THERMAL COMFORT OF STUDENTS' ACCOMMODATIONS IN UNIVERSITI SAINS MALAYSIA

by

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KESELESAAN TERMAL PENGINAPAN PELAJAR

DALAM UNIVERSITI SAINS MALAYSIA

ABSTRAK

Keselesaan termal tempat tinggal adalah penting kepada kesihatan, moral, produktiviti, dan kualiti kerja bagi pelajar yang menginap di bangunan asrama serta penginapan lain di kampus. Sebagai sebuah universiti yang mementingkan nilai keselesaan pelajar sama seperti pendidikan, iaitu sebagaimana yang ditunjukkan melalui konsep "Kampus Sejahtera" dan "Universiti Dalam Taman", maka Universiti Sains Malaysia (USM) perlu mengambil berat keadaan keselesaan termal yang terdapat di bangunan asrama penginapan para pelajarnya. Bangunan asrama perlu berperanan sebagai tempat perlindungan dan memberi keselesaan termal untuk pelajar. Justeru, satu kajian dijalankan untuk mengkaji perkara berikut: (1) faktor utama yang mempengaruhi keselesaan termal pelajar USM di bangunan asrama, (2) persepsi pelajar terhadap keadaan keselesaan termal di USM dan tahap keselesaan, dan (3) reka bentuk asrama di USM yang boleh menyediakan keselesaan yang optimum. Bagi tujuan kajian ini, sembilan asrama yang terdapat di kampus induk USM dipilih dan dibahagikan kepada tiga kategori. Pertama, asrama tingkat-rendah (LRH), iaitu bangunan asrama berketinggian tidak melebihi tiga tingkat. Kedua, asrama tingkat-sederhana (MRH), iaitu bangunan asrama berketinggian empat hingga enam tingkat. Ketiga, asrama tingkat-tinggi (HRH), iaitu bangunan asrama berketinggian melebihi sepuluh tingkat. Kajian ini melibatkan tinjauan soalselidik melibatkan 900 orang penghuni bangunan asrama dan pengukuran parameter persekitaran dalaman. Keputusan analisis menunjukkan bahawa halaju udara mempunyai kesan paling utama terhadap keselesaan termal di bangunan, diikuti dengan kadar aktiviti. Sementara itu, suhu udara dan kelembapan bandingan mempunyai kesan yang paling sedikit. Hampir 50% daripada responden melaporkan bahawa mereka mengalami keadaan hangat dan panas yang tidak menyelesakan. Hal ini menunjukkan bahawa mereka secara munasabah telah menyesuaikan diri dengan keadaan termal bangunan. Namun demikian, 90% daripada responden mengatakan bahawa mereka lebih suka pada keadaan suhu yang lebih sejuk. Analisis menggunakan skala sensasi termal terhadap suhu udara dalaman yang diukur, menunjukkan bahawa suhu selesa yang ideal kepada pelajar adalah 28.9 °C, berdasarkan julat keboleh terimaan termal yang diperolehi, iaitu 27.8 °C hingga 30.3 °C. Pelajar juga lebih menyukai asrama dalam kategori LRH.

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ABSTRACT

Thermal comfort is vital to the health, morale, productivity, and work quality of students living in hostels and other campus accommodations. Being a university that values student comfort as well as education-as demonstrated by its "Healthy Campus" and "University in a Garden" concepts, Universiti Sains Malaysia (USM) needs to address the thermal comfort conditions in its hostels. Hostels should provide students with both shelter and thermal comfort. Therefore, a study was conducted to examine the following: (1) major factors affecting the thermal comfort of USM students living in campus hostels, (2) students' perceptions on thermal conditions at USM and the resulting comfort level, and (3) the optimum USM hostel design that would provide optimum comfort condition. For the purpose of this study, the nine hostels at USM main campus were divided into three categories: low-rise hostels (LRH) not more than three storeys, medium-rise hostels (MRH) four to six storeys, and high-rise hostels (HRH), which have ten storeys and above. The study was carried out by a questionnaire survey of 900 hostel residents, as well as direct measurement of indoor environmental parameters. Result of the analysis showed that air velocity had the greatest effect on thermal comfort in the hostels, followed by activity rate. Meanwhile, air temperature and relative humidity, had the least effect. Slightly more than 50% of the surveyed students reported feeling uncomfortably warm and hot, indicating that they were reasonably adapted to their hostels' thermal conditions. However, 90% of the students stated a preference for cooler conditions. Analysis using the thermal sensation scale against measured indoor air temperature showed that the students' ideal comfortable temperature was 28.9 °C, based on the established thermal acceptability range of 27.8 °C to 30.3 °C. Students also preferred hostels in the LRH category.