IRENE WINIFRED ENO GRANT RESEARCH PROJECT

AMERICAN SOCIETY OF INTERIOR DESIGNERS FOUNDATION

Title: Investigating the Potential Impacts of Views to Nature in Classrooms on Students' Cognitive Performance and Mental Fatigue

Researcher:

Hessam Ghamari, Ph.D.
Associate Professor of Interior Design
Department of Family and Consumer Sciences
California State University Northridge

EXECUTIVE SUMMARY

ABSTRACT

This project engages senior interior design students to investigate the impacts of different lighting attributes, including illuminance and spatial pattern of light, on wayfinding behavior in a complex healthcare environment (identified university community engagement partner, Los Angeles Home for Aging) by using Immersive Virtual Environments (IVEs). This study will create twelve IVE cases/scenarios with three different levels of illumination (200, 500, and 750 lux), and spatial pattern of light (uniform/nonuniform, direct/indirect, and central/peripheral). The IVEs will be created based on the physical environment characteristics of the healthcare environment. The IVEs will measure the participants' wayfinding performance while participants navigate the virtual environments to find assigned destinations. To address the impact of different lighting variables, this study collects data on the total time of navigation, success/failure in finding destinations, and visual points of interest (through an eye-tracking procedure). The findings of this study will provide design recommendations for improving the lighting design in complex healthcare environments. These would help create supportive environments that ultimately improve the quality of health and ameliorate anxiety and depression-like behavior for patients, staff, and family visitors. The findings of this study will also provide design recommendations for healthcare facilities regarding designing lighting. Students involved in this project will provide lighting design guidelines that can positively impact wayfinding and subsequently contribute to the recovery, rehabilitation, wellbeing, and quality of life for residents in assisted living facilities.

PROCESS

The process of developing this project began with identifying the research gap around the impact of classroom views of nature on students' cognitive performance and mental fatigue. After securing IRB approval and funding, the team created virtual environments replicating various classroom conditions. These environments allowed for controlled experimentation on how different types of nature views and daylighting affect student outcomes. The next step involved recruiting participants and conducting cognitive tasks in the virtual settings, followed by data collection and analysis.

Advantages: One key advantage was using virtual reality technology, which enabled precise manipulation of environmental variables, such as window placement and daylight exposure. This technology also created an immersive experience for participants, simulating real-world scenarios while maintaining experimental control. Additionally, collaborating with interior design students gave them practical experience in evidence-based design.

Challenges: Some challenges included the technical complexity of creating realistic virtual environments and ensuring the VR equipment functioned correctly during experiments. Recruiting participants and coordinating schedules posed logistical hurdles, as did ensuring the validity of the cognitive tasks in a virtual setting. Moreover, balancing the scope of the study with time and funding constraints required careful project management.

KEY FINDINGS

- **Design for Mental Health:** Focus on creating learning environments that promote relaxation and reduce anxiety, fostering a more supportive atmosphere for students' mental health and academic success.
- **Incorporate Natural Views:** Classroom designs should include windows or other features that provide direct or indirect views to nature, as these can improve students' cognitive performance and reduce mental fatigue.
- **Maximize Daylighting:** Ensure that natural light is a key element in classroom design, as daylight exposure has been shown to enhance mental health and improve focus.
- **Flexible Window Placement:** Strategically place windows to minimize distractions while maximizing visual access to outdoor greenery, balancing the need for both natural views and reduced noise.
- **Use of Virtual Environment** Simulations: Prior to finalizing classroom layouts, consider using virtual reality tools to simulate different design scenarios and assess their potential impact on student well-being and performance.

LESSONS LEARNED

1. **Importance of Evidence-Based Design**: The project reinforced the value of evidence-based design, highlighting how environmental factors like views to nature and daylighting can significantly impact cognitive performance and mental health. This approach allows for more informed and impactful design decisions in educational environments.
2. **Virtual Reality as a Research Tool**: Virtual reality (VR) proved highly effective for simulating different classroom conditions, providing insights that would be difficult to gather in real-world settings. However, the complexity of VR technology required careful planning and troubleshooting to ensure accurate results.
3. **Collaborative Learning Opportunities**: Engaging students in the research process enhanced their learning experience and contributed fresh perspectives. Their involvement demonstrated the importance of integrating academic research with practical, hands-on learning.
4. **Managing Technical and Logistical Challenges**: While VR offered significant advantages, it also presented equipment malfunctions and participant scheduling challenges. Flexibility and strong project management were essential in overcoming these obstacles.
5. **Broader Implications for Design and Mental Health**: This study underscored the growing need for designing learning environments that prioritize mental health. Views to nature and adequate daylighting should be central considerations in classroom design to foster healthier, more productive educational spaces.

PROJECT TIPS

- Defining the objectives clearly from the beginning is crucial to maintaining focus and measuring success effectively. A detailed project plan with timelines, resources, and contingency strategies is essential to address unforeseen challenges.
- Engaging stakeholders early in planning helps gather valuable input and build support. Regular communication with team members and stakeholders keeps everyone informed and involved.
- Conducting pilot tests before full-scale implementation can identify potential issues and allow for necessary adjustments.
- Implementing robust data collection and analysis methods ensures accurate and actionable results. Including a feedback mechanism allows continuous improvement, while thorough documentation of processes and decisions provides transparency and valuable reference for future projects.

RESEARCHER BIO

Dr. Hessam Ghamari is an Associate Professor of Interior Design at California State University, Northridge (CSUN). With over 15 years of experience as an architect and interior designer in Iran and the United States, he has contributed to healthcare, hospitality, commercial, and residential design projects. Dr. Ghamari earned his Ph.D. in Environmental Interior Design from Texas Tech University in 2014. He has published numerous articles in prestigious peer-reviewed journals and presented at international conferences on environmental psychology, evidence-based design, and healthcare environments. His research focuses on creating spaces that improve health and well-being by addressing users' physiological and psychological needs.

His design philosophy centers on creating healthy, human-centered environments. He integrates insights from environmental psychology, healthcare design, and evidence-based practices to enhance the quality of life across diverse settings. Dr. Ghamari holds leadership roles as the Director of Strategic Initiatives and a board member at the Interior Design Educators Council. He is also the Director of Academy Awards and a board member at the International Academy of Design and Health. His contributions to the field have been recognized with awards such as the Irene Winifred Eno Grant from the American Society of Interior Designers (ASID). Dr. Ghamari is also a U.S. Fulbright Research Scholar, reflecting his commitment to international collaboration and research excellence.