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An Experimental Study of Thermal Comfort in the Offices of an Educational Building

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"Summary of The Research"

An Experimental Study of Thermal Comfort in the Offices of an Educational Building

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REB Number: 43559

Introduction:

This study examines the factors affecting thermal comfort in educational office settings at the Centre for Engineering Innovation (CEI) at the University of Windsor. Twelve participants were surveyed to evaluate variables such as age, gender, duration of office occupancy, weather conditions, clothing, activity level, equipment use, and sources of discomfort. The results revealed that females reported higher thermal comfort satisfaction than males. Additionally, those with less than a year of office occupancy experienced greater satisfaction compared to those with longer durations. The Neutral group reported the highest comfort satisfaction score of 4.83, in contrast to lower scores in the Cool, Hot, and Slightly Warm conditions. Weather conditions also influenced satisfaction, with clear skies and sunny weather providing higher satisfaction compared to overcast conditions. Significant correlations were identified between office type and thermal discomfort, with a Fisher's Exact Test confirming this relationship at a 90% confidence level. Acoustic satisfaction was notably correlated with thermal comfort satisfaction in both winter and summer, highlighting the interaction between auditory and thermal environments. Participants wearing Walking Shorts had higher comfort satisfaction compared to those in Trousers, and those standing or engaged in light activity reported higher satisfaction than seated individuals. Additionally, higher temperatures combined with high humidity were associated with lower satisfaction, indicating that humidity is a key factor in thermal comfort. Overall, these findings emphasize the need for a neutral thermal environment, addressing specific discomfort sources, and incorporating noise control measures to improve comfort in educational office settings. Results for Questions 1 and 2 related to participants' privacy have not been provided.

Question 3- What is your gender?

In this study, 50% of the participants identified as men, 41.7% identified as women, and 8.3% chose not to disclose their gender. (Figure 1)

Gender	Frequency	Percent
Man	6	50
Woman	5	41.7
Prefer not to say	1	8.3
Total	12	100

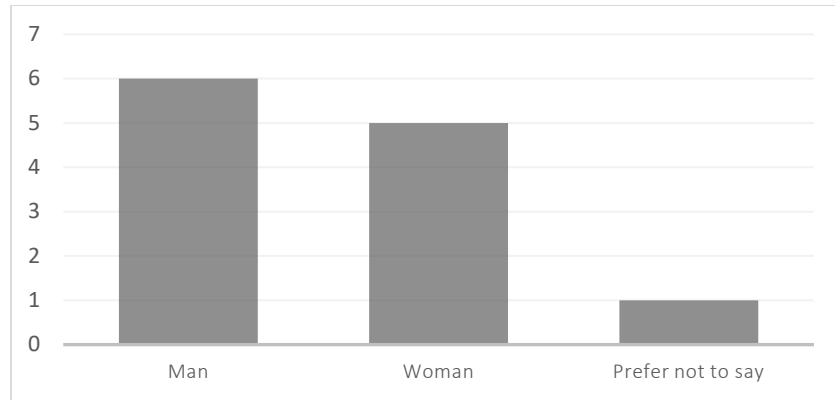


Figure 1: Gender distribution of participants.

Question 4- For how many months have you occupied your current office in this building?

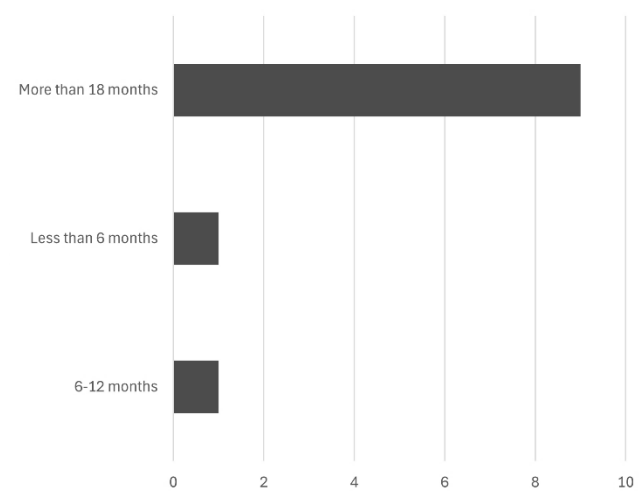


Figure 2: Duration of Office Occupancy by Participants in the Building

Question 5- How would you describe the weather outside today?

