learner and *passive* learner. Passive learners are those who only listen to the teacher in a classroom. Due to shyness or lack of confidence, they usually do not participate in the class. Again, there are some students who want to participate, but due to a large number of students, cannot. But if they are compelled to do group work some of them do in fact become active. On the other hand, active learners are more spontaneous and interactive. They try to participate and ask questions to teachers during class lecture. Nevertheless, these active learners can be further classified into two groups. In one group, some students ask the teacher questions and get the solution and this *feedback* increases their concentration level. The other group fails to get the solution of their questions and in turn lose interest completely.

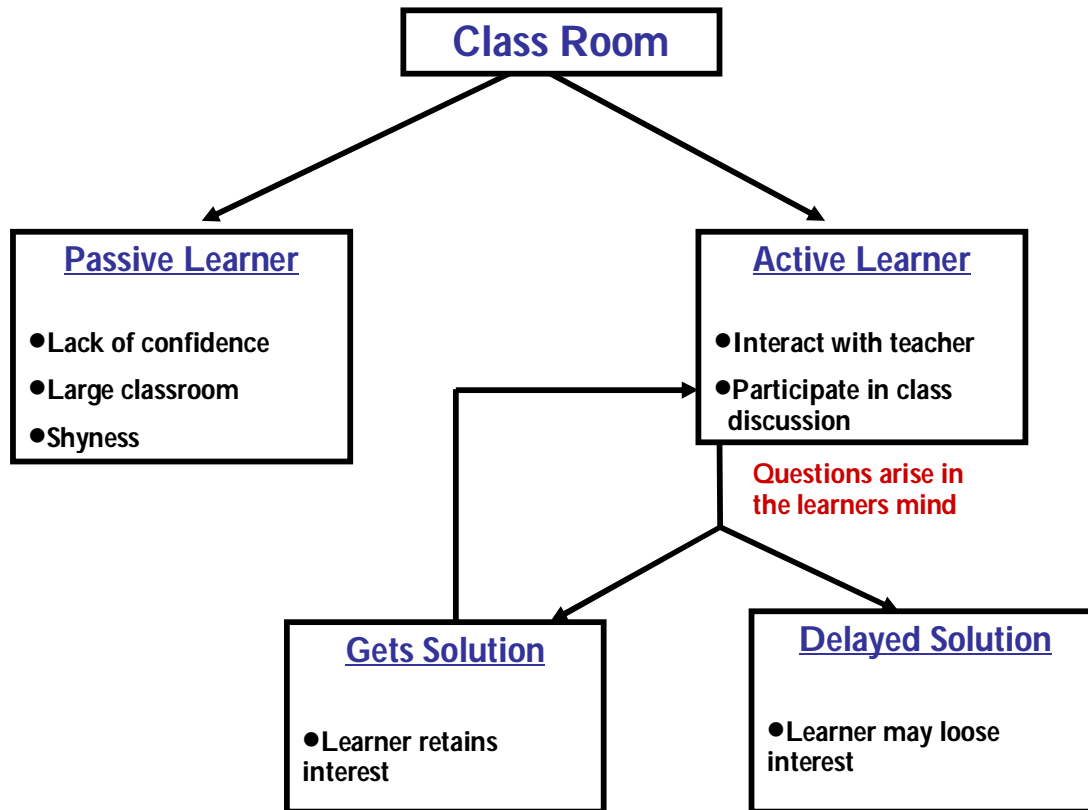


Fig. 2.1: Psychology of active learner and passive learner

### 2.1.1 ACTIVE LEARNING

In a classroom active learning involves students in doing things or thinking about the things they are doing. When students get immediate feedback from their teachers, it increases their motivation level and it also involves them in higher order thinking, analysis and evaluation.

There are lots of reports and researches which have been done based on active learning strategy in a classroom. Among them some of the statements are as follows:

*Students learn what they care about and remember what they understand.*

(Ericksen, 1984, p. 51)

*All genuine learning is active, not passive. It is process of discovery in which the student is the main agent, not the teacher.*

(Adler, 1982)

*The sort of teaching we propose requires that we encourage active learning and that we become knowledgeable about that ways in which our students hear, understand, interpret and integrate ideas.*

(AAC Task Group on General education, 1988, p.25)

So we can see that in a classroom active learning is important to enhance the students' learning.

### **2.1.2 IDEAL CLASSROOM**

In a classroom learning is important. And we know if the learners are active than the learning is more significant. So to enhance the learning we can think of an ideal classroom where we can make all the learners active. Such as

- Students sit at a computer terminal
- Teacher asks question in between the class related to the lecture
- The questions asked by teacher are shown in a monitor
- Students respond on their terminals
- Based on students percentage of answers a bar graph is drawn
- Seeing that bar graph both teacher and students can get immediate feedback.

