INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 14, Issue 12, (2024) E-ISSN: 2222-6990

Cultivating Emotional Wellbeing through Biophilic Design in Malaysian Architecture

Bernard Tang Wei Kiet[1], Mohd Zairul Mohd Noor[1], Aini Azeqa Ma'rof[2,3]

[1]Department of Architecture, Faculty of Architecture, Universiti Putra Malaysia, Serdang, Selangor, Malaysia, [2]Institute for Social Science Studies, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia, [3]Faculty of Human Ecology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.

Email: azeqa@upm.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v14-i12/24007 DOI:10.6007/IJARBSS/v14-i12/24007

Published Date: 10 December 2024

Abstract

The integration of biophilic design in Malaysian architecture seeks to reconnect urban dwellers with nature, enhancing well-being and addressing environmental concerns. Despite Malaysia's rich biodiversity and tropical climate, biophilic principles are underutilized, revealing a gap in architectural practice. This research investigates biophilic design's application and effectiveness in Malaysia, emphasizing cultural relevance and stakeholder engagement. By exploring key biophilic elements and their impact on emotional well-being, the study aims to develop strategies tailored to the Malaysian context. Expected outcomes include improved emotional health, productivity, and sustainable urban development, contributing to healthier, more holistic built environments.

Keywords: Biophilic Design, Emotional Well-being, Malaysian Architecture, Sustainability, Urbanization.

Introduction

The burgeoning interest in biophilic design reflects a profound acknowledgment of the significant impact environmental elements exert on human health and overall well-being. Rapid urbanization, characteristic of contemporary societies, is reshaping our landscapes into dense, overpopulated built environments dominated by towering buildings and sprawling infrastructure networks (Downton et al., 2017). However, amidst this urban expansion, a concerning trend emerges: the exclusion of living elements from our built environment. These living elements, integral components of our nature-informed cultural landscape within the Anthropocene epoch, are increasingly absent (Downton et al., 2017). This absence results in a disconnection between humans and the natural world, with profound implications for both human health and the remaining living environments (Downton et al., 2017). Therefore, it is imperative to reintegrate these natural elements into our urban landscapes to foster a

healthier and more sustainable coexistence. This reintegration not only addresses the environmental impacts but also enhances the well-being of urban dwellers, providing them with the much-needed connection to nature that modern urbanization often neglects.

As societies navigate the complexities of rapid urbanization and technological advancement, recent events, such as the global pandemic, have underscored the importance of prioritizing holistic well-being. The pandemic has emphasized the necessity of integrating physical and mental health considerations into the design of built environments (Soto et al., 2022). Consequently, there is a growing recognition of the imperative to create built environments that not only fulfill functional needs but also nurture the emotional and psychological well-being of their occupants (Soto et al., 2022). Within this evolving landscape, discourse surrounding biophilic design has gained considerable momentum. This discourse extends beyond the mere inclusion of natural elements in architectural settings; it encompasses a nuanced understanding of 'nature' and its multifaceted implications within architectural contexts. 'Nature' transcends its physical manifestations to embody a spectrum of meanings, encompassing not only tangible elements but also abstract concepts and idealized states (Zhong et al., 2022).Therefore, it is imperative to reintegrate these natural elements into our urban landscapes to foster a healthier and more sustainable coexistence. This reintegration not only addresses the environmental impacts but also enhances the well-being of urban dwellers, providing them with the much-needed connection to nature that modern urbanization often neglects.

At the heart of biophilic design lies the Biophilia hypothesis, which posits an innate human affinity for nature and emphasizes the pivotal role of exposure to natural environments in fostering holistic well-being (Gillis & Gatersleben, 2015). This intrinsic connection between humans and nature permeates various facets of life, profoundly influencing productivity, personal well-being, and social interactions (Hamimi et al., 2022). Biophilic design integrates considerations of human health, ecological harmony, and sustainability principles, revolving around six key features: environmental elements; natural shapes and forms; patterns and processes found in nature; manipulation of light and space; place-based relationships; and the evolution of human-nature connections (Gray & Birrell, 2014). Through these features, biophilic design aims to nurture a profound connection between occupants and their surroundings, promoting well-being across multiple dimensions. Numerous studies have highlighted the manifold benefits of biophilic design on human well-being. Exposure to biophilic elements has been correlated with improved mood, enhanced cognitive function, heightened creativity, concentration, and overall satisfaction with indoor spaces. Moreover, biophilic design fosters healing, attention restoration, and the development of various cognitive, imaginative, and social capacities (Gray & Birrell, 2014).

