

Development of Electronics Based Models for Science Subject for Primary / High School Students

[Under Unnat Bharat Abhiyan (UBA) , a flagship program of Ministry of Human Resource Development, Govt. of India.]

Submitted by



Name of the Principal Investigator

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| 1 | Name of the institute & AISHE code | S.D.M. College of Engineering and Technology, Dharwad C-1315 |
| 2 | Title of the project | Development of Electronics Based Models for Science Subject for Primary / High School Students |
| 3 | Name of Subject expert group | Curriculum Reforms and Educational Institutions Social Responsibility |
| 4 | Name of villages where project development activities were carried out | Government Schools at Yerikoppa and Nayakana Hulikatti; |
| 5 | Duration / Budget of the project | Six Months |
| 6 | Brief Introduction (Minimum 100 words) | <p>The project aims to develop electronics based models for science subject for primary / high school students to expose them to understand the real time applications and also to reinforce the science concepts strongly into the students.</p> <p>The following are the list of projects carried out</p> <ol style="list-style-type: none"> 1. A Simple Audio Amplifier 2. A Model of our Solar System 3. A water level controller 4. A free energy generator with DC motor 5. Traffic Light Controller <p>1. A Simple Audio Amplifier : This project is used to reinforce the concept of how the signals are amplified.</p> <p>2. A Model of our Solar System: Project is to give the idea of planetary motion and how electronic components are made use to illustrate the same.</p> <p>3. A water level controller: This project is used to indicate the water level in the tank and it controls the overflow of tank and also prevents water wastage and to brief the significance of how electronics has made our day to day life comfortable.</p> <p>4. A free energy generator with DC motor: This project illustrates how free energy can be generated using DC motor. Prototype model is developed to illustrate the same.</p> <p>5. Traffic Light Controller: The project is a prototype model developed to understand the working of Traffic signals in our day today life.</p> |
| 7 | (a) Current status | Project completed (Date: August 2019 to January 2020) |
| | (b) Achievement of the project (Minimum 150 words) | The electronics models developed for science subject for primary / high school students has ignited young minds of Government school, yerikoppa and Nayakana Hulikatti, nearby Dharwad city. Also it has given exposure to understand the real time applications and reinforced the science |

| | | <p>concepts strongly into them. The list of projects carried out are</p> <ol style="list-style-type: none"> 1. A Simple Audio Amplifier 2. A Model of our Solar System 3. A water level controller 4. A free energy generator with DC motor 5. Traffic Light Controller <p>The models are exhibited in front of government high school students, yerikoppa and they were very excited to understand the concepts, working of the models. Also they were very curious to know the details of the models and their real time applications. Really it was a happy moment to share the knowledge with those students.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|--|---|--|-------|-------------------|--------------------|---------------------|----|--------------------------|---|---|----|-----------------------------|--|---|----|--------------------------|---|---|----|---------------------------------------|------------------------|---|----|--------------------------|----------------------------|--|--|
| 8 | Project Outcomes | <ul style="list-style-type: none"> • Development of electronics based models for science subject for primary / high school students. • Expose the students to understand the real time applications. • Reinforce the science concepts strongly into the students. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | <p>Description of Project (Minimum 150 words) (Technology, Methodology, etc.)</p> <p>The table provided shows the technology, methodology adopted</p> | | <table border="1"> <thead> <tr> <th>S.No.</th> <th>Electronics Model</th> <th>Concept Reinforced</th> <th>Components required</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>A Simple Audio Amplifier</td> <td>Sound, Navigation and manipulation of sound</td> <td>Transistor, Resistors, Capacitors, Power Supply, CRO/Speakers, Connecting Wires</td> </tr> <tr> <td>2.</td> <td>A Model of our Solar System</td> <td>Planets, Movement of Planets in the solar system</td> <td>DC Motors, Arduino Uno, CNC shield, Stepper Motor, A4988 driver, batteries, gears for movement, plastic balls, Switches, Foam Sheet</td> </tr> <tr> <td>3.</td> <td>A water level controller</td> <td>Conservation of water, use of electronics in building solutions</td> <td>Arduino Uno, Ultrasonic sensor, LCD display, Connecting wires, Foam Sheet, Buzzer, Jumper Wires, Breadboard</td> </tr> <tr> <td>4.</td> <td>A free energy generator with DC motor</td> <td>Conservation of energy</td> <td>A bulb, single stranded wires, DC motor, Foam Sheet, Switches</td> </tr> <tr> <td>5.</td> <td>Traffic Light Controller</td> <td>Motion, Safety in movement</td> <td>LEDs, Arduino Uno, Jumper Wires, single stranded wires, Foam Sheet, Breadboard</td> </tr> </tbody> </table> | S.No. | Electronics Model | Concept Reinforced | Components required | 1. | A Simple Audio Amplifier | Sound, Navigation and manipulation of sound | Transistor, Resistors, Capacitors, Power Supply, CRO/Speakers, Connecting Wires | 2. | A Model of our Solar System | Planets, Movement of Planets in the solar system | DC Motors, Arduino Uno, CNC shield, Stepper Motor, A4988 driver, batteries, gears for movement, plastic balls, Switches, Foam Sheet | 3. | A water level controller | Conservation of water, use of electronics in building solutions | Arduino Uno, Ultrasonic sensor, LCD display, Connecting wires, Foam Sheet, Buzzer, Jumper Wires, Breadboard | 4. | A free energy generator with DC motor | Conservation of energy | A bulb, single stranded wires, DC motor, Foam Sheet, Switches | 5. | Traffic Light Controller | Motion, Safety in movement | LEDs, Arduino Uno, Jumper Wires, single stranded wires, Foam Sheet, Breadboard | |
| S.No. | Electronics Model | Concept Reinforced | Components required | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. | A Simple Audio Amplifier | Sound, Navigation and manipulation of sound | Transistor, Resistors, Capacitors, Power Supply, CRO/Speakers, Connecting Wires | | | | | | | | | | | | | | | | | | | | | | | | | |
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10 Photos with captions of the project activities (maximum of 6 photograph of high resolution)