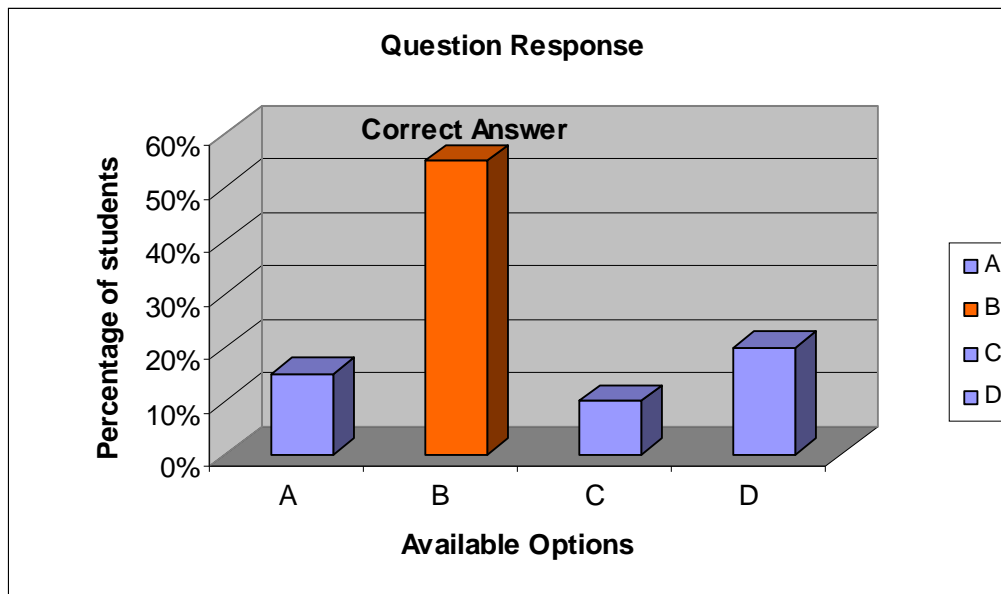


Fig. 2.2: A sample response graph in an ideal class room

### 2.1.3 CLASSROOM PARTICIPATION SYSTEM

#### 1. LAN based system

- Software designed by students of the CSE Department of BRAC University (*An interactive participatory solution to distance learning*). In this system each student has a computer in front of him/her. Special software is installed on those computers through which the students give the answers to questions given by the teacher during the class. Every teacher has his/ her own user ID. Using that ID teacher logs in and sets question according to the lecture. Again every student also has their own login ID. After a class starts every student can login and their log in is considered as their attendance. During a class a teacher can activate a question and after activation every student logged in can see that question in front of their computers. There is a time limit for every question. Within the time students have to answer. Based on the students' answer a graph will be shown in their individual computer similar to Fig 2.2 which will reflect the performance of the whole class for that particular question.

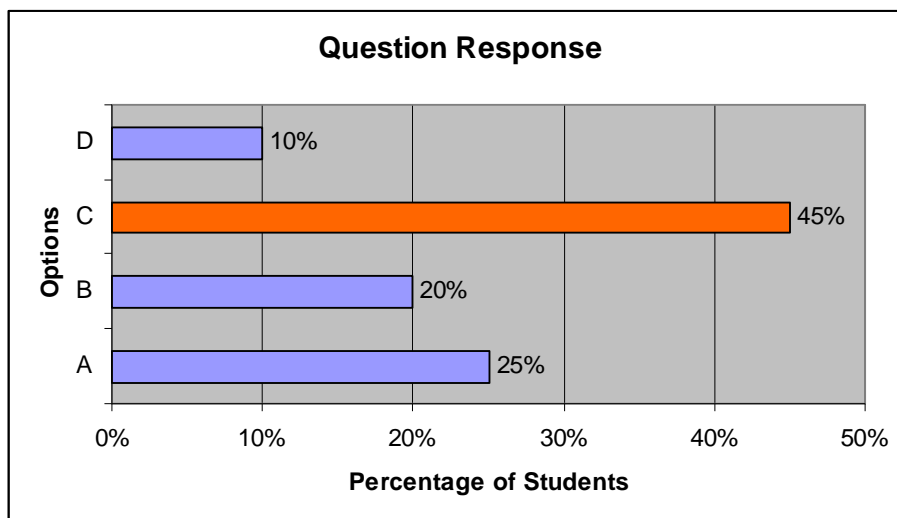


Fig. 2.3: Sample graph generated for an example question

## 2. iclicker

- An easy-to-use radio frequency classroom response system that facilitates teaching rather than impeding it. It comes in two parts: one software and the necessary hardware. The software is open source and it was initiated by the Physics department at the University of Illinois and later further support by Holtzbrinck Publishers. Iclicker requires no hardware installation. Only one portable iclickbase unit is needed for each class. The students during a class register to the base using the iclicker remote.

### 2.1.4 BLOOM'S TAXONOMY

If a teacher wants to ensure the learning within a class, his/her first job is to design the class. Designing lecture is not the only component of a well designed class. Designing questions is also a main factor. In terms of designing questions teachers should follow BLOOMS TAXONOMY. In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom found that teachers tend to ask questions that require recall of information or knowledge 80% to 90% of the time. Bloom introduced six question categories that require much more *brain power* and a more extensive and elaborate answer. The categories are given below:

Knowledge	Memorizing Recognizing Remembering	Who, When, Where .... Find the meaning of .... Describe what happened....
Comprehension	Interpreting Selecting facts and ideas Classifying	Write in your own word... What was the main idea... What do you think....
Application	Problem solving Applying information Use of facts, rules and principles	Can you develop.... Can you apply .... What factor would you change if ....
Analysis	Differentiate Appraise Analyze	How was this similar to ... What was the problem with... Why did ....change occur?
Synthesis	Combination of ideas Creating a unique, original product	How many ways can you ... Can you design a .....
Evaluation	Making value decision Resolving controversies Development of opinion, decisions	Is there a better solution to ... Judge the value.... Can u defend your position about ...

Fig. 2.4: Six levels of Bloom's Taxonomy

A student's critical thinking involves logical thinking and reasoning including skills such as comparison, classification, sequencing, cause/effect, patterning, webbing, analogies, deductive and inductive reasoning, forecasting and planning. Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, elaboration, brainstorming, modification, imagery, associative thinking, attribute listing and metaphorical thinking. The main aim of creative thinking is to stimulate curiosity and promote divergence.

A more detailed description of Bloom's taxonomy follows:



### Level 1 – Knowledge

- observation and recall of information
- knowledge of dates, events, places
- knowledge of major ideas
- mastery of subject matter
- *Question Cues:*  
list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.