Nonetheless, while the benefits of biophilic design are well-documented, there remains a pressing need to explore its application and effectiveness within specific cultural contexts, such as Malaysia. As a nation characterized by rich biodiversity and a tropical climate, Malaysia offers unique opportunities for the integration of biophilic elements into architectural design. Yet, the extent to which biophilic principles are currently implemented in Malaysian architecture and their impact on emotional well-being remain underexplored avenues warranting further investigation.

Problem Statement

Motivational Problem

The exploration of emotional well-being through biophilic design in Malaysian architecture is a compelling pursuit, yet it presents a motivational problem that warrants careful consideration. One significant challenge lies in bridging the gap between theoretical understanding and practical implementation (Nasar, 2008). While the benefits of biophilic design on emotional well-being are well-documented in global contexts, its application within the distinct cultural and architectural landscape of Malaysia remains relatively uncharted territory. The motivational problem thus centers on the need to translate theoretical knowledge into actionable strategies that resonate with Malaysian cultural values and architectural practices.

Furthermore, another motivational hurdle arises from the necessity to overcome inertia within the architectural community and construction industry. Despite the growing global discourse on biophilic design, its adoption in practice often faces resistance due to entrenched norms, budgetary constraints, and a lack of awareness regarding its potential benefits. Encouraging architects, developers, and policymakers in Malaysia to embrace biophilic principles requires overcoming skepticism and fostering a collective understanding of its relevance in enhancing emotional well-being. This entails not only providing evidence-based research but also fostering a cultural shift towards prioritizing human-centric design approaches that harmonize with nature. Additionally, navigating complexities such as traditional design preferences, socio-economic factors, regulatory frameworks, and less frequently mentioned difficulties like diseases in trees, inconvenient remains from fauna on cars and streets, changing demographics, and the fact that the projects often take place on public ground, is essential to effectively integrate biophilic elements into Malaysian architectural projects (Siebring, 2020). Overcoming these motivational barriers is essential for catalyzing meaningful change and cultivating emotional well-being through biophilic design in Malaysian architecture.

Research Problem

Biophilia, the innate human inclination to connect with nature and other living beings, forms the cornerstone of biophilic design. This design philosophy is articulated as "the deliberate attempt to translate this understanding of the inherent human affinity to affiliate with natural systems and processes in the built environment" and underscores "the necessity of maintaining, enhancing, and restoring beneficial experiences of nature." Essentially, biophilic design seeks to create meaningful connections with nature—whether direct, indirect, or symbolic—through elements classified under Nature in the Space, Natural Analogues, and Nature of the Space, further divided into fourteen patterns (Azan & Ismail, 2022). These patterns provide specific strategies for incorporating natural elements and principles into the built environment, promoting environments that enhance human health, well-being, and productivity.

Understanding the intricate interplay between biophilic design and emotional well-being in Malaysian architecture demands a nuanced approach. Firstly, it's crucial to delve into the multifaceted dynamics shaping perceptions of the physical environment and the utilization of biophilic elements within Malaysian architectural practices. This involves understanding how cultural attitudes towards nature, traditional design philosophies, and the evolving urban

landscape influence perceptions of biophilic elements. Moreover, it's essential to recognize that while nature often evokes positive emotions, not all aspects of it or its replications are universally restorative and stress-relieving for humans (Gillis & Gatersleben, 2015). Consequently, integrating biophilic principles into architectural design requires a thoughtful examination of how these elements align with cultural attitudes towards nature, traditional design philosophies, and the evolving urban landscape. Additionally, it's imperative to consider the physical attributes of the environment that relate to affect and meaning. Some direct physical measures of the environment may not fully capture people's perceptions, and some perceptions may have independent associations with physical activity (Nasar, 2008). This underscores the need for both physical and perceptual measures when evaluating the impact of biophilic design.

Furthermore, tackling the emotional and psychological effects of biophilic design interventions within the Malaysian context presents significant research challenges. Developing standardized methodologies for evaluation necessitates the creation of robust measurement tools and assessment frameworks that are sensitive to local cultural norms and sensitivities. This requires an understanding of various psychological perspectives, including performance psychology, which examines the psychological factors influencing human performance and improvement from diverse angles such as emotions, productivity, cognition, action, and perception (Abdul Tharim et al., 2023). Hence, it's vital to consider factors such as motivations, personality, leadership, and the work environment when evaluating the impact of biophilic design on occupants' emotional states. Collaboration among interdisciplinary teams, comprising architects, psychologists, environmental scientists, and sociologists, is essential for constructing comprehensive research protocols capable of capturing the holistic impact of biophilic design. Additionally, navigating methodological obstacles such as sample selection bias, data collection methods, and statistical analysis techniques is paramount for ensuring the rigor and validity of research findings.

