

# IMPACTS OF MULTI-SENSORY DESIGN ON THE EMPLOYEE'S WELL-BEING; AN EXPERIMENTAL STUDY OF SELECTED IT OFFICES IN COLOMBO DISTRICT

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**Abstract:** Multisensory architecture, which impacts occupants by stimulating their senses, is underexplored in workplace settings, where individuals spend most of their time. This study addresses the gap by examining the combined influence of visual and auditory elements on employee well-being using a 3D simulated model of an IT office in Colombo. Four scenarios were created for 20 employees to test these sensory elements. This research emphasizes the importance of selecting design elements that engage multiple senses without causing sensory incongruence. Integrating multisensory design in workplaces can boost employee well-being, improve work quality, and benefit financial and health outcomes. Findings reveal that sensory interventions significantly enhance psychological well-being: Control (62.2%), Green Wall (86%), Calming Music (70.33%), and Combined (78.9%). Nature-related elements were preferred, with the green wall scoring highest (86%) and 40% favouring nature sounds. However, combined sensory elements scored lower than the green wall alone, highlighting the need for sensory harmony. Employers, designers, and relevant authorities should consider these findings to foster a vibrant and enriching work environment that supports the psychological health and productivity of employees. By doing so, workplaces can become more engaging and supportive spaces.

**Keywords:** *Multi-sensory Architecture, workplaces, visual, auditory, psychological well-being*

## 1. Introduction

The environment shapes daily experiences, yet architecture often prioritizes function over human connection, overlooking sensory experience. Uninviting spaces can negatively affect well-being. Because sensory perception influences people across all settings—homes, commercial spaces, and public environments—designing for multiple senses becomes essential. This study focuses on office environments, where individuals spend much of their day, to examine how sensory stimulation affects workers' psychological well-being.

Most sensory design research centres on business, branding, and marketing, enhancing customer experience in retail, hospitality, and service sectors. Sensory design in office settings remains underexplored, despite its potential to improve well-being, motivation, and performance. Existing studies often examine single senses separately. In contrast, this study uses technology to investigate visual and auditory elements together. Visual perception processes light, colour, and spatial cues, while auditory perception interprets sound. These senses capture the highest proportion of human attention (Heilig, 1992), making them particularly relevant in workplace contexts.

A review of literature identifies clear gaps: limited research on multisensory design in office environments; few studies examining the combined effects of multiple senses; and a lack of Sri Lankan research on office-based employee well-being. While job satisfaction and productivity are well studied, psychological well-being receives less attention. As a result, a context-specific framework linking sensory design to employee well-being is missing—one that this study aims to develop. This study therefore focuses on visual and auditory senses, the most influential (Heilig, 1992) and feasible to manipulate within controlled 3D simulations. Olfactory and tactile senses are excluded due to practical constraints. Case studies and virtual simulations enabled precise control of sensory variables. A mixed-method approach—surveys and well-being measures (quantitative) combined with interviews and observations (qualitative)—provided a holistic understanding of participants' responses. Limitations include a small sample size, the focus on IT offices within a specific geographical area, and the assessment of immediate rather than long-term effects on well-being.

### 1.1. OBJECTIVES

#### General Objective

To evaluate the impact of multisensory design elements on the psychological well-being of employees in IT office environments with special reference to visual and auditory senses.

#### Specific Objectives

- To assess the effects of introducing greenery as a visual sensory element on employees' psychological well-being.
- To examine the impact of modifying the soundscape as an auditory sensory element on employees' psychological well-being.

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- To evaluate the combined influence of visual (greenery) and auditory (calming music) sensory elements on employees' psychological well-being.
- To propose design recommendations for implementing multisensory strategies that enhance well-being in office environments

## 2. Literature Review

### 2.1 SENSORY PERCEPTION THROUGH BODILY SENSES

Our senses are deeply entwined with our experiences, serving as the gateway to our awareness of the external world. A person's capacity to comprehend the arrangement of their surroundings, known as spatial perception, is facilitated by touch, hearing, sight, and scent. Humans also possess additional senses beyond the traditional five (Craig, 2002).

A sensory modality refers to any of the senses, with transduction being the process of encoding information from stimuli. Minor adjustments to sensory elements can greatly alter an individual's experience. These adjustments can include consciously designed stimuli in an environment—people, objects, spatial layout, or atmospheric conditions.

This interaction between environmental sensory stimuli and the occupants' perception is illustrated in the Mehrabian-Russell model (1996), which explains how stimuli influence emotions and, subsequently, behaviour. Even small modifications to sensory elements can affect emotional responses and overall experience.

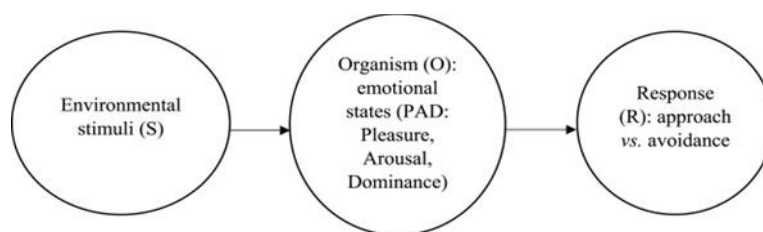


Figure 1: Mehrabian- Russell model (1996)

### 2.2 MULTI-SENSORY APPROACH IN ARCHITECTURE

Building on the understanding of how senses shape experience, architects are increasingly considering multi-sensory approaches to enhance occupant well-being. Architecture serves human needs by providing shelter and enabling diverse activities, but its impact extends beyond practicality and aesthetics. Beauty encompasses not only visual perception but also how interiors engage human senses, influencing emotions, moods, and overall affect.

