

# Enhancing Next-Generation Workplaces by Developing Office Interior Architecture with Biophilic Elements

\*Yalın Tan<sup>1</sup>, Vural Armutcuoğlu<sup>1</sup>, Mehmet Macid Aksu<sup>1</sup>

Yalın Tan İç Mimarlık Tasarım Uygulama LTD. ŞTİ, İstanbul, Turkey<sup>1</sup>

E-mail <sup>1</sup>: ytan@yalintanandpartners.com, E-mail <sup>1</sup>: varmutcuoglu@yalintanandpartners.com, E-mail <sup>1</sup>: mmaksu@yalintanandpartners.com

## Abstract

In today's world, with the impact of Covid-19 on businesses, hybrid work models have become necessity, and health and safety concerns have increased. Biophilic design has played a significant role, adapting to new requirements such as social distancing and hygiene in interior spaces. Biophilic design boosts employee motivation, performance, and enhances workplace ambiance through nature interaction. This study examines how biophilic design can be utilized to adapt to hybrid work models and enhance employee health and well-being. Innovative design proposals based on biophilic design principles, including plant arrangements, natural lighting, ventilation optimization, and flexible workspaces, have been developed. These designs adopt a human-centered approach, considering ergonomics, productivity, and employee well-being. Consequently, this study provides a comprehensive understanding of the importance of biophilic design for businesses and how interior workspaces can be designed. Additionally, the use of sustainable materials and energy efficiency was emphasized in the design process.



**Keywords:** Biophilic Design; Workplace Interior Design; Sustainability; Ergonomic Design; Work Efficiency.

## 1. Introduction

With the Covid-19 pandemic, businesses' transition to hybrid working models and people's increased health and safety concerns have made it necessary to rethink workplaces. With this change, new requirements such as social distance, cleanliness and hygiene have come to the fore, and the potential of biophilic design to adapt to these requirements has come to the fore. In this context, this study aims to investigate the potential of biophilic design to increase health, happiness and performance in workplaces. Modern workplaces generally consist of sterile and artificial environments. Such environments can leave employees feeling de-energized and susceptible to stress and health problems. It is stated that biophilic design can reduce these negative effects and increase employee well-being, safety and productivity by integrating natural elements into interior spaces. It has been emphasized in the literature that the integration of biophilic design into workplaces can have positive effects on the health, happiness and performance of employees. In particular, it has been stated that the use of biophilic elements such as natural light, vegetation and natural materials in interior spaces has positive effects on human psychology and physiology.

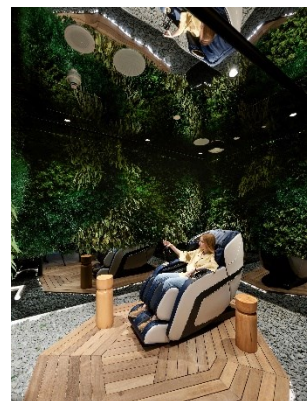
Although telecommuting dates back historically to the late 1960s, its implementation has been rare. However, in recent years, the demand for the remote working model has increased due to technological developments and the impact of the pandemic. This change has revealed that the current design of homes is not suitable for working from home. During the lockdown, many employees were forced to work from home, using existing spaces as temporary offices. This situation emphasized that houses should have factors such as natural lighting, heat and sound insulation. There are many studies addressing the applicability of biophilic design in workplaces, its advantages and benefits to businesses. These studies focus on the potential of biophilic design to reduce workers' stress levels, increase their concentration, and improve their overall well-being. As a result, this study aims to investigate the potential of biophilic design to increase health, happiness and performance in workplaces and to determine how this design can be

effectively applied to businesses. For this purpose, the study aims to develop an office interior architecture design that includes biophilic design principles and to help businesses adapt to hybrid working models.

Nowadays, businesses' transition to hybrid working models and increased health and safety concerns of employees require re-evaluation of office interior architecture and working environments. In this context, the integration of biophilic design into interior spaces and the adoption of sustainability principles can help businesses adapt to these new requirements. This project aims to develop an innovative and functional office interior architecture design for businesses. Within the scope of the study, extensive literature studies were examined to design office interior architecture containing biophilic elements to adapt to hybrid working models, and to



