



# The Impact of outdoor shading strategies on Student thermal comfort in Open Spaces Between Education Building

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## Abstract:

The aim of this study is to evaluate and improve student thermal sensation in the open spaces of the Faculty of Engineering, Assiut University, Egypt using different shading strategies. Firstly, the thermal conditions of outdoor spaces were evaluated based on field measurements in different locations of shaded outdoor spaces between educational buildings within the Faculty of Engineering. Then, the microclimate model ENVI-met was applied to evaluate the impact of different shading scenarios on improving student thermal comfort. Also, the Thermal Sensation Vote (TSV) of the was studied by a questionnaire survey using the 118 effective questionnaire responses of the student sitting in the spaces between buildings. Hence, the results concluded that high air temperature is found in most outdoor open spaces, especially in the sitting area with low trees density and high Sky View Factor (SVF). Similar results were obtained by the TSV analysis. In addition, a significant reduction in the Predicted Mean Vote (PMV) values resulted from the ENVI-met simulation model with an average temperature difference of 0.7 °C due to increasing tree density for the main open space. Thus, it is recommended to increase greenery and tree density, to reduce heat stress and create student thermal comfort in outdoor.

## Keywords:

Outdoor open space Students thermal sensation Assiut University ENVI-met model.

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