The research focuses on three primary questions. First, it aims to explore the key elements of biophilic design in contemporary architectural practices. Second, it seeks to investigate the impacts of biophilic design on emotional well-being and psychological health. Lastly, the research aims to examine how biophilic design principles can be effectively implemented within the Malaysian architectural context.

To address these questions, the research objectives are: first, to identify and categorize the key elements of biophilic design in contemporary architectural practices. Second, to develop strategies for the effective implementation of biophilic design principles within the Malaysian architectural context. Third, to evaluate the long-term environmental and social benefits of biophilic design interventions in Malaysian architecture through longitudinal studies of selected projects, focusing on indicators such as energy efficiency, biodiversity enhancement, and user satisfaction.

Literature Review

The literature on biophilic design covers a broad spectrum of topics, from the theoretical frameworks guiding biophilic design principles to practical applications in enhancing urban environments and individual well-being. Each study presents unique contributions to

understanding how biophilic design can address environmental, psychological, and social challenges in contemporary architecture and urban planning.

Starting with Wijesooriya (2023), the focus is on the compatibility between biophilic design frameworks and LEED sustainable design criteria. The study highlights that biophilic design has been underrepresented in the literature compared to other green building frameworks. Through a detailed content analysis, the research finds that there is about 43% compatibility between biophilic design frameworks and sustainable design tools. This research underscores the potential for integrating biophilic design into broader sustainability efforts while recognizing the challenges in aligning sensory placemaking with performance-based design criteria.

Zulkifli (2023), builds upon this by concentrating on indoor work environments and how biophilic design elements (BDEs) can improve employee productivity, focus, and well-being. The study identifies a significant gap in the literature regarding frameworks specifically tailored to indoor settings and proposes a conceptual model that integrates biophilic elements with restorative environment theories. This research is particularly relevant for office spaces where long-term exposure to indoor environments can negatively affect health, highlighting the importance of incorporating nature into the design of workspaces.

Moving to a broader perspective, Zhong (2022) explores the theoretical aspects of biophilic design, specifically focusing on its contribution to sustainability, health, and well-being in architecture. The study reveals ongoing debates around the interpretation of ‘nature’ in architectural practice and provides a framework to guide the application of biophilic principles in sustainable architecture. This study aligns well with the findings of Wijesooriya by stressing the need to bridge the gap between biophilic theory and practical sustainable design.

Siebring (2020), provides a case study on biophilic urbanism in the Netherlands, exploring how integrating nature into urban environments can enhance climate resilience and public well-being. This study uses interviews with experts to evaluate the effectiveness of biophilic urbanism at the street and neighborhood levels. The findings suggest a growing adoption of biophilic design in Dutch cities, with opportunities for further research on measuring its impact on both environmental and health outcomes.

Gray (2014), takes a more focused approach by examining the health benefits of biophilic design in construction site offices. The study identifies a gap in understanding long-term interactions between workers and biophilic design elements. Through qualitative data collected from interviews and observations, the research concludes that biophilic design positively impacts workers' psychological health, improving satisfaction and morale. This study adds practical insights into how biophilic design can be applied in non-traditional workspaces, suggesting that such environments benefit from more natural connections.

Mohd Arof (2020), shifts the focus to the challenges of implementing biophilic city concepts in Malaysia. The research uncovers several critical causal factors, including lack of government awareness and limited green spaces, that hinder the adoption of biophilic city principles. This study fills a vital gap by addressing why biophilic concepts often fail to take hold in Malaysia,

offering insights into the necessary changes in policy and urban planning to support biophilic city initiatives.

Similarly, Abdul Tharim (2023) examines biophilic design strategies in green-rated office buildings in Malaysia. The study identifies significant benefits to occupants' psychological well-being and performance but notes a lack of awareness about these strategies among stakeholders. Through quantitative analysis, the study provides evidence that biophilic design enhances comfort and pleasure in indoor environments, reinforcing the importance of integrating these principles into office spaces.

