

# E SLATE: COST EFFECTIVE LEARNING TOOL

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## Abstract

*This paper has presented our interest in wireless human graphical interfacial system along with proper tools for learning. Considering the present scenario in learning system, in our proposed project, we aim at developing a system mainly focusing on two main aspects: 1. a way in which e-slate would provide an effective learning tool for such rural and government aided schools at a primary teaching level and 2. Also prove helpful in cases where it is difficult for a teacher to teach a particular subject or make understanding easier along with giving the teacher a freedom of remotely teaching as well as communicating with a larger group of students in rural places where there is shortage of able teachers.*

**Keywords** – e-slate, wireless RF communication- RF transmitter/receiver, ATMEGA controller, touchscreen, Smart algorithm recognition.

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## 1. INTRODUCTION

Wireless communication has announced its arrival on big stage and the world is going mobile. We want to control everything and without moving an inch. This remote control of appliances is possible through Embedded Systems. Now a days every advertisement is going to be digital. The big shops and shopping centres are using the digital moving displays now. In railway station and bus stands everything that is ticket information, platform number etc. is displaying in digital moving display. [3]

Education in rural area is still not taking the advantages of advanced technologies. The cost effective teaching aid is required in schools in rural area. The proposed project will address use of advanced technology with low cost. The solution provides an effective way for interactive teaching in schools.

In the recent years, there has been an increasing awareness of the need for education in most of the developing countries. But lack of sufficient resources is severely impeding the Success of this mission. As a context, in India there are approximately 104 million students in grades 1-7 who do not have access to electricity and about half a million primary schools, each with less than three teachers . Also, the average per capita income of the families of the students attending these schools is less, making it difficult for them to afford costly educational devices or even the necessary text books. To respond to this challenge, we propose an interactive and intelligent, e-Slate that on one hand is very energy friendly, while enabling support for education in developing economies on the other.

## 2. PROBLEM STATEMENT

Following independence, India viewed education as an effective tool for bringing social change through community development. The Indian government lays emphasis on

primary education up to the age of fourteen years, referred to as elementary education in India. But still schools in rural India face a major problem of lacking teaching techniques and learning tools. Along with lack proper tools for learning there is a severe shortage of qualified and able teachers. There by leading to ineffective teaching and hard to understand learning. The Annual Status of Education Report (ASER) released earlier this year had some startling observations on reading and maths levels in all Indian states. In 2011, nationally, 46.3 per cent of all children in Class V could not read a Class II-level text. This proportion increased to 51.8 per cent in 2012 and further to 53.2 per cent in 2013.

The most well-known, cheapest approach for teaching is the use of chalk-blackboard. The main disadvantage of this approach is harm caused by the chalk dust to the people around especially the children. In addition to this, it takes efforts to wipe off the writing on the board with the help of duster while with the system that we have proposed; it is possible with the help of single tap on the touchscreen.

Another method is the use of whiteboard and marker which doesn't include chalk and hence there is no harm caused by chalk dust. The disadvantage that has been often highlighted in case of a whiteboard is that it often causes contrast problems for people who have vision impairment issues. People who are left handed also face some problems when they have to write on the whiteboard as most left handers tend to smudge the content that they have already written because of the way they hold the pen and write on it. [1]

## 3. SYSTEM DESCRIPTION

In our project, we are using the handheld device consists of touch screen, microcontroller and RF module. As we slide the finger or stylus over the touch screen, specific voltage is generated across the two wires of touch screen as shown:-

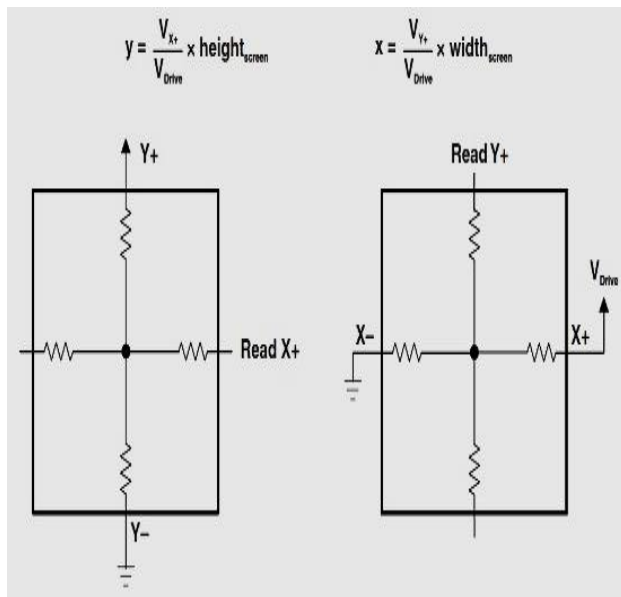


Fig. 4 wire Touchscreen coordinates and voltages

(A 4 wire resistive touchscreen is the product of choice for us because it can easily produce high resolution of 4096 x 4096 DPI or higher. There are several advantages of this technology. Resistive touchscreens are low cost as compared to their 'active' counterparts. This technology can be produced to support multi-touch output. Moreover, a stylus or any pointed object can be utilized to operate such touchscreens.)[9]

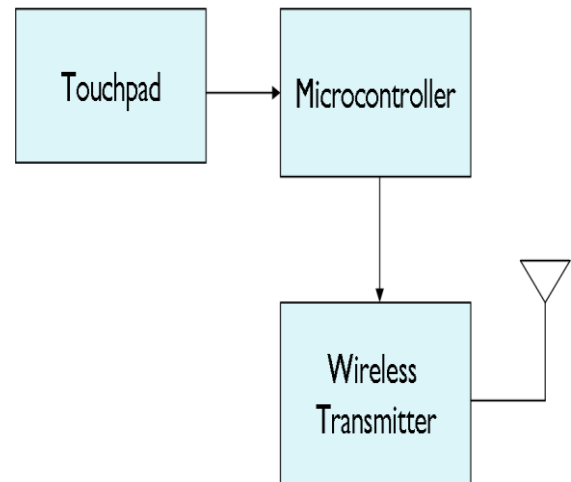
This voltage is converted into digital form with the help of microcontroller having in-built ADC i.e. ATMEGA controller.

