

REFRAMING POSTURE HEALTH: EMOTIONAL AND ENVIRONMENTAL DESIGN FOR DIGITAL WELLBEING

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ABSTRACT

Young adults face growing challenges in maintaining healthy posture due to pervasive digital engagement. Conditions like "tech neck" and chronic back strain are common and often dismissed as minor student discomforts. Ergonomic tools and posture-correcting devices are widely available but often fail to drive lasting behavioural change as they address physical correction more than underlying motivation. This research adopts a service design perspective to explore how emotional engagement and environmental design can foster healthier posture habits among young adults. A series of interviews, observations, workshops, and diary studies were conducted to uncover patterns in awareness, motivation, and behaviour. The findings revealed that participants often view discomfort as a normal condition, dismissed app reminders as being intrusive, yet responded positively to social encouragement and environmental cues.

Two final design outcomes were developed. Firstly, a posture awareness app prototype incorporating social nudges and reward systems, and secondly, a signage-based environmental intervention designed for university spaces. Together, these outcomes demonstrate that behavioural change in posture requires emotional engagement and contextually embedded experiences, which reframes digital wellbeing not as a technological issue but as a matter of human experience and environmental empathy.

Keywords: Posture Health, Ergonomics, Service Design, Behavioural Change, Digital Wellbeing

1 INTRODUCTION

Digital technology has transformed the way young adults study, communicate, and interact with their surroundings [1]. Yet this constant engagement with screens has produced unintended health consequences, including poor posture, eye strain, and musculoskeletal discomfort [2]. Within academic environments, where productivity and connectivity are prioritised, poor posture has become an accepted trade-off rather than a problem to be solved.

Despite the growing popularity of ergonomic solutions such as adjustable furniture and posture-correcting devices where most interventions remain superficial. These ergonomic solutions focus on correcting behaviour mechanically without addressing the emotional and environmental factors that sustain healthy posture habits. Research highlights that posture awareness alone rarely lead to behavioural change. Young adults are prone to reverting to unhealthy habits when posture awareness is not supported by emotional significance or environmental reinforcement [3].

This study approaches posture health through the lens of service design, viewing it as an experiential and behavioural challenge rather than a purely physical one. The research focuses on young adults aged 18–27, particularly university students, who represent a digital-native generation that navigates increased independence, digital reliance, and self-formation.

By adopting a multidisciplinary perspective that draws from behavioural science, human-centred design, and digital ergonomics, this paper seeks to investigate:

- (1) How digital lifestyles influence posture-related behaviours
- (2) How emotional and social factors shape awareness and motivation
- (3) How design interventions can foster sustainable and engaging postural wellbeing within campus environments

2 LITERATURE AND CONTEXT

Research in ergonomics traditionally focuses on biomechanical adjustment and physical comfort. [4]. However, emerging perspectives in behavioural science and experience design highlight the importance of emotion, context, and social interaction in sustaining long-term behavioural change.

Studies in human–computer interaction (HCI) suggest that self-tracking tools often fail to maintain user engagement without an emotional or social reinforcement [5]. Service design offers a valuable framework to address this gap by integrating the emotional, social, and spatial dimensions of wellbeing. While research in digital wellbeing and persuasive design supports the use of “nudging” strategies, subtle design interventions that encourage small yet meaningful behavioural shifts without coercion [6]. This study situates postural health within these theoretical perspectives, bridging ergonomic science and design-led approaches which prioritises lived experiences, self-motivation, and human-centred behavioural change.

2.1 Shifts in Work and Study Habits

The rise of the digital-native generation has fundamentally transformed work and study habits, particularly among university students. This generation has grown in an era where digital connectivity is central to education, employment, and social life. The COVID-19 pandemic further accelerated this shift, normalising remote learning, virtual collaboration, and online meetings.

As a result, students often work in informal, ergonomically inadequate environments, such as beds, sofas, or shared spaces, frequently lacking appropriate furniture, such as proper seating or desk support. [7]. These conditions, coupled with prolonged screen exposure, contributed to rising reports of neck, back pain and other musculoskeletal complaints. Research consistently shows that individuals who lack ergonomic setups experience higher levels of physical discomfort, fatigue, and reduced productivity. This evidence reinforces the need for holistic interventions that promote both digital wellbeing and healthy physical habits.