### Level 2 – Comprehension

- understanding information
- grasp meaning
- translate knowledge into new context
- interpret facts, compare, contrast
- order, group, infer causes
- predict consequences
- *Question Cues:*  
summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend

### Level 3 – Application

- use information
- use methods, concepts, theories in new situations
- solve problems using required skills or knowledge
- *Questions Cues:*  
apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover

### Level 4 – Analysis

- seeing patterns
- organization of parts

- recognition of hidden meanings
- identification of components
- *Question Cues:*  
analyze, separate, order, explain, connect, classify, arrange, divide,  
compare, select, explain, infer

#### Level 5 – Synthesis

- use old ideas to create new ones
- generalize from given facts
- relate knowledge from several areas
- predict, draw conclusions
- *Question Cues:*  
combine, integrate, modify, rearrange, substitute, plan, create, design,  
invent, what if?, compose, formulate, prepare, generalize, rewrite

#### Level 6 – Evaluation

- compare and discriminate between ideas
- assess value of theories, presentations
- make choices based on reasoned argument
- verify value of evidence
- recognize subjectivity
- *Question Cues:*  
assess, decide, rank, grade, test, measure, recommend, convince, select,  
judge, explain, discriminate, support, conclude, compare, summarize

So if the teacher designs his/her question using *Bloom's Taxonomy*, the question pattern will cover all the needed learning aspects for the students. By asking those questions teacher can at least identify whether the students understood the topic or not.

### **2.1.5 RELEVANCE OF THE TAXONOMY IN THE UNIVERSITY CONTEXT**

In our university classrooms the students have to cover all the sides which are covered by the six levels of Bloom's Taxonomy – knowledge, comprehension, application, analysis, synthesis and evaluation. They have to develop these skills and within a short period of time, so considering our system where the students face questions made from these six parts every class, they will quickly develop the skills required. So we can say that Bloom's Taxonomy is indeed important for our university class rooms.

### **2.1.6 TESTING THE SYSTEM IN CLASS**

During the testing phase we used the LAN based software developed by Abu Sayed, Shakib Zaman and Shafiq Samsur Razzak of BRAC University named "An interactive participatory solution to distance learning". This software was installed in 20 computers in one of our university labs. The software requires both the teacher and the student to login to the system. During the lecture the teacher enables a question and within a time period the students have to select answers from their screen. Then the main software processes the answers and shows them as a graph which the students can see on their screen.

In our proposed system the teacher will ask questions during the class and students will answer them using an electronic device. The question pattern will be guided by *Bloom's Taxonomy*. The questions will have multiple answers and the student will choose the correct answer by clicking or pushing any one of the four answer buttons on the device. The answers would also be designed in such a way that even if the students answer incorrectly the teacher would be able to identify which part of his/her lecture the students did not understand. Then accordingly he/she will change his lecture style or he could also re-explain the previous topic. When the students finish answering a computer will process the answers and show the results using a graph. The graph would show what percentage of the students selected which options. The graph will not show any student identification so as the student himself, knows which option he selected, he will know instantly his position in the class. The students who answered

incorrectly would not be dissuaded as they would be able to see that there are other students (the percentage of the incorrect option) who gave the wrong answers.

As a simple example consider the question: *Evaluate the expression:  $4+5-3*4/2$* . The answers could be i) 12, ii) 3 iii) 24, iv) -1.5. The right answer to this expression is the second option 3, now if a student selects the first option or the fourth option it could only mean that he/she did not understand the precedence of the arithmetic operators but he can perform the calculations so the teacher would try to explain the precedence of the operators again. But if the student selects the 3<sup>rd</sup> option 24 which is a random incorrect answer it could only mean that the student did not understand anything at all.

### **2.1.7 APPLICATION OF THE SYSTEM IN CLASS**

To test our idea in the university class room we have used the software built by students of the CSE department of BRAC University (An Interactive Participatory Solution to Distance Learning) which works on a Local Area Network. In their system each student has a computer in front of him/her. A special software is installed on those computers through which the students gave the answers to questions given by the teacher during the class. In this system each student can see the performance of the whole class similar to Fig. 2.3 in their individual computer.

We selected a class of 16 students and divided them equally into two groups – the first group (group A) who attended a typical class where the participatory method was not used and the second group (group B) who sat in front of a personal computer and used the software. The same teacher took two classes on the same topic within a fixed time duration. We tried to divide the two groups equally considering their cumulative grade point average (CGPA), number of credit earned and their gender. In our first study a teacher took the first class with group A where he delivered a normal lecture and at the end of the class took a short exam (post test – consisting of four questions) based on that days lecture.

In the next class with group B the same teacher lectured on the same topic. This time the students used the software and answered multiple choice questions (based on *Bloom's Taxonomy*) designed on the specific topic. After the end of this class the group B students also gave the post test which contained the same questions given to group A. In our second study the groups were swapped, this time group A used the software and group B attended the normal lecture on another topic.

### 2.1.8 RESULTS

To analyze the two groups' performance we plotted graphs based on their post test answers. Below in figure 2.5 is the result of our first study.

