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Article

AN EMPLOYEE WELLNESS MODEL IN THE METAVERSE FOR PRIVATE HIGHER EDUCATION INSTITUTIONS IN SOUTH AFRICA

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Abstract: The rapid digital transformation of higher education has created new opportunities for employee wellness interventions through immersive technologies such as the metaverse. The study examines readiness for and perceptions of metaverse-enabled wellness environments rather than actual metaverse usage behaviour. It aimed to develop and empirically validate a multidimensional employee wellness model for a metaverse-enabled Private Higher Education Institution (PHEI) in South Africa. The study employed a quantitative design within an exploratory sequential mixed-methods framework. We collected data through a structured online questionnaire administered to employees at a selected PHEI. The instrument measured 13 wellness dimensions, metaverse-related barriers and challenges, technology acceptance, and life satisfaction. We analysed the data using descriptive statistics, reliability analysis, exploratory factor analysis, correlation analysis, and multiple regression analysis. The results showed that employees reported moderate levels of life satisfaction and satisfaction across most wellness dimensions. Four dimensions significantly predicted life satisfaction: Personal Identity Wellness, Emotional Wellness, Recreational Wellness, and Social Wellness. Emotional Wellness was the strongest predictor and served as a key mediating construct in the model. A secondary regression analysis demonstrated that Social Wellness and Physical Wellness positively predicted Emotional Wellness, while Personal Identity Wellness displayed a significant negative relationship. Together, these variables explained 74% of the variance in Emotional Wellness and 46% of the variance in Life Satisfaction. The study further identified critical implementation barriers, including workplace constraints, digital trust and privacy concerns, digital accessibility, and technology readiness. The findings support integrating holistic wellbeing theory with the Technology Acceptance Model and demonstrate that successful metaverse-based wellness initiatives require simultaneous consideration of technological, organisational, psychological, and cultural factors. The study contributes to the emerging field of metaverse wellness by presenting a validated multidimensional wellness framework and a practical implementation roadmap for Private Higher Education Institutions operating in digitally mediated environments.

Keywords: Metaverse; Employee wellness; Private higher education institutions; Life satisfaction; Emotional wellness; Higher education; Virtual reality; Employee wellbeing; South Africa

JEL Codes: I12; I23; I31

1. INTRODUCTION

The rapid integration of digital technologies within higher education has fundamentally transformed institutional practices, with the emergence of the metaverse introducing new possibilities for immersive learning, collaboration, and engagement. While these advancements offer significant opportunities, they have simultaneously intensified challenges related to employee wellbeing, particularly within digitally mediated and “always-on” work environments. As academic and administrative functions increasingly shift into virtual spaces, issues such as occupational burnout, digital fatigue, and psychological strain have become more pronounced. Wellbeing within digital contexts is increasingly recognised as a multidimensional and systemic phenomenon, shaped by interactions

among individual experiences, organisational structures, and technological environments. In response to this complexity, previous research identified key wellness dimensions and highlighted a critical gap in the absence of integrated, contextually relevant wellness frameworks within Private Higher Education Institutions (PHEIs).

This study addresses this gap by adopting a quantitative approach to evaluate employees' readiness to engage with a metaverse-based managerial wellness framework within a Private Higher Education Institution (PHEI). Specifically, it examines technological, cultural, and adoption readiness as key determinants of implementation success. This study provides empirical evidence to inform a phased implementation strategy, ensuring that the proposed framework is not only conceptually sound but also operationally viable in a resource-constrained and contextually complex environment.

In doing so, this article advances the research by moving beyond framework development to implementation, positioning readiness assessment as a critical bridge between conceptual innovation and institutional practice within a metaverse-enabled higher education environment.

2. PROBLEM STATEMENT

Despite the growing recognition of employee wellbeing as a critical priority within digitally mediated higher education environments, institutional approaches to wellness remain fragmented, reactive, and insufficiently aligned with the complexities introduced by immersive technologies such as the metaverse. Existing wellness initiatives within Private Higher Education Institutions (PHEIs) are often characterised by isolated interventions that fail to address the systemic nature of digital strain, resulting in limited effectiveness and low levels of sustained engagement.

While prior research has explored various dimensions of digital wellbeing, there remains a lack of empirically validated, context-specific frameworks that integrate technological, cultural, and organisational considerations, particularly within Global South contexts. In one study, Ebrahim et al. (2025) addressed this gap by co-creating a theoretical managerial wellness framework using a Design Thinking approach grounded in employees lived experiences. However, the transition from framework development to implementation introduces a new layer of complexity that remains underexplored.

The successful implementation of a metaverse-based wellness framework is contingent on multiple interdependent factors, including technological readiness, organisational culture, and user adoption. Variations in digital infrastructure, disparities in access to devices and connectivity, differing levels of digital literacy, and concerns about data privacy and institutional trust may significantly affect the feasibility and acceptance of such interventions. Furthermore, sociocultural dynamics, including perceptions of vulnerability, stigma associated with participation in wellness programmes, and resistance to digital innovation, may constrain adoption.

In Global South environments, these challenges are intensified by structural constraints such as high data costs, unreliable connectivity, and resource limitations, which may contribute to what has been conceptualised as Resource Guilt and the Equity Paradox. Without addressing these contextual realities, metaverse-based wellness initiatives risk being underutilised, perceived as performative, or reinforcing existing inequalities.

Consequently, there is a critical need to move beyond conceptual framework development to the empirical validation of readiness conditions that influence implementation. A systematic, data-driven assessment of technological, cultural, and adoption readiness is essential to inform a phased implementation strategy that is contextually relevant, inclusive, and sustainable within a PHEI environment.

3. OBJECTIVES

The primary objective of this study is to develop a quantitative wellness model in the metaverse for managing employee wellness within a Private Higher Education Institution (PHEI).

The secondary objectives are to:

- Identify the wellness dimensions relevant to PHEIs.

- Measure these wellness dimensions within a PHEI and determine employees' current levels of life satisfaction.
- Identify the significant wellness dimensions that predict life satisfaction.
- Formulate strategic managerial interventions to improve employees' life satisfaction.

4. LITERATURE REVIEW

The literature review comprises two parts. Part 1 identifies and assesses the wellness dimensions relevant to employees of PHEIs in South Africa. Part 2 discusses how employees transition from traditional wellness models to the metaverse. The Technology Acceptance Models I, II and III (TAM) (Davis, 1989) serve as the theoretical foundation for this transition.

4.1 Managing wellness in the Metaverse

Managing wellness in the metaverse comprises 13 wellness dimensions and the associated challenges and barriers. Figure 1 shows the theoretical Metaverse wellness model (Ebrahim et al., 2025). The model comprises wellness dimensions, challenges and barriers.



Figure 1: Theoretical model of wellness in the metaverse for a private higher education institution

Source: Ebrahim et al. (2025)

Professional wellness in higher education extends beyond traditional notions of career satisfaction to encompass employees' ability to perform effectively, engage in continuous professional development, and adapt to rapidly evolving digital work environments (Educause, 2025). Digital transformation within higher education requires institutions to develop digitally capable staff, provide effective digital leadership, and create supportive environments that promote positive work experiences, wellbeing, and a sense of belonging (Jisc, 2023). Furthermore, the growing integration of artificial intelligence and other advanced technologies is reshaping academic and administrative work, creating opportunities for enhanced performance, collaboration, professional learning, and workforce development while simultaneously increasing the need for new digital and AI-related competencies among faculty and staff (Zwolińska-Glądys et al., 2024). As a result, professional wellness increasingly depends on an organisations' ability to support continuous learning, digital capability development, leadership growth, and employee engagement within technology-enabled workplaces.

Consequently, wellness within the metaverse reflects both organisational support and employees' capacity to thrive in technology-mediated workplaces (Shah et al., 2025). Table 1 presents the wellness dimensions and their theoretical foundations.

4.1.1 Wellness dimensions

The wellness dimensions, their definitions, and the theoretical grounding of each dimension are presented in Table 1.

Table 1: Wellness dimensions and their theoretical grounding

DIMENSION & DEFINITION	SOURCES
Cultural wellness refers to an individual's ability to understand, value, and engage with their own cultural identity while respecting and embracing the cultural diversity of others. In workplaces and educational environments, it is reflected through shared values, inclusion, participation, belonging, and a sense of community that supports meaningful interpersonal connections. Cultural wellness recognises that wellbeing is shaped by cultural traditions, beliefs, norms, and worldviews, and therefore requires culturally responsive practices that foster respect, cohesion, and engagement among diverse individuals and groups.	Shah et al. (2025); Al-Thani (2025)
Professional wellness refers to an individual's ability to achieve satisfaction, growth, competence, and balance in their professional life through meaningful work, continuous learning, and career development. In technology-enabled and metaverse workplaces, professional wellness encompasses ongoing skills development, immersive learning experiences, effective virtual collaboration, leadership growth, and adaptation to digital work environments. It is further supported by organisational policies and practices that promote mental health, work-life balance, wellbeing, and professional support, enabling individuals to thrive, maintain productivity, and achieve long-term career fulfilment.	Shah et al. (2025); Hendriks et al. (2024); Raman et al. (2024); Raman et al. (2024); Hengoden et al. (2023); Al-Thani (2025)
Environmental wellness refers to an individual's ability to thrive in safe, healthy, accessible, and supportive physical and virtual environments that promote wellbeing and quality of life. Within metaverse-enabled workplaces, environmental wellness encompasses secure digital infrastructure, cybersecurity, accessibility, ethical platform design, privacy protection, and equitable access to immersive technologies. By fostering inclusive, well-regulated, and user-centred virtual environments, organisations can support wellbeing, collaboration, learning, and productivity while minimising risks associated with digital participation.	Shah et al. (2025); Raman et al. (2024)
Personal Identity Wellness refers to an individual's ability to develop and maintain a positive, authentic, and evolving sense of self that is grounded in personal values, beliefs, purpose, and life experiences. It encompasses self-awareness, meaning-making, and a sense of belonging, recognising that identity is shaped by the	Al-Thani (2025).