### 2.3 MULTI-SENSORY ARCHITECTURE IN OFFICE BUILDING TYPOLOGY

Extending the principles of multi-sensory architecture to workplaces, multi-sensory office design examines how environmental stimuli affect employee well-being. People spend approximately 90% of their time indoors (Clements-Croome, 2000; Klepeis et al., 2001), amplifying the influence of office environments on mental health. Research by the British Council for Offices (2018) indicates employees prefer natural light, greenery, and quiet spaces, while disliking noise and sterile settings.

Sensory elements such as colour, materials, views, and spatial layout collectively shape engagement and satisfaction. The Flourish Model (Clements-Croome, 2018) provides a framework to assess office environments, emphasizing user growth and mental health. Concepts like biophilic design and sensory integration guide strategies to strengthen emotional connection and performance in office settings.

### 2.4 EMPLOYEE PSYCHOLOGICAL WELL-BEING IN OFFICE SPACES

Employee well-being is affected by physical, psychological, and environmental conditions. Shmotkin & Ryff (2002) and Danna & Griffin (1999) define psychological well-being as encompassing mental and emotional health. Ryan & Deci (2001) distinguish between hedonic (pleasure-based) and eudemonic (meaning-based) well-being. The BCO (2017) states a productive workplace must first be a healthy one. CIPD outlines well-being domains such as health, autonomy, social support, and fair compensation. Environmental factors like lighting, space, sound, and greenery directly affect these dimensions. As workplaces shift toward knowledge-based industries (Haynes, 2008), user-focused design becomes crucial in promoting mental health, engagement, and resilience.

### 2.5. THEORETICAL FRAMEWORK

#### 2.5.1 Selecting parameters to study

In Part II, the study focused on all seven *subjective* parameters of the Flourish Model—layout, character, space, view, greenery, design, and aesthetic quality—because these could be directly observed and assessed by the researcher, reflecting employees' perceptions and experiences of the office environment. For analysis, the *design* parameter was further divided into three components: soundscape, lighting, and materiality, allowing a more detailed examination of how specific design

aspects influence well-being. Objective parameters were not included due to practical measurement limitations in an observational study.

Part III then focused specifically on modifying greenery and the soundscape. These were chosen because they showed notable variation between the two offices in Part II, were practical to adjust without changing the fundamental character of the workspace and aligned with the study’s aim to examine visual and auditory sensory interventions. Altering views, layouts, materiality, or colour schemes would require major physical renovations, making them unsuitable for controlled experimental manipulation. In contrast, adding greenery and introducing a curated sound environment were feasible, minimally disruptive, and consistent with existing literature highlighting the influence of biophilic and acoustic elements on well-being. This allowed the study to meaningfully explore the combined effects of visual and auditory modifications while addressing a gap in research on multi-sensory interventions in Sri Lankan office contexts.

