

RESEARCH REPORT

INVESTIGATING AN EFFECTIVENESS OF USING EXTRACTION FAN FOR CREATING THERMAL COMFORT IN LOW COST LIVING SPACE

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Disember 2012

Abstract

Before air-condition was introduced, Fan is considered to be the best machine to ventilate rooms in building. Most low cost housing estate has made compulsory to install ordinary fan. Without fan, most spaces experience discomfort in their living space as the heat accumulates during the day and generates at night.

There is another type of fan which could helps to create comfort. This type of fan which is known as extraction fan is popular to industrial building. Extraction fan is seldom use on domestic building as its usage is applicable only to passive spaces like toilets and stores. Normal use of extraction is to extract hot air and create space vacuum and to fill with cold air moving in from out site. This idea might look practical but the feeling of coldness is always experience from the outside of the building. The outdoor temperature is always colder than the indoor temperature and it refers to our climatic condition. Even though our weather is generally warm, temperature such as Kuala Lumpur is recorded between minimum of 19°C to maximum of 37°C (1). If thermal comfort values are taken as suggested by Ku Azhar, between 23° C to 31°C, there is a possibility to create thermal comfort in indoor spaces.

Preliminary study on non natural ventilation such as using extraction fan, that has been conducted privately and it shows that the process of 'extracting air in' rather than 'extracting air out, works much faster to lower the room temperature. Conventional use of extraction fan by extracting air-out, may need to be redefined it purposes and to introduced a new concept of it usage.

Alternatively extraction fan as a non natural ventilator can also produce good thermal comfort space, but not to extract the air out, but instead to extract the air in. The idea is to redefine the usage of Extraction fan for its effectiveness to create comfort living in interior space.

Acknowledgements

Alhamdulillah and many thanks to Allah, our Lord and Cherisher, for guiding me to accomplished my research during my Sabbatical Leave. Indeed, without His Help and Will, this report would not have completed.

My deepest appreciation goes to **Dr Haroman Ahmad** for his guidance and assistant as well as official supervisor for this Research Report. Without his support, ingenuity and expertise some of this experiment would not have made possible. Many thank also to **Pn. Asmat Ismail and husband** for the assistant and resource contributions which make the finding and analysis a success.

I would like to thank all my colleagues from **Department of Interior Architecture** for their cooperative support throughout the year of research. Many thank also goes to all **my friends and staff members of University Technology MARA Perak**.

Lastly I would like to thank **my wife and family** for their long waiting commitments and passion which make this research a success. Thank you.

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1.0 CHAPTER 1: INTRODUCTION

1.1.0 General

More than 2 million houses are over heated. 75% residences claim that their houses were too hot almost half the day of the year and 65% residences suffer headaches for heat stress (1). That is what happening in Malaysia and the resident of most Malaysian.

To overcome these problems, the most effective and costly solution is to install an air- condition. Majority of middle incomes group install air-condition unit at least at their master bedroom. Most Malaysian public and commercial spaces are also equipped with air condition unit as the alternative means whereby other solution may be possible. Though air conditions are now generally use, but there is a setback. Air conditioning is said to be contributing to an unhealthy living. Even though it is encouraging the use for improving standard of living, the health problems is always associated with the air-conditioning system and the low air quality of indoor which appear more frequently.

Currently the introducing of using 'misting fan' is also getting popular. Psychologically it feels the temperature dropped dramatically. As far as health is concern increasing humidity may also helps to restore germs and bacteria surrounding. Thermal comfort is defined in British Standard BS EN ISO 7730 as: *"that condition of mind which expresses satisfaction with the thermal environment."* Increasing use of 'misting fan' artificially increase the humidity more than 80% as not recommended by the Health and Safety Executive of British Standard (5).

For majority domestic building, low budget and cost effective alternatives is preferable. One way of sorting the problems is by introducing ordinary general fan.

For minimal comfort, lower income group, used at least ordinary general fan or ceiling fan to ventilate their rooms. Without fan, most spaces experience