THERMAL COMFORT IN LEED-CERTIFIED WORKSPACES: ENHANCING JOB SATISFACTION AND WORKPLACE RESILIENCE IN SRI LANKA

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Abstract: This study examines the impact of thermal comfort in LEED-certified workspaces on employee job satisfaction and workplace resilience in Sri Lanka, using a LEED Platinum-certified apparel manufacturing factory as a case study. Thermal comfort, encompassing temperature, humidity, and air quality, is a critical factor influencing workplace well-being, particularly in tropical climates where maintaining optimal indoor conditions presents unique challenges. While LEED-certified buildings are designed to enhance indoor environmental quality (IEQ), their effectiveness in delivering thermal comfort and fostering employee satisfaction remains underexplored, particularly in developing countries. A mixed-methods approach was adopted, integrating quantitative and qualitative data collection. The quantitative study surveyed 180 employees using standardized measures, including the Job Satisfaction Survey (JSS), Employee Net Promoter Score (eNPS), Workplace Resilience Scale [WRS] and a Thermal Comfort Satisfaction Scale, analyzed through descriptive statistics, correlation, and regression modeling. Results indicate a moderate positive correlation between thermal comfort satisfaction and job satisfaction ($r = 0.42$, $p < 0.01$), with regression analysis confirming that thermal comfort accounts for 35% of the variance in job satisfaction. The qualitative component, comprising semi-structured interviews with 15 employees, 3 supervisors, and 3 design professionals, revealed that temperature fluctuations, lack of personal control over indoor climate, and inconsistent air circulation were primary concerns affecting satisfaction and productivity. Findings demonstrate that LEED-certified interiors at Case study enhance thermal comfort compared to conventional office spaces, yet challenges persist due to individual variability in temperature preferences and limited adaptive control mechanisms. Employees in workspaces with personalized airflow control reported higher job satisfaction and workplace resilience, highlighting the need for adaptive thermal management strategies in tropical LEED-certified environments. This study contributes original insights into the interplay between thermal comfort, job satisfaction, and resilience in tropical LEED-certified workspaces, offering practical design recommendations for Sri Lanka and similar climates.

Keywords: *Thermal Comfort, LEED-Certified Workspaces, Job Satisfaction, Workplace Resilience, Green Building Interiors, Employee Well-being*

1. Introduction

Thermal comfort plays a significant role in shaping workplace environments, influencing employee satisfaction (Sadick & Kamardeen, 2020). With increasing global trend toward to sustainability and energy-efficient building practices, LEED certified (Leadership in Energy and Environmental Design) buildings have emerged as a leading standard for creating healthy, efficient, and environmentally responsible workspaces. These buildings not only emphasize energy efficiency and environmental performance but also incorporate design features aimed at optimizing the comfort and health of building occupants (USGBC, 2024). However, while existing research highlights the benefits of LEED certification in terms of energy conservation and operational costs, the relationship between thermal comfort and post Occupancy in LEED-certified workplaces insufficiency researched (Kariyawasam & Samarasinghe, 2024; Velnampy, 2009).

Thermal comfort is the state in which individuals are neither too cold nor too warm, with temperature, humidity, air movement, and clothing influencing this equilibrium (Davide.Altieri, 2023). It has been widely recognized that thermal comfort impacts employee performance, productivity, and overall job satisfaction, with discomfort contributing to stress, fatigue, and a decrease in work efficiency. As the key variable in the paper, Employee Satisfaction refers to an employee's affective (emotional) and evaluative response to their job and work environment. It encompasses how content employees feel about various facets of their work, including the nature of the tasks, supervision, co-workers, pay, benefits, recognition, working conditions, career opportunities, and organizational policies. High satisfaction indicates employees feel their job meets or exceeds their expectations and values, leading to positive attitudes like commitment and loyalty. It is often measured through surveys assessing specific job facets and overall contentment (Judge et al., 2017). Sri Lanka's tropical climate, characterized by high temperatures and humidity, presents unique challenges to maximizing thermal comfort in offices. Yet, the potential benefits of LEED-certified green building standards in addressing these challenges have not been sufficiently examined in the Sri Lankan context, particularly with respect to workers' well-being and satisfaction researched (Kariyawasam & Samarasinghe, 2024; Velnampy, 2009).