2.5.2 Theoretical framework

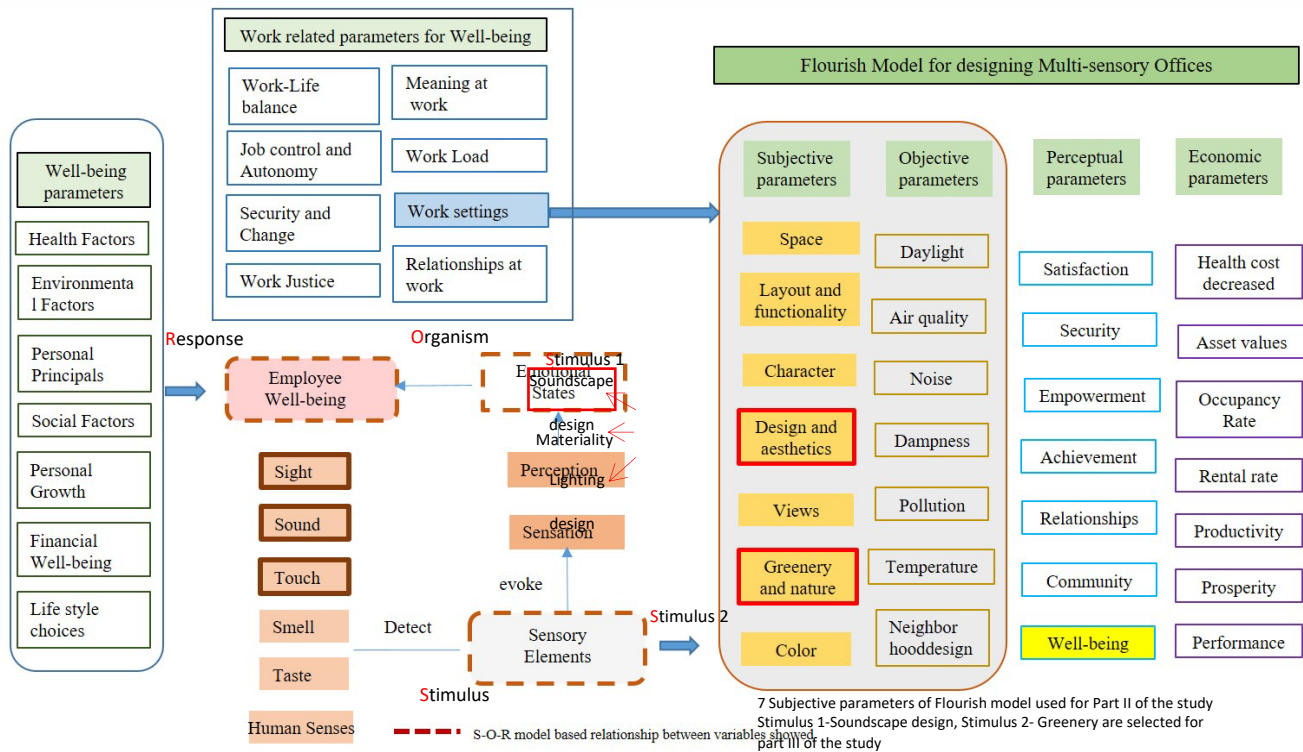


Figure 2: Theoretical framework

The theoretical framework of the present study is based on an adaptation of the Stimulus–Organism–Response (S–O–R) Model (Mehrabian & Russell, 1996), the Flourish Model (Clements-Croome, 2018). Also, the general parameters related to psychological well-being were informed by Guest (2017), while work-related well-being parameters and specific factors influencing well-being in the workplace were explored through research conducted by the BSB.

In the classical S-O-R model, stimulus is defined as those factors that affect internal states of the individual and can be conceptualized as an influence that stimulates the individual (Eroglu, 2001). Organism refers to ‘internal processes and structures intervening between stimuli external to the person. Response refers to the observable behaviors, actions, or responses that the organism produces because of the interaction between external stimuli and its internal processes.

In this context, office interventions such as the green wall and calming music served as the Stimuli (S). The Organism (O) component represents participants’ emotional and cognitive responses to these interventions, assessed through observational notes and survey responses. The Response (R) is captured as changes in psychological well-being scores, indicating the effect of the sensory modifications on employee well-being.

3. Methodology

The research was divided into three parts to achieve the objectives effectively. Part 1 involved a literature study on multi-sensory aspects of office spaces and employee well-being, providing foundational knowledge on their intricate relationship. This literature review focused on well-being measures and sensory design in buildings, as this specific combination had not been widely studied. Part 2 comprised observational studies and preliminary questionnaires with 20 employees from each of two selected offices, evaluating the implementation of sensory designs and their impact on well-being. This phase aimed

to identify which sensory elements influenced well-being the most and which offices scored lower in these aspects. Part 3 expanded on insights from Part 2, targeting one workplace to modify two impactful sensory elements: a green wall for visual sense and calming music for auditory sense, based on the research objectives and findings.

Data collection involved on-site observational studies and questionnaire surveys. Tools included the Building Wellbeing Scale (SACRA 15) for psychological well-being and an Author Defined Questionnaire for sensory elements, user preferences, experiences, and demographics. For that Two IT tech parks in Sri Lanka were selected for case studies due to their proximity and consistent Class A office standards, ensuring controlled external factors and comparable, high-quality workspaces.

### 3.1 EXPERIMENTAL SETUP

This approach enables a comprehensive understanding of how selected sensory elements influence office environments and employee well-being, consistent with the Flourish Model. A modular living green wall was installed for versatility and ease of setup (Erçin & Usluer, 2022), covering 160.72 sqft and featuring plants such as *Epipremnum aureum*, *Philodendron xanadu*, and *Syngonium podophyllum* for visual appeal and adaptability (Lohr & Agate, 2014). A mix of species with varied leaf sizes and shades simulated realistic foliage and green cover ratios. Calming music was neutral, instrumental, and culturally inclusive, avoiding familiar songs or specific genres to prevent strong emotional responses. Bird and water sounds were added for relaxation, and the track was selected from YouTube based on popularity and suitability for diverse employees.

Process steps with timeline for part III of the research

Table 1: Process steps with timeline for part III of the research

<p><b>Day 1:</b> Office visit, measurements, and sound recordings.</p> <p><b>Day 2:</b> 3D model creation and new music selection.</p> <p><b>Day 3:</b> 3D model completed; videos for scenarios created.</p> <p><b>Day 4:</b> Integrated sounds and created four scenario videos.</p>	<p><b>Day 5:</b> Pre-trial run and feedback collection.</p> <p><b>Day 6-7:</b> Video modifications; sent first scenario video and questionnaire.</p> <p><b>Day 8-10:</b> Collected data, sent next scenario video.</p> <p><b>Day 11:</b> Final data collection and organization.</p>
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**Limitations:** The use of a 3D model may affect the accuracy of sensory experiences compared to real-world settings. The study focuses only on visual and auditory senses, neglecting olfactory and tactile dimensions that could impact well-being. Findings may not be generalizable to all workplace contexts.

**Delimitations:** The study focused on two IT offices in the same geographical area to minimize external variance. Participants were all from the IT sector, ensuring relevance. Offices were of the same standard, and the virtual model allowed precise control over experimental variables, enhancing internal validity.