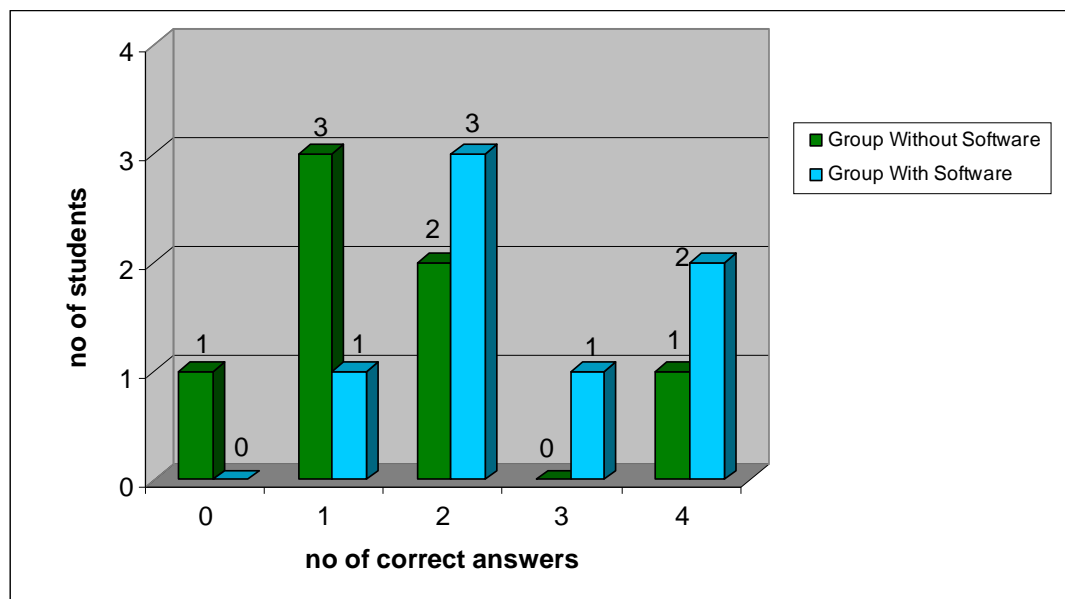


Fig. 2.5: First study results

In Fig. 2.5, we can see that group B who used the software has more percentage of correct answers than group A. Next in fig. 2.7 given below, we can see that after the groups were swapped the performance of group A increased and that of group B fell.

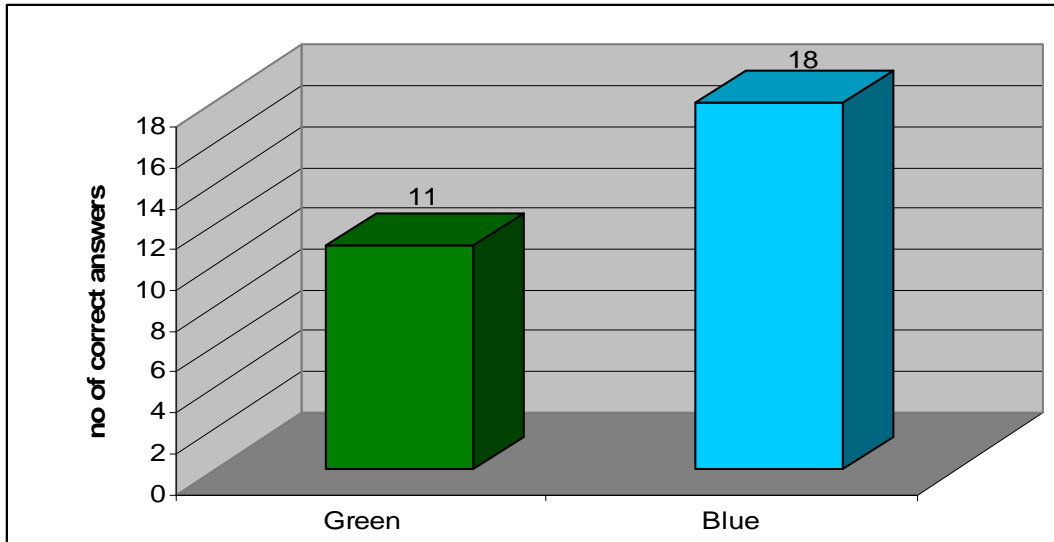


Fig. 2.6: First study results simplified

In fig. 2.6, we can see the simplified results of our first study. Here we can see that the blue group performed better in contrast to the green group. Blue group answered 18 questions correctly whereas green group answered 11.

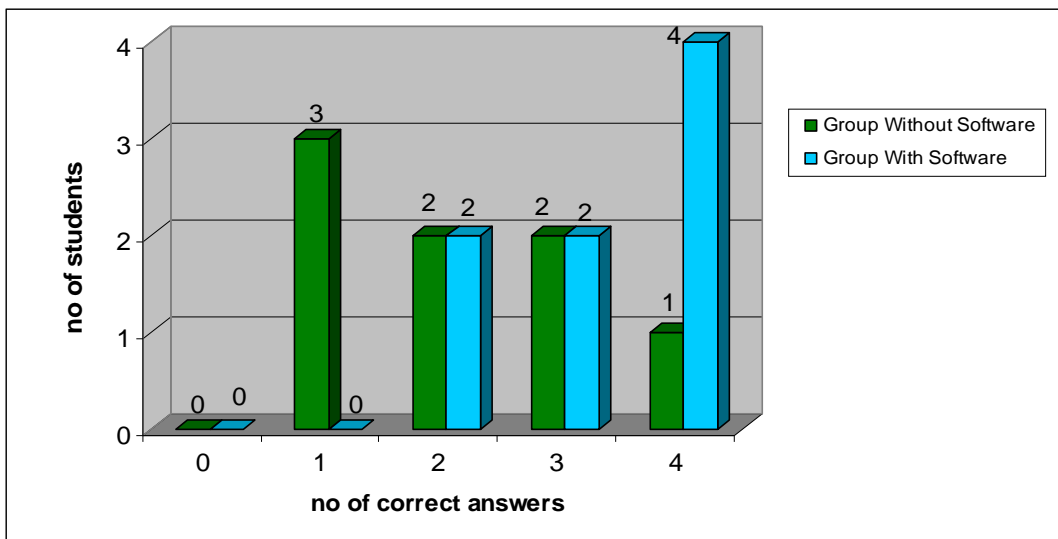


Fig. 2.7: Second study results with groups 'swapped'

