

Assessment on Accuracy of Design Science Research (DSR) Framework as a Daylighting Measurement Tool for Islamic Religious School

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Abstract

Daylight efficiency correlates to window design. Standards and guidelines recommended 20% window to floor ratio (WFR) at 800mm to 900mm windowsill height for classrooms, where it should provide the recommended illuminance level between 300 lx to 500 lx measured at working plane height (WPH) between 800mm to 900mm. Instead, Islamic religious schools use 'rehal' at 300mm WPH. Since that the WPH is lower, the measured illuminance level is at different intensity. This paper assesses the accuracy of Design Science Research (DSR) methodology framework adaptation in measuring and designing daylight consideration in Islamic religious schools that uses lower working plane height.

Keywords: Daylighting; Islamic religious school; methodology framework

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1.0 Introduction

Many research shows that students' learning performance is affected by daylight conditions. Due to its importance to human well-being, standards and guidelines were introduced to recommend various parameters for classroom design, such as the average illuminance level and the window-to-floor ratio (WFR). Illuminance level is defined as the reflected light from a source on a working plane, then received by the human eye. Most standards and guidelines recommended 300 lx to 500 lx of illuminance level in any learning space (MS1525, 2014). The illuminance level is measured at 800mm to 900mm working plane height (GBI, 2009). However, the Islamic religious schools in Malaysia uses a table with a significantly lower working plane height known as 'rehal'. The working plane height of the 'rehal' is suited for tasks at 300mm height, suitable for sitting in a cross-legged position (Neufert, et al., 2012). Meanwhile, these standards and guidelines also recommend the design of the learning spaces' window.

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