3 METHODOLOGICAL APPROACHES

A multi-method qualitative approach was adopted to investigate posture habits, motivations, and contextual influences among university students within an era of increasing digital immersion.

The study aimed to uncover how behavioural, emotional, and social factors intersect to shape posture awareness and everyday ergonomics.

3.1 Research Questions

- RO1: How do young adults perceive and experience posture-related discomfort in their everyday academic and digital routines?
- RO2: What emotional, social, and environmental factors influence their motivation to maintain healthy posture?
- RO3: How might design interventions foster sustained posture awareness and behavioural change in campus settings?

3.2 Methods

To address these questions, four complementary qualitative methods were employed:

- Interviews – Ten participants aged 20–25 were interviewed to explore their daily digital routines, ergonomic awareness, and self-perceived posture habits.
- Observations – Conducted in shared study spaces such as libraries and studios to identify environmental and social influences shaping posture behaviour.
- Diary Studies – A one day diary study with eight participants captured real-time reflections on discomfort, fatigue, and moments of self-correction throughout daily routines.
- Co-Design Workshops – Collaborative sessions with twelve students generated ideas for interventions promoting posture awareness and collective motivation through social nudges.



Figure 1. Observation in Shared Study Spaces. Observations documented posture behaviours and environmental influences during study sessions.

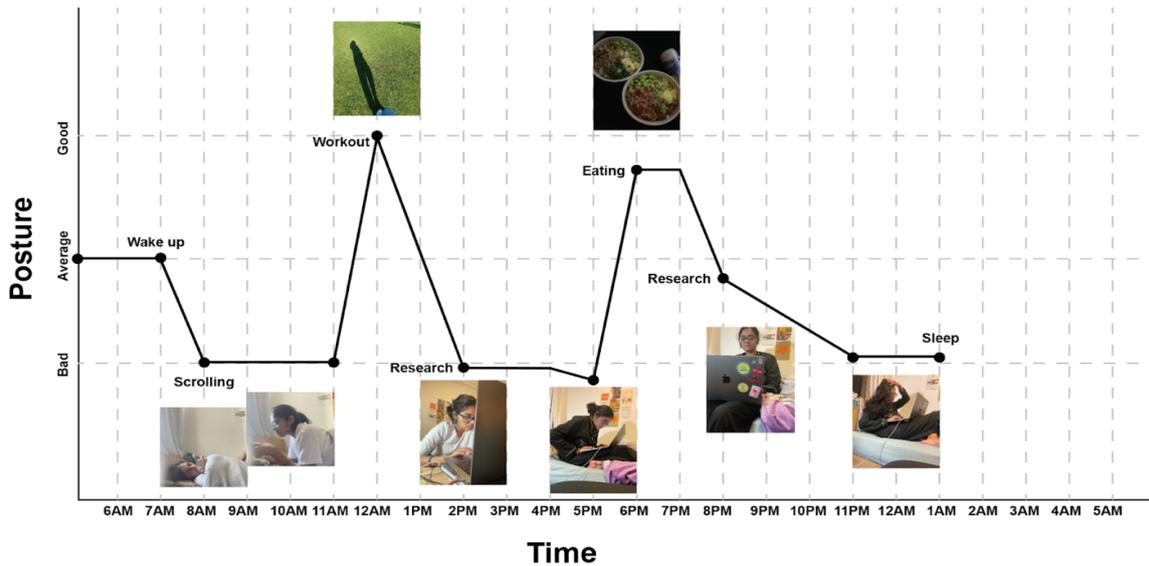


Figure 2. Diary Study: Daily Posture Patterns among University Students. Participants documented posture quality across daily activities, illustrating how posture fluctuates with digital engagement, study routines, and rest periods.



Figure 3. Co-Design Workshop Session. Students collaboratively explored posture-awareness interventions through interactive and social co-design activities.

3.3 Data Analysis

All qualitative data were analysed using thematic analysis, with a focus on recurring patterns related to emotional triggers, peer influence, and environmental feedback loops that shape and sustain posture-related behaviours.

4 FINDING

4.1 Drivers and Enablers of Change

Nine key drivers were identified as shaping young adults' posture-related behaviours within their digital lifestyles. Each driver reflects a social, technological, or psychological influence on how students perceive and respond to bodily awareness.

