

**COOLING EFFICIENCY: A CORRELATIONAL STUDY ON  
POWER CONSUMPTION AND THERMAL COMFORT IN  
DE LA SALLE UNIVERSITY – DASMARIÑAS**

An Undergraduate Research Presented to  
the Mathematics Department  
College of Science and Computer Studies  
De La Salle University – Dasmariñas

In Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in  
Applied Mathematics

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September 2013



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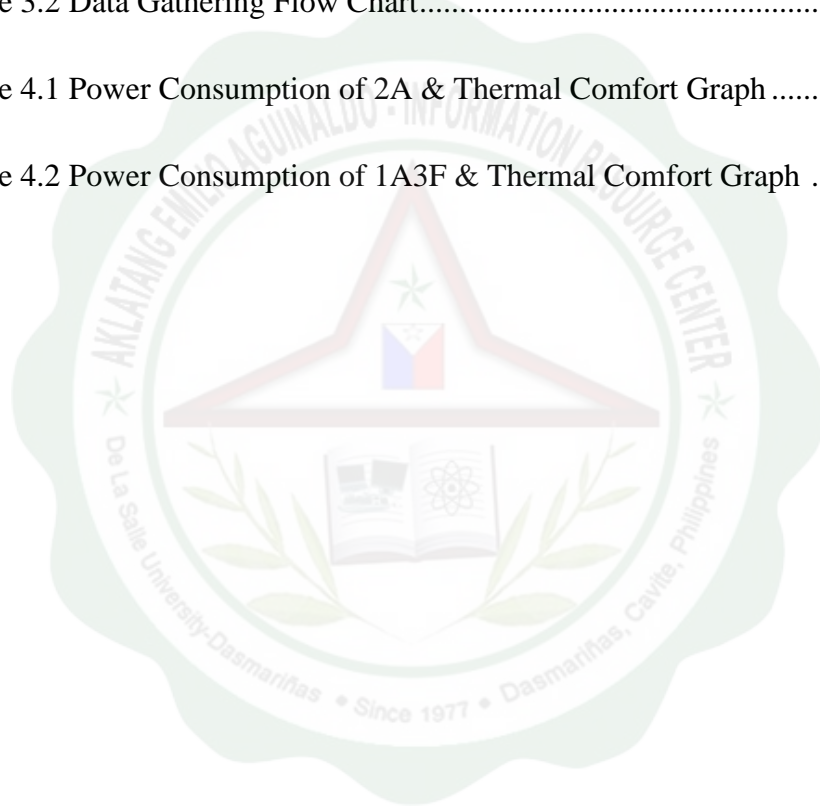
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### ABSTRACT

This study aimed to determine the most cost efficient cooling configuration for classrooms that provides relatively significant comfort level to its occupants. This is accomplished by finding out the significant relationship between the power consumption of the two air conditioning units (2A) and one air conditioning unit + 3 ceiling fans (1A3F) configurations, with the thermal comfort level of the occupants from 16°C to 23°C.

The participants in the study were 240 students enrolled for the summer term of the Academic Year 2012-2013. Thermal comfort level of the participants was measured through the use of questionnaire while the power consumption of air conditioning units was measured with the use of a watt-hour meter. Both indoor and outdoor air temperature, relative humidity, and dew point were measured as well with the use of additional tools.

Results showed that the current thermostat setting of the air conditioning units has a power consumption of 4.228kWh (approx. PhP41.27 per hour) per classroom. Results also showed that there is no significant relationship between the power consumption of 2A configuration and thermal comfort level of the students; there is a significant relationship between 1A3F configuration and thermal comfort level. Based on the Wilcoxon Z test, there is a significant change in the respondents' thermal comfortat thermostat temperatures 16°, 17° and 22°, favoring the 2AC configuration. The cooling configuration 2AC 21° has the highest thermal



comfort mean, but the change from 2AC 21° to 1AC3F 21° does not show any significant change in the respondents' comfort level. Based on this assessment, the 1AC3F 21° is the most cost efficient, which has 48.75% less power consumption than the current cooling configuration.

The following recommendations are suggested:

**De La Salle University – Dasmariñas.** The university should make ways to improve the air conditioning system design in the classrooms of the university by consulting an HVAC engineer. The researchers also recommend the university to change the current cooling configuration of the air conditioning units at the Julian Felipe Hall to 21°C 1A3F, reducing the power consumption of the units by 48.75%.

**Students of De La Salle University – Dasmariñas.** The current thermostat setting practiced in the university is inefficient in providing a comfortable environment in the classrooms. The thermostat setting 21°C 1A3F would provide more comfort to the students of the university.

**Environmental Resources Management and Campus Development Office (ERMCDO).** The researchers recommend the ERMCDO to collaborate with the university administration in improving the air conditioning system design in the university and in providing a cost efficient and environmentally friendly means of cooling the classrooms in the university.





**Other institutions relying on the use of air conditioners.** Other institutions should assess the effectiveness of the air conditioning units in providing cost efficient and thermally comfortable classrooms for their students.

**Future researchers.** The researchers recommend further studies involving more variables that may affect thermal comfort.