interaction of personal characteristics, cultural influences, spirituality, and social relationships. Personal identity wellness supports individuals in navigating their personal and professional lives with confidence, authenticity, and purpose, while fostering connections to communities that share common values, traditions, and beliefs.	
Financial wellness is an essential component of holistic wellness and incorporates budgeting tools, scholarship information, financial management resources, and financial literacy initiatives to reduce financial stress and improve stability among students. Financial wellness is therefore viewed as both a protective factor and a contributor to overall wellbeing.	Morris et al. (2022); Berg and Farbenblum (2020); Gallagher et al. (2020)
Spiritual wellness refers to an individual's ability to find meaning, purpose, and fulfilment in life through personal values, beliefs, faith, identity, and connection with the self, others, and the broader world. It extends beyond religious practice to encompass self-reflection, moral development, personal growth, and a sense of connectedness and belonging. Spiritual wellness contributes to resilience, ethical decision-making, emotional wellbeing, and life satisfaction, while recognising that spirituality is subjective, culturally influenced, and closely interconnected with emotional, social, intellectual, physical, and cultural dimensions of holistic wellbeing.	Al-Thani (2025); Psaila (2019); Schulte et al. (2015); Trudel-Fitzgerald et al. (2019
Intellectual wellness refers to an individual's ability to engage in continuous learning, critical thinking, creativity, and knowledge acquisition that supports personal and professional growth. It involves curiosity, cognitive engagement, reflective thinking, and the development of skills and competencies through meaningful learning experiences. Within metaverse-enabled environments, intellectual wellness is enhanced through immersive, interactive technologies such as virtual and augmented reality, which provide safe, engaging opportunities for simulation-based learning, problem-solving, and skill development. By fostering lifelong learning and purposeful intellectual growth, intellectual wellness contributes to broader personal development, adaptability, and overall wellbeing.	Raman et al. (2024); Chengoden et al. (2023); Huang et al. (2024); Al-Thani (2025); Pappa et al. (2024); Dodd et al. (2021)
Occupational wellness refers to an individual's ability to achieve satisfaction, balance, productivity, and fulfilment through meaningful work within a supportive and sustainable work environment. It encompasses effective work practices, professional growth, organisational support, fair performance management, and healthy work-life integration. In digitally enabled and virtual-first organisations, occupational wellness requires adaptive workplace policies, wellbeing-focused organisational cultures, and technology-supported interventions that promote employee engagement, resilience, and productivity. By adopting proactive and preventative wellbeing strategies, organisations can foster healthier, more sustainable work environments that support both individual and organisational success.	Shah et al. (2025); Romoser (2025); Duffy et al. (2020); Taylor et al. (2024); Berg and Farbenblum (2020)
Digital wellness encompasses employees' ability to engage safely, responsibly, and effectively within immersive digital environments. It includes digital accessibility, digital competence, cybersecurity, privacy protection, digital fatigue management, and equitable access to virtual technologies. Digital wellness is defined as the effective use of virtual reality technologies to promote mental health and well-being in higher education settings. Technology-based interventions can improve depression, anxiety, wellbeing and positive mental health while providing accessible and scalable support for students. Digital interventions are particularly valuable because higher education institutions are increasingly unable to meet growing mental health demands through traditional counselling services alone.	Marabelli and Lirio (2024); Alsetoohy et al. (2024); Kusi et al. (2025); Taylor et al. (2024); Xu et al. (2024); Baghaei et al. (2021); Sherman and Craig (2003); Best et al. (2022); Raman et al. (2024)
Social wellness refers to an individual's ability to build, maintain, and benefit from positive, meaningful, and supportive relationships with others and the broader	Park et al. (2023); Duffy et al. (2020);

community. It encompasses social connectedness, belonging, collaboration, empathy, mutual respect, and active participation in social networks that enhance wellbeing. In metaverse-enabled and virtual environments, social wellness is fostered through immersive digital engagement, virtual communities, mentoring, teamwork, and accessible support services that strengthen interpersonal relationships and reduce social isolation. By promoting meaningful interaction, community engagement, and a sense of belonging, social wellness contributes significantly to psychological wellbeing, resilience, and overall quality of life.	Abrams (2022); Romoser (2025); Al-Thani (2025)
Emotional wellness refers to an individual's ability to understand, manage, and express emotions effectively while maintaining psychological resilience, positive mental health, and overall life satisfaction. It encompasses emotional regulation, self-awareness, stress management, coping with challenges, and the capacity to build positive relationships and experience emotional fulfilment. In metaverse-enabled environments, emotional wellness can be supported through immersive technologies such as virtual reality counselling, mindfulness applications, therapeutic interventions, and digital support communities, which reduce stress, anxiety, loneliness, and burnout while promoting positive affect, resilience, and psychological wellbeing. By combining proactive wellbeing strategies with accessible and user-centred support systems, organisations and educational institutions can foster healthier emotional experiences and improve overall wellbeing.	Kusi et al. (2025); Ma (2025); Modrego-Alarcón (2021); Zheng et al. (2024); Browning et al. (2020); Browning et al. (2023); Frewen (2020); Raman et al. (2024); Yang et al. (2023); Al-Thani (2025)
Physical wellness refers to an individual's ability to maintain and enhance physical health through healthy lifestyle behaviours, regular physical activity, effective self-care, and the prevention or management of illness and injury. It encompasses physical fitness, nutrition, stress management, restorative practices, and engagement in activities that support overall bodily functioning and quality of life. In technology-enabled environments, physical wellness can be promoted through immersive technologies such as virtual reality and augmented reality, which support exercise, rehabilitation, physical therapy, pain management, and recovery. By encouraging healthy behaviours and providing accessible digital health resources, physical wellness contributes to improved physical functioning, resilience, long-term health outcomes, and overall wellbeing.	Romoser (2025); Baghaei et al. (2021); Xu et al. (2024); Raman et al. (2024)
Recreational wellness refers to an individual's ability to engage in enjoyable, meaningful, and restorative leisure activities that promote relaxation, personal satisfaction, and overall wellbeing. It encompasses participation in activities that reduce stress, enhance mood, encourage creativity, and provide opportunities for enjoyment, balance, and psychological renewal. In metaverse-enabled environments, recreational wellness can be supported through immersive virtual reality experiences, including virtual tourism, nature exploration, games, creative applications, and guided leisure activities that foster engagement, positive emotions, and psychological detachment from daily stressors. By providing accessible and enjoyable recreational opportunities, immersive technologies can contribute to improved wellbeing, life satisfaction, and sustained engagement in healthy lifestyle practices.	Romoser (2025); Ma (2025); Browning *et al.* (2020); Browning *et al.* (2023); Frewen (2020); Raman *et al.* (2024); Mandal *et al.* (2024)

4.1.2 Metaverse barriers and challenges

Several barriers can influence the successful implementation and adoption of metaverse-based wellness initiatives within Private Higher Education Institutions. These barriers extend beyond technological limitations to include organisational, psychological, cultural, ethical, infrastructural, and socioeconomic factors that collectively influence employee wellbeing and technology acceptance. The most prominent barriers and challenges are:

- **Technological Infrastructure and Digital Accessibility:** Reliable digital infrastructure forms the foundation for successful participation in metaverse-based environments. Employees require stable internet connectivity, compatible hardware, virtual reality technologies, and equitable access to digital resources to engage effectively in immersive wellness programmes. Unequal access to digital infrastructure may exclude

employees, particularly within developing contexts, highlighting the importance of inclusive technologies and assistive platforms (Shah et al., 2025; Marabelli & Lirio, 2024). The digital divide further represents a significant implementation challenge. Infrastructure readiness, equitable access, affordability, and user protection are essential to ensure that metaverse technologies do not disadvantage vulnerable or underserved populations (Raman et al., 2024). Robust digital infrastructure is equally important for supporting virtual reality and augmented reality applications. Reliable infrastructure enables immersive learning, healthcare simulations, educational modules, and digital wellbeing interventions, thereby facilitating broader organisational wellness outcomes (Raman et al., 2024).

- **Technology Acceptance and Digital Readiness:** Technology acceptance remains a fundamental determinant of successful metaverse implementation. Perceived usefulness, perceived ease of use, trust, facilitating conditions, and social influence significantly influence employees' willingness to adopt immersive technologies. These findings align closely with the Technology Acceptance Model (TAM) and its subsequent extensions (Davis, 1989; Venkatesh & Davis, 2000; Raman et al., 2024).

Digital competence also represents an important antecedent of technology acceptance. Insufficient technical knowledge, inadequate pedagogical preparation, and limited confidence in using digital technologies hinder successful technology adoption and increase technology-related stress among educators and employees (Pappa et al., 2024).

- **Technology-Induced Stress and Digital Wellbeing:** The literature consistently identifies technology-related stress as one of the greatest barriers to digital wellbeing. Technostress arises when individuals are unable to cope effectively with rapidly evolving digital technologies, negatively affecting physical health, emotional wellbeing, work-life balance, motivation, burnout, and overall quality of life (Pappa et al., 2024). Extended exposure to immersive technologies may also contribute to digital fatigue, cognitive overload, psychological disengagement, reduced productivity, and diminished employee wellbeing. Organisations should therefore promote healthy technology use through structured digital wellness programmes, mandatory offline breaks, and organisational policies that encourage balanced technology engagement (Shah et al., 2025; Kusi et al., 2025). Technology-related stress is further exacerbated by technical failures, unreliable internet connectivity, hardware limitations, poor system usability, and increasingly complex digital platforms (Donham et al., 2022; Aktan & Toraman, 2022). Large volumes of digital information distributed across multiple platforms increase cognitive overload, making it difficult for users to remain organised, focused, and motivated (Pappa et al., 2024).

- **Organisational and Workplace Barriers:** Successful implementation extends beyond technology itself and requires organisational readiness. Existing digital learning and workplace environments frequently fail to identify or address technology-related psychological stressors during system design and implementation, leaving employees vulnerable to avoidable technostress (Pappa et al., 2024). Heavy workloads, competing responsibilities, and ineffective time management further reduce employee engagement with digital wellness initiatives while increasing stress and reducing overall wellbeing (Pappa et al., 2024). Maintaining organisational identity and team cohesion also becomes increasingly challenging within virtual-first organisations due to reduced face-to-face interaction. Organisations should therefore promote virtual community building, mentoring, employee recognition programmes, gamification, and engagement initiatives to strengthen organisational culture and employee belonging (Shah et al., 2025).