Hamimi (2022), expands on this topic by identifying three main predictors for the successful implementation of biophilic design strategies in Malaysia and Indonesia: direct experience of nature, indirect experience of nature, and spatial design. This research complements the findings of Abdul Tharim by providing a more detailed framework for applying biophilic design in Southeast Asian contexts, with an emphasis on improving the psychological well-being of occupants.

Azan (2022), offers insights into the impact of biophilic design on human health in Kuala Lumpur, focusing on how natural elements in buildings contribute to psychological and physical health. The study emphasizes the importance of categorizing biophilic design patterns to maximize their restorative effects on individuals. These findings are particularly relevant for future studies aimed at developing guidelines for implementing biophilic designs in urban environments.

Finally, Nasar (2008) explores how environmental perceptions influence physical activity, contributing to the broader understanding of how biophilic design can encourage healthier lifestyles. While not specifically focused on biophilic design, the study provides valuable insights into how perceptions of the environment can affect behavior, complementing other studies that highlight the psychological and physical health benefits of biophilic architecture.

In summary, the reviewed literature demonstrates a growing recognition of the importance of biophilic design in improving health, well-being, and sustainability. From indoor workspaces to urban environments, the integration of natural elements into architecture is shown to have significant psychological and social benefits. However, challenges remain in implementing biophilic design strategies, particularly in regions like Malaysia, where awareness and infrastructure may be lacking. Future research should focus on refining these strategies and expanding their practical applications across different architectural contexts.

Impact of Biophilic Design on Health, Well-being, and Sustainability

Biophilic design has been recognized for its significant influence on health and well-being, particularly in enhancing the physical and psychological comfort of individuals in built environments. Research highlights that natural elements and restorative environments contribute to stress reduction and mental recovery. For instance, the Stress Reduction Theory (SRT) emphasizes that features such as social support, movement, natural distractions, and environmental control help alleviate stress and improve health outcomes (Mat Idris et al., 2021). Similarly, the Attention Restorative Theory (ART) underscores how attributes like

fascination and compatibility within an environment can restore mental fatigue, promoting a sense of relaxation and focus.

Biophilic design elements, especially in indoor work environments, are categorized into experiences of nature, space, and comfort. These elements—such as natural light, water, greenery, and ergonomic design—impact multiple sensory domains, influencing both physical and psychological comfort. By addressing these factors, biophilic design plays a crucial role in reducing stress, mitigating health risks, and improving mood and overall happiness (Wijesooriya et al., 2023; Wu et al., 2022).

Furthermore, a sustainable design approach to biophilic environments includes strategies like integrating green spaces, transportation connectivity, and the work-live-play concept, fostering not only individual well-being but also environmental sustainability. These principles align with holistic health practices, ensuring that biophilic design promotes both personal and ecological benefits (Zulkifli et al., 2023).

