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Investigation of the Indoor Environmental Quality (IEQ) in Lecture Theatres: A Sri Lankan Case Study

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Abstract

A higher educational student spends around 3-8 years in institutional buildings. Thus, it is of a prime importance to maintain proper Indoor Environmental Quality (IEQ) in lecture theatres in higher educational institutions as inadequate IEQ will lead to Sick Building Syndrome (SBS) and Building Related Illnesses (BRI). When it comes to the Sri Lankan context, there are only limited studies done on assessing the IEQ in institutional buildings. Therefore, the purpose of this research is to assess the IEQ of lecture halls by considering various parameters such as indoor air quality, thermal comfort, visual comfort and acoustic comfort for mechanically ventilated lecture halls. This study has investigated whether IEQ of the higher education facilities complies with the American society of heating, refrigerating and air-conditioning engineers (ASHRAE) standard which is the current standard we are using in Sri Lanka for the IEQ assessment. The study has also performed a qualitative assessment of the IEQ through questionnaire surveys with the students and assessed whether it there is a co-relation with the IEQ and SBS. Five different lecture theatres of different indoor environmental conditions at University of Sri Jayewardenepura, Faculty of Applied Sciences premises were selected to carry out the investigation. Different IEQ parameters such as thermal comfort, indoor air quality, visual comfort and acoustic comfort were measured with using specific instruments. Quantitative data collection was done throughout a semester and qualitative data collection was done using a questionnaire. A statistical data analysis was conducted to assess whether there are co-relations between the IEQ and the SBS symptoms for the particular lecture halls.The results have shown that some of the lecture theatres have exceeded standard values of indoor CO_2 levels when compared to the ASHRAE standards. However, it could be improved by allocating the students with the proper occupant density.There were some disturbances to the acoustic comfort in certain lecture halls due to some ventilation machineries. The results of this study could be used for the future improvements in designing of the lecture theatres for the higher education facilities in Sri Lanka.

Keywords: Indoor environmental quality (IEQ), Sick building syndrome (SBS), Building related illnesses (BRI)