- **Social, Psychological and Socioeconomic Barriers:** Psychological and social factors continue to influence participation in digital wellbeing initiatives. Reduced face-to-face interaction contributes to feelings of loneliness, weakened social support, and diminished wellbeing (Pappa et al., 2024). Similarly, feelings of loneliness, separation from family, weak community connections, and reduced social belonging significantly increase psychological distress, highlighting the importance of digital platforms that intentionally promote meaningful social connectedness (Romoser, 2025). Financial hardship further constrains employee wellbeing. Financial stress arising from tuition fees, living expenses, employment insecurity, food insecurity,

and housing instability negatively affects psychological wellbeing, work performance, and overall quality of life. Fear of judgement and social stigma remain important barriers preventing individuals from seeking mental health support, particularly within culturally diverse populations. Similarly, language barriers reduce help-seeking behaviour, lower self-esteem, and diminish feelings of belonging, emphasising the need for multilingual and culturally inclusive digital wellbeing platforms (Al-Thani, 2025).

- **Ethical, Legal and Governance Challenges:** Successful metaverse implementation depends on robust ethical governance. Collecting behavioural, biometric, and personal information in immersive environments raises significant privacy, ethical, and cybersecurity concerns (Alsetoohy et al., 2024). Sustainable implementation therefore requires secure data management, comprehensive governance frameworks, and compliance with international privacy legislation (Shah et al., 2025). Privacy protection, fair access, user safety, and robust regulatory frameworks further represent essential prerequisites for successful metaverse adoption (Raman et al., 2024). The decentralised nature of metaverse workplaces also introduces legal complexities relating to employment contracts, taxation, labour legislation, jurisdiction, governance, and organisational accountability (Kusi et al., 2025). Consequently, organisations must establish comprehensive compliance frameworks that protect both employers and employees within virtual work environments (Hendriks et al., 2024; Park et al., 2023).

- **Cultural and Measurement Challenges:** The literature further highlights conceptual and cultural barriers associated with wellbeing itself. Western-centric wellbeing models may fail to capture diverse cultural, spiritual, and contextual understandings of wellbeing (Abma et al., 2019), limiting the applicability of institutional wellbeing frameworks across different cultural contexts (Al-Thani, 2025; Hendriks, 2019). Cultural bias in wellbeing measurement similarly limits the development of inclusive assessment frameworks, as different societies possess distinct beliefs, values, and perceptions regarding what constitutes wellbeing and a good life (Wijngaards et al., 2021). Spiritual wellbeing remains inherently subjective because individuals interpret meaning, purpose, values, faith, and fulfilment differently (Psaila, 2019). More broadly, wellbeing itself is increasingly recognised as a multidimensional construct encompassing emotional, intellectual, physical, social, cultural, psychological, and spiritual domains, requiring holistic rather than reductionist approaches to conceptualisation and intervention (Bartels et al., 2019). Finally, methodological challenges remain. Response bias and reluctance to disclose sensitive personal experiences may affect wellbeing assessments (Al-Thani, 2025), while the absence of a universally accepted definition of wellbeing continues to complicate theory development, conceptual clarity (Trudel-Fitzgerald et al., 2019), and the creation of valid and reliable measurement instruments across diverse contexts (Cooke et al., 2016; Kowalski & Loretto, 2017).

4.2 The Technology Acceptance Model

The Technology Acceptance Model (TAM) is a widely used theoretical framework for explaining and predicting user acceptance of information systems and technologies (Davis, 1989; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008). Rooted in the Theory of Reasoned Action (TRA), TAM explains the determinants of technology adoption by focusing on users' cognitive perceptions and how these influence behavioural intentions and actual system use. Specifically, the model centres on two core constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived usefulness refers to the extent to which an individual believes that using a particular system will enhance job performance, while perceived ease of use refers to the extent to which an individual believes that using the system will require minimal effort. These constructs directly influence users' attitudes towards the technology, which in turn shape their behavioural intention to use it. Behavioural intention is considered the immediate antecedent of actual system use, thereby completing the causal chain (Davis, 1989).

Subsequent developments extended the original TAM to TAM2 (Venkatesh & Davis, 2000) and, later, to TAM3 (Venkatesh & Bala, 2008). Figure 2 presents a simplified representation of the TAM3 model.

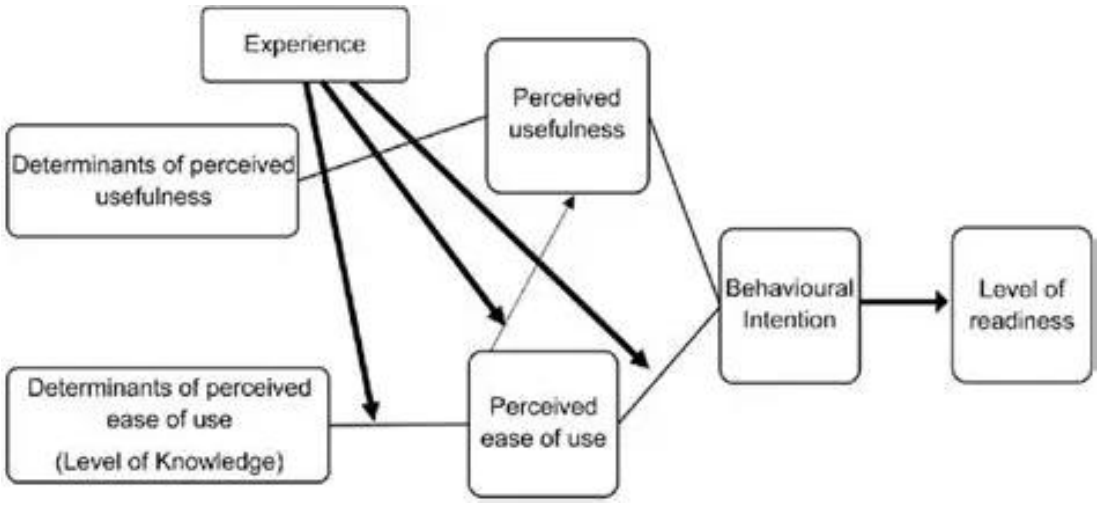


Figure 2: Technology Acceptance Model (Version 3)

Source: Venkatesh and Bala (2008)

The metaverse is a complex, multifunctional digital environment in which virtual reality (VR), Artificial Intelligence (AI), and avatars can be used for wellness applications (Mensah et al., 2026). As such, the TAM3 model is particularly well suited to explaining users' acceptance of technology in metaverse-based wellness environments (Badda, 2025). TAM3 links users' perceptions of technological usefulness and ease of use to behavioural intention and sustained engagement. Its strength lies in its ability to explain how immersive platforms can support multiple dimensions of wellness (in this case, 13) while simultaneously accounting for user experience, digital literacy, and system complexity (Mensah et al., 2026). In highly interactive environments such as the metaverse, holistic wellbeing depends on continuous user participation. Accordingly, TAM3 provides a theoretical foundation for explaining both the adoption and effective utilisation of wellness technologies.

The TAM3 model retains the core causal structure of its predecessor models, whereby Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) influence behavioural intention, which in turn predicts actual system use (Badda, 2025). However, its principal contribution lies in the systematic incorporation of antecedents, such as knowledge and experience, that influence perceived ease of use alongside the established determinants of perceived usefulness. Consistent with TAM3, experience and knowledge are critical antecedents that shape both PU and PEOU, as familiarity with immersive systems reduces complexity and enhances perceived value (Toraman, 2022). These perceptions jointly influence behavioural intention, which ultimately determines users' readiness to adopt and integrate the metaverse into holistic wellness management (Mensah et al., 2026). Importantly, the model suggests that sustained engagement within PHEIs depends on a platform's capacity to support multiple, interrelated wellness dimensions while maintaining intuitive usability, thereby reinforcing the metaverse as a viable ecosystem for comprehensive wellbeing management.

A recent study by Romoser (2025) found that students expressed a strong willingness to adopt virtual reality for wellbeing purposes. Approximately half indicated that they would use a higher-education virtual-reality wellbeing programme, with preferences for weekly participation and home-based delivery formats. This demonstrates a strong behavioural intention to adopt technology and supports technology acceptance principles, suggesting that future immersive wellbeing systems should align with users' preferences, accessibility requirements, and perceived usefulness. Furthermore, the relationship between behavioural intention and actual technology use is supported by the Theory of Planned Behaviour, which proposes that behavioural intention is the immediate antecedent of actual behaviour (Bosnjak et al., 2020). Technology adoption should be supported through intuitive design, structured learning experiences, technical support, teacher competence development, and proactive mitigation of technology-related stressors. Users are more likely to engage with digital environments when systems are perceived as supportive,

accessible, user-friendly, and capable of enhancing rather than disrupting learning and wellbeing (Pappa et al., 2024). Successful digital wellbeing systems should be accessible, culturally sensitive, integrated, proactive and empowering. These design principles enhance usability, encourage engagement and promote sustained participation in digital wellbeing programmes, thereby supporting technology acceptance and long-term use (Romoser, 2025; Al-Thani, 2025).

4.3 Summary of the literature

The literature demonstrates that employee wellness within Private Higher Education Institutions can no longer be understood through traditional single-dimensional wellness models. Instead, wellbeing in digitally mediated environments is increasingly recognised as a multidimensional construct shaped by the interaction of social, emotional, physical, professional, cultural, environmental, financial, intellectual, occupational, digital, recreational, spiritual and personal identity dimensions. Collectively, these dimensions provide a comprehensive understanding of employee wellbeing within increasingly immersive higher education environments.

The review further highlights that the transition towards metaverse-enabled wellness extends beyond technology adoption alone. Successful implementation depends upon employees' perceptions of usefulness, ease of use, digital competence, organisational readiness, trust, privacy, accessibility and institutional support, all of which are consistent with the Technology Acceptance Model and its later extensions. At the same time, implementation is influenced by numerous contextual barriers, including digital accessibility, infrastructure limitations, technostress, digital fatigue, ethical and regulatory concerns, cybersecurity, organisational culture, financial constraints and cultural diversity.