encourage the use of natural elements and sustainability principles to increase the health, happiness and work performance of employees (Afara et al., 2024; Amen et al., 2024 ). The quarantine period is reflected in the literature as a period in which living areas such as work, education, entertainment and exercise require a flexible approach and individuals are recommended to have at least a private room (Bettaieb and Alsabban, 2021; Cuerdo-Vilches et al., 2021; Nanda et al. , 2021). During the COVID-19 pandemic, many employees have had to use their existing living spaces as temporary offices (Nanda et al., 2021). In this context, it has been stated that the requirement for a minimum surface area of 60 m<sup>2</sup> in residences and the importance of residences overlooking green areas should be emphasized (Mirza, 2015). (Kaji-O'Grady and Glover, 2021) examined how biophilic design can be integrated in workplace interiors and the positive effects of this design on the efficiency of work spaces and employee health and happiness. (DeBlois et al., 2020) investigated how biophilic design can improve employee well-being and performance. This article focuses on the potential of biophilic design design principles, which include elements such as natural light, vegetation, natural materials and landscape, to reduce workers' stress levels, increase their concentration and improve their overall well-being. (Terrapin Bright Green, 2012 and 2015) evaluated the effects and economic aspects of biophilic design on indoor people. A review of the literature highlights the potential of biophilic design to reduce people's stress levels, improve their well-being, and provide economic benefits to businesses. Today, modern workplaces often consist of sterile walls, harsh lighting and artificial environments. Such environments can leave employees feeling disconnected from nature, lacking energy, and even susceptible to stress and health problems. However, it is stated that biophilic design can reduce these negative effects and increase the well-being, safety and productivity of employees by integrating natural elements into interior spaces. As a result, it is necessary to emphasize the importance of biophilic design within the corporate framework, to reflect the importance that businesses attach to the health and well-being of their employees and to emphasize the importance of benefiting from the positive effects of nature on people.



## 2. Material and Methods

The aim of this study is to evaluate the effects of the integration of biophilic design into workplaces on employee well-being and performance. In the research, workplaces where biophilic design was applied were directly observed. In order to evaluate the effects of the design on the employees, the practices in the spaces and the behaviors of the employees were observed. Previous studies on the effects, benefits and application methods of biophilic design were examined. The information and findings obtained from this literature review were compiled and evaluated. A cross-sectional study method was used to examine a situation using the same data sets at different time periods. The well-being and performance of employees in spaces where biophilic design is applied have been examined over a period of time. The case study method was adopted to examine a specific issue in detail. The effects of biophilic design applied in a specific workplace have been examined in detail. In order to evaluate the effects of the application of biophilic design in workplaces, natural lighting, vegetation and natural materials, which are design elements, were observed and architectural evaluations were made. Limitations of the research include the sample size, the diversity of selected business venues, and the limitations of the data collection methods used. In this study, an approach was adopted that evaluates the importance of the integration of biophilic design into workplaces for businesses and how this design can increase the health, happiness and performance of employees.

## 3. Results

The integration of biophilic elements into workplaces has been associated with a significant reduction in employee stress levels. Natural light, vegetation and the use of natural materials contributed to employees feeling calmer and more comfortable. Workers in workplaces with biophilic design features reported higher levels of mental health and mental well-being than those working in traditional office environments. Lower levels of stress and anxiety have been associated with happier and more satisfied employees overall. Evidence has been found that implementing biophilic design in workplaces increases employees' job performance. Happier and healthier employees tend to work more creatively, efficiently and effectively. Additionally, the integration of biophilic design elements into workplaces has increased the overall quality of work environments. A more natural and sustainable environment can increase employee motivation and improve the overall atmosphere of the workplace. The use of biophilic design in the workplace can have a positive impact on employer branding and reputation. Being perceived as employers who care about employees' well-being and happiness can help a company attract and retain employees.



These findings highlight the positive effects of biophilic design in workplaces, encouraging businesses to adopt these design principles. Thanks to the observations obtained, it was concluded that biophilic elements such as sunlight and natural vegetation are effective in reducing the stress and anxiety levels of employees. These findings highlighted the importance of biophilic design on physiological and mental well-being in workplaces.

In future studies, it is possible to create curved paths inspired by rivers or open spaces reflecting meadows to imitate natural forms and processes in the design layout. Additionally, the use of biomorphic furniture that resembles organic shapes can also be part of this design approach. These design elements aim to create a more organic and natural atmosphere in interiors by taking inspiration from nature. A literature review of scientific studies investigating the effects of sunlight, plants and other natural elements on employees' stress levels was conducted. It can be used in the design process to integrate various sensory elements of nature into space: sights, sounds, smells, textures and tastes. This can include natural light from plants, the calming sounds of water features, the aroma of wood, or even the taste of edible gardens. Creating designs that incorporate elements that change and evolve over time may include elements such as a butterfly garden that showcases metamorphosis, a rooftop garden that reflects seasonal changes, or dynamic lighting systems that mimic the movement of the sun. Such designs aim to enrich users' experiences by reflecting the dynamism and ever-changing elements of nature into interior spaces.

