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Investigating the impacts of shaded outdoor spaces on thermal adaptation and cognitive performance of children in classroom environments

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The effects of green areas and shading strategies have been identified as an effective means to reduce urban risk factors such as the Urban Heat Island (UHI) effect. Even though the importance of shaded outdoor spaces and thermal comfort have been well documented in the existing literature; there is still limited research on how these spaces can influence thermal adaptability and cognitive performance in primary school children.

As a result, the aim of the study is twofold: (1) to evaluate the effect of outdoor shaded spaces upon thermal comfort; and, (2) link such results upon the cognitive performance of primary school students in a classroom environment with natural ventilation. A case study shall be conducted with primary school students between the ages of 8-10 in the Bilkent Primary School in Ankara during the month of September.

The quantitative thermal microclimatic conditions of unshaded/shaded areas of the schoolyard and indoor classrooms are obtained through the Physiologically Equivalent Temperature (PET) index. The qualitative evaluation of thermal comfort is undertaken by using both the adaptive model, and a complementary thermal sensation survey. As a result, both human physiological and psychological attributes of thermal comfort adaptation shall be evaluated and cross-examined in the study. Attention and memory tasks are given to the respondents in order to measure the cognitive performance of the students that are subjected to different experiences of outdoor shading levels.

The outcome of this individual study shall pinpoint the contributions of shaded outdoor green spaces upon the thermal adaptability and cognitive performance of children within classroom settings.