Together, these findings informed the development of a theoretical model comprising thirteen interrelated wellness dimensions and associated implementation challenges. This model provides the conceptual foundation and supports the proposition that employee wellness in the metaverse requires an integrated, human-centred and contextually responsive approach that simultaneously addresses technological, organisational and psychological determinants of wellbeing.

5. RESEARCH METHODOLOGY

5.1 Research Design

This study adopts a quantitative research design within an exploratory sequential mixed-methods framework, in which the findings from the preceding qualitative phase and the theoretical model developed by Ebrahim et al. (2025) informed the questionnaire's measurement criteria. The purpose of this design is to quantitatively validate and extend the identified constructs (Creswell & Creswell, 2023) and to generate empirical evidence to support a phased implementation strategy for the proposed metaverse-based managerial wellness framework. This quantitative approach enables the examination of relationships among key variables, including technological readiness, cultural factors, and adoption intent, thereby providing a structured basis for implementation planning.

5.2 Research Approach

The study is underpinned by a pragmatist research paradigm, which supports integrating qualitative insights with quantitative validation to address complex, real-world problems (Creswell & Creswell, 2023). This approach is appropriate given the study's focus on understanding lived experiences while generating actionable implementation strategies. The research further employs abductive reasoning, which facilitates the iterative refinement of theoretical constructs by integrating empirical data with existing theory. This aligns with the Design Thinking methodology, enabling a dynamic, user-centred exploration of wellness within metaverse environments.

5.3 Design of the questionnaire

The questionnaire development followed established guidelines to ensure clarity, relevance, and alignment with the research objectives. It was developed based on the identified constructs and aligned with the five phases of Design Thinking, namely, to Empathise, Define, Ideate, Prototype, and Test. The questionnaire was designed to capture:

- Systemic strain and employee wellness experiences
- Institutional barriers and trust-related concerns
- Preferences for metaverse-based wellness environments
- Technological readiness and infrastructural constraints
- Adoption intention and perceived usefulness
- Multidimensional wellness constructs

The study employed a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to quantify participants' responses. In addition, elements of the *Satisfaction with Life Scale (SWLS)* (Diener et al., 1985) were incorporated to assess overall wellbeing. A pilot study refined the questionnaire and confirmed its reliability, construct validity, and face validity prior to full deployment (Yin, 2018).

5.4 Data Collection

Data were collected through a structured electronic questionnaire administered to participants at a selected Private Higher Education Institution (PHEI). The instrument utilised five-point Likert-scale items to measure attitudes, perceptions, and experiences related to wellness, technology, and adoption readiness. The questionnaire was distributed via the QuestionPro online platform, with the Human Resources (HR) department serving as the institutional gatekeeper to facilitate participant access. This approach ensured broad participation while maintaining organisational protocols.

The study population comprised all full-time employees within the selected PHEI, including academic, administrative, and support staff. A purposive sampling approach was employed to ensure representation across different organisational roles and levels. This inclusive approach enabled the capture of diverse perspectives on wellness and digital engagement, allowing for comparative analyses across job categories. The use of stratification further ensured that different employee groups were adequately represented, enhancing the generalisability of the findings within the institutional context.

Participants received an email invitation containing a link to the online questionnaire hosted on the QuestionPro platform. The first page of the questionnaire provided information about the study, requested informed consent to participate, and asked respondents whether they were confident they could provide accurate information about the metaverse. Only respondents who provided informed consent completed the questionnaire. Responses were automatically captured through the QuestionPro platform and stored anonymously.

A total of 606 questionnaire invitations were distributed. Of these, 185 respondents indicated that they were confident in providing accurate information about the metaverse, and 87 completed the questionnaire. Although this was below Cochran's recommended sample size (n = 126) (Cochran, 1977), we subsequently assessed sample adequacy using the Kaiser-Meyer-Olkin (KMO) measure. The results indicated excellent sampling adequacy (KMO = 0.906; decision criterion: KMO > 0.70) (Field, 2017), confirming that the data were suitable for multivariate statistical analysis. Using Green's (1991) guideline ($N \geq 50+8m$) for a minimum sample size in regression modelling for 13 predictors, the study required 154 cases. Again, the responses fall short. As such, this study was classified as exploratory in nature. However, the results show that the regression models produced moderate to large effect sizes ($R^2 = 0.46$ and $R^2 = 0.74$) despite the modest sample size, thus demonstrating substantial predictive power. The analysis also identified statistically significant relationships among the key variables, suggesting the sample was sufficient to detect the strongest effects in the data.

Notably, the relatively modest sample size may have reduced statistical power and limited the detection of smaller effects. Consequently, the findings should be interpreted with caution and validated in future studies using larger samples across multiple institutions

5.5 Data Analysis

The data were analysed using IBM SPSS Statistics (Version 31.0). The analysis included descriptive statistics, reliability analysis using Cronbach's alpha to assess internal consistency, correlation analysis to examine relationships among variables, and multiple regression analysis to identify significant predictors of readiness. Collectively, these analytical techniques provided the empirical basis for the proposed phased implementation strategy.

5.6 Ethical Consideration

This study adheres to stringent ethical standards consistent with doctoral-level research within a pragmatist research paradigm, utilising a structured quantitative questionnaire as the primary data-collection instrument in an exploratory sequential mixed-methods framework. Given the study's focus on employee wellbeing, organisational culture, and the implementation readiness of a metaverse-based managerial wellness framework, ethical considerations were carefully embedded throughout the research process to protect participants' dignity, autonomy, and wellbeing.

This study adheres to strict ethical standards consistent with doctoral-level research involving human participants. Ethical approval (Ethics number: NWU-00693-25-A4) was obtained from the relevant institutional ethics committee prior to data collection.

Participation was voluntary, and informed consent was obtained electronically. Participants were provided with detailed information regarding the purpose of the study, data usage, and their right to withdraw at any stage without penalty. Confidentiality and anonymity were ensured using coded identifiers, and no personally identifiable information was reported. Data were securely stored on password-protected systems accessible only to the researcher. Given the focus on employee wellbeing, care was taken to minimise psychological discomfort. Participants were informed that they could skip any questions they found sensitive, and access to institutional support services was provided where necessary.

The study further ensured fairness, inclusivity, and transparency throughout the research process, aligning with the principles of beneficence, non-maleficence, and respect for participant autonomy. Collectively, these ethical considerations ensured that the study was conducted with integrity, respect, and doctoral-level rigour, safeguarding participant wellbeing while strengthening the validity, credibility, and scholarly contribution of the research.

6. RESULTS

The analysis comprises four chronological stages. In the first stage, the data were tested for suitability. This included examining the normality of the data distribution, assessing reliability, determining the significance of the data, and evaluating sample adequacy prior to conducting the multiple regression analyses (Pallant, 2020). In the second stage, the theoretical model was applied as a measurement model to assess respondents' perceptions of the wellness dimensions, the barriers and challenges associated with using the Metaverse, and their self-reported life satisfaction, which served as the dependent variable. In the third stage, the validity of the measurement items was confirmed, and each wellness dimension was examined to determine whether underlying wellness sub-dimensions existed (Hair et al., 2019). In the fourth stage, multiple regression analysis was conducted to determine the significance of the wellness dimensions as predictors of life satisfaction (Field, 2017).

6.1 Normality of the data, reliability and significance of the data

Skewness and kurtosis were used to assess whether the data were normally distributed. Established methodological guidelines regard skewness values of ±2 and kurtosis values of ±7 as acceptable indicators of approximate normality for social science data (Hair et al., 2019; Kline, 2016).

The analysis showed that across all items (B-, C-, D-, E-, F-, G-, and S-series), skewness values ranged approximately from –0.90 to +0.53. Most items displayed slight negative skewness, indicating a modest clustering of responses towards the higher end of the Likert scale. This phenomenon is common in attitudinal and perception-based survey data (Hair et al., 2019). However, no item exceeded ±1.0. This indicates that all skewness values fell well within the acceptable thresholds and that no serious asymmetry existed. As such, there was no violation of the assumption of univariate normality due to skewness.

The results showed that the kurtosis values ranged from -1.36 to +0.92. This indicated that the distributions were predominantly platykurtic (flatter than normal), with some mild mesokurtic tendencies (Field, 2017). The dominant negative kurtosis values reflected broader dispersion of responses, as expected in multi-item scale development (Hair et al., 2019). However, no kurtosis value approached the critical threshold of ±7, while a few positive kurtosis values (such as G6, G8, and G9) remained well within acceptable bounds. The analysis indicated that no problematic peakedness existed.

In essence, no data transformation was required. The data were therefore suitable for multivariate statistical analysis (Field, 2017; Pallant, 2020).

Cronbach's coefficient alpha was used to assess the reliability and internal consistency of the data. The results showed high data reliability (α = 0,978), as the alpha coefficient exceeded the required threshold of 0,70 (Cortina, 1993; Hair et al., 2019). Additionally, all wellness dimensions, as independent variables ($\alpha \geq$ 0,850), demonstrated good to excellent reliability and maintained internal consistency. This confirmed their suitability for individual analysis. Likewise, the dependent variable, *Life Satisfaction,* also demonstrated excellent reliability (α = 0.901).

Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy were used to assess whether the data were suitable for analysis and whether the sample comprised sufficient entries. The results showed that the data were statistically significant and that the sample was adequate for analysis (Field, 2017). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.906, indicating excellent suitability for multivariate statistical analysis. Bartlett's Test of Sphericity was significant ($\chi^2(21) = 33.67$, $p = 0.039$), indicating that the correlation matrix was not an identity matrix and that the data could be safely analysed (Field, 2017).

6.2 Measurement model

The theoretical model (see Figure 1) identified 13 wellness dimensions (independent variables) within the Metaverse that contribute to the variable *Life satisfaction* (the dependent variable). The model also identified five barriers and challenges that employees needed to overcome to utilise the metaverse as a platform for enhancing life satisfaction. These variables were subsequently measured.