### Selected Offices for Part II and Part III of the study

**Office A** - Office building at Orion city, Colombo 09

**Office B** - Office building at Trace city, Colombo 08

Table 2: (Site plan – offices marked in red)




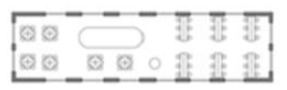












	Office A	Office B
Site plan		
Layout		
Exterior view		

Table 3: Interior elements - comparisons of selected offices

	Office A in Orion City	Office B in Trace City
Outside Views from two offices		
Working spaces		
Greenery		
Character		
Materiality		

**4. Data Presentation and Analysis: This chapter presents all the results and findings from both the parts of the research (Part II and Part III)**

Table 4: Sensory Parameters Scores of Office A

Parameter	Sensory modalities	Observations	Score
Lighting design	Visual	Entirely artificial lighting, uniform distribution, lacks task-specific lighting	03
Materiality	Visual + tactile	Smooth, modern, and varied textures, clean and sophisticated look	04
Soundscape	Auditory	Open layout leads to sound travel and distractions	02
Art works	Visual	Simple, effective typography art matching minimalist design	04
Views	Visual	Panoramic urban views, limited external visibility from other areas	04
Greenery	Visual	Modest number of potted plants, visually refreshing but limited impact	03
Color	Visual	Consistent white with contrasting dark floors and grey ceilings	03
Character	Visual	Modern, minimalist, sophisticated appearance with clean lines	04
Functionality/layout	Visual + auditory	Functional, open-plan, minimalist with subtle zoning	03
Space	Visual	Efficient layout with dedicated areas for different functions	03
Overall score	—		35/55

Table 5: Sensory Parameters Scores of Office B

Parameter	Sensory modalities	Observations	Score
Lighting design	Visual	Warm, diffused light with texture brick and lanterns	05
Materiality	Visual + tactile	Exposed brick, carpet, and warm furniture enhance comfort	04
Soundscape	Auditory	Courtyard sounds and equipment provide privacy	03
Art works	Visual	Limited artwork; mainly plants and a lighted office name	03
Views	Visual	nature views and window treatments offer calming breaks	03
Greenery	Visual	Desk-level and hanging plants add Privacy and interest	05
Color	Visual	Warm, harmonious colors create a cozy atmosphere	04
Character	Visual	Brick and arches blend traditional and modern styles	04
Functionality/layout	Visual + auditory	Open-plan layout supports work and teamwork	04
Space	Visual	Welcoming lobby and breakout areas with greenery	03
Overall score	—		42/55

#### 4.1 PART II OF THE STUDY – OBSERVATION STUDY OF TWO OFFICES FOR SELECTED SENSORY ELEMENTS IN THE OFFICE

Based on the Sensory Parameters Scores of two offices, Office B has the better scores based on this study. Office A lacked outside views, had minimal greenery, an open-plan layout with no barriers allowing unrestricted sound access, and a cool color scheme. Conversely, Office B featured views of outside courtyards and greenery, better sound control due to workstation barriers, and a warm color scheme with brick usage.

Following that the well-being scores were gathered at the two offices by providing SACRA -15 questionnaire.

Table 6: Well-being levels of Office A

Mean well-being score for Hedonic Well-being (positive emotions)	22.9
Mean well-being score for Eudemonic Well-being (positive functioning)	30.75
Mean total well-being score	53.65
Percentage of achievement within the Hedonic Well-being (positive emotions) category	76.33%
Percentage of achievement within the Eudemonic Well-being (positive functioning) category	68.33%
overall well-being percentage based on the total marks available	71.52%
Overall Range of well-being achieved	High

Table 7: Well-being levels of Office B

Mean well-being score for Hedonic Well-being (positive emotions)	24.95
Mean well-being score for Eudemonic Well-being (positive functioning)	37.15
Mean total well-being score	62.10
Percentage of achievement within the Hedonic Well-being (positive emotions) category	83.16%
Percentage of achievement within the Eudemonic Well-being (positive functioning) category	82.55%
overall well-being percentage based on the total marks available	82.80%
Overall Range of well-being achieved	High

Part II of the study identified significant differences in well-being scores between two offices based on their sensory elements.

Part III of the study aimed to address the variance by focusing on modifications to greenery and soundscapes in the less favorable office in Part II. The research highlighted a gap in studies combining multiple sensory elements, which informed the choice of green features and soundscape for modification. Modifying views and color schemes was deemed impractical due to potential major alterations in the office's overall character and ambiance. The study prioritized changing greenery and sound environments to assess their impact on well-being effectively. This approach allows for a detailed analysis of how these sensory changes affect the working environment, providing valuable insights into the interaction between visual and auditory elements.









**Green Walls:** Green walls, or living walls, improve employee well-being by enhancing mood, reducing stress, and boosting energy levels. They offer benefits like better air quality and noise reduction and support sustainable practices, though they require regular maintenance (Erçin & Usluer, 2022; Teotónio et al., 2021).

**Calming Music:** Music, especially classical or instrumental, can enhance cognitive tasks, reduce stress, and improve creativity. In open offices, it helps mask distractions and boosts focus. However, music choices should be culturally inclusive and not overly loud to avoid disrupting concentration (Waterfield, 2021; Lesiuk, 2005; Kiss & Linnell, 2021; Huang & Shih, 2011)

#### 4.2 PART III OF THE STUDY - EXPLAINED PROCESS OF THE STUDY

The study involves four video scenarios designed to explore the impact of multimodal sensory interventions on workplace well-being. The control scenario depicts the standard office model without any enhancements, providing a baseline for assessing well-being. In the second scenario, a green wall introduces natural elements, hypothesized to improve well-being based on existing research. The third scenario features calming music, aiming to enhance mood and reduce stress as supported by previous studies. The fourth scenario combines both greenery and Calming music to create a multisensory environment, expected to maximize well-being through the integration of visual and auditory stimuli.