1. Principal, UBA Co-ordinator,PI, HOD-ECE, ECE Faculty, Student Team



2. Demonstration/Exhibition of Models by Students



3. Student Team, PI, HM, UBA Co-ordinators, Teachers, Government High School, Yerikoppa



4. Government High School, Yerikoppa



5. Demo given to Ninth and Tenth Standard Students, Government High School, Yerikoppa



6. Government School, Nayakana Hulikatti

11 Description of each photo in maximum of 25 word

Photo-1 Description: Models developed on Table
 Dr. Vijaya C., HOD, ECE; Dr. Prakash Munolli, UBA Co-ordinator, Dr. S.B. Vanakudre, Principal, SDMCET; Mr. M. Vijay Kumar, Principal Investigator; ECE Faculty; Dr. S.S. Kerur, Deputy UBA Co-ordinator; Student Team;

Photo-2 Description: Demonstration of models by students to Principal; UBA Co-ordinator; Deputy UBA Co-ordinator; HOD, ECE; PI and ECE Faculty.

Photo-3 Description: Demonstration was given to Government high school

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| | | <p>students of yerikoppa village on 25/02/2020 along with student team and members present. Members from Left to Right Student Team; PI; Head Mistress, Govt. School, Yerikoppa; UBA Co-ordinator; Deputy UBA Co-ordinator; Teachers of Govt. School.</p> <p>Photo-4 Description: Demonstration was given to Government high school students of yerikoppa village on 25/02/2020 along with student team and members present. Members from Left to Right Student Team; PI; Head Mistress, Govt. School, Yerikoppa; UBA Co-ordinator; Deputy UBA Co-ordinator; Teachers of Govt. School.</p> <p>Photo-5 Description: High School students of Government school, yerikoppa village.</p> <p>Photo-6 Description: Student Team, Head Mistress, PI, Teachers at Government school, Nayakana Hulikatti village.</p> |
| 12 | Final impact of this project in the adopted villages in 100 words | The impact was the project ignited the minds of government high school students of yerikoppa village and students of Government School, Nayakana Hulikatti. It created curiosity among the students, how the things work in real time. It helped them to reinforce the concepts of science subject through these models. They posed several questions and got their doubts cleared, thus it enhanced their learning abilities. Finally it had lot of impact on the young minds and increased their rational thinking. |
| 13 | Number of Family benefited | Around 125 students and their families. |
| 14 | Link of feedback videos of villager (If any) | - |
| 15 | Other relevant information (Minimum 100 words) , like optional | It was really a good experience working on this project. The interaction with students at Government high school, yerikoppa and Government School, Nayakana Hulikatti was altogether a new experience for the PI and student team. Lot of curiosity among the students to know the working and understanding the concepts behind the models. Overall experience was good. |
| 16 | Comments from NCI/ SEG | Considered and Approved |
| 17 | Clarification from PI | The models developed served the purpose of enhancing the learning capabilities of students in electronic components and models. The students visualized the working models and realized the concepts of science and technology behind the work. |