#### 4. Discussions

The integration of biophilic design into workplaces has been associated with a significant reduction in employee stress levels. Natural light, vegetation and the use of natural materials contributed to employees feeling calmer and more comfortable. Workers in workplaces with these design features reported higher levels of mental health and mental well-being than those working in traditional office environments. Evidence has been found that implementing biophilic design in workplaces increases employees' job performance. These findings highlight the positive effects of biophilic design in workplaces, encouraging businesses to adopt these design principles. It has been concluded that biophilic elements such as sunlight and natural vegetation are effective in reducing employees' stress and anxiety levels.



The workspace on the ground floor of the biophilic office is open and overlooks a green garden in the centre. This garden contains a variety of plant species and creates a cool microclimate with carbon dioxide absorbing plants such as grasses, shrubs and trees with sturdy leaves. The water element creates a soothing sound, creating a more natural atmosphere and reducing employee stress. The architecture and design processes provide a modern and contemporary look, with the design of the office space surrounded by curved and transparent walls reflecting the company's characteristic language. The 360-degree view of the vegetation provides an organic interaction with nature and enlivens the office interior. Flexible workspaces, collaboration areas and relaxation areas are designed to meet different work styles and needs. The study highlights the importance of ergonomic furniture design to support hybrid working models. These furniture have been specifically developed to support biophilic design principles and hybrid working models. Ergonomic furniture design plays a critical role in improving employees' work performance and supporting their well-being

As a result, a more effective and human-centered approach is adopted by supporting biophilic design principles and hybrid working models in work environments. These methods aim to create a natural environment indoors and increase users' health, happiness and work performance. In future studies, the potential of design to imitate natural forms and processes can be evaluated in a wide range of ways. It is thought that curved paths inspired by rivers can be aesthetic and functional elements that add calmness and fluidity to work spaces. These paths can provide employees with rest and walking opportunities, allowing them to relax both physically and mentally. Open spaces reflecting the meadows can bring the cool and expansive atmosphere of nature to office interiors. These spaces can reduce stress and encourage creativity by providing employees with an outdoor experience. It can also support the illumination and energy efficiency of interior spaces by increasing contact with natural light.

The use of biomorphic furniture can have aesthetic and ergonomic features that resemble organic shapes and natural forms. While this type of furniture adds naturalness and warmth to work spaces, it can also increase the comfort and convenience of users. It is thought that furniture in organic form can help reduce employees' stress levels and increase their overall well-being. These design approaches aim to encourage biophilic design to encourage people to establish a deeper connection with the natural environment and experience the physical and psychological benefits that arise from this connection. Therefore, it is recommended that further studies be conducted on how such natural and organic design elements can be integrated in workplaces to increase the health, happiness and productivity of employees.



## 5. Conclusions

This study highlights the importance of biophilic design to adapt to hybrid operating models of businesses. Our findings show that biophilic design positively affects employee well-being, happiness and job performance in workplaces. It has been determined that design elements, especially natural lighting and vegetation, contribute to healthy and productive working environments both when working from home and in the office. These findings suggest that biophilic design is a viable solution for hybrid working models and that businesses can increase employee well-being, happiness and business performance if they adopt these design principles. This can provide significant gains for businesses in terms of sustainability, productivity and employee satisfaction.

In future studies, it is recommended to evaluate from a broader perspective how biophilic design is effective in different sectors and employee groups with demographic characteristics. Additionally, cost-effective analysis of biophilic design can be made for businesses. The contributions of this design to businesses can be determined by evaluating its effects on business performance, as well as factors such as return on investment, employee productivity and satisfaction. It is also important to conduct studies that evaluate the long-term effects and environmental impacts of biophilic design. The effects of the applied biophilic design on the health, motivation and performance of employees can be monitored for a long time. Studies can be conducted to evaluate the environmental effects of biophilic design. The contributions of factors such as the use of natural light, energy efficiency and the use of sustainable materials to environmental impacts can be investigated. Studies can be conducted on how biophilic design may differ in different cultures and geographical regions. Thus, a broader perspective on the universality and applicability of biophilic design can be gained. This and similar research can provide more information about how biophilic design can be applied more effectively in workplaces and improve practices in this field.

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## Conflict of Interests

The Author(s) declare(s) that there is no conflict of interest.

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