Abstract—Research and practice in the use of electronic voting systems has developed over the last many years. Electronic voting systems, also known as personal response systems audience response systems or classroom communication systems or student response system (SRS) use handsets to elicit responses from students as part of structured teaching sessions, typically lectures. Student response system is associated with the introduction of interactive, discursive and more segmented approaches to teaching. This paper provides information about the development of a Student Response System in large lecture sections. This give details on SRS including setting up the necessary files, writing questions, incorporating questions into lectures, grading questions, and posting scores. Block diagram of SRS transmitter and receiver section is also described. In addition the flowchart of SRS system is also included which describes the complete operation of SRS system. Finally, the result obtained is also included.

Keywords-personal response system; electronic voting systems; structured teaching sessions.

I. INTRODUCTION

Student response systems (SRS) are being used in classrooms in order for the instructor to obtain real-time feedback on student comprehension of presented concepts. A typical PRS comprises hand-held transmitters, or “clickers,” for students to submit answers, receivers that collect the answers, and software that creates the question slides and displays the statistics of the student answers in real time. In a traditional lecture where the instructor does most of the talking, students are passive, especially in a large lecture hall where students have few opportunities or incentives to ask or answer questions. Even when the instructor asks for responses from students, typically the same small number of students would choose to participate. The large lecture syndrome is well known: the professor solemnly expounds his materials, the class passively absorbs it. The professor obtains no feedback and the students scribble notes mechanically. The major problem to be overcome is the lack of two-way communication between the teacher and the students. A proposed solution to the lack of interactivity in a large lecture is the use of personal responses systems. One of the first hard-wired SRS systems was installed for physics education in 1972. In recent years, the development of portable radio frequency SRS systems and associated software has made it feasible to implement a SRS system in classrooms. SRS can be used to provide an “anonymous” way for students to answer questions posed by the instructor, circumventing the discomfort that some students feel about speaking in front of a large class. Many research studies have looked at the use of SRS, or polling, and have noted positive impacts on learning.

II. STUDENT RESPONSE SYSTEM

Since about 1998, the simplest remote Student Response Systems were adopted in academic environments. Even though this technology has had quite a success, it has taken longer for the sciences/engineering to implement it. In this study, an engineering lecture-based course, with low satisfaction from the students’ perspective was modified to incorporate SRS. Each participant is assigned a clicker, which resemble TV remote control units. The clickers use infrared or radio frequency technology to transmit and record participant responses. A receiver, connected to the computer, collects and records the responses. The software employed to create the modules, is very similar to the traditional PowerPoint software. Once the slides are created, the evaluation runs almost as a typical PowerPoint presentation except that the presenter has three additional jobs: accountability, repolling and saving responses.

III. OVERVIEW OF BLOCK DIAGRAM

In the hardware section, the remote control is used as a transmitter. Fig-1 shows the block diagram of transmitter. There are three switches in transmitter for selecting one option from the asked question.

![Block diagram of transmitter](image-url)
Whenever the switch is pressed the interrupt pin of microcontroller goes low and the address of that switch along with that transmitter address is sent to the receiver microcontroller through transmitter and receiver RF modules. Fig-2 shows the block diagram of receiver. The programming for transmitter and receiver section is to be done in ‘C’ language using AVR studio software.

Prolific pl2303 is used for Communication interface between USART based serial port of microcontroller and USB port of computer. Visual basic based GUI makes it easy to pre-store the response of transmitter user. RF modem (RFM02 IC) is used to transmit the data. After that data is transmitted through the Antenna. RFM01 is a receiver IC that that is used to receive the data.

IV. HOW DOES SRS WORK????

When in operation, the screen for the SRS displays the number of the question being asked, the time allotted to the question, and the number of chances each student has to answer the question. Once a question is asked, the clock is started and the time remaining in which to answer is continually shown. Fig-3 illustrates the flow diagram of SRS system. A count of the number of handsets that have responded to the question asked is shown, and as each different handset is used to answer a question another cell on the screen changes colour.

The SRS system can be operated in two modes: anonymous and named. In the anonymous mode, when students respond to a question using their handset, a cell on the screen changes colour and the number of the handset responding is displayed. If students are allocated a handset, and a file is set up to associate handsets with student names, then when screen cells change colour they can also indicate the name of the student answering. Each handset’s response to a question can be shown on the screen or kept hidden. If it remains hidden from the audience, double clicking on a cell reveals the answer selected and the time taken to answer the question after the clock was started. This ensures that, for example, by double clicking on the first cell to change colour it is possible to congratulate the first student to answer if they answer correctly.

The handsets have three digits corresponding to three possible answers to the multiple-choice questions. However, the computer keeps a record of the responses of the numbered handsets for the entire class session when the SRS is in the anonymous mode, and records the responses of individual students when in the named mode. The saved information also includes details of the time taken by each handset to answer every question, the number of attempts made by a handset when each question was asked.

V. RESULT OF SIMULATION IN VISUAL BASIC

The below Fig-4 shows the form 1 created in visual basic. Here after entering the port, file for two users are created by one by one pressing the switch from the transmitter for five times. In form 1 number of questions are also displayed.
Then by pressing the graph we get the output of both the users in form 2 as shown in Fig-5. Here, the response of both the users are shown in graphical manner.

VI. CONCLUSION

Hence, we can state that SRS offer a powerful and flexible tool for teaching. It can be used in a variety of subjects with students of almost any level of academic training. SRS may occupy either a peripheral or central role during class. It can be incorporated into a standard lecture course to increase interaction between students and instructor or used as part of a more radical change in teaching style toward primarily active learning in class.

Overall, SRS have the potential to improve classroom learning, especially in large classes. Students and instructors find their use stimulating, revealing, and motivating as an added benefit.

For future work, some applications should be added to the system so it can also be used for other purposes.

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