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ENG401 – 1

A proposal to investigate and produce possible solutions related to the electricity waste in Bilkent Dormitory 78

Introduction

Bilkent University dormitories cater to more than 4000 students in order to provide them with accommodation during their studies. One such dormitory that we'll examine is the 78th dormitory. The dormitory features 89 rooms reserved for female students, and 147 rooms for the male students. Ultimately, the building has the ability to host a grand total of 586 students. Alongside so many students living in one building, come certain issues that need to be addressed such as the water and energy consumption of the students, as well as the infrastructure to dispose of the waste produced by such a vast crowd. One such topic to be examined relating to the 78th dormitory is the consumption of electricity by its inhabitants.

In this paper, the root causes of the problem of electricity consumption will be examined and appropriate solutions addressing these issues will be introduced and discussed.

Problem Definiton

As a thorough research has not yet been conducted, all of the root causes defined below are results of educated assumptions and conjectures.

1. **Forgetting to turn off the lights**

   The issue with having lots of rooms in a dormitory is that all of the rooms need proper illumination. A big issue that could be causing the waste of electricity inside Dormitory 78 is that students could be forgetting to turn off the lights in the common-use spaces inside the building. There is a kitchen, and bathrooms on each of the floors and sections inside the dormitory, all of which are shared by the students. In addition, there are the hallways which must always be kept lit. Finally, the students might be forgetting to turn off the

lights in their own rooms and go to sleep with the lights on, resulting in the lights staying on through the night, which causes unnecessary waste of electricity.

2. **The specification of the light bulbs**

The dormitory building is quite old and as a result the lightbulbs used during its construction are not up to the standards of energy saving that we have currently. The traditional lights used in the dorms consume unnecessary energy because they are technologically inferior devices.

3. **Inefficient positioning and usage of lights**

The illumination of the dormitory building was not designed with efficiency in mind, resulting in redundant quantities of lighting to be distributed along the commonly used areas on the floors, as well as the needlessly large fluorescent lights to be placed inside smaller areas that do not require such devices.

Proposed Solutions

1. **Use of sensors and timers to cut down on unnecessary up-time**

Proximity sensors could be installed on the areas used commonly by all students, so that the lights will only be turned on if there is someone present to use the facilities. In addition, timers can be installed on each of the rooms in the building so that they will automatically turn off after a certain hour.

2. **Incorporating energy efficient LED lightbulbs**

Energy expenditure can be reduced by installing energy saving LED lights instead of the traditional lights currently used inside the building. On average, one LED lightbulb saves 2.5$ annually if it is used instead of the traditional incandescent lightbulbs. Taking into account that the building features a total of 236 rooms, simple math leads us to the conclusion that the replacement of the lightbulbs of the student rooms inside the dorm will result in 590$ saved annually.

3. **Optimizing the quantity and location of the lights in the building**

The placement of the lights can be designed in such a way to optimize the quantity and the power of the lights installed in each of the rooms, in order to maximize the usability while keeping down the energy use as minimal as possible. Most lights are installed by following a certain standard, without taking into account the different requirements each room may need. The issue can be redeemed by evaluation the different conditions in each of the living spaces, ultimately providing a more energy efficient environment.

4. Implementation of a study room

A study room can be put into service, compelling students to turn off their room lights after a certain hour and if they do desire to study or partake in other activities that require light, they should come to the shared study room which will be illuminated. Doing so will reduce the amount of individual lights staying on in different rooms, and it will gather students inside one dedicated room for everyone to use a single light.

Criteria for Assessing Solutions

The solutions will be examined according to the following criteria:

Cost: A research will be conducted regarding the cost of realizing the solutions, the materials and the man-hours needed to put these plans into place. Main method of the assessment will be using the internet for the cost of the lightbulbs and talking to the dormitory personnel to gather some information related to the infrastructure of the buildings.

Effectiveness: The prospect of how these solutions will have an impact on the usage of energy inside the dormitory should be examined and the inferences should be used to optimize which solutions will be realized and to what extend will they be sought after.

Acceptability: Students will be asked whether they would adopt the changes proposed in the paper, especially the one regarding the use of a common study room as it currently stands as the most restricting of the solutions. If such measures are not welcome by students then the proposed solutions might be reconsidered and reevaluated.

Applicability: It will be examined whether the proposed solutions can actually be realized, whether the ceilings in the building are appropriate for a redesign of the lighting

structure, whether installing sensors and timers inside the light switches and bulbs is a feasible task to do, and the solutions will be evaluated in light of these questions.