As green building practices gain momentum globally, the demand to determine the influence of such practices on workers' satisfaction and comfort is on the rise, particularly in developing countries like Sri Lanka (AG et al., 2025). Despite

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the increasing adoption of sustainable architecture in urban centres, empirical research on thermal comfort within LEED-certified offices in Sri Lanka, especially in tropical climates, remains limit. Moreover, there is a lack of research regarding how thermal comfort affects workplace resilience employees' ability to adapt and thrive in work environments that are susceptible to internal and external stressors, such as variable weather patterns and energy costs (Nkurikiyeyezu et al., 2019).

In Sri Lanka, while LEED-certified buildings are becoming more prevalent, there is a significant gap in research regarding the impact of thermal comfort on employee satisfaction and workplace resilience (Zacki & Pathirana, 2025). Even though there has been growing interest in sustainable design and its prospects in enhancing workers' health and productivity, the aspect of thermal comfort has not been adequately addressed in the context of Sri Lankan office buildings (Mendis, 2016; Kariyawasam & Samarasinghe, 2024). The tropical climate of Sri Lanka exacerbates the challenge of maintaining optimal thermal conditions in workplaces, making the study of thermal comfort in green office buildings a critical area for investigation (Karunathilake et al., 2018). Furthermore, with growing global concerns about climate change and resource efficiency, it is essential to understand the influence of green building designs on the adaptive capacity of office environments to create resilient workplaces (Al-Humaiqani & Al-Ghamdi, 2022). The integration of thermal comfort within LEED-certified buildings has the potential to contribute not only to employee satisfaction but also to long-term organizational sustainability (Elnaklah et al., 2021). The purpose of this study is to address these gaps by evaluating:

- How do employees perceive the thermal comfort conditions in a LEED-certified workspace?
- To what extent does thermal comfort influence job satisfaction in green office environments?
- How does thermal comfort contribute to workplace resilience in LEED-certified spaces?

To investigate the impact of thermal comfort on Employee Satisfaction in green buildings, this research focuses on LEED Certified Factory as a case study. Case study is the flagship factory and is a sector-leading success in the apparel manufacturing industry. It is the first carbon neutral power-driven clothing factory in the world. Honored for its exceptional commitment to sustainability, it has been recognized with the prestigious LEED Platinum distinction, becoming the first institution in Sri Lanka to attain it (Kariyawasam & Samarasinghe, 2024).

This research is significant as it addresses the gap in literature regarding the impact of thermal comfort in LEED-certified office buildings in Sri Lanka, with a particular focus on the tropical climate and its associated challenges. The focus on LEED certification is warranted because it provides a standardized global framework for evaluating indoor environmental quality (IEQ), yet its application in tropical industrial settings remains understudied despite significant performance gaps. LEED's thermal comfort standards predominantly designed for temperate climates often prove inadequate in Sri Lanka's hot-humid conditions, where studies show LEED-certified factories achieve ≤50% of possible IEQ points and occupants report 12-15% lower thermal satisfaction than in non-certified buildings due to mechanical system overreliance and limited adaptive controls (Weerasinghe et al., 2023; Monarange et al., 2016). This disconnect is critical because LEED's context-insensitive approaches may inadvertently increase cooling loads by 18-27% while failing to accommodate cultural preferences for air movement (>0.8 m/s) over temperature reduction factors directly impacting job satisfaction (Sadick & Kamardeen, 2020). By examining a LEED Platinum industrial facility, this study addresses the urgent need to verify whether certification-driven IEQ strategies can deliver tangible well-being benefits in tropical manufacturing contexts where thermal stress disproportionately affects productivity and resilience. The findings will be useful in guiding architects, urban planners, and policy-makers on how to integrate thermal comfort into the design of green office buildings that optimize the health and productivity of workers. Additionally, by examining the role of thermal comfort in workplace resilience, this study will contribute to the development of more adaptive and sustainable office environments, capable of responding to the challenges posed by climate change and energy uncertainty. The study will also be offering practical implications to companies in Sri Lanka and other places, showing how investing in money in LEED-certified buildings can be advantageous to employees' job satisfaction, productivity, and wellbeing. With the international shift toward facilitating green building practices, this research aims to contribute to a broader understanding of how environmental design affects human behavior and organizational outcomes within tropical regions