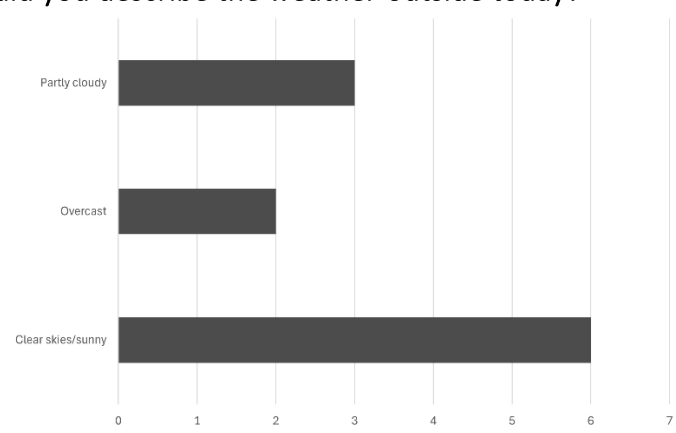


Figure 3: Depiction of Current Weather Conditions

Question 6- What is your current thermal comfort?

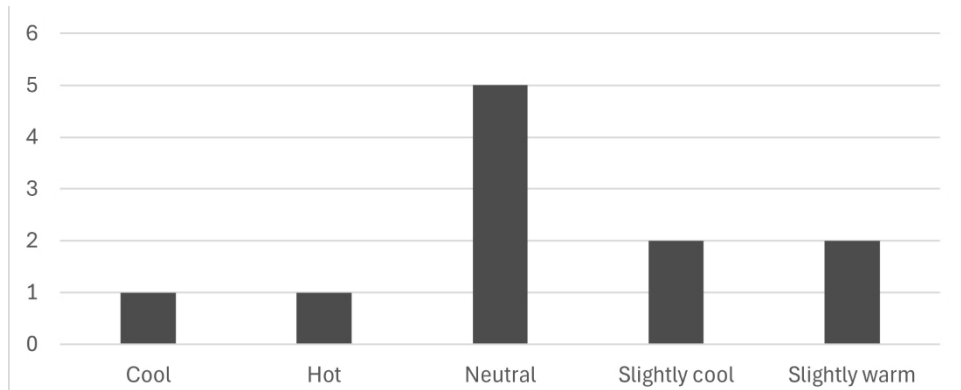


Figure 4: Perceived Thermal Comfort Levels Based on Current Environmental Conditions

Question 7- How satisfied are you with the temperature in your office today?

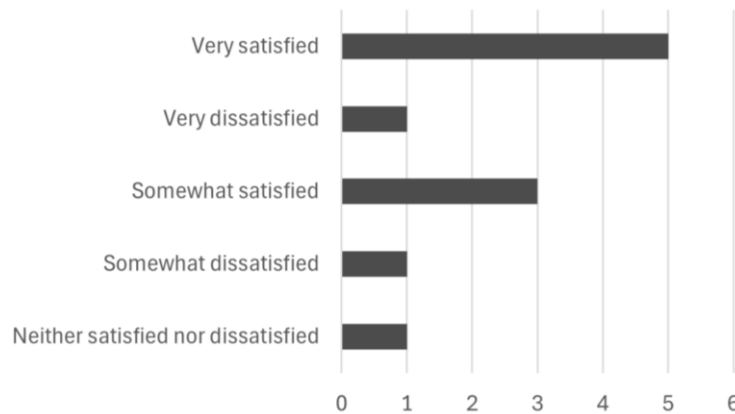


Figure 5: participants Satisfaction with Office Temperature

Question 8- If you are dissatisfied, how would you best describe the source of your dissatisfaction? Select all that apply.

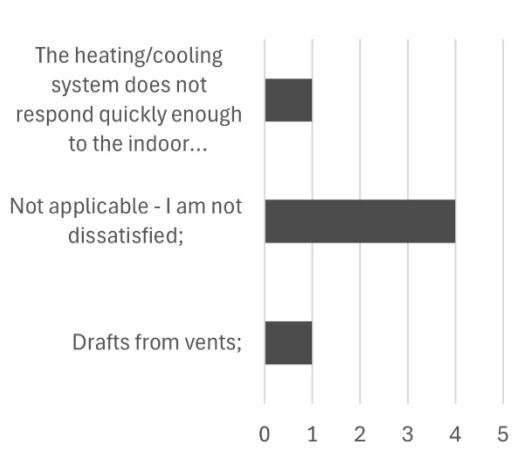


Figure 6: Sources of Dissatisfaction: Key Factors Identified by Participants

Question 9- Are any of the following currently operating in your office?