Now this data in digital form is transmitted with the help of RF module which is interfaced with microcontroller. Then wireless receiver receives the data which is connected to microcontroller. Then the pattern which has drawn on the touchscreen of the handheld device will be recognized in the form of letters and numbers with the letter approximation algorithm and will be displayed on M x N multiplexed LED display (i.e. matrix board).

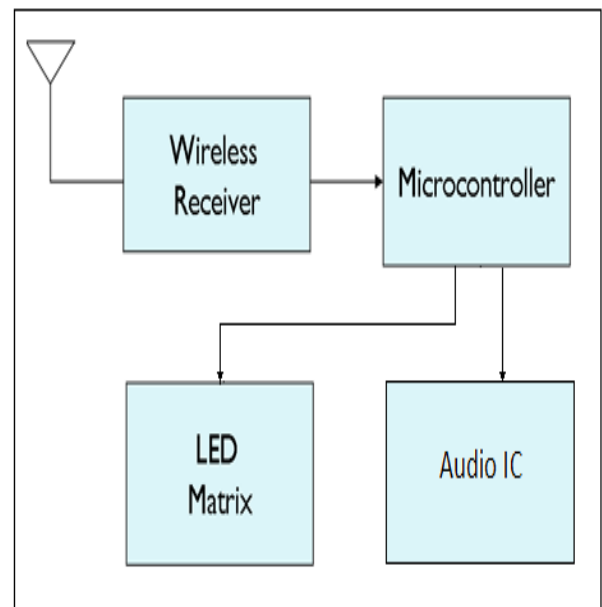
Also the pronunciation of respective recognized letter or number is played as an audible voice with the help of audio IC which has integrated files in it, so as to get a complete understanding of the relevant letter/number.

## 4. BLOCK DIAGRAM DESCRIPTION:

### 4.1 Transmitter Section:



### Receiver Section:



The transmitter components used in the proposed project are mainly touchpad, microcontroller of ATMEGA family, and RF transmitter. Resistive touchscreen has been selected making cost as the main criteria as our aim is to produce a cost efficient tool. Also an ADC is required so as to get analog data, produced by touchpad, digitalised. A RF transmitter governs wireless data transmission.

As shown, receiver components comprised of RF receiver, microcontroller, LED matrix for displaying, audio module. The transmitted digital data by transmitter is then received and forwarded to another microcontroller which will be approximated and compared and patterns of letters/numbers are generated which will be displayed on LED matrix and an audio acknowledgement is played for respective letter/number.

## 5. APPLICATIONS

Use this idea for blind students: This idea can be proved as a learning tool to blind and physically challenged children. For blind kids we can use this tool for learning them by using their hearing capability. This can be done by changing output device i.e. from a matrix display to a speaker which will recognize which character is been drawn on touch pad. Disabled people will be able to write on their own. Use for advertisements in big malls, shops etc. Use in classrooms of schools and colleges for interactive teaching. Use as a token display in malls. Use to place orders in hotels

[5]. [http:// www.ijcaonline.org/](http://www.ijcaonline.org/)

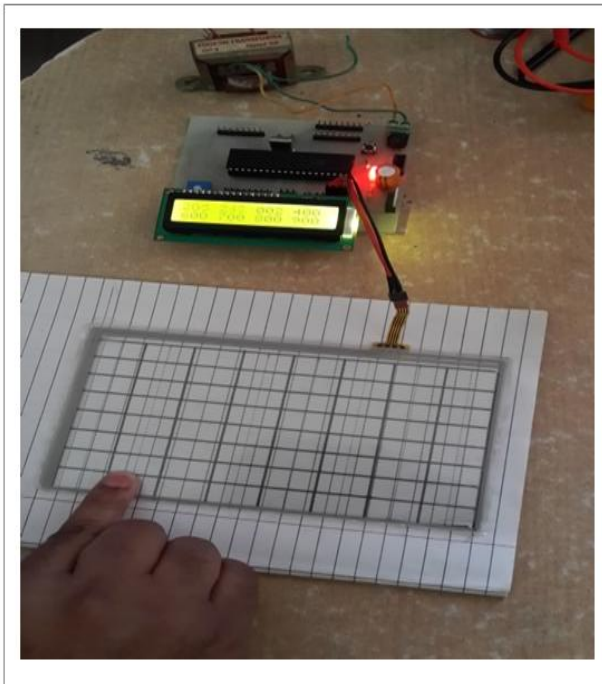
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## 6. RESULT AND CONCLUSION



Thus in this paper we successfully implemented the system which will allow the person to write on the board from a distance (30 meters). We also overcame the shortcomings of traditional chalk-blackboard approach of teaching by replacing it with easy to use portable touch screen device. This system can be effectively implemented in schools and colleges as well.

## REFERENCES

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