Table 8: 4 scenarios with 3D model created for Part III of the study

<p>1. 3D modeled video of existing office with current visual settings and on-site recorded existing soundscape of the office attached</p>	<p>2. 3D modeled video of the office with new green wall added into the interior with recorded existing soundscape of the office attached</p>
 	 
<p>3. 3D modeled video of existing office with current visual settings and newly added audio with calming music</p>	<p>4. 3D modeled video of added green wall in the interior and newly added audio with calming music</p>
 	 

4.2.1 Scenario 1 – Impacts of the control conditions on employees’ well-being

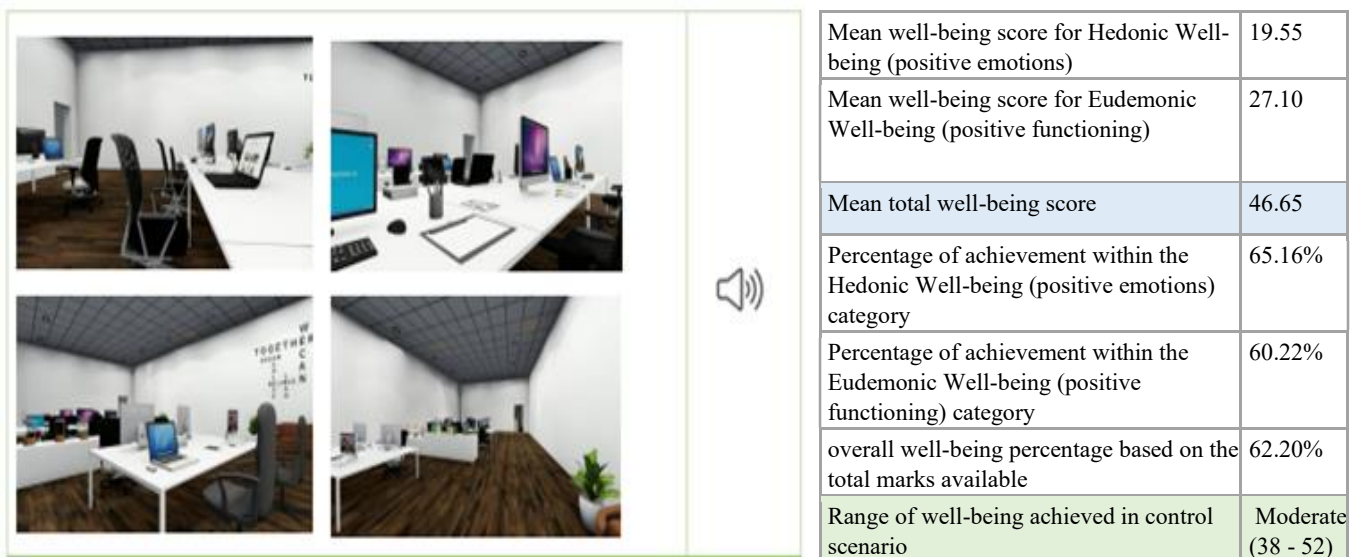
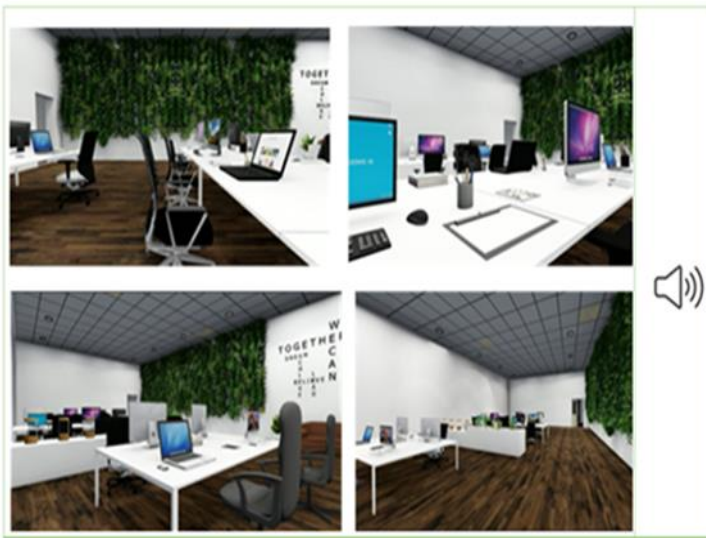


Figure 3: Scenario 1 – Control condition

Analyzing the percentages of achievements within each category gives some insights. The lower percentage of Eudemonic well-being (60.22%) than Hedonic well-being (65.16%) states that, even though they have a positive response of emotional experiences with the virtual model, functioning related well-being is not much to be able to achieve as like Hedonic well-being.

4.2.2 Scenario 2 – impacts of the added green wall on employee’s well-being

The hedonic well-being shows a means score of 26.40 which is 88%. Also, the score of eudemonic well-being, which is 38.1, that is 84.66% percentage of total score 45. These high level of scores shows that employees well-being increases by a significant amount when the green wall element added into their office’s Virtual model.