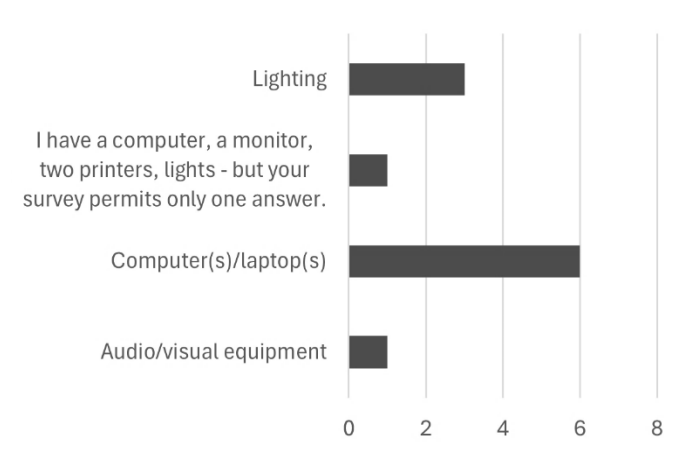


Figure 7: Current Operational Systems

Question 10- Please select all the articles of clothing you are currently wearing. (This is an indication of the comfort level of your interior space.)

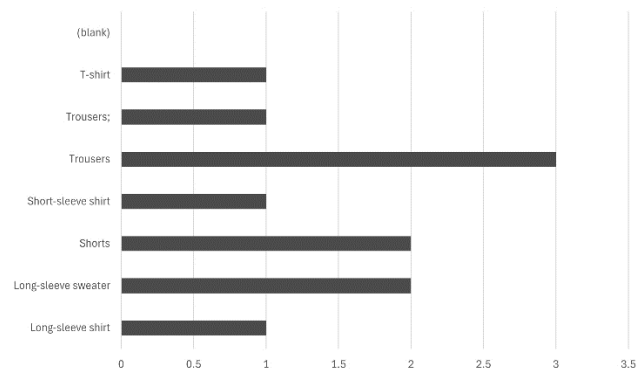


Figure 8: Clothing Selection by Participants.

Question 11- How would you describe your activity level before completing the survey?

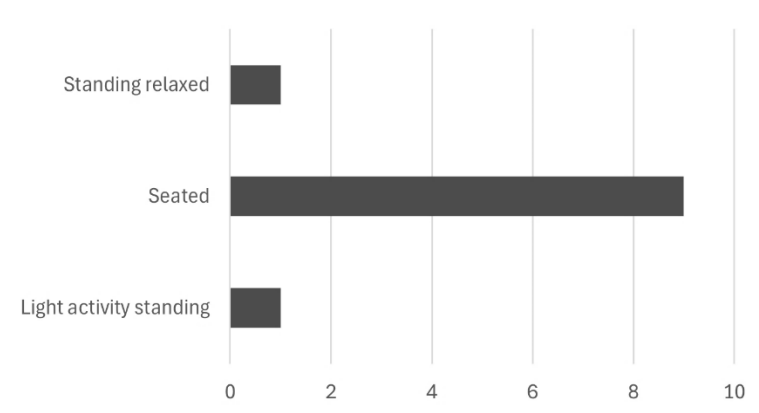


Figure 9: Pre-Survey Activity Level of Participants

Question 12- In the winter months, how satisfied are you with the temperature in your office?

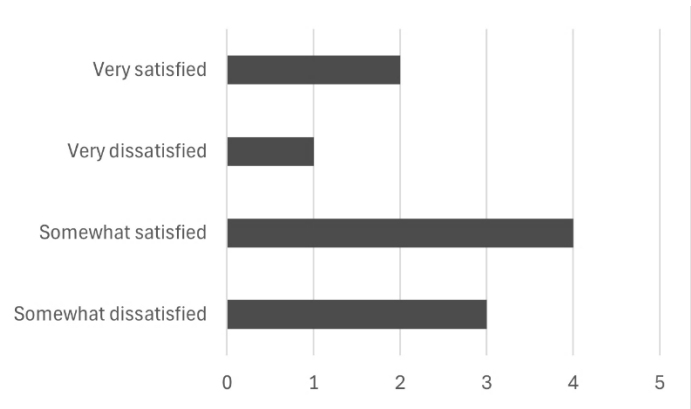


Figure 10: Winter Office Temperature and Participants Satisfaction

Question 13- If you are dissatisfied, would you describe the temperature as too hot or too cold?

