AS01- Performance and Behavior Research

ARCH273
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Research Method

Indicative Phase

The classroom setting of room 410 at the CAP building is the area under investigation in this study. The purpose of the study is to see how environmental factors such as humidity, temperature, lighting, and sound impact students' felt comfort levels in this specific classroom.

Investigative Phase

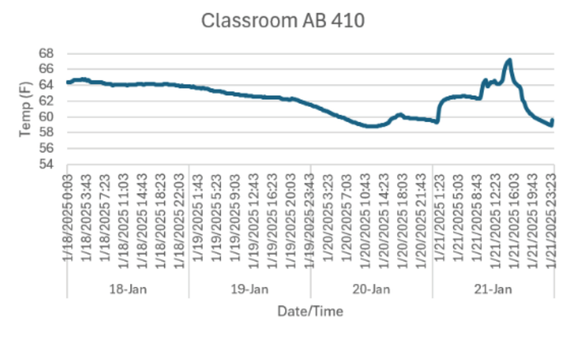
Our study's argument is that, although the space's thermal comfort and indoor air quality are slightly below acceptable limits, the occupants believe it to be significantly warmer than the specified IEQ levels. We evaluated the surrounding conditions using both subjective occupant opinions and measurable sensor data in order to test this hypothesis.

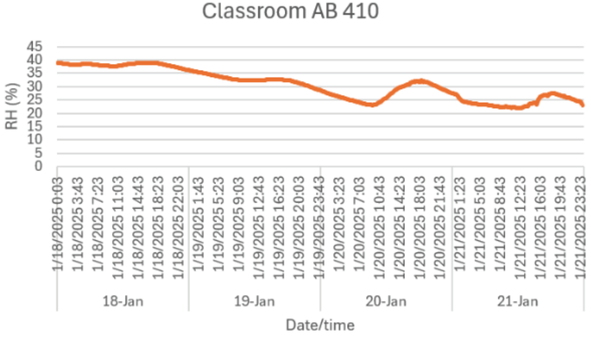
Diagnostic Phase

Data was gathered using two main techniques:

1. Sensor Data (Given)
   - Tools Used: Environmental sensors that measure acoustics, temperature, relative humidity, and light exposure levels.
   - Variables Measured:
     - Temperature in degrees Fahrenheit
     - Relative Humidity
     - Lighting
     - Levels of Acoustic

2. Survey
   - The survey's methodology involved asking participants to rate their level of thermal comfort, their level of satisfaction with the lighting and acoustics, and any behavioral changes (such outfit selections) they had made in response to the surroundings.
   -Variables Gathered:
     - Temperature perception
     - Comfort Level
     - Clothing Choices





Diagnostic Phase

Monitoring Method: Temperature & Relative Humidity Analysis

In order to evaluate indoor environmental quality, we used HOBO sensors to gather temperature and relative humidity data. While the relative humidity showed a decreasing pattern with occasional shifts, the temperature was seen to have gradually dropped over time.

Temperature Analysis

-Range: [67.242–58.798]

-Observations:

• The measured temperatures indicate a gradual cooling effect.

• Despite recorded values, many participants reported feeling warm or slightly warm.

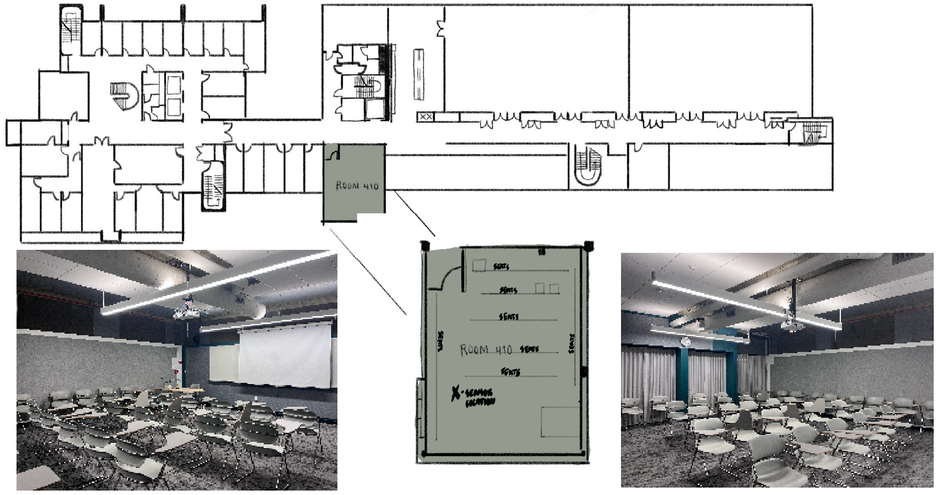
• This discrepancy suggests that factors such as clothing and activity levels influence thermal perception.

Relative Humidity Analysis

- Range: [38.972% –21.853%]
- Observations:

• RH showed a decreasing trend but shifted at certain intervals.

• Variability in RH levels may contribute to occupant discomfort



Our results offer evidence to the theory that, despite the measured IEQ values showing a colder environment, occupants' opinions on the space are warmer because of environmental and behavioral factors. The following significant conclusions surfaced:

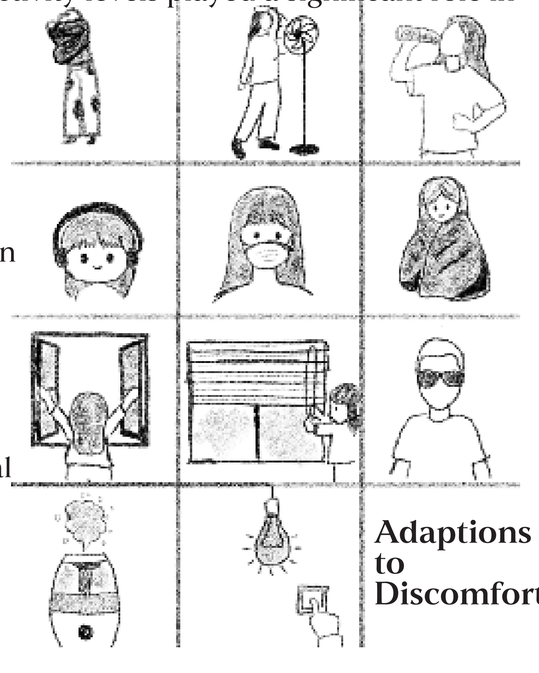
1. **Discrepancy Between Measured and Perceived Thermal Comfort:**
   • The thermal perception did not align with the recorded temperature values.
   • Clothing choices and activity levels played a significant role in perceived warmth.

2. **Impact of Clothing and Metabolic Rate on Comfort:**
   • Participants wearing heavier clothing reported feeling significantly warmer.
   • Those engaged in more active tasks experienced greater warmth.

3. **Challenges in Comparing Methods:**
   • The monitoring method and survey were conducted on different dates, limiting direct comparability.
   • However, trends observed in both methods provide a holistic understanding of occupant comfort.

Conclusion

Our work highlights the importance of taking behavioral and environmental factors into account when analyzing thermal comfort by combining quantitative environmental data with subjective occupant feedback. Additional acoustic and illumination modifications might improve overall occupant satisfaction.



Adaptions to Discomfort