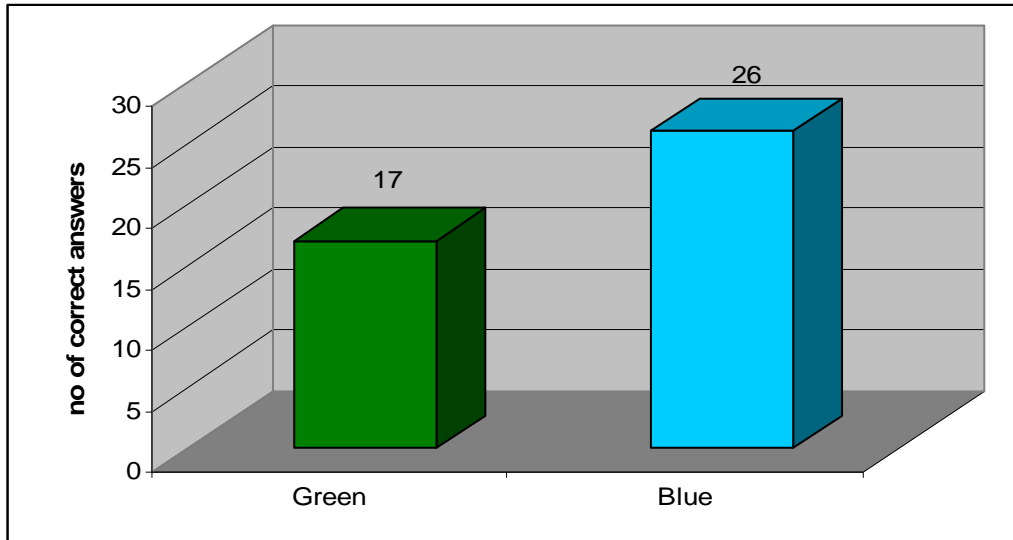


Fig. 2.8: Second study results

In fig. 2.8 and fig. 2.7 we can see that here also the blue group answered more questions correctly than the green group. Blue group answered 26 correct and green group answered 17.

Therefore, from fig. 2.6 and fig. 2.8 we can calculate the percentage increase in the number of correct answers blue group's performance increased by 25 percent and green group's performance increased by 19 percent.

We can, from the previous figures observe that the participatory system works quite well and the students' performance has increased.

### 2.1.9 LIMITATIONS OF THE USED SYSTEM

- It is not cost-effective: In our university classrooms, we usually have around 40 students and in the system used, we need to have 40 computers for the students. This will be quite cumbersome and costly to implement for the whole university with 2500 students and about 50 classrooms.
- LAN connectivity is necessary: In this system, there has to be a network established among the classrooms.
- The teacher cannot see the performance of the students over all the classes taken.

## 2.2 DESIGN

Considering the limitations, we have decided to further improve the current system.

### 2.2.1 SYSTEM MIND MAP

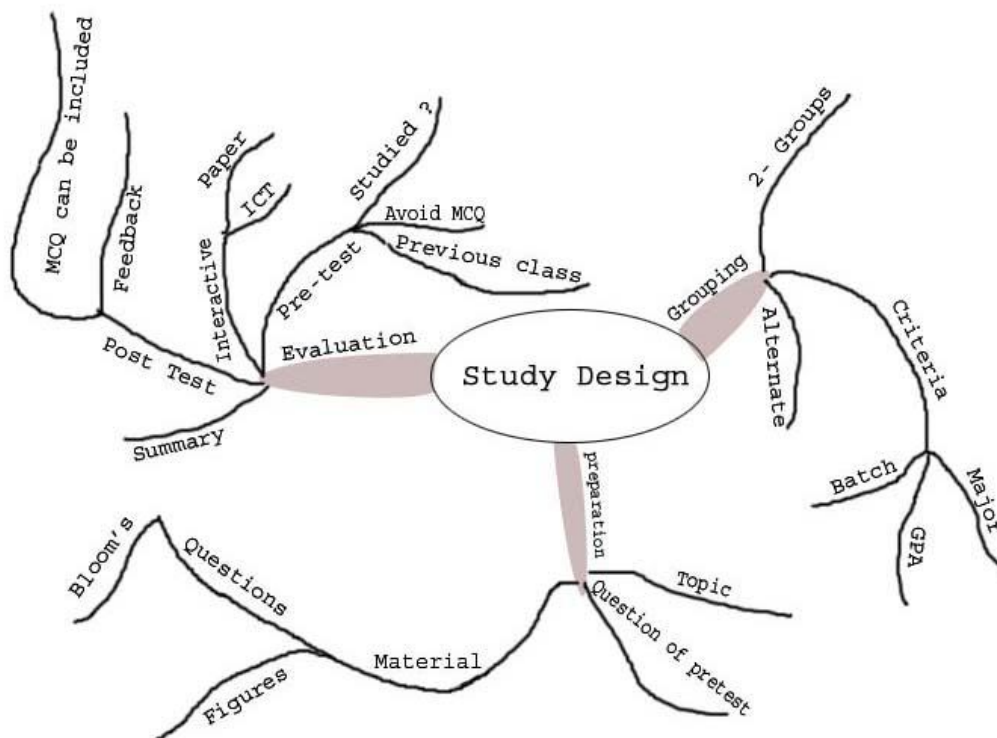


Fig. 2.9: System mind map



## **2.2.2 PROPOSED DEVICE DESIGN**

To properly implement our new system in the classroom we plan to use a wireless device that will be attached to every chair in the classroom. The students will use this device to give their attendance and answering the questions asked by the teacher.

