



**6th UNDERGRADUATE  
SEMINAR ON BUILT  
ENVIRONMENT  
AND TECHNOLOGY  
(USBET) 2023**

**SUSTAINABLE BUILT  
ENVIRONMENT**

**25 - 27 SEPTEMBER 2023**

**E-PROCEEDING**



**USBET 2023**



# e-Proceeding

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**Published by,**

Department Of Built Environment Studies And Technology  
Faculty Of Architecture, Planning & Surveying  
Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus  
*usbet.fspuperak@gmail.com*

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eISSN 2821-3076



02 October 2023 | Perak, Malaysia  
Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus

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# THE EFFECTIVENESS OF NATURAL LIGHTING FOR INDOOR FOOD COURT IN PERAK

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## ABSTRACT

*An investigation of the efficiency of natural lighting in indoor food courts is summarized in this abstract. This study's objective is to ascertain how well natural lighting may be used in a building's interior to suit occupant comfort needs while also reducing the energy consumption of the building. According to preliminary research, having natural illumination improves the dining experiences of patrons at indoor food courts. According to the study, natural light leads to a cosier and more welcoming atmosphere by fostering a feeling of openness and connectedness to the outside world. In environments with lots of natural light, participants reported feeling more at ease and at ease, which boosted their pleasure with their dining experience. This study will also comprise a problem statement and research objectives, as well as a literature review, data collection, analysis, and discussion, as well as a summary conclusion and presentation. The research procedure began with defining the research problems, which are the most important aspects of this study, and then moving on to data analysis based on the data collected. The methodology section of this study aims to outline the research design, approach, and methods employed to investigate the effectiveness of designing natural lighting in an indoor food court. By adopting a systematic approach, reliable data can be collected and analyzed.*

**Keywords:** *Natural Lighting, Indoor Food Court*

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## INTRODUCTION

The general focus of this study introduction is on natural lighting in food court areas. The problem statement was followed by research objectives, research questions, scope, and constraints in this study. Explain the overview of the research methodology and the assertion of significance in this chapter by referring to relevant studies or statistics. Based on the material provided, this research proposal investigates natural lighting in food court areas in Malaysia. People have a natural attractiveness and necessitate daylight. In general, Malaysia has many food courts in each state, which continued to grow over time. Food courts are becoming increasingly popular in numerous locations for people to dine and drink. Furthermore, the food court is more user-friendly in terms of design or structure in this era. It is quite rare to see a food court area, such as one found in a retail mall, that is smaller than the open space. It demonstrates that the building needs a natural environment to reduce the use of power and heat. (Kwon & Lim, 2017). The problem is that many facility managers are still unaware of the benefits and drawbacks of daylighting as a new technology.

Natural light conditions are dependent upon time, space, and environmental factors. Light conditions change throughout the day, night, and year. Lighting is also dependent upon the landscape, weather, lunar cycle, and celestial bodies. Furthermore, lighting is complicated by its own physical properties which include wavelength, frequency, polarization, hue, chroma, and intensity. It is vital that lighting is studied with all these parameters in mind as biological functions have evolved under specific lighting conditions that depend upon time, space, weather, and the spectral properties of light. (Seymoure, 2018)

The goal of this study is to determine the effectiveness for placing natural lighting in the building area to meet the comfort needs of the occupants while also lowering the building's energy consumption. Given the aim of the research, the research objectives are as follows:

1. To identify the effectiveness of natural lighting for indoor food court in shopping mall

## **LITERATURE REVIEW**

### **Definition of Natural Lighting**

Natural lighting, commonly referred to as daylighting, is a technique that effectively uses exterior glazing (windows, skylights, etc.) to bring natural light into your home, minimizing the need for artificial lighting and saving energy. There is evidence to suggest that natural illumination improves the health and comfort of building inhabitants. The comfort, health, and mood of a person are significantly influenced by natural illumination; however, this depends on our location. It adds value to a building's design and is essential to architecture. (The Ohio State University, 2012)