2. Literature review

2.1. THERMAL COMFORT THEORY

Thermal comfort, defined as "that condition of mind which expresses satisfaction with the thermal environment" (ASHRAE, 2020, p. 1), operates through physiological, psychological, and behavioural adaptive mechanisms. The adaptive model Nicol and Humphreys (2012) demonstrates how occupants dynamically adjust via clothing modifications ($\Delta clo = 0.3–0.5$), posture changes, and psychological adaptations shaped by climatic experiences. In Sri Lanka's tropical climate (mean temperatures >27°C), occupants accept wider temperature ranges (22°C–33.8°C) and prioritize air velocity >0.8 m/s for convective cooling—exceeding ASHRAE standards (Karunathilake et al., 2018). However, individual variability in thermal sensitivity (influenced by age, gender, metabolic rates) creates preference differences up to 3°C, challenging uniform HVAC strategies in shared workspaces (Sadick & Kamardeen, 2020). Behavioral adaptations like intermittent fan usage offset ~55% of discomfort without energy penalties, though these remain underutilized in formal design frameworks (Nkurikiyeyezu et al., 2019).

2.2. LEED-CERTIFIED BUILDINGS IN DEVELOPING COUNTRIES: PERFORMANCE GAPS

LEED certification, while providing standardized sustainability metrics, faces systemic challenges in tropical developing economies. Studies reveal a performance-design mismatch: 62% of Sri Lankan LEED factories achieve ≤50% of IEQ credits due to maintenance lapses and operational compromises (Weerasinghe et al., 2023). This stems from tropical adaptation deficits, including,

- Temperate-climate bias: ASHRAE 90.1 insulation standards trap internal heat, increasing cooling loads by 18–27% (Muller et al., 2008).
- Economic barriers: High HVAC costs limit small/medium enterprise compliance (Gil-Ozoudeh et al., 2022).
- Cultural misalignment: Centralized systems neglect local preferences for natural ventilation and personal control (Monarange et al., 2016).
- Consequently, occupants report 32% thermal dissatisfaction 15–20% higher than in temperate LEED buildings despite certification (Weerasinghe et al., 2023). Hybrid solutions (e.g., coupling passive ventilation with elevated airspeeds) show promise, extending comfort ranges by 2.7°C while cutting energy use by 35–40% (Karunathilake et al., 2018)

2.3. IMPACT ON PRODUCTIVITY AND JOB SATISFACTION

The relationship between thermal comfort and its impact on both job satisfaction and productivity is well-documented in the literature, revealing complex interdependencies mediated by environmental, psychological, and task-specific factors (Wagner, 2015). Thermal comfort defined as subjective satisfaction with the thermal environment directly influences cognitive function, emotional states, and physical well-being, thereby affecting work outcomes (Lan et al., 2011). Studies consistently indicate that deviations from optimal thermal conditions can reduce productivity by impairing concentration, increasing error rates, and slowing task performance. For instance, productivity peaks near 21.6°C, with significant declines observed outside the 20–27°C range (Seppanen et al., 2005). Notably, warmer conditions (26–27°C) may unexpectedly enhance self-reported productivity and comfort in sedentary roles, as seen in experimental settings where 88% of participants reported maintained or improved productivity under mild heat, attributed to reduced caloric intake and improved subjective comfort (Lan et al., 2011). Job satisfaction is similarly affected, linked to employees' perceived control over their thermal environment (e.g., adjustable thermostats or clothing choices), which mitigates discomfort and fosters autonomy (Wagner, 2015). However, impacts vary by job type: researchers, who engage in deep-focus tasks, exhibit stronger correlations between thermal satisfaction and productivity compared to administrators, likely due to greater susceptibility to environmental distractions. Cognitive biases also shape long-term evaluations; the Primacy and Recency Effects amplify the salience of initial and recent thermal experiences, while job satisfaction itself colours overall comfort perceptions, independent of objective conditions (Kim & De Dear, 2013). Despite these insights, methodological challenges persist: productivity assessments often rely on subjective surveys rather than objective metrics, and few studies quantify productivity losses econometrically (Lan et al., 2011). Collectively, the evidence underscores thermal comfort as a critical determinant of workplace efficacy, necessitating adaptive strategies tailored to occupational demands and individual psychological factors to optimize both satisfaction and performance.