Conceptual Framework

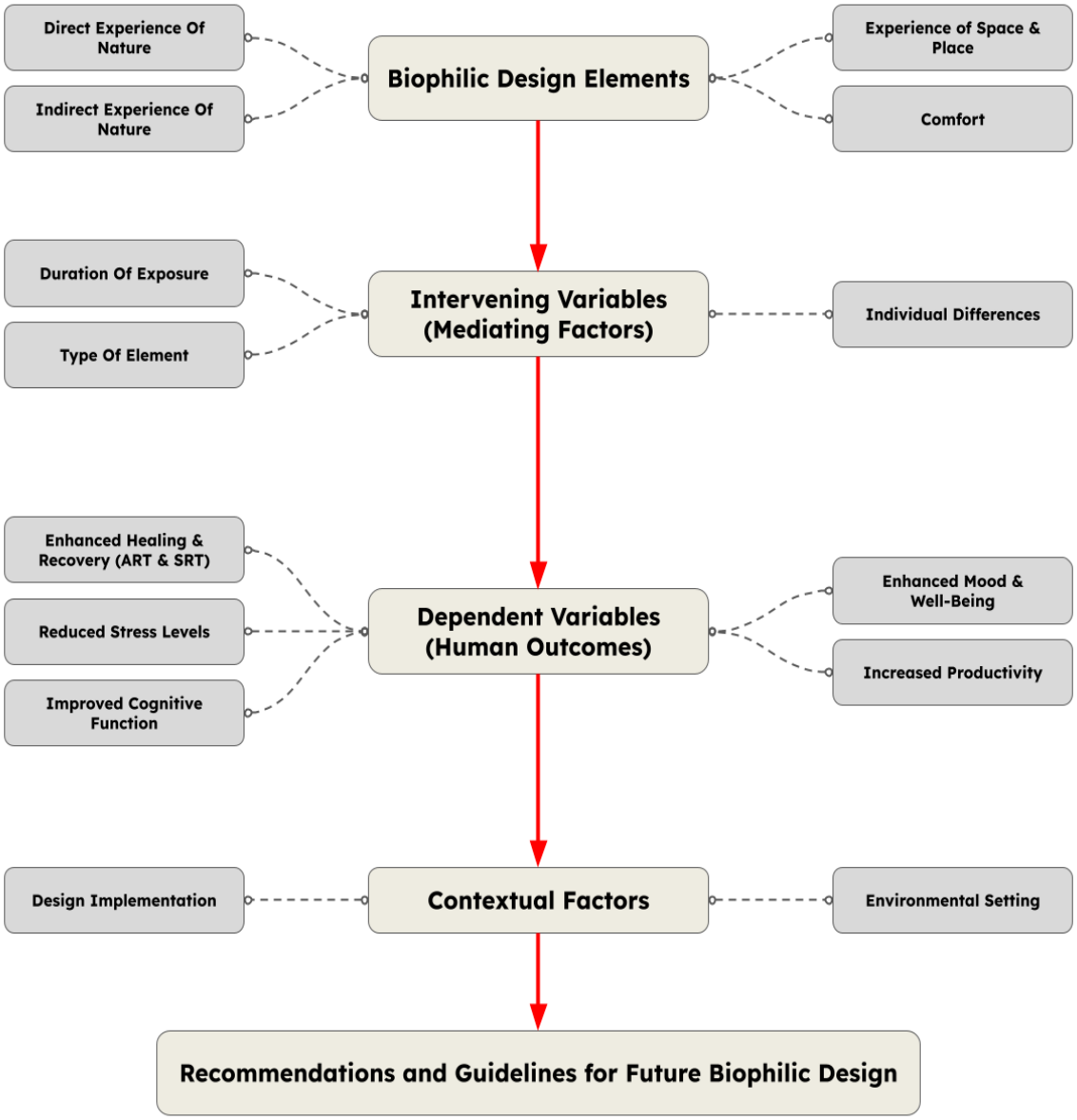

Figure 1: Conceptual Framework

The conceptual framework for biophilic design establishes the intricate relationships between design elements, mediating factors, and human outcomes within built environments. Biophilic design seamlessly integrates both direct experiences of nature, such as plants, water features, and natural light, as well as indirect experiences, including natural materials, colors, and patterns, to enhance occupants' overall spatial experiences, sense of place, and comfort. The effectiveness of these design elements is mediated by various factors, such as the duration of exposure, the specific type of biophilic element incorporated, and individual differences among occupants.

The ultimate goal of biophilic design is to yield a spectrum of positive human outcomes, including enhanced healing and recovery processes, reduced stress levels, improved cognitive function, elevated mood and overall well-being, and heightened productivity. However, these

outcomes are subject to contextual factors, such as the implementation of biophilic design principles within specific architectural projects and the surrounding environmental setting.

This conceptual framework serves as a guiding tool for future research and practice in biophilic design, offering recommendations and guidelines aimed at optimizing human well-being and performance in built environments. By understanding the interplay between design elements, mediating factors, and human outcomes, architects and designers can make informed decisions to create spaces that foster a deeper connection with nature and promote holistic well-being for occupants.

Conclusion

The exploration of biophilic design in the context of Malaysian architecture offers valuable insights into the intersection of culture, nature, and built environments. Throughout this thesis, we have delved into the significance of biophilic design as a means to reconnect urban dwellers with the natural world, addressing both environmental concerns and human well-being.

From the theoretical framework to the systematic literature review, we have identified key elements and principles of biophilic design and explored their potential impacts on emotional well-being and psychological health. By bridging the gap between theory and practice, we have highlighted the motivational challenges inherent in implementing biophilic design within the Malaysian architectural landscape, emphasizing the importance of cultural relevance and stakeholder engagement.

Through our research questions and objectives, we have laid the groundwork for further inquiry into the effective implementation and evaluation of biophilic design interventions in Malaysian architecture. By addressing these research gaps, we can better understand how biophilic principles can be tailored to suit local contexts and contribute to the creation of healthier, more sustainable built environments.