- (1) Digital Fatigue — Prolonged exposure to screens leads to physical and mental exhaustion, contributing to reduced concentration, eye strain, and musculoskeletal discomfort.

- (2) Digital Recreation — Leisure activities are increasingly mediated through screens, replacing physical breaks with sedentary activities like streaming or gaming.
- (3) Wellness Obsession — Wellness culture promotes self-optimization but often reinforces unrealistic standards and anxiety.
- (4) Loneliness and Anxiety — Digital connectivity paradoxically exacerbates social isolation and stress.
- (5) Ergonomics Principles — Awareness of proper posture exists but is undermined by unsupportive physical and digital environments.
- (6) Emerging Technologies — Tools such as AI, VR, and AR enhance learning yet simultaneously increase screen dependency.
- (7) Device Ubiquity — The widespread use of smartphones and wearables blur productivity and personal boundaries, normalising poor posture.
- (8) Hyper-personalisation — Algorithmic tailoring narrows focus and contributes to attention fatigue.
- (9) Human–Tech Symbiosis — Students adapt their bodies to technology, rather than technology adapting to them.

These drivers indicate that posture health is not merely an isolated ergonomic concern, but a cultural phenomenon shaped by a multitude of factors, mainly stemming from social norms, emotional states, and digital infrastructures.

4.2 Systemic Patterns of Behaviour

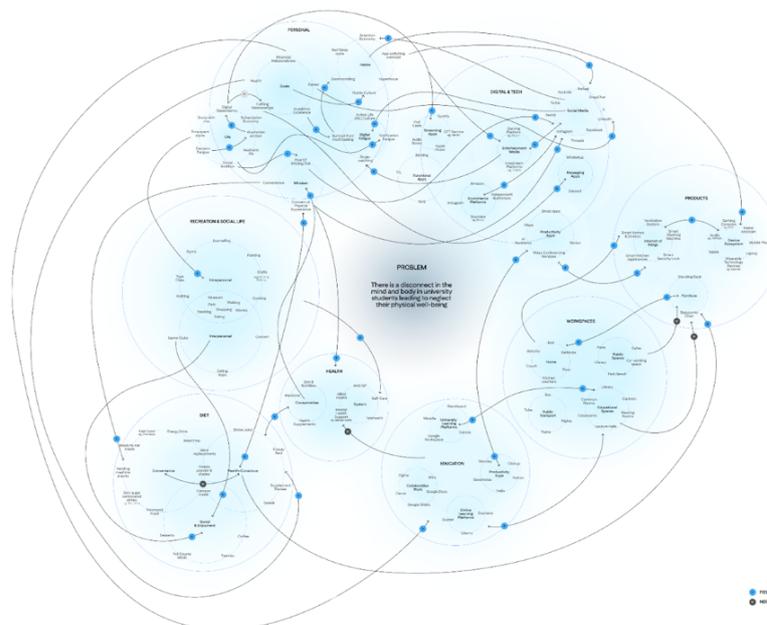


Figure 4. System Map of The Disconnect of Mind and Body in University Students Leading to Neglect in Their Physical Well-Being

The system map highlights paradoxical behaviours and trade-offs between intention and action. Students aspire to maintain health, yet convenience often takes precedence. This mind-body tension can be better understood through Kahneman’s dual-system theory of thinking: posture habits are largely governed by automatic, unconscious processes (System 1), while deliberate adjustments (System 2) occur only after discomfort becomes noticeable [8]. Additionally, traditional ergonomic frameworks no longer fit hybrid learning contexts. Students often work in cafés, beds, or on the floor, adapting their posture to fit makeshift spaces rather than physical environments designed for bodily support.