6.2.1 Dependent (outcome) variable: Life Satisfaction

Life satisfaction, the dependent variable in this study, was conceptualised as a self-reported cognitive evaluation of respondents' overall quality of life. It is a central component of subjective wellbeing and reflects the extent to which individuals perceive their lives as desirable, fulfilling, and consistent with their personal goals and expectations (Diener et al., 2018). In this study, life satisfaction was conceptualised as an outcome influenced by the 13 wellness dimensions, particularly emotional and recreational wellness. The moderate mean score suggests that respondents generally experienced a satisfactory level of wellbeing, although there remains scope for improvement, underscoring the importance of multidimensional wellness interventions to enhance their overall life satisfaction. Table 1 presents the descriptive statistics (mean values and standard deviations) for the life satisfaction construct, measured using five items.

Table 1: Life satisfaction

DEPENDENT VARIABLE:	SD	MEAN	INDEX ($\grave{I}$)
LIFE SATISFACTION		**3,11**	**0,62**

S1: In most ways, my life is close to my ideal.	1,001	3,13	
S2: The conditions of my life are excellent.	1,055	3,02	
S3: I am satisfied with my life.	1,067	3,26	
S4: So far, I have gotten the important things I want in life.	1,189	3,19	
S5: If I could live my life over, I would change almost nothing.	1,258	2,96	

Typically, a score of 3.5 or higher ($\grave{I} \geq 0.70$) indicates high satisfaction, while scores from 3 to 3.5 ($0.60 \leq \grave{I} < 0.70$) indicate some satisfaction. Scores below 3 ($\grave{I} < 0.60$) indicate dissatisfaction with life (Hough & Bisschoff, 1995; Bisschoff & Lotriet, 2009; Nag et al., 2025).

The overall mean score for life satisfaction was 3.11 (SD = 0.62), indicating a moderate to slightly positive level of life satisfaction among respondents. At the item level, responses were relatively consistent, with means ranging from 2.96 to 3.26, suggesting that participants generally viewed their lives positively, though not strongly. The highest-rated item was *"I am satisfied with my life*" (M = 3.26; SD = 1.07), reflecting general contentment, while the lowest-rated item was *"If I could live my life over, I would change almost nothing"* (M = 2.96; SD = 1.26), indicating some degree of regret or a desire for change.

The standard deviations (approximately 1.00–1.26) indicated moderate variability, suggesting that perceptions of life satisfaction differed among respondents. Overall, the results indicate a reasonably stable, although not uniformly high, level of life satisfaction, with some variation in how individuals evaluated their lives.

6.2.2 Barriers to using the Metaverse

The barriers to using the metaverse as a wellness platform reflected challenges associated with institutional pressures, digital infrastructure limitations, and psychological safety concerns. Within higher education institutions, academics and professional staff often operate under significant workload constraints, which limit their ability to engage in wellness initiatives, whether delivered in person or through virtual teaching and working environments (Cassim et al., 2025). The preference for anonymity and the separation of wellness initiatives from performance evaluation systems highlighted persistent concerns regarding surveillance and reputational risk within institutional hierarchies, which may be amplified in digitally mediated environments such as the metaverse. Furthermore, infrastructural challenges, including data costs, load shedding, and unequal access to advanced devices, were particularly salient in developing contexts, potentially limiting equitable participation in immersive platforms.

From a Technology Acceptance Model (TAM) perspective (Davis, 1989), these barriers directly influence both perceived usefulness and perceived ease of use, which are key determinants of technology adoption (Venkatesh et al., 2003). For example, concerns about privacy and surveillance reduce perceived usefulness, as users may not see the platform as beneficial if it could lead to professional consequences. Similarly, infrastructural constraints, such as connectivity and device limitations, undermine perceived ease of use. Recent research on immersive technologies further emphasises that trust, data security, and user control (Dwivedi et al., 2022) are critical antecedents of metaverse adoption, particularly within organisational and educational settings (Lee et al., 2021).

Consequently, the successful implementation of metaverse-based wellness interventions in higher education requires trust-centric system design, clear data governance policies, low-bandwidth accessibility options, and culturally relevant, user-centred environments. Addressing these factors enhances both perceived usefulness and perceived ease of use, thereby increasing the likelihood of acceptance and sustained engagement with metaverse wellness platforms. Although the theoretical model identified several barriers and challenges, respondents identified six notable barriers. Table 2 presents respondents' perceptions of these barriers and challenges within a metaverse-based employee wellness environment.

Table 2: Metaverse wellness barriers and challenges

BARRIERS & CHALLENGES	**SD**	**MEAN**	**INDEX (*Ì*)**

Workplace Wellness Barriers		**3,00**	**0,60**
B1: Hide stress level from the team	1,261		3,11
B2: Attending in-person harms professional reputation	1,312		2,48
B3: Anonymity in a wellness session	1,372		2,92
B4: More comfortable with avatar	1,493		2,86
B5: Load shedding increases work-related anxiety	1,379		2,78
B6: No time for wellness activities at work	1,247		3,78
Digital Trust & Privacy		**3,36**	**0,67**
C1: Uncomfortable using a digital wellness tool if HR accesses my data	1,429		3,34
C2: Fear of admitting mental health struggles could impact career progression.	1,385		3,12
C3: Prefer wellness interventions separate from performance reviews.	1,206		3,81
C4: Trust the employer will not use metaverse data to evaluate performance.	1,297		3,23
C5: Only use a digital wellness tool if hosted by a third party, not HR.	1,396		3,30
Metaverse Design & Safety Preferences		**3,45**	**0,69**
D1: Prefer SA landscape over a generic virtual office.	1,118		3,56
D2: An anonymous avatar increases the likelihood of attending a wellness session.	1,243		3,03
D3: Immediate access to a human counsellor increases the sense of safety.	1,169		3,77
Digital Access & Readiness		**3,19**	**0,64**
E1: Concerned about the data costs of using a metaverse platform.	1,256	2,64	
E2: Have access to a device capable of running 3D simulations.	1,444	3,53	
E3: Prefer “lite” version (audio/2D) for low connectivity or load shedding.	1,241	3,40	
Technology Acceptance		**3,54**	**0,71**
F1: Would use private, anonymous “Metaverse Sanctuary.”	1,211		3.59
F2: Believe technology could help manage workplace stress.	1,275		3.49

The results in Table 2 present descriptive statistics on the key metaverse-related barriers and challenges influencing workplace wellness adoption. Overall, the mean scores across the constructs ranged from 3.00 to 3.54, indicating that respondents experienced barriers and challenges at moderate (3.00 to 3.50) and high (3.5 and above) levels. Respondents identified the lack of time for wellness activities (within the *Workplace Barriers* construct) as a prominent constraint (M = 3.78; SD = 1.25), suggesting that time pressure was a primary obstacle to engagement. Moderate agreement regarding hiding stress from colleagues (M = 3.11) further indicated stigma-related barriers, while the relatively lower score for reputational harm (M = 2.48) suggested less concern about in-person participation.

Regarding *Digital Trust and Privacy* (M = 3.36; SD = 0.67), respondents expressed clear concern about data governance and a strong preference for separating wellness interventions from performance management (M = 3.81). This highlighted the importance of confidentiality within digital environments. The *Metaverse Design and Safety Preferences* construct (M = 3.45; SD = 0.69) indicated a positive orientation towards immersive wellness solutions, particularly the need for immediate access to human counselling (M = 3.77) and culturally relevant environments (M

= 3.56). Regarding *Digital Access and Readiness* (M = 3.19; SD = 0.64), participants reported moderate readiness, with strong agreement regarding access to capable devices (M = 3.53) and a preference for low-bandwidth alternatives (M = 3.40), reflecting existing infrastructural constraints.

Finally, *Technology Acceptance* recorded the highest overall mean (M = 3.54; SD = 0.71), with respondents indicating their willingness to adopt a private, anonymous metaverse-based wellness platform (M = 3.59) and a general belief in the value of technology for stress management (M = 3.49). Collectively, the findings suggest cautious optimism towards metaverse-enabled wellness solutions, conditioned by concerns relating to time, privacy, and accessibility.

6.2.3 Metaverse wellness dimensions

The wellness dimensions and their respective measurement items in the questionnaire are detailed in Appendix A. Table 3 presents respondents' perceptions of each wellness dimension (see Appendix A for details of the individual measurement items).

Table 3: Wellness Dimensions in the Metaverse

WELLNESS DIMENSION	DIMENSION MEAN	INDEX ($\grave{I}$)
Cultural Wellness	3,18	0,64
Professional Wellness	3,30	0,66
Environmental Wellness	3,36	0,67
Personal Identity Wellness	3,26	0,65
Financial Wellness	3,03	0,61
Spiritual Wellness	2,83	0,57
Intellectual Wellness	3,35	0,67
Occupational Wellness	3,14	0,63
Digital Wellness	3,13	0,63
Social Wellness	3,09	0,62
Emotional Wellness	3,05	0,61
Physical Wellness	3,10	0,62
Recreational Wellness	2,97	0,59
MEAN OF ALL THE DIMENSIONS	**3.14**	**0.63**

The results in Table 3 present descriptive statistics for the wellness dimensions within metaverse-based environments. Overall, the mean scores across the dimensions ranged from 2.83 *(Spiritual wellness)* to 3.36 *(Environmental wellness)*, with most wellness constructs clustering around moderate levels (M ≈ 3.00–3.36). Using the midpoint of **3** on the five-point Likert scale as a secondary measure (Fullerton & Bisschoff, 2025), all dimensions, except *Spiritual wellness* (2.83) and *Recreational wellness* (2.97), exceeded the midpoint. Additionally, the relatively higher standard deviations across the items indicated diverse user experiences, likely influenced by differences in access, familiarity, and institutional context (see Appendix A).

Overall, the findings suggest that respondents reported satisfactory levels of life satisfaction. However, none of the wellness dimensions showed high satisfaction. *Spiritual* and *Recreational wellness* recorded satisfaction levels below both the satisfaction index of 0.60 and the midpoint of **3**. These findings suggest that all wellness dimensions, particularly *Spiritual* and *Recreational wellness*, would benefit from targeted interventions to enhance respondents' life satisfaction within a metaverse-based wellness environment.