Mean well-being score for Hedonic Well-being (positive emotions)	26.4
Mean well-being score for Eudemonic Well-being (positive functioning)	38.1
Mean total well-being score	64.50
Percentage of achievement within the Hedonic Well-being (positive emotions) category	88%
Percentage of achievement within the Eudemonic Well-being (positive functioning) category	84.66%
overall well-being percentage based on the total marks available	86.00%
Range of well-being achieved in scenario 2	High (53 - 66)

Figure 4: Scenario 2 – Green Wall

4.2.3 Scenario 3 – impact of added calming music - modified soundscape on employee's well-being



Mean well-being score for Hedonic Well-being (positive emotions)	22.3
Mean well-being score for Eudemonic Well-being (positive functioning)	30.45
Mean total well-being score	52.75
Percentage of achievement within the Hedonic Well-being (positive emotions) category	74.33%
Percentage of achievement within the Eudemonic Well-being (positive functioning) category	67.66%
overall well-being percentage based on the total marks available	70.33%
Range of well-being achieved in scenario 3	Moderate (53 - 66)

Figure 5: Scenario 3 – Calming Music

The mean hedonic well-being score is 22.3, representing 74.33% of the maximum possible score in that domain. Additionally, the eudemonic well-being score is 30.45, or 67.66% of the total score of 45. The elevated scores indicate a substantial improvement in employees' well-being after the incorporation of the calming music added to the virtual model of their office.

4.2.4 Scenario 4 – Impact of modified soundscape and green wall on employee's well-being



Mean well-being score for Hedonic Well-being (positive emotions)	24.75
Mean well-being score for Eudemonic Well-being (positive functioning)	34.45
Mean total well-being score	59.20
Percentage of achievement within the Hedonic Well-being (positive emotions) category	82.5%
Percentage of achievement within the Eudemonic Well-being (positive functioning) category	76.55%
overall well-being percentage based on the total marks available	78.93%
Range of well-being achieved in scenario 4	High (53 - 66)

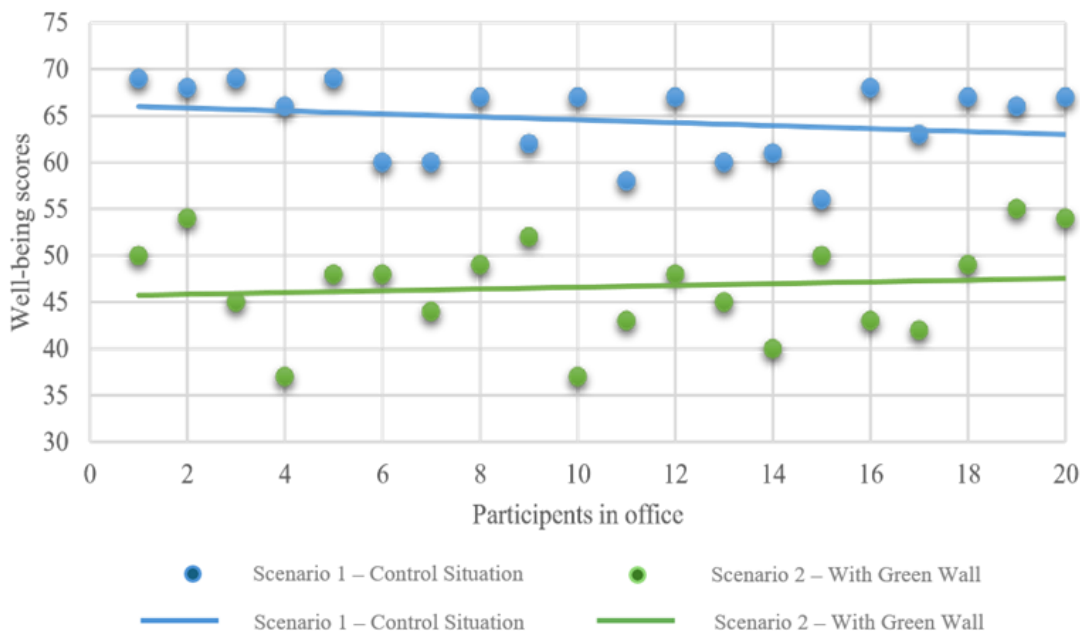
Figure 6: Scenario 4 – Combined scenario

The total well-being score 59.20, which is approximately 13 points higher than the control situation which highlights a comparatively higher state of well-being, which in this case falling under the high range in the psychological well-being scale.

4.3 ANALYSIS BY COMPARISON BETWEEN SCENARIO 1 (CONTROL CONDITION) VERSUS SCENARIO 2 (WITH GREEN WALL) – VISUAL SENSE

Introducing a green wall raised well-being scores from 62.2% (control) to 86%. Participants described the greenery as calming, fresh, and emotionally uplifting. Many referenced improved focus and mood. The positive response was tied to the visual impact of nature, confirming strong biophilic effects.

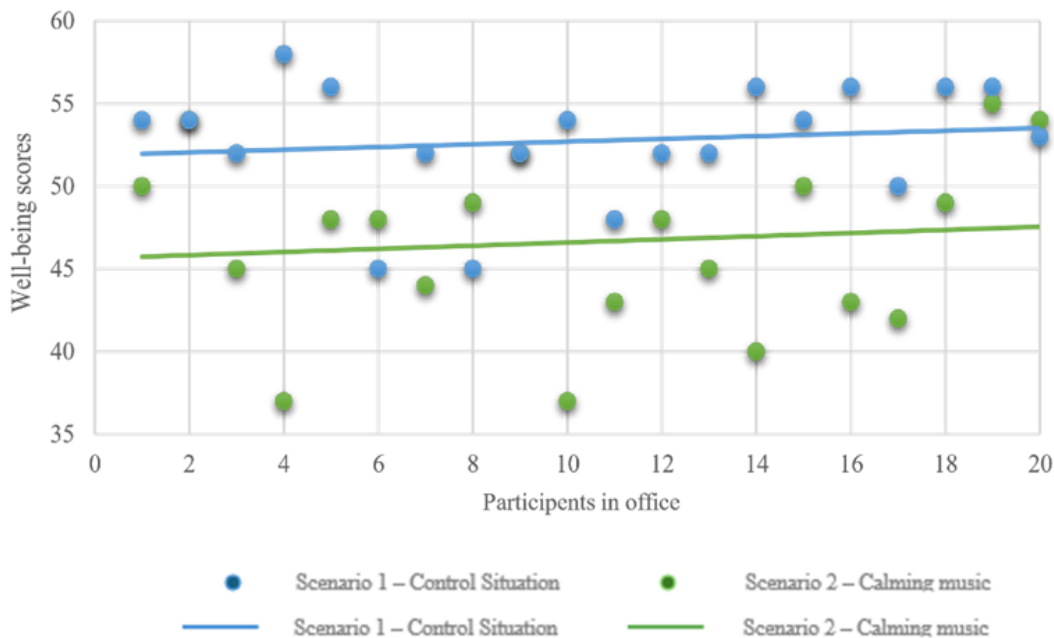
Table 9: Comparison between Scenario 1 and Scenario 2