In conclusion, the integration of biophilic design into Malaysian architecture holds immense potential for enhancing the well-being of occupants and promoting environmental stewardship. By embracing biophilia as a guiding principle, architects, developers, and policymakers can create spaces that not only support human health and happiness but also foster a deeper sense of connection with the natural world. As we move forward, it is imperative to continue exploring innovative strategies for incorporating biophilic elements into architectural practice and monitoring their long-term impacts on both individuals and communities. Through collaborative efforts and a commitment to sustainability, we can build a future where architecture not only enriches our lives but also nurtures the planet we call home.

References

Abdul Tharim, A. H., Mohamed Saraf, M. H., Che Ahmad, A., Mohamed Saraf, M. H., Ahmad, A. C., Purwanto, E., Tafridj, I., Purisari, R., & Prasetio, T. (2023). Biophilic Design Strategies Performance in Malaysian Green Rated Office Buildings. *International Journal of Academic Research in Business and Social Sciences*, *13*(4). https://doi.org/10.6007/ijarbss/v13-i4/16673

Azan, A. R. A., & Ismail, L. H. (2022). The Impact of Biophilic Design Building on Human Health and Wellbeing of The Physical Environment in Kuala Lumpur. *… Trends in Civil Engineering and Built …*, *3*(1), 1857–1863.
https://publisher.uthm.edu.my/periodicals/index.php/rtcebe/article/view/3010%0Ahttps://publisher.uthm.edu.my/periodicals/index.php/rtcebe/article/download/3010/2243

Downton, P., Jones, D., Zeunert, J., & Roös, P. (2017). Biophilic Design Applications: Putting Theory and Patterns into Built Environment Practice. *KnE Engineering*, *2*(2), 59. https://doi.org/10.18502/keg.v2i2.596

Gillis, K., & Gatersleben, B. (2015). A review of psychological literature on the health and wellbeing benefits of biophilic design. *Buildings*, *5*(3), 948–963. https://doi.org/10.3390/buildings5030948

Gray, T., & Birrell, C. (2014). Are biophilic-designed site office buildings linked to health benefits and high performing occupants? *International Journal of Environmental Research and Public Health*, *11*(12), 12204–12222. https://doi.org/10.3390/ijerph111212204

Hamimi, A., Tharim1, A., Ahmad1, A. C., & Sidrotul, P. (2022). the Determinant Factors of Biophilic Design Strategies and Occupants' Psychological Performance in Office Building. *Malaysian Journal of Sustainable Environment Special Issue*, 87–106. https://doi.org/10.24191/myse.v9i3.18292

Mat Idris, M., Sibley, M., Hadjri, K., & Abd Manaf, A. (2021). Factors Influencing the Visit to the Courtyard Gardens in Public Hospitals in Malaysia. *Asian Journal of Environment-Behaviour Studies*, *6*(20), 29–47. https://doi.org/10.21834/ajebs.v6i20.396

Nasar, J. L. (2008). Assessing Perceptions of Environments for Active Living. *American Journal of Preventive Medicine*, *34*(4), 357–363. https://doi.org/10.1016/j.amepre.2008.01.013

Siebring, E. (2020). *Biophilic Urbanism in the Netherlands*. 1–23.

Soto, M., Xue, H., & Tsekleves, E. (2022). Diseño para el equilibrio bienestar y salud. *Base Diseño E Innovación, 7*(6), 4–11. https://revistas.udd.cl/index.php/BDI/article/view/786/609

Wijesooriya, N., Brambilla, A., & Markauskaite, L. (2023). Biophilic design frameworks: A review of structure, development techniques and their compatibility with LEED sustainable design criteria. *Cleaner Production Letters*, *4*(February), 100033. https://doi.org/10.1016/j.clpl.2023.100033

Wu, Y., Wu, S., Qiu, X., Wang, S., Yao, S., Li, W., You, H., Zhang, J., Xia, S., & Guo, Y. (2022). Integrated Evaluation Method of the Health-Related Physical Environment in Urbanizing Areas: A Case Study From a University Campus in China. *Frontiers in Public Health*, *10*(February), 1–18. https://doi.org/10.3389/fpubh.2022.801023

Zhong, W., Schröder, T., & Bekkering, J. (2022). Biophilic design in architecture and its contributions to health, well-being, and sustainability: A critical review. *Frontiers of Architectural Research*, *11*(1), 114–141. https://doi.org/10.1016/j.foar.2021.07.006

Zulkifli, N. H., Sapian, A. R., & Ibrahim, P. H. (2023). Conceptual Framework of Biophilic Design Elements (BDE) for Indoor Work Settings. *Jurnal Kejuruteraan*, *si6*(1), 123–137. https://doi.org/10.17576/jkukm-2023-si6(1)-12