### **The Effectiveness of Daylighting on Food Court Health**

Daylighting, the practice of bringing natural light indoors, can significantly affect a food court's operations and general wellness. Natural light has many advantages that make the atmosphere healthier and more interesting in addition to improving the space's aesthetic appeal. The circadian rhythm, the internal clock that affects numerous physiological processes, including sleep-wake cycles, is regulated by exposure to natural light. A food court's use of daylighting can help the body's internal clocks better synchronize, which can enhance sleep quality and general wellness. (Brainard et al., 2016)

Furthermore, natural light enhances the visual quality of a space, improving visual comfort and making it easier to perceive details, colors, and textures. In a food court, this can enhance the presentation of food, making it more appealing to customers and potentially increasing their appetite. (Veitch & Newsham, 2017). Lastly, daylighting can reduce the reliance on artificial lighting during daylight hours, resulting in significant energy savings. Utilizing natural light effectively through well-designed windows, skylights, or light shelves can help reduce energy consumption and lower operational costs in a food court. (Mardaljevic et al., 2015).

### **Issues on natural lighting for indoor food courts**

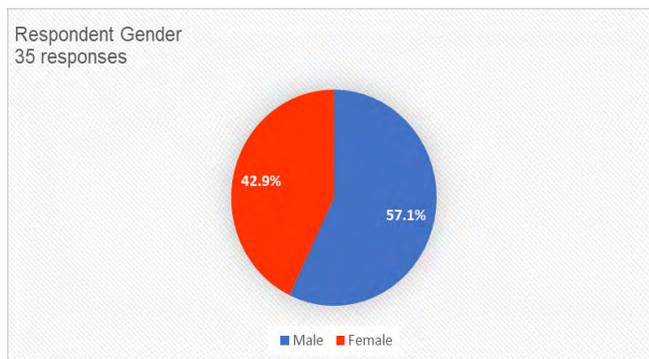
Today, ensuring that homes have appropriate insulation and typical natural lighting is a pressing global issue. The primary guidelines and specifications for residential area illumination and insulation were developed in domestic practice throughout the first half of the 20th century. The study demonstrates how, as cooperative, and municipal construction took off in the Soviet Union in the latter part of the 1920s and the early 1930s, there was a significant quest for mathematical techniques. (Vasilieva Anna V. et al., 2021).

## METHODOLOGY

The two types of questionnaires that can be used in research are open-ended questions and close-ended questions. Open-ended questions provide respondents the freedom to express their degree of knowledge, as opposed to closed-ended questions, which demand that respondents choose from a list of multiple-choice answers in accordance with the question. Both approaches were used in the questionnaire that assessed the respondent's knowledge of the subject. Sections A,B, and C make up the three sections of the questionnaire. English will be used to present it.

In section A, respondents will be questioned about their history, including their gender, age, race, and the respondent occupational. The purpose of Section B was to discuss the effectiveness of natural lighting for an indoor food court. The respondent could only choose "yes" or "no" from a list of possible answers in this section, and they could also pick the answer they wanted to use. Overall understanding of respondent awareness can be determined based on the respondent's response.