The device's communication with the main software would be wireless, radio frequency or microwave communication will be preferred.

The device will have 16 buttons, 10 number buttons for registering their IDs and 4 buttons for answering – A,B,C and D, lastly there would be a power button to turn the device on.

The device will be small in size roughly 3 x 5 inches in dimension so it could be easily attached to the chairs.

The main power source will be one or two AA pencil batteries.

The devices will communicate with a central receiver that would be interfaced with a computer that the instructor will use.

## **CHAPTER 3**

### **IMPLEMENTATION**

Primary Contribution

By

Rezwan-ul Haque Bhuyan & Golam Mohit Bappy

### 3.1 PROTOTYPE

The prototype of our system is based entirely on Microsoft Excel and the forms and everything is built using VBA code. The background pictures were designed with adobe illustrator.

#### 3.1.1 Form Name: User Login

User: Teacher/Instructor

Purpose:

- Teacher needs to login to the system to take the class

Process:

- The teacher types a user name and the password and then enters the system and the main page form loads. Here 'zillur' and "1234" is typed in the respective fields.

Environment:

- Windows

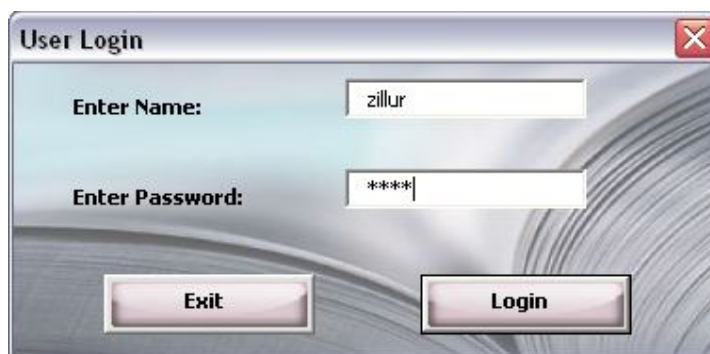
The image shows a screenshot of a 'User Login' window. The window has a title bar with the text 'User Login' and a red close button on the right. The main area of the window has a light blue background with a subtle wave pattern. There are two input fields: the first is labeled 'Enter Name:' and contains the text 'zillur'; the second is labeled 'Enter Password:' and contains masked characters '\*\*\*\*'. At the bottom of the window, there are two buttons: 'Exit' on the left and 'Login' on the right.

Fig. 3.1: User Login Form

### 3.1.2 Form Name: Main Page

User: Teacher/Instructor

Purpose:

- The teacher will take classes and show the results using this form

Process:

- Teacher will first press the attendance button and then the Device Input form shows up and when the student will press the Power On button the device will be activated and the number pad will be enabled.
- After the id is entered it is checked against the student database for validity, then the main page form shows up again with the Take Class button enabled.

Environment:

- Windows



Fig. 3.2: Main Page Form

### 3.1.3 Form Name: Device Input

User: Student

Purpose:

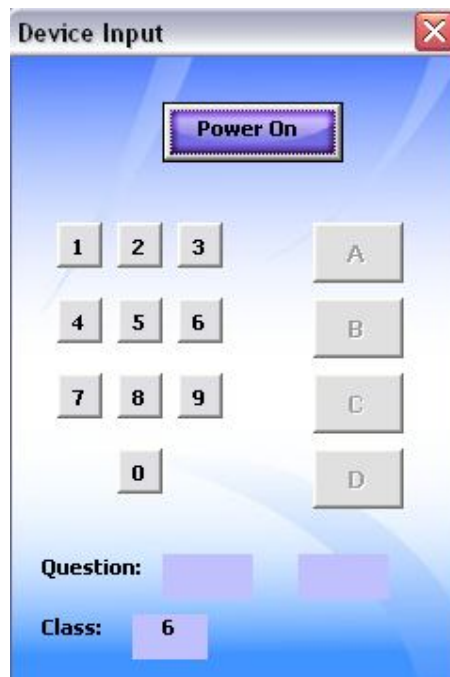
- The student will give their attendance and their answer choices using this form.

Process:

- The teacher enables a question and assigns a time period to it. The device is then activated and the student enters their choice of answers. As this form was built using excel we could not implement the time checking as excel does not have any timers. So the students have only one chance to give their answers. After the answer is recorded in the database the main page form shows up.

Environment:

- Windows



The image shows a screenshot of a software window titled "Device Input". At the top center is a "Power On" button. Below it is a numeric keypad with buttons for digits 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0. To the right of the numeric keypad is a letter keypad with buttons for A, B, C, and D. At the bottom of the window, there are two input fields: "Question:" followed by two empty boxes, and "Class:" followed by a box containing the number "6".

Fig. 3.3: Device Input Form

### 3.1.4 Form Name: Class

User: Teacher/Instructor

Purpose:

- Teacher selects the class, current lecture and the questions here.

Process:

- The questions have the Bloom's level associated with them which the teacher can see while selecting the questions. The teacher selects the questions and then the device form shows up and the students select their answers.
- The teacher can create a new question also using the Create New Class button. After pushing the button the newquestions form shows up.

Environment:

- Windows

The screenshot shows a window titled "Class" with a close button in the top right corner. The window contains the following elements:

- Select class:** A dropdown menu showing "cse260-1".
- Select lecture:** A dropdown menu showing "L31".
- Select question:** A dropdown menu showing "Which one of them is a negative-edge triggered 3 bit ripple".
- Duration:** A text input field containing "2" followed by the label "Minutes".
- Level:** The text "Level: 1".
- Buttons:** Three blue buttons at the bottom: "Activate", "Create New Class", and "Back to Main Menu".