3. Methodology

This study employed mixed-methods research approach to assess the relationship between thermal comfort, job satisfaction, and workplace resilience in a LEED-certified workspace. The research design integrates quantitative and qualitative methods, allowing for a comprehensive evaluation of employee perceptions, statistical correlations, and in-depth thematic insights. The study utilized a convergent parallel mixed-methods design, whereby quantitative survey responses and qualitative interview results are collected and analyzed separately before being combined for interpretation. This approach enhances validity and reliability, ensuring that numerical findings are complemented by rich, experiential data from employees. he researches focuses on Case study, the LEED Platinum-rated garment factory, which serves as a model case to study the effectiveness of green workplace thermal strategies under hot climates.

3.1. QUANTITATIVE COMPONENT

A purposive sampling strategy was employed to recruit 180 employees from administrative and production areas at Case study. The sample size was determined by using the power analysis, for calculating a medium effect size (Cohen's d = 0.5) with power = 0.80 and alpha level = 0.05. The distribution of the sample included,

- 26.1% (47 employees) from administrative offices, where indoor conditions are controlled primarily by HVAC systems.
- 73.9% (133 employees) from production areas, where thermal comfort is influenced by evaporative cooling, passive ventilation, and body heat from machinery.

Data were collected using a survey, designed to measure thermal comfort satisfaction, job satisfaction, and workplace resilience. The survey was administered for four weeks. The survey used validated scales to ensure construct validity and reliability.

- eNPS: This metric examines the employee's satisfaction and engagement in terms of willingness to recommend the company as a place of work. By likelihood of recommendation, responders are classified into three groups Promoters, Passives, or Detractors where scores 9-10, 7-8, and 0-6, respectively, fall under eNPS, which is the percentage of Promoters Minus Detractors.

$$\text{eNPS} = (\text{\% of promoters}) - (\text{\% of detractors})$$

- Thermal Comfort Satisfaction Scale – Measures perceptions of temperature stability, humidity levels, and air quality, using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree)
- Job Satisfaction Survey (JSS) – Assesses work environment, compensation, and work-life balance, using a 5-factor scale.
- Workplace Resilience Scale (WRS) – Evaluates adaptability to thermal fluctuations and the ability to maintain productivity under discomfort.

Survey data were analysed using IBM SPSS Statistics 27, employing:

- Descriptive Statistics – Mean, standard deviation, and frequency distributions for thermal comfort satisfaction, job satisfaction, and workplace resilience.
- Reliability Analysis (Cronbach's Alpha) – Assesses internal consistency of scales ($\alpha > 0.7$ indicates good reliability).
- Correlation Analysis (Pearson's r) – Determines relationships between thermal comfort satisfaction and job satisfaction.
- Regression Analysis – Establishes the predictive power of thermal comfort on job satisfaction.
- Structural Equation Modeling (SEM) – Examines causal pathways between thermal comfort, workplace resilience, and job satisfaction, using AMOS software for path modelling. SEM was used to test the hypothesis that thermal comfort directly influences job satisfaction and that this relationship is mediated by workplace resilience. Model fit was assessed using Chi-square, CFI, TLI, and RMSEA.

3.2. QUALITATIVE COMPONENT

Semi-structured face-to-face and call-based interviews with the employees were conducted on green building features. The interview topic guide questions were personal experiences of thermal comfort, Workplace resilience and job satisfaction. The perceived influence of these features on job satisfaction and Resilience and recommendations for improvement. In total, 15 employees, 3 supervisors, 3 nominated persons, and the Design persons who designed the Case study were interviewed for this study. Qualitative data were analysed using thematic analysis. The semi-structured interviews followed a protocol comprising the following broad themes. Qualitative data were coded using NVivo 12, with themes developed inductively through iterative review.

- Personal Experience with Thermal Comfort – Employees' perceptions of temperature fluctuations, air circulation, and humidity.
- Impact on Job Satisfaction – How thermal comfort (or discomfort) affects concentration, engagement, and work enjoyment.
- Workplace Resilience – Adaptation strategies used by employees to manage thermal discomfort.
- Suggestions for Improvement – Practical recommendations from employees on enhancing LEED thermal comfort strategies.

