



UNIVERSITI
TEKNOLOGI
MARA

College of
Built Environment

Poster Book

IIIDBEE X 2023
20 JANUARY 2023
*International Invention, Innovation & Design Exposition
for Built Environment and Engineering 2023*

**College of Built Environment
UiTM Puncak Alam**
20 January 2023 | Friday

Editors:

*Dr Aidatul Fadzlin Bakri, Nurzafira Zainul Abidin, Sr Dr Noor Akmal Adillah Ismail,
Dr Har Einur Azrin Baharuddin, Assoc. Prof. Ts Gs Dr Abdul Rauf Abdul Rasam*



BY SUBJECT | 2022



kab.uitm.my



kab.uitm



KAB UTM

#weareAlamBina

Generations of Professional Excellence

Unleashing Potentials
Shaping the Future

CONTENTS

01 Contents

02 Preface

03 Welcome remarks

04 Exhibition layout

05 Event programme

06 List of entries

**07 Poster category: Academician &
Professionals**

08 Poster category: Postgraduate

09 Poster category: Undergraduate

10 Appreciation

FIELD MEASUREMENT STUDIES ON THERMAL COMFORT IN AN AIR-CONDITIONED CAFE

IIIDBEE
20 JANUARY 2023

2023
International Invention, Innovation & Design Exposition
for Built Environment and Engineering 2023



College of
Built
Environment
(CBE)

INTRODUCTION

Cafes have become popular social gathering spots as well as a "third space" for relaxation, socialising, and work, particularly among young customers. This trend can also be seen on Malaysian university campuses, such as Universiti Teknologi MARA (UiTM). Indoor thermal comfort is an important aspect in the establishment of comfort in a building including cafes.

ISSUES/ PROBLEM STATEMENT

The mechanical, ventilation, and air conditioning (MVAC) control systems have an impact on the temperature difference across various cafes, which can result in variable degrees of thermal comfort. However, the air-conditioning system had a significant impact on energy consumption.

OBJECTIVES

The objective of this study is to evaluate the indoor thermal of an air-conditioned cafe environment in a hot-humid climate.

METHODOLOGY

Cafe A is a rectangle-shaped building, approximately 43.81m², cafe B is a square-shape building with about 47.53m² and cafe C is a rectangle-shape with area about 55.74m². The four thermal variables that were measured in this were air temperature, air velocity, relative humidity, and mean radiant temperature. These variables were recorded using the OHM Delta Thermal Microclimate HD32.3TC instruments. The data was collected at 10-minute intervals between 1100 and 1600 hours each day for a two-week sampling period. The instruments were positioned at a height of 1.5 to 1.6 meters, which is the head height of a standing person.



Cafe A



Cafe B



Cafe C

FINDINGS

The results of this study also showed that all the thermal environmental parameter for all the cafe were within the suggested guidelines except for air radiant temperature which slightly higher from the ASHRAE guidelines. The surrounding features such as trees outside the building, can influence the indoor air temperature by blocking the cafe's glass walls from direct sunlight.

Thermal Environmental Parameters	Cafe					
	A		B		C	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Air Temperature (Ta) (°C)	25.9	0.48	24.4	0.56	24.8	1.62
Mean Radiant Temperature (mTr) (°C)	26.7	0.66	24.5	0.57	25.5	1.61
Air Velocity (Va) (m/s)	0.02	0.03	0.02	0.03	0.29	0.25
Relative Humidity (RH) (%)	51.30	3.78	55.06	2.38	60.44	2.17

NOVELTY

This research aims to determine thermal comfort in cafe UiTM Shah Alam through field measurement. This research is important to improve students' satisfactions by providing guidance to cafe designer and operators on how to manage the internal temperature of cafe. Furthermore, this research will contribute to better knowledge of the benefits for improving the indoor environment and overall occupants well-being. This research very useful in designing MVAC system in the cafe.

COMMERCIALIZATION

This research is important as it can provide knowledges that can be used to solve current indoor environment issues especially MVAC system in any cafes. Commercialization through collaborating with university and other helps to increase quality and value of this research.

CONCLUSION

Field measurement of thermal comfort helps to assess the effectiveness of a cafe's MVAC system in maintaining a comfortable environment for occupants. Findings from these investigations showed that all three cafes had environmental parameters within ASHRAE and DOSH guidelines.

RECOGNITIONS

Gloria Jeans Coffees Dataran Cendekia, The Cups Coffee & Kitchen Kolej Mawar UiTM Shah Alam, Rotiboy Dataran Cendekia, Faculty of Applied Sciences (FSG), Faculty of Architecture, Planning and Surveying (FSPU)

CONFERENCES & PUBLICATION

Conferences: College Built Engineering, UiTM Puncak Alam during the programme of International Invention, Innovation & Design Exposition for Built Environment and Engineering 2023.