

Assignment 4.1 Applying the Engineering Design Process

Lawrence C. Tobias | CPE11S1

Given Scenario: Managing Power Consumption in a Student Boarding House

In a student boarding house near your campus, the electricity bill has been increasing every month. The landlord notices that many students forget to unplug their devices, leave lights or fans on when they go out, and use appliances inefficiently.

The landlord asks you, as a computer engineering student, to come up with a solution to help monitor and reduce electricity waste.

1. Identify the problem clearly

In the boarding house, many students forget to turn off the lights, fans, or unplug their chargers. Because of this, the electricity bill keeps getting bigger every month. This is a problem for the landlord because the bills are too high, and it can also be a problem for students if the rent gets more expensive.

2. Research

Electricity is wasted when things are left on even if nobody is using them. Chargers, fans, lights, and other appliances use power even when not needed. Some common ways people fix this are by using smart plugs, timer switches, or special strips that turn off the power when the device is not used.

3. Specify requirements

- **Cheap**, so the landlord and students can afford it.
- **Easy to use**, so everyone can understand it.
- **Helpful**, so it really saves electricity.

4. Brainstorm 3 Solutions

- Put **motion sensors** on lights and fans so they turn off when nobody is in the room.
- Use a **prepaid card system** where each room has a limit of electricity.
- Plug devices into **smart power strips** that turn off when gadgets are done charging or not being used.

5. Choose the best solution and justify why

The best choice is the **smart power strips**. These strips turn off power when a device is not being used, like when a phone is already fully charged. They are simple to use, not too expensive, and help save electricity without students needing to remember to unplug things.

6. Flowchart / System Representation

The flowchart shows that the appliances are plugged into the smart power strip. The strip checks if the device is still being used. If the device is not active, the strip turns off the power. This system helps lower electricity bills and makes sure that energy is not wasted in the boarding house.