Fig. 3.4: Class Form

### 3.1.5 Form Name: newquestions

User: Teacher/Instruction

Purpose:

- The teacher will enter new questions for a specific class lecture.

Process:

- The teacher selects the class, lecture and then one by one the question, the options and the Bloom level forms show up.
- The teacher can also see some sample question pattern along with the Bloom level in this form so that he can design the questions accordingly.

Environment:

- Windows

Level	Category	Sample Question
Level 1	KNOWLEDGE	<i>Who, When, Where ... Find the meaning of ...</i>
Level 2	COMPREHENSION	<i>What was the main idea... What do you think...</i>
Level 3	APPLICATION	<i>Can you apply ... What factor would you change if ...</i>
Level 4	ANALYSIS	<i>How was this similar to ... What was the problem with...</i>
Level 5	SYNTHESIS	<i>How many ways can you ... Can you design a .....</i>
Level 6	EVALUATION	<i>Is there a better solution to ... Judge the value...</i>

Fig. 3.5: NewQuestions Form

### 3.1.6 Form Name: Reports

User: teacher/Instructor

Purpose:

- The teacher will use this form to show the graphical results to the students.

Process:

- The teacher selects the current response button and an excel graph shows up showing the current response with the percentage of students on the Y- axis and the options on the X - axis. The correct option is colored orange to distinguish it from the other blue colored options.
- The teacher can also see the whole class' one day performance by pushing the today's performance button.

Environment:

- Windows



Fig. 3.6: Reports Form



### 3.1.7 RULES

- i. The user has to log in to the system using the user login form by giving a name and password.
- ii. The name and password is checked against those saved in an excel page named 'Passwords' and only valid combinations are allowed.
- iii. As excel does not support multithreading we have used only one student i.e. device for demonstration purpose.
- iv. After logging in the teacher takes attendance – the device input form shows up and the student pushes the power button and then enters his/her id using the number pad.
- v. After taking the attendance the teacher takes class or continues his lecture.
- vi. During the middle of the class teacher pushes the take class button and the class form shows up.
- vii. In the class form class-id, lecture, and question number is selected by the teacher.
- viii. Each selected question has a Bloom's level (1-6) associated with it.
- ix. The teacher then selects/activates a question and enters the duration in minutes.
- x. During our testing phase we took three classes using 'An Interactive Participatory Solution to Distance Learning' and used the questions and the student's answers in the prototype.
- xi. The device input form shows up and the student enters his choice using any one of the four buttons 'A', 'B', 'C' or 'D'.
- xii. The entered option is kept an excel page named 'Answers'.
- xiii. When the teacher selects the generate report button the reports form shows up.
- xiv. When the current response button is pushed the students' answers are checked against the correct answers in the 'Questions' page and a graph is generated showing percentage of student response against all the options, which the students will see on the projector.

- xv. When the today's performance button is pushed a graph is generated showing correct results against the students' ids. Here all the students' can be seen for a given lecture.
- xvi. If the teacher wants to enter a new question for a lecture he has to push the 'create new class' button in the class form. Then one by one he would be prompted to enter the question, the options, the correct option number and finally the Bloom level of that question.

### **3.1.8 PROBLEMS**

As we used Microsoft excel for building the prototype we could not implement:

- Several student devices
- Calculation of time so that the device input form stays active for that time period only
- Have minimize buttons in the forms
- Show the graphs in the software itself, in the prototype the user has to switch between forms and excel pages.

### **3.1.9 SOLUTIONS**

In building the actual software use of Microsoft visual basic will hopefully solve all the problems.

### 3.1.10 RESULTS USING THE PROTOTYPE

Below are some sample graphs generated using the prototype.

