ROBOSTEM Project

Agreement no: 2019-1-RO01-KA202-063965

Turning ON/OFF Lights using an Arduino Board

Topic/Subject: Students use an Arduino board to create and test a program that turns a light on and off. The students connect the hardware, write the code, test their system, modify it to account for variations in blinking times, assess their outcomes, and present their findings to the class.

Target Group: Highschool students with basic computer skills.

Objectives:

Obj1. Learn about redesigning and engineering design.
Obj2. Learn about computers, software coding, and electronic circuitry.
Obj3. Learn how to solve problems in teams.

Approach/Methodology used: Students examine how software and computer experts collaborate to address societal problems, such as the need for automated light-switching systems. Students build up and program an Arduino board in teams to turn a light on and off at intervals of 5 seconds and 3 seconds. Teams develop, program, and test their system before reflecting on the problem and sharing their findings with their class.

Means/Tools/Educational technology

Computer with Internet, Arduino board, connectors, optional breadboard, led lights, fan, insulators.
Worksheets

Plan for work

Time 90’	Activities	Methods/ means
	1. Display the student reference sheets to the class. These can be assigned as reading for the previous homework or read aloud in class. 2. Think about asking the students how stoplights are timed to change for traffic when introducing the topic.	A text editor for writing code, a message area, a text console, a toolbar with buttons for basic operations, and a number of menus are all included in the Arduino development environment or software. In order to upload programs and communicate with them, it connects to the Arduino

	3. Groups of two or more students will deliberate on their problem and investigate how the Arduino works. 4. Once the Arduino is set up, programmed, and tested, the students see if it can complete the challenge. 5. Teams discuss the problem and share their insights with the class.	hardware. A "sketch" is a piece of software created with Arduino. The text editor was used to write these sketches. Sketches are stored in files with the.info extension. There are tools for text searching and text replacement as well as copying and pasting. When saving and exporting, the message section provides feedback and shows errors. The console shows text that was produced by the Arduino environment, including error messages in their entirety and other data. The current board and serial port are visible in the window's bottom right corner.

Assessment/Feedback:

Require students to make the Arduino blink in the pattern of S-O-S…or have them select three other activities (run a fan, make a stoplight, etc.).

Bibliography:

Try Engineering (www.tryengineering.org)
Try Computing (www.trycomputing.org)
Arduino (www.arduino.cc)