4.4 ANALYSIS BY COMPARISON BETWEEN SCENARIO 1 (CONTROL CONDITION) AND SCENARIO 3 (WITH CALMING MUSIC IN BACKGROUND) – AUDITORY SENSE

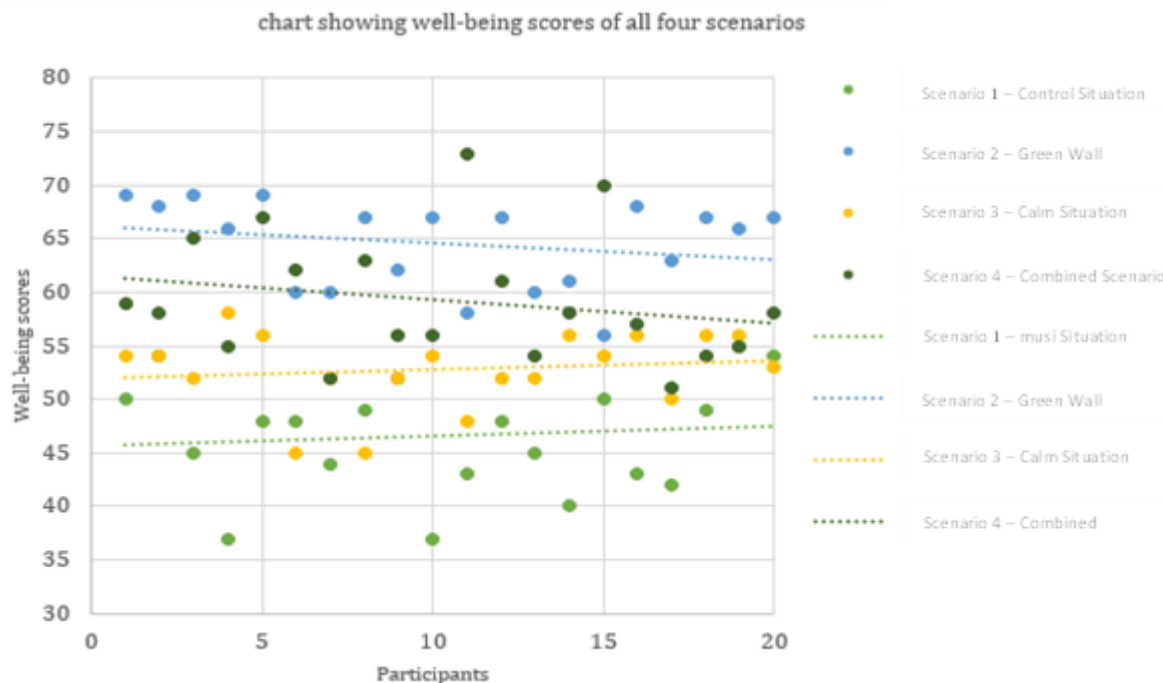
Well-being increased to 70.33% with background music. Participants preferred nature-based sounds (birds, water), though a few found the music distracting. Instrumental, culturally neutral tracks were chosen to reduce bias.

Table 10: Comparison between Scenario 1 and Scenario 3



### 4.5 ANALYZING THE RESULTS OF ALL FOUR SCENARIOS ON BUILDING WELL-BEING OF THE EMPLOYEES

Table 11: the results of all four scenarios on building well-being of the employees



From the overall analysis the study found that psychological well-being improved with thoughtfully applied modifications. Visual elements, particularly green walls, had a more significant impact on well-being than auditory elements like calming music. Scenarios with green walls alone scored higher than those combining green walls with calming music, suggesting that visual stimuli play a predominant role in enhancing well-being.

While auditory elements were positively perceived, their impact on well-being was not as pronounced as that of visual stimuli. The integration of visually appealing elements, like green walls, holds substantial potential for enhancing well-being, though it does not discount the positive influence of auditory elements. The study revealed that scenarios featuring solely a green wall alongside existing ambient sound garnered higher well-being marks compared to those introducing both new calming music and a green wall.