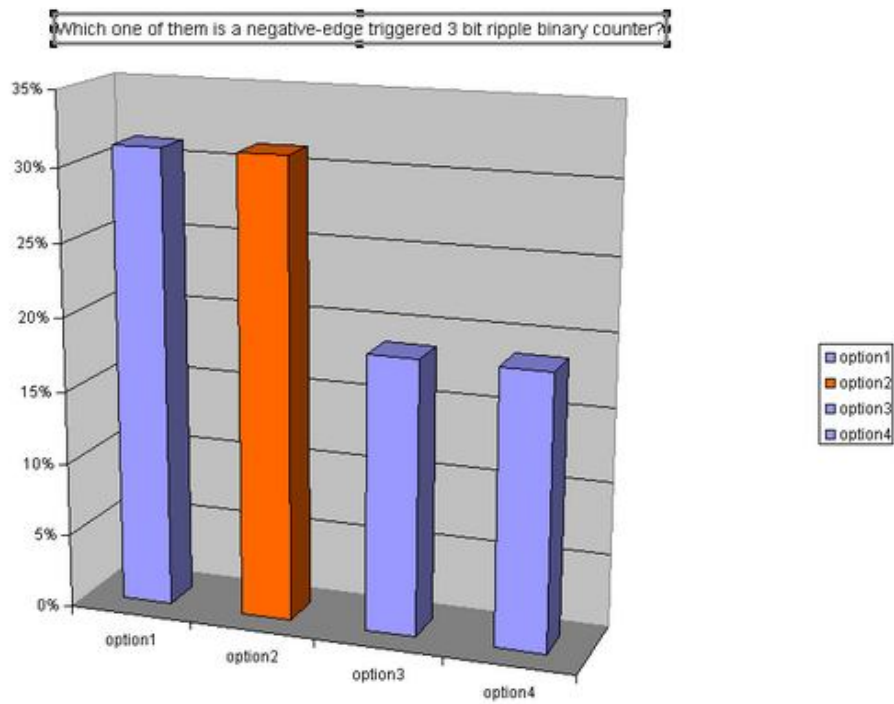


Fig. 3.7: Current Response graph for Lec-31 Q:2

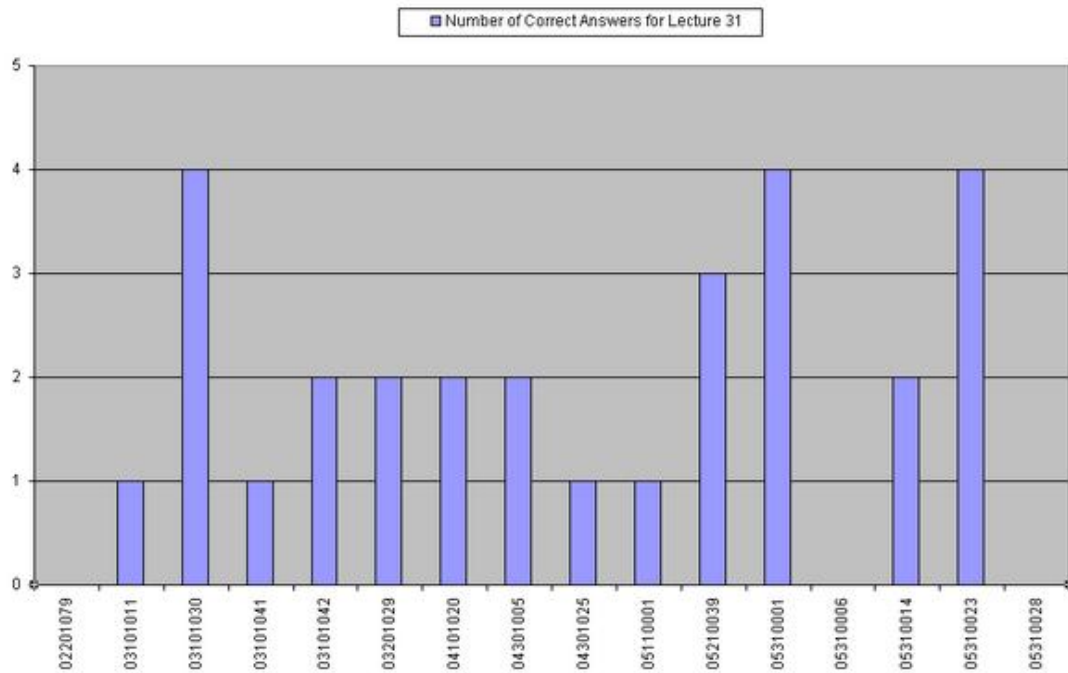


Fig. 3.8: Today's Performance graph for Lec-31

### 3.2 IMPROVED DESIGN OF INTERFACE

To improve the software (An interactive participatory solution to distance learning) that we used in the class we made some changes while developing the prototype.

#### 3.2.1 CHANGES TO HELP THE TEACHER

- In the prototype the teacher only has to input the question once. By doing so he does not have to type in all the questions during the class.
- The system remembers the teachers name and password so he/she just have to login and select the class and the lecture, then the questions relating to that lecture will automatically be loaded in the 'class' form's drop-down menu. So the teacher can easily select one of them.
- The system notifies the teacher if all students are not absent and the student record is also kept so attendance is taken care of.
- The teacher can view the entire class result at the end of the day.

- The teacher can see the Bloom's Taxonomy level when he selects the questions.
- The students' answers are recorded and the teacher can review them if needed.
- Bloom's Taxonomy examples are given the forms level-wise to guide the teacher in making the questions.

## **CHAPTER 4**

### **LIMITATIONS AND FUTURE WORK**

## **4.1 LIMITATIONS**

Due to the limitation of time we could only take three test classes. And in our system the teacher has to give a good effort in designing the questions during the beginning of the course. Our test was done on a class of 16 students whereas in a university classroom the number of students is greater than 30. So if we had taken the test on a greater number of students and took the tests on a few different classes our results would have been much stronger. In our prototype the teacher can only specify four questions for a lecture. Due to time constraint we could not implement our proposed device so instead of testing with a device we took the class with a LAN based software (An interactive participatory solution to distance learning).

## **4.2 FUTURE WORK**

In the future we want to implement the actual software with the device interfaced with it. We would also want to complete the construction of the wireless device which we plan to attach to every chair in the class rooms. In the software we want to include the option of 'overall performance' through which the teacher can see the progress of the students over time. Our work covered the classes in the university but in the future we want to expand our work and implement the system in colleges and schools. To accomplish such goals we would need:

- Funding for the devices
- More test classes
- Involvement of non-technical departments e.g. BBA, Economics
- Support from the teachers and the students
- Funding for the entire system

## **CHAPTER 5**

### **CONCLUDING WORDS**



## **5.1 CONCLUSION**

Through the passage of time a lot has changed in the classroom, 30 – 20 years back students attended classes with copies and pencils, but nowadays students attend classes with laptops and mobiles and the teachers give lectures through multimedia projectors. Continuing with this change we have tried to implement a more innovative system where there will be use of technology and the properties necessary for learning. It can be concluded from the above literature and figures that using an advanced/enhanced system of class room learning students can perform better in their studies. Moreover, as they are actively participating in the classroom and visualizing their performance almost instantly the knowledge that they achieve will reside in them for a long time. This method of classroom participatory learning is not new but in our country not much work has been done. If we are able to implement this method of teaching hopefully students will be more interested to attend the classes and increase both their participation and knowledge.

## 5.2 REFERENCES

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