4.3 The Iceberg Model

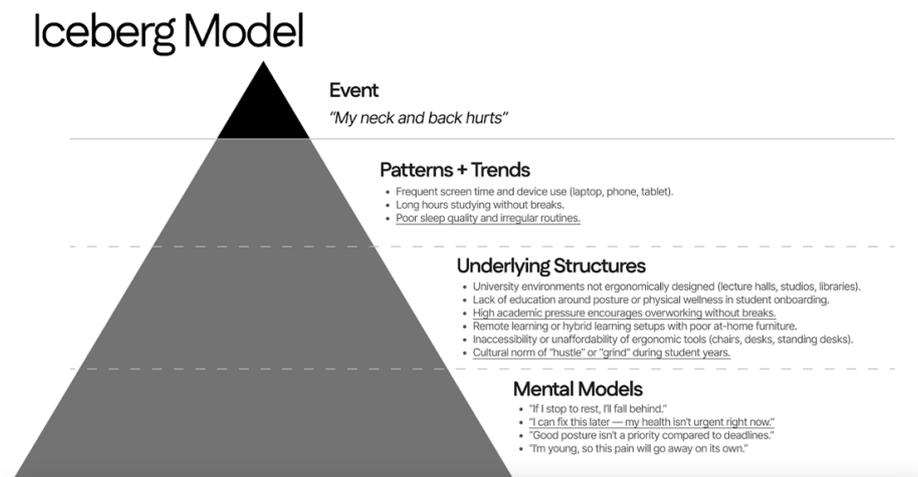


Figure 5. The Iceberg Model of Posture Health.

The Iceberg Model was employed to examine both the visible and underlying layers of posture-related challenges. On the surface, physical pain represents the most tangible symptom ("My neck and back hurt"). Beneath this lie deeper behavioural, structural, and cognitive determinants:

- **Patterns:** excessive screen time, irregular schedules, multitasking.
- **Structures:** non-ergonomic study spaces, academic pressure, and limited institutional support.
- **Mental Models:** Beliefs such as prioritisation of deadlines over health and productivity over rest.

Sustainable change thus requires a holistic reframing, addressing not only physical interventions but also the mindsets and environments that influence daily posture-related behaviours.

4.4 Behavioural Triggers

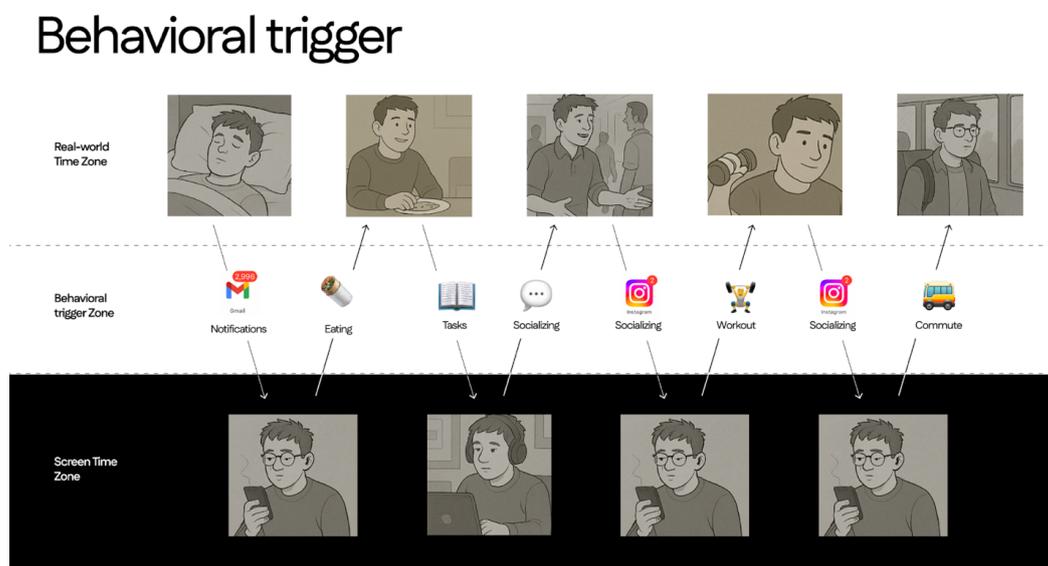


Figure 6. Behavioural Triggers in Digital–Physical Transitions.

Behaviour mapping has identified multiple factors that prompt students to alternate between digital and physical modes of activity. Notifications, online communication, and coursework serve as primary triggers to draw students into digital spaces, whereas physical needs such as eating, socialising, or exercising, draw them back into the physical world. However, multitasking often blurs this physical digital boundary; students have reportedly scrolled through social media while eating or listening to music while studying. These patterns illustrate how digital immersion has reshaped attention and the perception of what constitutes a "break".