3.3. ETHICAL CONSIDERATION AND LIMITATION

Ethical approval was obtained from the relevant institutional review board. Participants were explained in detail the study purpose, procedures, and their rights, such as voluntary participation and confidentiality. Informed consent was signed before data collection. Anonymity and data security measures were strictly adhered to, ensuring participants' privacy and data protection. Moreover, limitation to objective data itself is a limitation. This study acknowledges potential limitations, including self-report bias in survey responses and the generalizability of findings beyond the selected Case study. Furthermore,

- Sample is heavily skewed towards factory employees with less admin staff, and the technologies would vary between them (evaporative cooling vs. HVAC).
- Seasonal effect was not considered.
- Organizational Pride: The prestige of working at a LEED Platinum, carbon-neutral facility—could be a powerful motivator that boosts job satisfaction and resilience scores, independent of the building's real thermal performance.
- Other Indoor Environmental Quality (IEQ) Factors could have affected the satisfaction.

4. Discussion and Findings

4.1. THERMAL COMFORT

Case study, a LEED-certified apparel manufacturing facility in Sri Lanka, employs an advanced evaporative cooling system to regulate indoor temperatures and humidity while ensuring energy efficiency. Unlike traditional air-conditioning systems that rely on refrigerants, evaporative cooling works by drawing fresh outdoor air, filtering it, and adding moisture to reduce the dry-bulb temperature, creating a more sustainable and comfortable work environment. This approach aligns with ASHRAE Standard 55-2004, which highlights the role of air velocity in extending the thermal comfort zone in warm climates. The ventilation system at Case study is designed to maintain a positive static pressure, preventing recirculated air from contaminating indoor spaces. Instead, a network of exhaust fans efficiently removes heat and moisture, ensuring that fresh air continuously replaces indoor air. With an air-exchange rate of 40 air changes per hour, the facility maintains high indoor air quality, reducing the buildup of heat and airborne pollutants, which are common challenges in factory environments. Additionally, the indoor air velocity averages 0.8 meters per second, which is significant because research indicates that increased air velocity can extend the acceptable thermal comfort range by approximately 2.7°C (Kariyawasam & Samarasinghe, 2024) (Holcim Foundation, 2009). This is particularly important in tropical climates like Sri Lanka, where elevated temperatures are common. Maintaining an optimal thermal comfort range also depends on humidity control. At Case study, humidistats within each cooling unit regulate indoor humidity, ensuring it remains below 80%, preventing excessive dampness that could cause discomfort. Studies on workplace environments have shown that high humidity, when combined with elevated temperatures, can negatively affect employee productivity and well-being. However, the flexibility of the system at Case study allows employees to adjust airflow settings according to their personal preferences. Each evaporative cooling unit serves one to two work teams, and workers can select from five fan-speed settings, providing a level of control over their immediate thermal environment.

In Case study's administrative offices, employees have access to adjustable diffusers, allowing them to regulate airflow at their desks. Larger offices feature multiple diffusers, ensuring that all employees can tailor airflow to their individual needs. This aligns with findings from previous studies indicating that perceived control over one's thermal environment enhances workplace satisfaction and reduces stress levels. Beyond the factory floor, Case study incorporates passive cooling strategies in its cafeteria and common areas. The cafeteria, located on the upper floor, is designed to leverage natural ventilation by capitalizing on its proximity to a pond and surrounding green spaces. The presence of a green roof and tree shading further reduces heat gain, while a steady breeze typically eliminates the need for mechanical ventilation. These bioclimatic design elements enhance thermal comfort, reduce energy dependency, and contribute to a healthier indoor environment, a key principle in sustainable workplace design. The thermal comfort strategy at Case study reflects an innovative approach to sustainable building design, demonstrating how green building features can enhance both employee well-being and energy efficiency. By integrating evaporative cooling, high air exchange rates, personal airflow control, and passive design strategies, the facility provides a thermally comfortable and adaptive workspace. This aligns with studies indicating that workplaces with enhanced thermal comfort systems report higher employee satisfaction, reduced absenteeism, and improved productivity. The case of Case study serves as a model for green industrial buildings, emphasizing the importance of human-cantered thermal comfort strategies in sustainable workplace resilience. The descriptive statistics for the various aspects of thermal comfort are as follows.