6.3 Identifying sub-dimensions of wellness

The validity of the items measuring each wellness dimension was examined using Varimax-rotated exploratory factor analysis. Nine wellness dimensions each loaded in one factor. However, four of the 13 wellness dimensions did not load as a single wellness dimension. These four wellness dimensions comprise sub-dimensions. They are:

- *Social Wellness* comprised three sub-dimensions: *Support & Connection, Engagement & Participation,* and *Strain or Isolation.* All three sub-dimensions demonstrated excellent reliability ($\alpha \geq 0.070$).
- *Physical Wellness* comprised two sub-dimensions: *Health & Functioning* and *Lifestyle Behaviour.* Both sub-dimensions demonstrated excellent reliability ($\alpha \geq 0.070$).
- *Environmental Wellness* comprised two sub-dimensions: *Physical & Environmental Conditions* and *Systems & Institutional Environment.* Both sub-dimensions demonstrated excellent reliability ($\alpha \geq 0.070$).
- *Digital Wellness* also comprised two sub-dimensions: *Engagement & Usage* and *Capability & Readiness.* Both sub-dimensions demonstrated excellent reliability ($\alpha \geq 0.070$).

Figure 3 summarises the results within the measurement model, clearly indicating the sub-dimensions of these four wellness dimensions.



Figure 3: Measurement model results

6.4 Multiple regression: Wellness Dimensions Predicting Life Satisfaction

Multiple linear regression analysis was used to assess the extent to which the metaverse wellness dimensions predicted *Life Satisfaction*. All 13 wellness dimensions served as the independent variables. The results showed that the regression model was statistically significant ($R^2 = 0.46$; $p = 0.009$) and explained 46% of the variance in *Life Satisfaction*. This indicated strong explanatory power (Field, 2017).

However, only four wellness dimensions were statistically significant predictors ($p \leq 0.05$), namely *Personal Identity Wellness* ($\beta=0.48$; $p=0.036$), *Emotional Wellness* ($\beta=0.66$; $p=0.009$), *Recreational Wellness* ($\beta=0.43$; $p=0.023$), and *Social Wellness* ($\beta= -0.73$; $p=0.020$).

Emotional Wellness emerged as the strongest positive predictor of *Life Satisfaction,* while *Personal Identity Wellness* and *Recreational Wellness* also contributed positively. In contrast, *Social Wellness* demonstrated a strong, statistically significant negative beta coefficient.

The remaining nine wellness dimensions *(Cultural Wellness, Professional Wellness, Environmental Wellness, Financial Wellness, Spiritual Wellness, Intellectual Wellness, Occupational Wellness, Digital Wellness,* and *Physical Wellness)* were not statistically significant and could not be used as predictors of *Life Satisfaction* in the multivariate model. This suggests that these dimensions did not directly contribute to *Life Satisfaction*. However, this finding does not preclude the possibility that these dimensions may contribute indirectly or share variance with the significant wellness predictors, particularly *Emotional Wellness.* These potential relationships were investigated further, and only *Emotional Wellness* demonstrated such potential

6.4.1 Predictors of Emotional Wellness

A secondary regression analysis was conducted to further investigate the *Emotional Wellness* dimension. This analysis used *Emotional Wellness* as the dependent variable and assessed the extent to which the remaining 12 wellness dimensions predicted it.

The results showed that the model had satisfactory explanatory power ($R^2 = 0.74$; $p < 0.001$), indicating that 74% of the variance in *Emotional Wellness* was explained by the other wellness dimensions. Three statistically significant predictors ($p < 0.05$) were identified, namely *Social Wellness* ($\beta=0.56$; $p=0.002$), *Physical Wellness* ($\beta=0.50$; $p=0.007$), and *Personal Identity Wellness* ($\beta= -0.29$; $p=0.030$).

Social Wellness and *Physical Wellness* emerged as strong positive predictors, highlighting the relational and embodied foundations of emotional wellbeing. In contrast, *Personal Identity Wellness* demonstrated a significant inverse relationship, suggesting that identity negotiation and self-expression may involve emotional strain within digitally mediated environments. The respondents' preference for using avatars in the metaverse may support this interpretation.

6.4.2 Emotional Wellness as a mediator in predicting Life Satisfaction

A regression-based mediation analysis indicated that *Emotional Wellness* mediated the relationship between the key wellness dimensions and *Life Satisfaction*. The results confirmed mediation, as all three mediation criteria were satisfied. The analysis showed that *Emotional Wellness* served as a mediator and, together with *Recreational Wellness*, formed a satisfactory predictive model (see Figure 3).

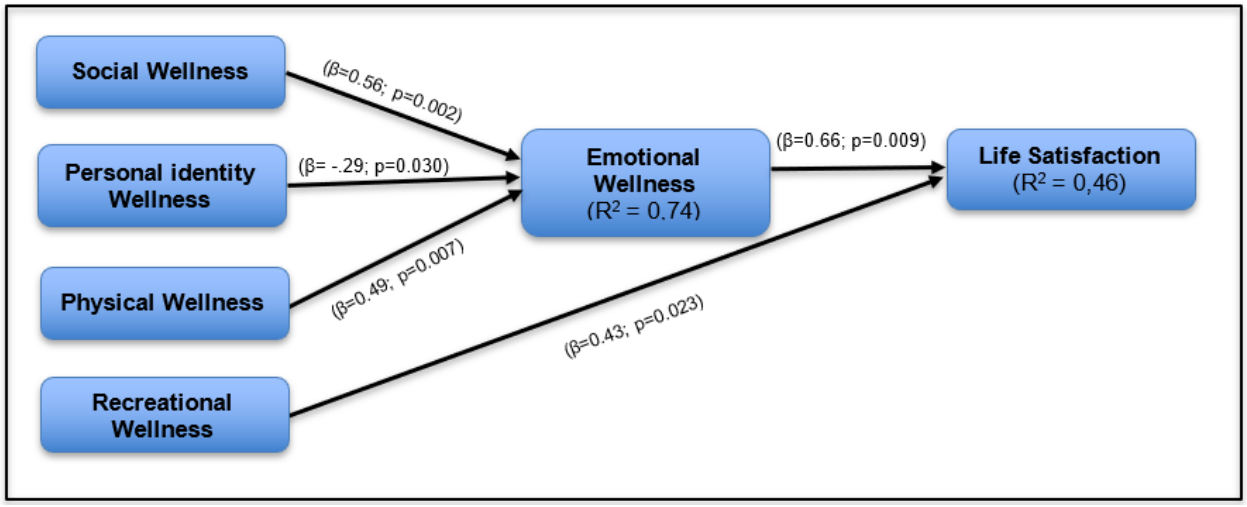


Figure 3: An integrated predictive model for Metaverse wellness

Figure 3 presents the predictive wellness model, in which *Emotional Wellness* served as a mediator between *Social Wellness, Physical Wellness, and Personal Identity Wellness* in predicting *Life Satisfaction*. The predictors (*Social Wellness, Physical Wellness,* and *Personal Identity Wellness*) jointly explained 74% of the variance in the mediating variable, *Emotional Wellness*. This indicates very strong explanatory power and confirms *Emotional Wellness* as a highly determined psychological outcome.

Emotional Wellness (β=0.66) and *Recreational Wellness* (β=0.43) explained 46% of the variance in *Life Satisfaction. Personal Identity Wellness* (β= -0.29) contributed negatively to *Emotional Wellness.* The explained variances were highly satisfactory, as they indicated large effect sizes in social science research, particularly in wellbeing studies involving subjective outcomes such as feelings, emotions, and perceived wellbeing.

7. DISCUSSION OF RESULTS

The normality results confirmed that the data were suitable for analysis. No distribution abnormalities were identified, and the collected data were adequate, statistically significant, and reliable. These findings indicate that the data could be analysed with confidence using multivariate statistical techniques (Nag et al., 2026; Rehman et al., 2025).

The 13 wellness dimensions extend well beyond traditional wellness models. Conventional wellness frameworks typically include social, emotional, physical, financial, and spiritual dimensions (e.g., the SAMHSA wellness model). However, this study extends the concept of wellness in the metaverse by incorporating digital, cultural, personal-identity, professional, and environmental dimensions. This extension is consistent with contemporary digital wellness literature and emphasises the importance of including digital literacy, online behaviour, and technology-mediated experiences as integral components of overall wellbeing. The strong reliability coefficients (e.g., $\alpha \geq 0.70$ across all dimensions) further suggest that the measurement of these constructs is robust and internally consistent.

The inclusion of *Digital Wellness* as a distinct dimension is particularly noteworthy. Within the model, Digital Wellness is operationalised through sub-components such as *Digital Engagement* and *Digital Capability/Readiness*, which align with empirical research highlighting the role of digital competence, responsible technology use, and online satisfaction in shaping wellbeing outcomes. Within PHEI contexts, where individuals interact across both physical and immersive digital spaces, Digital Wellness becomes a foundational determinant influencing other dimensions, including social connectedness, professional functioning, and mental wellbeing.

The identified barriers and challenges, including workplace wellness constraints, digital trust and privacy concerns, technology acceptance, and digital access/readiness, represent the structural and psychological conditions that enable or inhibit wellness within the metaverse. For example, trust, privacy, and safety concerns (α=0.72; σ=67%) reflect widely documented issues in immersive environments, where data security, identity protection, and ethical design remain unresolved challenges. Research indicates that although the metaverse has the potential to enhance social connection and autonomy, it also introduces risks such as addiction-like behaviours, reduced offline engagement, and psychological strain. Similarly, barriers to digital access and readiness highlight the persistent digital divide, which may exacerbate inequalities in wellbeing outcomes.

From a practical perspective, the framework offers important implications for organisations, policymakers, and designers of metaverse environments. First, it highlights the need for holistic wellbeing strategies that integrate digital, psychological, and organisational interventions. Second, it emphasises the importance of ethical design principles, including privacy protection, accessibility, and inclusivity. Third, it underscores the need to develop digital competencies among users to ensure that engagement within PHEI environments promotes positive rather than adverse wellbeing outcomes.

The regression model analysing the predictive ability of the 13 wellness dimensions demonstrated strong explanatory capacity, accounting for 74% of the variance in *Emotional Wellness* ($R^2 = 0.74$) and 46% of the variance in *Life Satisfaction* ($R^2 = 0.46$). However, only four wellness dimensions were statistically significant predictors. *Social Wellness* emerged as the strongest predictor ($\beta = 0.56$; $p = 0.002$). This finding aligns with research demonstrating that social connectedness is a primary determinant of mental health and wellbeing across populations (Holt-Lunstad, 2018; Ozbay et al., 2007; Santini et al., 2020). Strong social networks are associated with improved emotional regulation, reduced stress, and a lower risk of psychological distress, reinforcing their central role in multidimensional wellness frameworks. These findings are consistent with contemporary conceptualisations of wellbeing that emphasise the interaction between emotional, physical, and social functioning (Diener et al., 2018; VanderWeele, 2017).