4.5 Key Insights

Three key insights emerged from the study, revealing the complex relationship between awareness, motivation, and environment in shaping posture-related behaviours.

- **Normalization of Discomfort:** Participants commonly perceived back and neck pain as a normal aspect of student life, acknowledging discomfort yet failing to act upon it. This reflects a broader cultural acceptance of strain as an inherent part of productivity.
- **Social Motivation over Digital Reminders:** While app-based reminders are often described as intrusive or guilt-inducing, participants responded positively to peer-driven prompts. Collaborative activities, such as group stretching or mutual reminders, encouraged participation and redefined posture awareness as a shared social activity.
- **Need for Emotional and Contextual Reinforcement:** Awareness alone was insufficient for sustained change. Participants valued supportive cues such as encouraging phrases, or environmental triggers that evoked emotional resonance and made good posture feel rewarding.

Collectively, these insights underscore the importance of posture interventions that integrate emotional, social, and environmental dimensions, reframing posture health as a shared experience rather than an individual responsibility.

5 PROTOTYPE DEVELOPMENT

5.1 Concept Overview

The final concept, PlayBack, is a posture wellness service designed to help university students mitigate sedentary digital habits and reconnect with their bodies through social interactions.

Unlike traditional reminder apps, PlayBack fosters collective awareness by turning micro-breaks into shared, gamified experiences. The design promotes sustainable behavioural change through peer connection, subtle nudges, and contextual feedback integrated into students' daily digital routines.

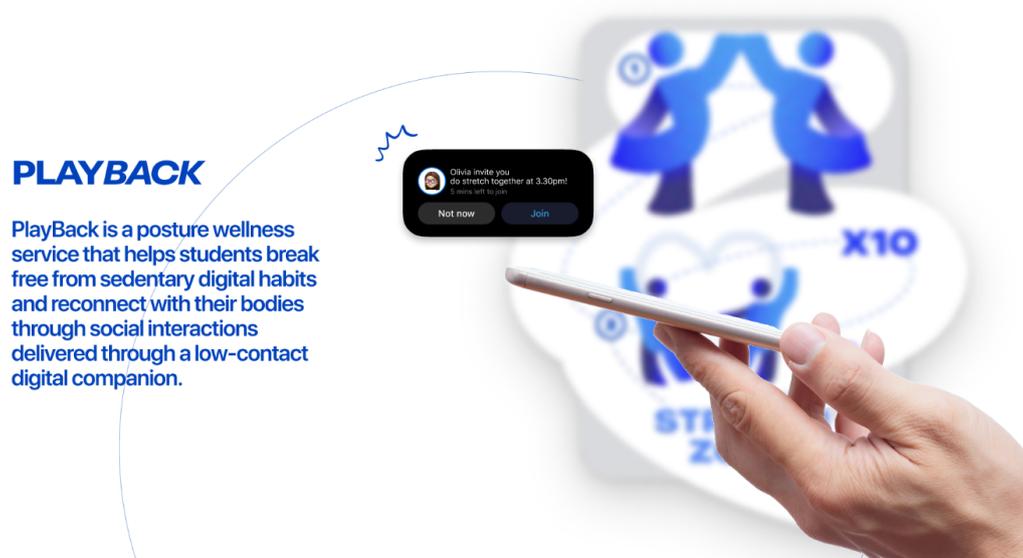


Figure 7. Overview of PlayBack Service Concept – A social posture wellness tool fostering physical and emotional balance through low-contact digital interaction.

5.2 User Journey

The service flow consists of five stages—Daily Nudges, Social Nudges, Wellness Points, Achieve, and Grow. Each stage is designed to encourage incremental posture awareness and social motivation.

Students receive reminders to stretch or take breaks and can nudge nearby peers to join them. Completing collective goals earns “Wellness Points” and unlocks new levels, reinforcing physical activity as a shared, rewarding habit.