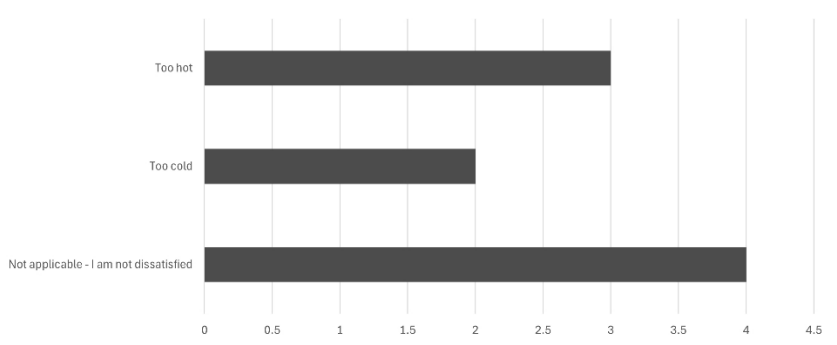


Figure 11: Temperature Satisfaction Levels in winter

Question 14- If you are dissatisfied, how would you best describe the source of your dissatisfaction?

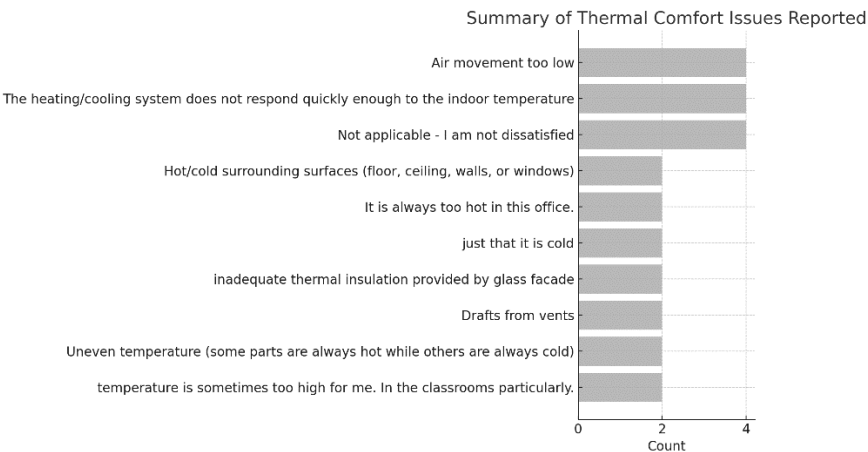


Figure 12: Key Factors Contributing to Dissatisfaction in winter.

Question 15- Are you satisfied with the acoustic performance of your office in winter? (i.e., is your office too noisy from fans, vibrations, or ambient noise?)

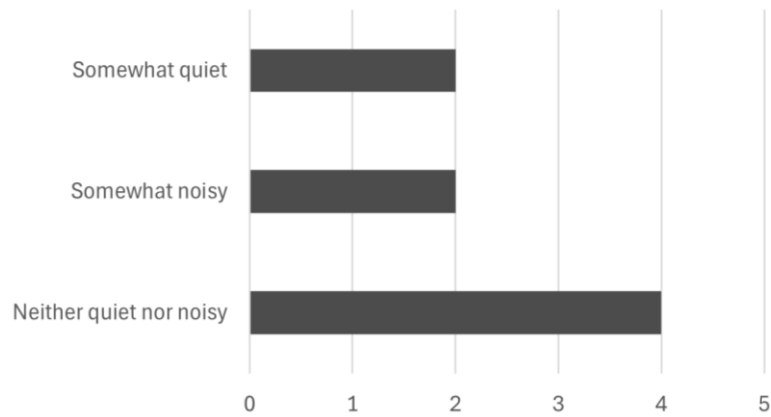


Figure 13: Assessment of Acoustic Performance in Winter

Question 16- In the summer months, how satisfied are you with the temperature in your office?