Similarly, *Physical Wellness* demonstrated a substantial positive relationship with *Emotional Wellness* ($\beta = 0.48$; $p = 0.007$). This finding is supported by growing evidence that physical activity and healthy lifestyle behaviours are strongly associated with improved mental health outcomes, including reduced depression and enhanced emotional wellbeing (Biddle et al., 2019; Kandola et al., 2019; World Health Organization [WHO], 2022). The integration of physical and psychological domains is central to contemporary biopsychosocial and lifestyle medicine models.

In contrast, *Personal Identity Wellness* was negatively associated with *Emotional Wellness* ($\beta = -0.29$; $p = 0.030$). Although initially unexpected, this finding can be understood considering recent identity research, which suggests that identity exploration and instability may be associated with psychological distress, particularly during transitional or developmental stages (Luyckx et al., 2013; Schwartz et al., 2013). Emerging evidence indicates that identity processes are not uniformly beneficial and may involve emotional strain when individuals experience identity confusion or conflict. This finding highlights the importance of understanding identity wellness as a dynamic and context-dependent construct.

A key contribution of the model is identifying Emotional Wellness as the primary pathway by which other wellness dimensions influence *Life Satisfaction.* The strong positive relationship between *Emotional Wellness* and *Life Satisfaction* ($\beta = 0.66$; $p = 0.009$) is consistent with contemporary research on subjective wellbeing, which positions emotional functioning at the core of life evaluation (Diener et al., 2018; Pressman et al., 2019). Advances in positive psychology further emphasise emotional regulation, resilience, and psychological flexibility as key determinants of life satisfaction (Kashdan et al., 2015; Seligman, 2018). The mediating role identified in the model suggests that improvements in *Social Wellness* and *Physical Wellness* enhance *Life Satisfaction* primarily by influencing emotional processes, reinforcing *Emotional Wellness* as a key intervention target.

The model further identified a direct positive effect of *Recreational Wellness* on *Life Satisfaction* ($\beta = 0.43$; $p = 0.023$). This finding is strongly supported by literature demonstrating that leisure engagement contributes

significantly to wellbeing, independent of other psychological factors (Iwasaki, 2017; Newman et al., 2014). Based on the core components of Self-Determination Theory, Richard Ryan and Edward Deci (2017) argue that recreational activities promote autonomy, competence, and social interaction. Additionally, a recent study by Borovica et al. (2024) highlights the role of leisure in stress recovery, meaning-making, and life satisfaction, particularly in high-demand or resource-constrained contexts.

8. STUDY IMPLICATIONS

8.1 Theoretical implications

The findings strongly support the use of an integrative, holistic model of wellness in public health and positive psychology. This approach aligns with the work of VanderWeele (2017), who argues that human wellness and life satisfaction are multidimensional constructs that cannot be reduced to happiness or income alone. Likewise, the World Health Organization (2022) emphasises that physical wellness is influenced by the frequency, duration, and intensity of physical activity.

The measurement model demonstrates that *Emotional Wellness* plays a central mediating role, while *Social Wellness* and *Physical Wellness* serve as fundamental determinants of *Emotional Wellness*. The negative effect of *Personal Identity Wellness* on *Emotional Wellness* further illustrates the complex and evolving nature of identity processes (Erikson, 1968; 1994; Karaś & Cieciuch, 2018). Recreational Wellness also contributes independently to Life Satisfaction.

However, the negative association between *Personal Identity Wellness* and *Emotional Wellness* suggests a need for further theoretical refinement to better understand the underlying mechanisms driving this relationship. Such refinement may help address identity-related challenges and strengthen wellness within the proposed metaverse wellness model.

Higher education institutions should develop preventative, technology-enabled wellbeing programmes that complement traditional counselling services (Romoser, 2025). Home-based virtual reality delivery, weekly participation, and relatively short intervention sessions were identified as practical implementation strategies that maximise accessibility, feasibility, and sustained engagement. These findings support broader recommendations that digital mental health interventions should be implemented within real-world higher education institutions and evaluated beyond effectiveness alone to ensure successful adoption and long-term sustainability (Taylor et al., 2024; Riches et al., 2023; Lattie et al., 2019).

8.2 Practical implications of the study

From a practical perspective, the findings suggest that interventions aimed at improving life satisfaction should adopt a multidomain, integrated approach, consistent with recent health promotion and policy frameworks (WHO, 2022). Several studies have identified evidence-based strategies for strengthening employee wellness. Based on the findings of this study, the following practical interventions are recommended:

- Holt-Lunstad (2018) recommends strengthening employees' social connectedness and community engagement. This recommendation is particularly relevant within the post-COVID-19 higher education environment, where online teaching, hybrid work, and work-from-home arrangements have become increasingly common (Cassim et al., 2025).
- Kandola et al. (2019) recommend promoting physical activity and healthy lifestyles among employees. This recommendation is strongly supported by the World Health Organization (2022), particularly for middle-aged and older employees, who tend to be less physically active than their younger counterparts.
- Iwasaki (2017) recommends encouraging meaningful leisure participation. Organisations can facilitate this through employer-supported initiatives such as sports and wellness days, fun runs, walking or cycling

programmes on campus, on-site exercise facilities, and physical activity classes offered before or after working hours.

9. LIMITATIONS AND FUTURE RESEARCH

Despite its strengths, this study has several limitations. First, the use of a cross-sectional research design limits causal interpretation and the assessment of changes over time. Future longitudinal research could validate and extend this study's findings by examining the stability of the proposed metaverse wellness model over time.

Second, this study did not examine demographic variables as potential moderators. Future research could incorporate demographic factors, such as culture, age, and gender, to better understand how these variables influence the adoption and effectiveness of metaverse-based wellness applications and to provide deeper insight into developmental and contextual differences.

10. CONCLUSION

This study contributes to the growing body of knowledge on digital wellbeing by developing and empirically validating a multidimensional employee wellness model for metaverse-enabled Private Higher Education Institutions. While previous studies have primarily focused on individual aspects of digital wellbeing or technology adoption, this research integrates 13 wellness dimensions into a single, evidence-based framework that reflects the complexity of employee wellbeing in immersive digital environments.

The findings demonstrate that employee wellness is influenced by multiple interconnected dimensions rather than isolated organisational interventions. Social wellness, physical wellness and personal identity wellness emerged as significant predictors of emotional wellness, while emotional wellness and recreational wellness significantly predicted life satisfaction. The identification of emotional wellness as the principal mediating mechanism provides new empirical evidence explaining how different wellness dimensions collectively influence overall wellbeing within digitally mediated workplaces.

Beyond its statistical contribution, the study advances metaverse wellness research by integrating holistic wellbeing theory with the Technology Acceptance Model. The findings demonstrate that successful implementation of metaverse-based wellness initiatives depends not only on technological capability but also on organisational readiness, employee trust, digital competence, accessibility, ethical governance, and inclusive institutional cultures. These factors are particularly important within Global South higher education contexts where resource constraints, infrastructure limitations and digital inequalities continue to influence technology adoption.

The study therefore provides Private Higher Education Institutions with an evidence-informed managerial framework for designing, implementing and evaluating future metaverse wellness initiatives. By integrating technological readiness with multidimensional employee wellbeing, the proposed model offers a practical roadmap for creating digitally enabled, psychologically safe and sustainable institutional wellness ecosystems.

Ultimately, the research demonstrates that the future of employee wellness lies not in replacing human-centred wellbeing with technology, but in using immersive technologies to strengthen human connection, organisational resilience and holistic wellbeing. In doing so, this study provides both a theoretical and practical foundation for the next generation of employee wellness strategies within the evolving metaverse

11. DECLARATION OF AI USE

During the preparation of this article, the author(s) utilised Microsoft Copilot and OpenAI ChatGPT to:

- Verify that all sources listed in the reference list were cited in the text and that all in-text citations were included in the reference list.
- Verify the accuracy of the Digital Object Identifier (DOI) information and associated bibliographic details (e.g., publication years and page numbers).

- Assist in searching the literature to identify relevant scholarly studies.
- Verify the authenticity and validity of the sources used.
- Provide guidance on the quality and academic standing of journals when identifying suitable literature sources.
- Assist with language refinement, academic editing, improvements to clarity, grammar, readability, structure, and overall presentation of the manuscript.

Following the use of these tools, the author(s) carefully reviewed, verified, and edited all AI-assisted content and assume full responsibility for the originality, accuracy, integrity, analysis, interpretation, and conclusions presented in this article.