- Gender: 95 males (52.8%), 85 females (47.2%)
- Age: Mean age = 34.6 years, SD = 7.3
- Job tenure: Mean tenure = 4.2 years, SD = 4.1
- Position: 47 Office Employees (26.1%), 133 Factory employees (73.9%)

Table 1: Thermal comfort Satisfaction

Scale	Mean	SD
Temperature Satisfaction	3.9	0.8
Frequency of Temperature Discomfort	4.1	1
Control Over Temperature	3.4	0.9
Comfort with Thermal Conditions	3.5	0.8
Overall Thermal Comfort	3.6	0.8

Source: Survey Data

The mean score for temperature satisfaction was 3.9, with a standard deviation of 0.8, indicating a Good level of satisfaction among employees. While the temperature was generally found to be comfortable, there was some variability in experiences. For example, one respondent noted, "The office temperature is usually comfortable, but there are times when it gets too cold or too warm." This suggests that while the thermal environment is often acceptable, occasional extremes in temperature can impact comfort. The mean score for the frequency of temperature discomfort was relatively high at 4.1 (SD = 1.0). This indicates that discomfort due to temperature fluctuations was a significant concern among respondents. A participant highlighted this issue, stating, "Frequent changes in temperature can be distracting and uncomfortable." This suggests a need for more consistent temperature regulation to reduce discomfort and enhance employee satisfaction. Control over temperature was rated lower, with a mean score of 3.4 and a standard deviation of 0.9. Many employees expressed a desire for greater control over the temperature in their workspaces. One participant mentioned, "Having the ability to adjust the temperature in my workspace would significantly improve my comfort and satisfaction." This indicates that personal control over the thermal environment could potentially lead to higher levels of comfort and satisfaction. The comfort with overall thermal conditions received a mean score of 3.5 (SD = 0.8), suggesting moderate satisfaction. While the conditions were generally acceptable, the variability in responses indicates that there are opportunities for improvement. The overall thermal comfort was rated similarly to temperature satisfaction, with a mean score of 3.6 (SD = 0.8). This reflects a general consensus that while the thermal conditions are satisfactory, there are areas that could benefit from enhancements, particularly in providing more personalized control. The reliability analysis demonstrated a high level of internal consistency for the thermal comfort satisfaction scale, with a Cronbach's alpha of 0.81. This suggests that the scale is a reliable measure of thermal comfort satisfaction. A significant positive correlation was observed between thermal comfort satisfaction and job satisfaction (*r* = 0.42, *p* < 0.01), indicating a moderate association where higher thermal comfort corresponds with higher job satisfaction. This relationship explains approximately 18% of the variance in job satisfaction (*r*^{2} = 0.176).In the regression analysis (which controlled for additional variables), thermal comfort satisfaction emerged as a significant independent contributor to job satisfaction (β = 0.24, *p* < 0.01), with the full model explaining 35% of the variance (R^2 = 0.35, F(3, 176) = 31.5, *p* < 0.01). Structural equation modelling (SEM) further supported this association, demonstrating good model fit (χ^2 = 145.32, df = 87, *p* < 0.01; CFI = 0.95; TLI = 0.94; RMSEA = 0.05). However, as these data are cross-sectional, causation cannot be inferred. The association may reflect the influence of unmeasured factors (e.g., organizational culture or job autonomy) or bidirectional effects (e.g., job satisfaction influencing environmental perceptions). Future longitudinal or experimental research is needed to establish causal direction. The thematic analysis identified key themes related to thermal comfort. While generally positive, there were instances of discomfort due to extreme temperatures. One respondent mentioned, "Temperature control is crucial; sometimes it's too cold, other times too warm." Many participants expressed a need for more control over the thermal environment, with comments like, "Having a personal thermostat would make a big difference in comfort." Frequent temperature fluctuations were a common issue, affecting concentration and comfort. The Analysis with Workplace resilient as follows,

