Adaptive reuse of heritage building and the impact to the visual comfort: Assessed by the lighting quality

Rani Prihatmanti*, Maria Yohana Susan

*Interior Architecture Department, Ciputra University, Surabaya-Indonesia

*Corresponding author. Tel.: +6231-745-1699; fax: +6231-745-1698
E-mail address: rani.peanut@gmail.com

Abstract

Heritage buildings are designed mostly to be adaptive with the local climate. The main purpose of these adaptive strategies is to create users' thermal comfort as well as solving the problem of high rain precipitation in the tropical climate area. These thermal adaptation strategies will definitely influence room daylight condition. External shading device used in heritage building is one of thermal adaptation strategies, but it will also obstruct the daylight penetration. Design solution should be thought to maximise daylight condition. However, the design solution for heritage building has its own limitations where certain guidelines must be adhered, especially when resizing the existing windows to obtain better daylight condition is needed. This research studies the daylight condition on the designated schools and finding the most feasible solutions to overcome the lighting problems. The existing condition of the daylight was measured using lux meter and the data obtained were analysed descriptively by comparing to the related references in order to gain a maximum result. A simulation by using computer software was also conducted for simulating daylight level in both buildings. Based on the measurements that have been conducted, it shows that the daylight level on the designated buildings was below the standard and the current artificial lighting system was also failed to create the standard illuminance level. The solutions for this problems are resizing the window or creating an artificial lighting system. Although in this research proposes 2 solutions to overcome the problems, the latter solution is considered as the most feasible solution to treat heritage building to be a visually comfortable building without major alteration on the building fabrics since both studied buildings are listed as a National Heritage Monument.

Keywords: heritage building; adaptive reuse; daylight; artificial lighting; solutions

1. Introduction

School building can be defined as the learning environment for every people. It plays an important role in learning performance and productivity on both students as well as the educators. According to (Bernardi & Kowaltowski, 2006), schools should be safety, accessible, and comfort for all the users. Comfort can be defined as the favorable conditions related to functionality, thermal, illumination, and its acoustic conditions. Unfavorable conditions of comfort in schools, such as high temperatures, excessive noise, inadequate illumination, excessive