Appendix A: Wellness dimension, items and mean values

WELLNESS DIMENSION	RESPONSES	MEAN	SD	DIMENSION MEAN	INDEX
Cultural Wellness				**3,18**	**0,64**
G1: EMPATHY: Satisfaction with cultural diversity representation in virtual environments.	58	3,17	1,078		
G2: Define: Perception of virtual spaces that respect and celebrate cultural diversity.	57	3,02	1,061		
G3: Ideate: Importance of cultural awareness and sensitivity in virtual spaces.	57	3,82	1,071		
G4: Prototype: Effectiveness of virtual spaces in supporting cultural inclusion and representation.	55	2,95	0,931		
G5: Test: Frequency of cultural values and beliefs being respected in virtual spaces.	56	3,02	1		
Professional Wellness				**3,30**	**0,66**
G6: Empathise: Satisfaction with professional growth opportunities in virtual spaces.	58	3,12	0,839		
G7: Define: Perception of sufficiency of professional development opportunities in virtual spaces.	57	3,14	0,895		
G8: Ideate: Importance of virtual spaces supporting professional development (skills training, networking).	57	3,81	1,008		
G9: Prototype: Effectiveness of virtual spaces in supporting professional growth and skill development.	56	3,5	0,894		
G10: Test: Frequency of engagement in professional networking or development activities in virtual spaces	56	2,84	1,141		
Environmental Wellness				**3,36**	**0,67**

G11: Empathise: Satisfaction with environmental aspects (design, accessibility) of virtual spaces.	58	3,19	0,907		
G12: Define: Perception of virtual spaces providing a comfortable and conducive environment for learning or work.	57	3,47	1,071		
G13: Ideate: Importance of virtual spaces supporting a positive and healthy environment (clear navigation, ease of access)	56	3,88	1,046		
G14: Prototype: Effectiveness of virtual environments in promoting a positive, stress-free experience.	54	3,37	1,033		
G15: Test: Frequency of mental fatigue or overwhelm from virtual environment design and structure	55	2,93	1,052		
G16: Empathise: Satisfaction with physical/virtual environment (surroundings, design, ambience).	58	3,28	0,951		
G17: Define: Perception of environment supporting overall wellbeing (safety, peace, focus).	57	3,26	0,955		
G18: Ideate: Importance of environment (physical/virtual) promoting wellness (cleanliness, order, comfort)	57	3,86	1,043		
G19; Prototype: Effectiveness of environment in supporting wellbeing and productivity (ergonomics, accessibility, calm)	56	3,21	0,986		
G20: Test: Frequency of positive impact from environment (motivation, calm, focus).	55	3,13	0,944		
Personal Identity Wellness				**3,26**	**0,65**
G21: Satisfaction with representation of personal identity in virtual environments.	57	3,12	1,119		
G22: Define: Comfort expressing authentic self in virtual environments.	57	3,33	1,155		
G23: Ideate: Importance of virtual spaces supporting personal identity expression.	56	3,73	1,087		
G24: Prototype: Effectiveness of virtual spaces in enabling self-expression and individuality.	57	3,25	1,04		
G25: Test: Frequency of personal identity being acknowledged or celebrated in virtual spaces	56	2,86	0,98		
Financial Wellness				**3,03**	**0,61**
G26: Empathise: Satisfaction with financial support/resources in virtual environments (students, employees).	57	2,89	0,939		

G27: Define: Perception of virtual spaces addressing financial wellbeing (literacy, support).	56	2,84	1,023		
G28: Ideate: Importance of virtual environments promoting financial literacy and wellbeing.	56	3,54	1,026		
G29: Prototype: Effectiveness of virtual spaces in providing financial wellness support (budgeting tools, advice).	55	2,95	0,97		
G30: Test: Frequency of financial stress or overwhelm in virtual environments.	54	2,91	1,202		
Spiritual Wellness				**2,83**	**0,57**
G31: Empathise: Satisfaction with opportunities for spiritual reflection/practice in virtual environments.	57	2,81	1,109		
G32: Define: Perception of virtual spaces enabling exploration and expression of spiritual beliefs.	56	2,66	1,195		
G33: Ideate: Importance of virtual spaces supporting spiritual wellbeing (meditation, communities).	55	3,36	1,267		
G34: Prototype: Effectiveness of virtual environments in enabling spiritual practices or expression.	55	2,78	1,117		
G35: Test: Frequency of engagement in spiritual or reflective practices in virtual spaces	54	2,52	1,24		
Intellectual Wellness				**3,35**	**0,67**
G36: Empathise: Satisfaction with intellectual stimulation in virtual spaces.	57	3,19	1,125		
G37: Define: Perception of virtual spaces that encourage intellectual growth and curiosity.	56	3,43	1,142		
G38: Ideate: Importance of virtual spaces fostering intellectual engagement and learning.	55	3,71	1,083		
G39: Prototype: Effectiveness of virtual environments in supporting intellectual development (content access, discussions).	55	3,4	1,132		
G40: Test: Frequency of engagement in intellectually stimulating activities in virtual spaces.	53	3	1,193		
Occupational Wellness				**3,14**	**0,63**
G41: Empathise: Satisfaction with work-life balance in virtual spaces.	56	2,95	1,166		
G42: Define: Perception of virtual spaces supporting professional wellbeing and career advancement.	54	3,19	1,083		
G43: Ideate: Importance of virtual spaces supporting occupational wellness (flexibility, career growth).	55	3,49	1,215		

G44: Prototype: Effectiveness of virtual spaces in supporting career development and wellbeing.	55	3,09	1,041		
G45: Test: Frequency of work-related stress or burnout in virtual spaces.	55	2,98	1,194		
Digital Wellness				**3,13**	**0,63**
G46: Empathise: Satisfaction with digital wellbeing in virtual environments (screen time, digital detox).	57	2,88	1,151		
G47: Define-1: Perception of virtual spaces encouraging healthy digital habits and boundaries.	55	2,91	1,127		
G48: Define-2: Use of virtual environments to escape real-life stress or challenges.	54	3,24	1,212		
G49: Define-3: Frequency of spending more time in virtual environments than intended.	55	3,05	1,026		
G50: Ideate: Importance of virtual spaces promoting digital wellness (screen time, online safety).	55	3,76	1,154		
G51: Ideate: Importance of privacy and data security in virtual environments.	55	3,02	1,194		
G52: Prototype: Effectiveness of virtual spaces in supporting healthy digital practices.	54	3,04	1,045		
G53: Prototype: Effectiveness of virtual environments in preventing digital overload and supporting mindful usage.	53	2,7	1,17		
G54: Test: Frequency of digital burnout or fatigue in virtual spaces.	52	3,17	1,115		
G55: Test: Comfort with level of digital interaction in virtual environments.	49	3,08	1,057		
G56: Test: Ability to disconnect from virtual environments for other activities.	53	3,32	1,14		
G57: Test: Frequency of feeling overwhelmed by digital notifications or interactions.	51	3,41	1,134		
Social Wellness				**3,09**	**0,62**
G58: Empathise: Satisfaction with social interactions in virtual environments.	55	3,07	1,12		
G59: Define: Perception of virtual spaces fostering meaningful social connections.	52	3,25	1,1		
G60: Define: Perception of stigma associated with seeking mental health support in virtual environments	52	2,98	1,229		
G61: Define: Avoidance of mental health or wellness resources in virtual spaces due to stigma concerns.	54	2,85	1,365		

G62: Ideate: Importance of virtual spaces promoting positive social interactions (community-building, collaboration)	54	3,63	1,121		
G63: Ideate: Importance of collaborative activities in virtual spaces.	54	3,31	1,179		
G67: Ideate: Importance of inclusivity in promoting diverse social interactions in virtual environments.	54	2,94	1,123		
G68: Ideate: Importance of virtual environments facilitating emotional expression and wellbeing.	53	3,04	1,126		
G69: Prototype: Effectiveness of virtual spaces in supporting social wellness (engagement, networking).	51	3	0,938		
G70: Prototype: Effectiveness of virtual spaces in supporting friendship building and maintenance.	50	3,14	1,178		
G71: Prototype: Effectiveness of anonymous virtual settings in supporting access to social wellbeing resources.	54	3,09	1,12		
G72: Test: Frequency of engagement in social activities or discussions in virtual spaces.	54	3,09	1,086		
G73: Test: Frequency of opportunities for socialising and networking in virtual environments.	53	3,06	1,082		
G74: Test: Frequency of social support experienced in virtual environments.	52	3,17	1,098		
G75: Test: Frequency of feeling isolated in virtual environments.	49	2,76	1,283		
Emotional Wellness				**3,05**	**0,61**
G76: Empathise: Perceived emotional support in virtual learning or working environments (metaverse).	56	3,02	1,104		
G77: Define: Perception of virtual spaces effectively addressing emotional wellbeing issues	54	3,06	1,071		
G78: Ideate: Importance of virtual spaces offering emotional support services (counselling, peer support, wellbeing resources).	54	3,37	1,138		
G79: Ideate: Importance of sense of belonging in virtual environments.	54	3,07	1,147		
G80: Ideate: The importance of mitigating stress and anxiety in metaverse-based environments.	53	3,11	1,086		
G81: Prototype: Effectiveness of virtual spaces in supporting emotional wellness activities.	55	2,71	1,197		

G82: Test: Frequency of feeling emotionally drained or overwhelmed in virtual environments.	52	3,1	1,071		
G83: Test: Frequency of emotional needs being acknowledged in virtual environments.	54	2,91	1,154		
G84: Test: Frequency of access to emotional wellness programs or resources in virtual spaces.	51	3,12	1,089		
Physical Wellness				**3,10**	**0,62**
G85: Empathise: Satisfaction with physical ergonomics in virtual spaces (posture, workstation comfort).	56	2,98	1,104		
G86: Empathise: Perceived physical health and wellbeing in metaverse environments.	54	2,87	1,01		
G87: Define: Perception of virtual spaces promoting physical wellness (break reminders, health support).	54	2,85	1,204		
G88: Define: Perception of physical discomfort from extended virtual space use (eye strain, headaches).	56	3,16	1,203		
G89: Ideate: Importance of physical wellness in metaverse environments.	55	3,51	1,086		
G90: Ideate: Importance of virtual fitness sessions or wellness activities in the metaverse.	54	3,54	1,059		
G91: Prototype: Effectiveness of virtual environments in supporting physical wellness initiatives (fitness challenges, health tracking).	54	3,06	1,106		
G92: Test: Frequency of engagement in physical wellness activities in virtual spaces.	54	2,87	1,082		
G93: Test: Frequency of physical wellness activities (exercise, movement) in virtual learning or working environments	54	2,94	0,998		
G94: Test: Frequency of limitations on physical activity in virtual environments.	54	3,04	1,197		
G95: Test: Frequency of perceived improvement in physical wellness in virtual vs traditional environments	55	3,31	1,052		
Recreational Wellness				**2,97**	**0,59**
G96: Empathise: Satisfaction with recreational and leisure activities in virtual spaces.	57	2,74	1,173		
G97: Define: Perception of adequacy of recreational and leisure activities in virtual spaces.	55	2,84	1,183		
G98: Ideate: Importance of recreational opportunities for relaxation and fun in virtual spaces.	54	3,44	1,11		

G99: Prototype: Effectiveness of virtual spaces in offering recreational activities (games, social gatherings, events).	52	3,06	1,056
G100: Test: Frequency of engagement in recreational activities in virtual environments.	47	2,79	1,041

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