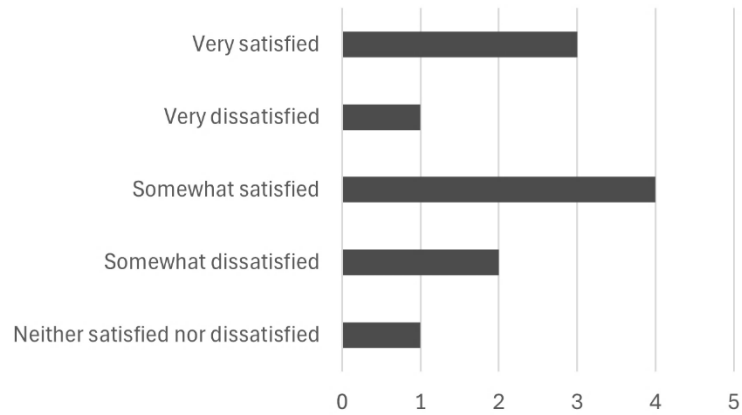


Figure 14: Office Temperature Satisfaction During Summer Months

Question 17- If you are dissatisfied, would you describe the temperature as too hot or too cold?

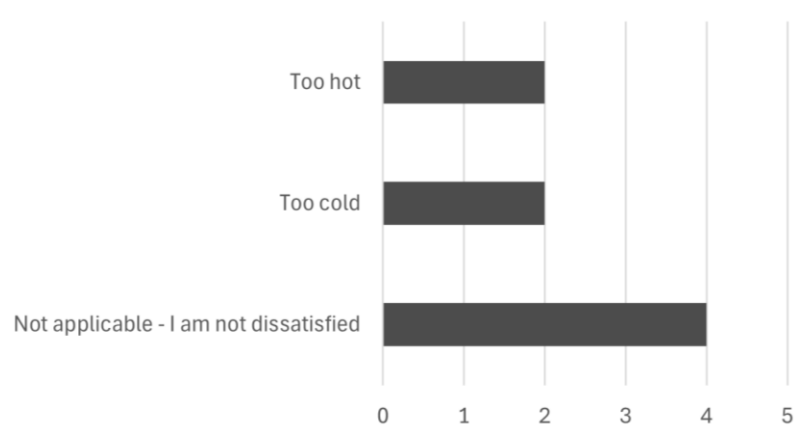


Figure 15: Temperature Satisfaction Levels in summer

Question 18- If you are dissatisfied, how would you best describe the source of your dissatisfaction?

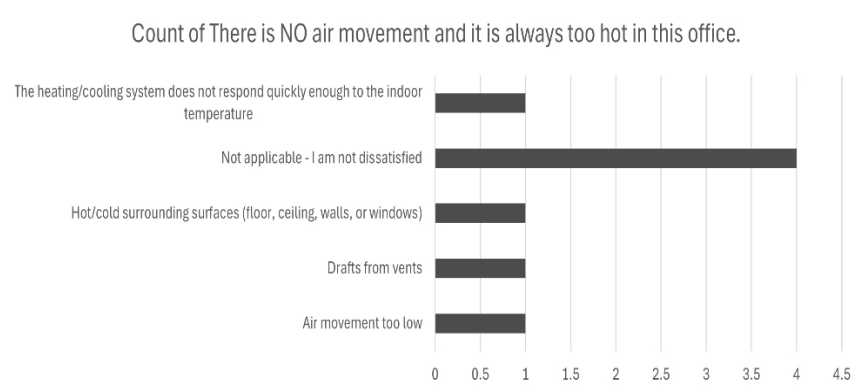


Figure 16: Key Factors Contributing to Dissatisfaction in summer.

Question 19- Are you satisfied with the acoustic performance of your office in the summer? (i.e., is your office too noisy from fans, vibrations, or ambient noise?)

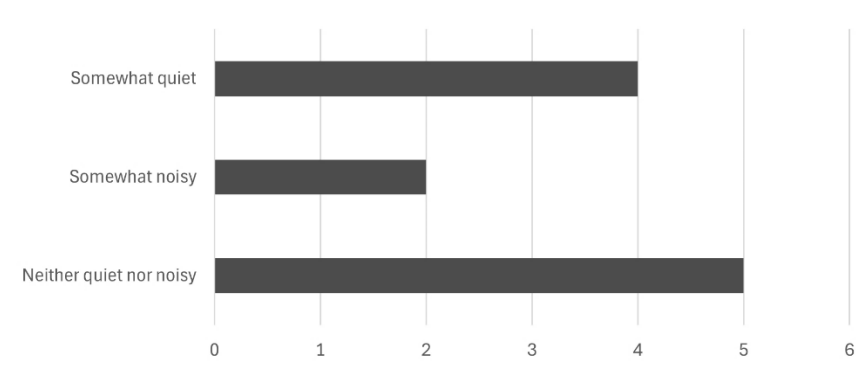


Figure 17: Assessment of Acoustic Performance in summer.