## DATA AND FINDINGS

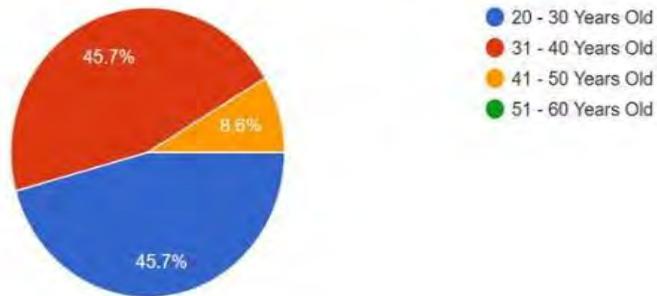


SECTION A: DEMOGRAPHIC QUESTION

**Figure 1: Respondent Gender**

## Respondent Age Range

35 responses



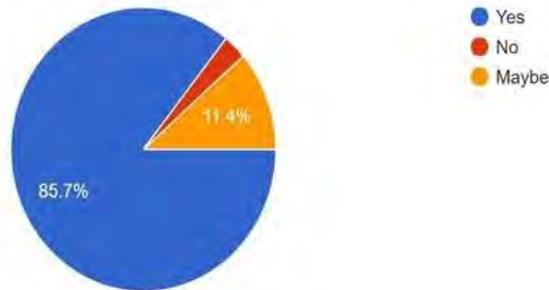
**Figure 2: Respondent Age Range**

The questionnaire was distributed using Google Form to engineers, architects, consultants, and individuals with experience working with natural illumination. Online respondents provided a total of 35 responses. Gender, age, and occupation are among the variables that Section A is founded on. The demographic survey covered every respondent's background. There was no lack of data. The basic objective of descriptive analysis is to know the respondent's profile. The fact that 42.9% of respondents were female shows that there are a lot of females in the sampled community. However, the 57.1% of male respondents shows that male make up most of the population polled. Male respondents outnumber female respondents in the pie chart because, depending on the type of survey or study, some industries or professions may have a higher percentage of male respondents. According to the data, respondents between the ages of 20 - 30 make up 45.7% of all respondents. In a similar vein, respondents between the ages of 31 - 40 account for 45.7% of all respondents. Additionally, the information shows that just 8.6% of respondents were between the ages of 41 - 50. Notably, the information shows that there were no responders between the ages of 51 - 60.

## Section B: To Identify the Effectiveness of Natural Lighting for Indoor Food Court

Do you find the lighting in indoor food courts to be important for your overall dining experience?

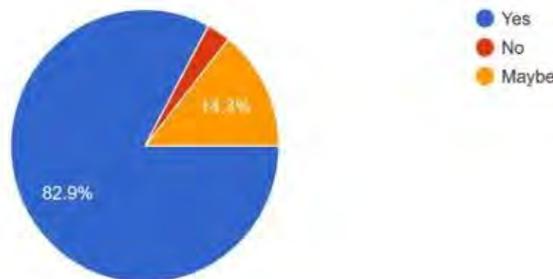
35 responses



**Figure 3: The Important of Lighting in Indoor Food Court**

Are you aware of any benefits associated with exposure to natural light while dining?

35 responses



**Figure 4: Benefits Associated with Exposure to Natural Lighting**

The study of the data gathered showed that the entire dining experience will be influenced by natural illumination. The majority of respondents, 30 (85.7%), agree that the lighting in indoor food courts is crucial. A sense of cleanliness is aided by clean lighting, which can also accentuate food presentation and improve the mood. A small minority of respondents, however, do not see lighting as being important, while a second group has conflicting views on the matter. Additionally, the vast majority of responders (80.6%) are aware of the advantages of dining in natural light. This emphasizes how important it is to have access to natural light while dining. The analysis of the collected data revealed that natural lighting has a substantial influence on customer perceptions and preferences in indoor food courts. In this section, the question only focuses on the effectiveness of natural lighting for indoor food court at Aeon Seri Manjung and Econsave Seri Iskandar.

Respondents expressed a strong preference for spaces with ample natural light, as it creates a pleasant and inviting atmosphere. Natural lighting was found to contribute to a sense of openness and spaciousness, leading to increased satisfaction and enjoyment among customers. Last but not least, the majority of respondents were extremely delighted with the lighting at Aeon Seri Manjung and Econsave Seri Iskandar's indoor food courts. This suggests that because natural lighting enhances the whole dining experience, it is often preferred. When evaluating the ambiance and appeal of various lighting conditions in food courts, it's crucial to take into account personal preferences and arbitrary judgments.

## **RECOMMENDATION**

It is advised that food court owners, designers, and managers give priority to incorporating natural lighting into their restaurants in light of these findings. Firstly, investigate specific lighting design elements that contribute to the effectiveness of natural lighting. Explore factors such as window placement, skylights, light fixtures, and their impact on the distribution of natural light throughout the food court. Analyze how these factors influence customer perceptions and satisfaction. Secondly, architects and designers should prioritize the inclusion of windows, skylights, and other elements that maximize the entry of natural light. This should be done in a way that ensures consistent illumination throughout the food court, taking into account factors such as building orientation and the position of surrounding structures.