Table 12: table showing results of *author* defined questionnaires

Scenario 1 (control scenario)	Visual Appeal	60% of participants liked their office's visual appeal, while 40% were dissatisfied.	Scenario 2 (with Green Wall)	Prior Exposure	65% had previous exposure to green walls, enhancing their perception and realism in the virtual environment, leading to higher well-being scores.
	Soundscape Perception	40% found people talking distracting, 25% cited telephone ringing, 20% air conditioning sounds, and 15% outdoor sounds.		Green Wall Preference	55% preferred natural plant walls, 35% moss walls, and 15% artificial walls, indicating a preference for living plants for their environmental and aesthetic benefits.
	Sensory Design Preference	sound (35%), greenery (25%), and views/light/colour (25%). These preferences align with Cooper's Human Spaces research.		Feedback on Green Walls:	Most participants (9 out of 12) responded positively to incorporating green walls in the office, reinforcing their high well-being scores in the green wall scenarios.
Scenario 3 (with Calming Music)	Music Preference	95% preferred instrumental, 5% classical. Scenario 3's satisfaction score (70.33%) was lower than Scenario 2's (84%) due to individual preferences.	Scenario 4 Analysis (Green Wall and Calming Music)	Impact on Perception	55% found the combination more positive 30% found it similar 15% found it less positive Indicates a generally positive influence, though not universally transformative.
	Integration	60% favoured calming music in the workplace, 40% did not.		Opinions on Integration	7 out of 12 responses were positive Positive feedback: Created a stimulating and serene environment Negative feedback: Music was potentially distracting
	Feedback	11 of 15 responses were positive, showing general approval despite personal music tastes.			

#### 4.6 FINDINGS FROM AUTHOR DEFINED QUESTIONNAIRES ABOUT USER PREFERENCES

Contrary to Morrin and Chebat (2005), the combined scenario still produced a positive impact compared to the control, though lower than the green wall alone. Questionnaire responses suggest this decrease is mainly due to individual sensory preferences, especially regarding music. Participants showed consistently strong preference for visual greenery—55% chose natural living walls, and most comments were positive—while responses to calming music were more divided, with several noting it did not suit their working style or preferred genre. This variability in auditory preference likely moderates the combined scenario's overall effect. The findings highlight that multi-sensory interventions work best when flexible and user-centered, allowing adaptation to diverse sensory needs. Additionally, prior experience with green walls enhanced participants' comfort and engagement in the visual scenarios, strengthening their positive reactions. Overall, the results emphasize the value of offering customizable environmental features rather than a single uniform solution.

#### 4.7 SUMMARY OF OVERALL FINDINGS AND DISCUSSION

The study examined the impact of multi-sensory design modifications, focusing on visual (green walls) and auditory (calming music) elements, on employee well-being in an office setting. Conducted in a virtual environment, the study included various sensory interventions. Scenario 2, featuring a green wall, significantly boosted both hedonic and eudemonic well-being, aligning with research that greenery improves mood, reduces stress, and enhances cognitive function. Participants favored natural plant walls, underscoring the importance of authenticity in nature-based elements.

Scenario 3, which introduced calming music, also improved well-being scores, though less dramatically than the green wall. Preferences for nature-inspired music highlighted the role of individual choices in creating a positive work environment. Scenario 4, combining green walls and calming music, further increased well-being scores, suggesting a harmonious multisensory experience. However, the enhancement was less substantial than expected, indicating individual preferences and sensitivities play a critical role.

Responses to a questionnaire highlighted the importance of prior experiences and personal preferences, with positive reactions linked to previous exposure to green walls and favored music types. Overall, the study achieved its objective, demonstrating that multi-sensory design elements positively affect well-being and offering valuable design recommendations for creating supportive office environments.

#### 4.8 SUGGESTIONS FOR DESIGNING MULTI-SENSORY WORKPLACES:

Incorporating indoor greenery, such as green walls, can promote calmness and psychological balance, while offering personalized soundscapes with natural background sounds may enhance concentration without overwhelming users. Sensory inputs should be balanced to avoid clashes and ensure harmony, preventing cognitive fatigue. Engaging employees in the selection of sensory modifications can make interventions more inclusive and effective, and allowing personalized workstations—through elements like personal plants or adjustable lighting—further supports individual well-being. Future research could expand on these strategies by investigating long-term and industry-wide applications, including the integration of additional senses such as smell and touch.

### 5. Conclusion

This study confirms that thoughtfully designed multi-sensory interventions, especially visual greenery and calming auditory elements, can significantly enhance employee psychological well-being in office environments. The green wall showed the highest impact, indicating the strong biophilic connection humans share with nature. Integrating green walls into office design significantly enhances employee welfare by fostering both hedonic and eudemonic experiences. Natural living plant walls promote a positive workplace atmosphere by providing a stimulating visual environment, highlighting the importance of genuine connections with nature. While calming music also contributes to well-being, its effectiveness depends heavily on personal preferences. Nature-inspired sound effects are generally well-received, but green walls may have a more substantial impact on well-being than auditory components alone.

Calming music also positively influenced mood and focus, though individual preferences varied. Interestingly, the combined sensory scenario did not outperform the green wall alone, suggesting that design harmony matters more than sensory quantity. Combining Calming music with green walls can further enhance well-being, creating a multisensory experience. However, personal preferences and the risk of overstimulation must be considered. Customizable office design strategies that accommodate individual sensory preferences can lead to a more inclusive and efficient work environment. Challenges in multisensory interventions, such as sensory incongruence, indicate the need for careful integration of visual and auditory elements to avoid diminishing their positive effects.

These findings validate the S-O-R and Flourish Models, emphasizing that sensory design is not just aesthetic but fundamental to employee experience. Effective integration of multi-sensory elements can foster emotionally enriching, productive workplaces.

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