HOW IT WORKS

Gamifying breaks

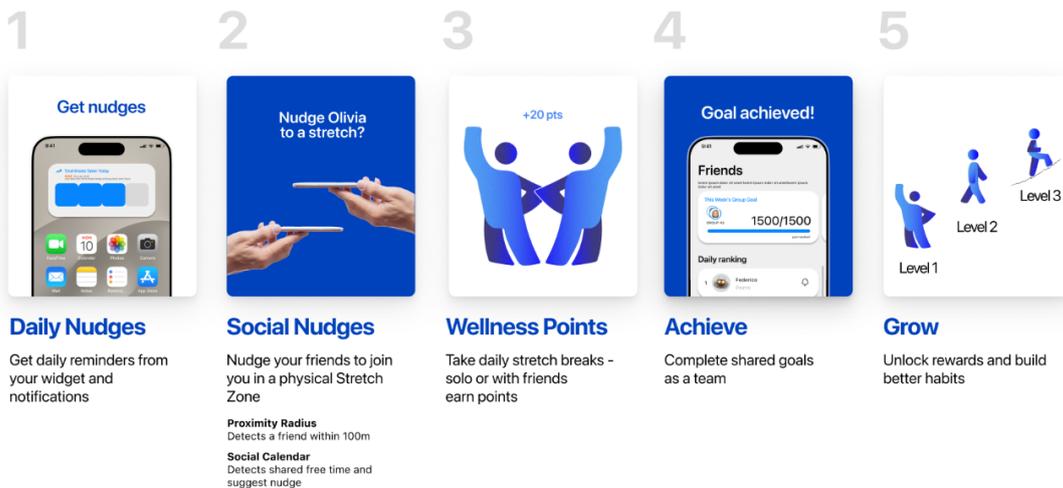


Figure 8. “How It Works” Journey Map – Illustrates the gamified cycle of nudging, stretching, and social reinforcement within the PlayBack system.

6 DISCUSSION AND CONCLUSION

This study investigated how young adults experience, understand, and act upon posture health within the cultural context of their technology-driven lifestyles. Through a multi-method qualitative approach including interviews, diary studies, observations, and co-design workshops. The research revealed that posture-related challenges extend far beyond physical ergonomics. These challenges are deeply rooted in emotional disengagement, social norms, and environmental contexts that shape behaviour over time.

6.1 Discussion

The findings indicate a persistent disconnect between awareness and action. Participants understood the importance of posture but perceived discomfort as a normal part of student life. This normalisation is reinforced by academic pressure and the broader “hustle culture,” where productivity outweighs health. Consequently, interventions that rely on digital reminders or mechanical correction tend to lose effectiveness once their novelty fades. From a service design perspective, posture health should be reframed as a shared and emotional experience rather than an individual task. Behavioural change in this context is driven not by rules but by resonance by making students feel supported, connected, and emotionally invested in their wellbeing. The study identifies three interconnected levers for sustainable change:

- (1) Emotional Engagement – Behavioural change is strengthened when feedback elicits positive emotions such as relief, confidence, or belonging.
- (2) Social Reinforcement – Peer participation encourages accountability and transforms posture correction into a collective activity rather than a solitary one.
- (3) Environmental Support – Spatial cues such as interactive signage or positive prompts gently sustain awareness without interruption.

These findings suggest that behavioural change in posture is not solely a technological challenge but fundamentally an experiential one. Digital tools alone cannot sustain motivation without emotional resonance or contextual cues. By combining individual and social elements (via the app) with environmental intervention (through signage), this research bridges the gap between personal and collective responsibility for holistic wellbeing.

From a service design perspective, the integration of emotional feedback, social engagement, and spatial interaction illustrates how wellbeing can be reconceptualised as a shared experience. This approach aligns with contemporary discourse in experience design, which emphasises the relational and participatory dimensions of health-related behaviour.

6.2 Conclusion

This research investigated how emotional and environmental design can support posture health among young adults in a technology-driven world. The study identified that posture-related discomfort is often normalised and that social and contextual factors play a pivotal role in shaping behavioural change. The resulting design outcome is a social posture awareness app prototype, paired with a signage-based environmental intervention that demonstrates how emotional engagement and environmental design can foster sustained posture awareness. These solutions represent a shift from technology-driven correction to experience-driven wellbeing, where posture health becomes part of everyday life rather than an external obligation. Ultimately, digital wellbeing should be understood not as a technological problem but as a human experience shaped by empathy, connection, and context. Future development will focus on piloting the prototype within university environments to evaluate behavioural impact and long-term engagement.

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