Thirdly, while natural lighting is highly beneficial, it should be complemented with appropriate artificial lighting. This ensures consistent illumination during cloudy days or in the evening. Striking the right balance between natural and artificial lighting will create an optimal environment that meets both functional and aesthetic requirements. Furthermore, share the findings and best practices related to natural lighting in indoor food courts with industry professionals, architects, designers, and food court owners. Facilitate knowledge exchange and encourage the implementation of effective lighting strategies to enhance the overall dining experience for customers. Lastly, develop practical design guidelines for architects, designers, and food court managers to optimize natural lighting in indoor food court environments. These guidelines could encompass window placement, skylight design, shading strategies, and the use of light-reflective materials to maximize the benefits of natural lighting.

## **CONCLUSION**

The research on the usefulness of natural lighting for indoor food courts has shed important information on how lighting affects patron pleasure and experiences.

The main findings are outlined in this conclusion, which also emphasizes the value of natural lighting in improving food courts' all-around ambiance. The analysis of the collected data revealed that natural lighting has a significant positive effect on customer satisfaction in indoor food courts. The majority of the respondents expressed their point of view about the natural lighting for indoor food courts at Aeon Seri Manjung and Econsave Seri Iskandar. Furthermore, the research demonstrated that natural lighting has a direct impact on customers' perception of food quality. Customers reported that food appeared more visually appealing and appetizing under natural light, leading to increased satisfaction and enjoyment of their meals.

Based on the researcher's observations and questionnaires issued to Engineers, Consultant, Architect and people who involved in natural lighting, a number of issues with natural lighting were found that have an influence on the occupants' comfort level and the effectiveness of natural lighting for indoor food court. The second objective was to assess how much the food court area would be using natural lighting. The findings of this research have important implications for food court owners, designers, and managers. Incorporating natural lighting into the design and layout of indoor food courts can enhance the overall customer experience, leading to increased satisfaction, longer stays, and potentially higher revenue. Additionally, these findings emphasize the need for strategic placement of windows and skylights to optimize the distribution of natural light throughout space. In conclusion, the effectiveness of natural lighting for indoor food courts has been established through this research.

## **ACKNOWLEDGEMENT**

I'm quite appreciative that everything is going well as I complete this work. My deepest appreciation goes out to Sr. Siti Zubaidah Binti Hashim, who is overseeing my academic project, for her patient direction, enthusiastic support, and helpful criticism on this thesis. She carefully guides me and always makes sure I understand each chapter, for which I am incredibly grateful. She gave me a clear comprehension of the topic throughout the critique session, which inspired me to give this task my best effort. My appreciation for my family, especially my parents, who have always been my rock and motivate me to put my all into whatever I do, especially my studies come next. I might not be able to finish this thesis without their support and love. Not to mention, a sincere thank you to all my classmates for always sharing and supporting one another in times of need during this trying period. Thankyou!

## REFERENCES

- Brainard, G. C., Hanifin, J. P., Greeson, J. M., Byrne, B., Glickman, G., Gerner, E., & Rollag, M. D. (2016). *Action Spectrum for Melatonin Regulation in Humans: Evidence for a Novel Circadian Photoreceptor*.
- Mardaljevic, J., Heschong, L., & Lee, E. (2015). Daylight metrics and energy savings. *Lighting Research and Technology*, 41(3), 261–283. <https://doi.org/10.1177/1477153509339703>
- Veitch, J. A., & Newsham, G. R. (2017). Lighting quality and energy-efficiency affect task performance, mood, health, satisfaction, and comfort. *Journal of the Illuminating Engineering Society*, 27(1), 107–129. <https://doi.org/10.1080/00994480.1998.10748216>
- Vasilieva Anna V., Kosenkova Julia L., & Shubenkov Mikhail V. (2021). *Light & Engineering*. 2021.
- The Ohio State University. (2012). *NATURAL LIGHTING*.

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