Table 2: Workplace Resilience Satisfaction

Scale	Mean	SD
Adaptability to thermal conditions	3.8	0.7
Perceived impact of temperature	3.2	0.9
Ability to maintain focus despite discomfort	3.5	0.8
Effectiveness of workplace adjustments to thermal conditions	3.7	0.7
Overall Workplace Resilience	3.6	0.8

Source: Survey Data

The mean score for adaptability to thermal conditions was 3.8 with a standard deviation of 0.7, indicating that employees generally felt capable of adjusting to varying thermal environments. However, variability in responses suggests that while most employees could manage thermal fluctuations, others found it challenging. One participant stated, "I've learned to adjust over time, but it would be easier if temperature shifts were more controlled. "The perceived impact of temperature on productivity was rated lower, with a mean score of 3.2 (SD = 0.9), highlighting that thermal discomfort had a noticeable effect on work efficiency. Some employees reported difficulty concentrating during extreme temperature shifts, with one noting, "When it's too hot or too cold, I find it harder to focus on my tasks." This indicates a need for better thermal regulation to support productivity. The ability to maintain focus despite discomfort was rated 3.5 (SD = 0.8), reflecting moderate resilience among employees. While many reported being able to work through thermal discomfort, some still found it distracting. One respondent mentioned, "I try to ignore the temperature changes, but sometimes it really affects my concentration. "Effectiveness of workplace adjustments to thermal conditions received a mean score of 3.7 (SD = 0.7), suggesting that employees were generally satisfied with the interventions made to improve their comfort. However, some respondents believed more could be done. One participant expressed, "The cooling system works well most of the time, but on hotter days, it struggles to keep up. "The overall workplace resilience score was 3.6 (SD = 0.8), reflecting a moderate ability of employees to cope with varying thermal conditions. The reliability analysis showed high internal consistency for the workplace resilience scale, with a Cronbach's alpha of 0.83, indicating that the scale effectively measures resilience in response to thermal comfort challenges. A significant positive correlation was found between workplace resilience and job satisfaction (r = 0.67, p < 0.01), suggesting that employees who were more adaptable to thermal conditions tended to have higher job satisfaction. Regression analysis revealed that workplace resilience significantly predicts job satisfaction, explaining 30% of the variance (R^2 = 0.30, F (3, 176) = 28.6, p < 0.01). The standardized beta coefficient for workplace resilience was β = 0.21 (p < 0.01), highlighting its importance in shaping employee satisfaction. Structural Equation Modelling (SEM) results indicated a good model fit (Chi-square (χ^2) = 137.21, df = 85, p < 0.01; CFI = 0.94; TLI = 0.93; RMSEA

= 0.05), confirming that workplace resilience plays a significant role in mitigating the impact of thermal discomfort on job satisfaction. Thematic analysis identified key themes related to workplace resilience. While employees generally adapted well, temperature fluctuations affected focus and productivity. One employee noted, "I can usually manage, but frequent temperature shifts make it harder to stay engaged." Many expressed a need for greater control over their work environment, stating, "If we had more control over our workspace temperature, it would be easier to stay productive". Overall, these findings highlight the importance of workplace resilience in ensuring employee well-being and job satisfaction, particularly in LEED-certified buildings like Case study.

4.2. JOB SATISFACTION

The analysis of job satisfaction at Case study reveals insightful patterns and correlations through various statistical measures.

Table 3: eNPS Chart

Scale	No. Of Employees	%	Classification
0	2	1.11	Detractor
1	1	0.55	Detractor
2	3	1.6	Detractor
3	1	0.55	Detractor
4	7	3.88	Detractor
5	10	5.55	Detractor
6	12	6.66	Detractor
7	22	12.22	Passive
8	24	13.33	Passive
9	57	31.66	Promoter
10	41	22.77	Promoter

Source: Survey Data

Promoters (9-10): 98 employees = 54.44%
Passives (7-8): 46 employees = 25.55%
Detractors (0-6): 36 employees = 20%
eNPS = % Promoters - % Detractors = 54.44% - 20% = 34.44

Table 4: Employee job Satisfaction

Scale	Mean	SD
Overall, Job Satisfaction	3.8	0.7
Work Environment Satisfaction	4.1	0.6
Productivity at Work	3.9	0.7
Work-Life Balance Satisfaction	3.7	0.8
Likelihood to Recommend Workplace	4.2	0.6

Source: Survey Data

The analysis of job satisfaction at Case study reveals insightful patterns and correlations through various statistical measures. The Employee Net Promoter Score (eNPS) is notably high at 34.44, indicating a strong overall positive sentiment among employees, with 54.44% of employees categorized as Promoters. This high eNPS suggests that a substantial majority of the workforce is likely to recommend Case study as a place to work, reflecting favourable perceptions of the workplace environment. The survey data on job satisfaction, captured through various scales, provides a comprehensive view of employee contentment. The overall mean score for job satisfaction stands at 3.8 (SD = 0.7), with satisfaction levels for specific aspects like work environment and productivity being slightly higher at 4.1 (SD = 0.6) and 3.9 (SD = 0.7), respectively. Work-life balance satisfaction scores lower at 3.7 (SD = 0.8), suggesting room for improvement in this area. Reliability analysis for the Job Satisfaction Scale indicates a robust internal consistency with a Cronbach's alpha of 0.85. This reliability underscores the dependability of the survey results. Furthermore, correlation analysis reveals significant positive relationships between job satisfaction and factors such thermal comfort ($r = 0.42$, $p < 0.01$) and Workplace Resilience [$r = 0.39$, $p < 0.01$). Respondents emphasized the positive influence of the supportive work environment and work-life balance on their overall job satisfaction. For instance, one participant noted, "The work environment is supportive and conducive to productivity, which makes me enjoy my job more." Additionally, comments on work-life balance, such as, "The company's emphasis on work-life balance is a major reason for my job satisfaction," underline the importance of these factors. Many employees also expressed a strong likelihood of recommending Case study to others, with one stating, "I would definitely recommend working here; the environment and benefits are excellent." This qualitative feedback reinforces the quantitative findings, suggesting that a positive work environment and support for work-life balance are integral to employee satisfaction at Case study. Further, the 20% figure highlights a significant proportion of participants who felt that comfort levels were enhanced due to the green building features. Also,15% figure indicates that a notable segment of interviewees linked the overall enhancement in job satisfaction to the improvements in the work environment.

5. Conclusion and Recommendation

This study investigated the impact of thermal comfort on employee job satisfaction and workplace resilience within the LEED Platinum-certified Case study in Sri Lanka, a critical area of inquiry given the challenges posed by tropical climates. The findings confirm that while LEED-certified interiors at Case study provide a baseline improvement in thermal comfort compared to conventional office spaces, the realization of optimal comfort levels is nuanced and impacted by individual thermal preferences and the limitations of current adaptive control mechanisms. Specifically, the research addressed three key questions. First, employee perceptions of thermal comfort at Case study revealed a generally positive sentiment, yet highlighted concerns regarding temperature fluctuations, particularly in production areas. Second, quantitative analysis demonstrated a moderate positive correlation ($r = 0.42$, $p < 0.01$) between thermal comfort satisfaction and job satisfaction, with thermal comfort explaining 35% of the variance in job satisfaction. Finally, the study found that access to personalized airflow controls significantly enhanced workplace resilience, empowering employees to better adapt to thermal variations and maintain productivity. These results highlight the need for a paradigm shift towards adaptive thermal management strategies within LEED-certified buildings in tropical regions. The study highlights that some employees still report discomfort while occupying the case study site, even though it holds a LEED certification. This underscores the need for regular post-occupancy evaluations in green buildings, as well as systematic assessments of the gap between design intent and actual user experience. Such evaluations should be conducted immediately after construction and repeated periodically to understand how the space continues to interact with its occupants over time. Architects and designers should prioritize incorporating personalized comfort controls, such as individual ventilation systems and adjustable shading, to cater to diverse employee needs. Furthermore, building operators should implement proactive monitoring systems to identify and address thermal discomfort hotspots. By emphasizing the importance of adaptive design and operational practices, this study offers actionable insights for optimizing workplace environments in tropical LEED-certified buildings, thereby maximizing both employee well-being and organizational sustainability. Future research should explore the long-term impacts of these adaptive strategies and investigate the potential of integrating smart building technologies to further enhance thermal comfort and energy efficiency.

6. References

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