

Accepted Manuscript

A new index combining thermal, acoustic, and visual comfort of moderate environments in temperate climates

C. Buratti, E. Belloni, F. Merli, P. Ricciardi



PII: S0360-1323(18)30249-X

DOI: [10.1016/j.buildenv.2018.04.038](https://doi.org/10.1016/j.buildenv.2018.04.038)

Reference: BAE 5434

To appear in: *Building and Environment*

Received Date: 22 November 2017

Revised Date: 22 March 2018

Accepted Date: 27 April 2018

Please cite this article as: Buratti C, Belloni E, Merli F, Ricciardi P, A new index combining thermal, acoustic, and visual comfort of moderate environments in temperate climates, *Building and Environment* (2018), doi: 10.1016/j.buildenv.2018.04.038.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

A NEW INDEX COMBINING THERMAL, ACOUSTIC, AND VISUAL COMFORT OF MODERATE ENVIRONMENTS IN TEMPERATE CLIMATES

C. Buratti^{a*}, E. Belloni^a, F. Merli^a, P. Ricciardi^b

^a Department of Engineering, University of Perugia, Via G. Duranti 67, 06125 Perugia, Italy

^b Department of Architecture and Civil Engineering, University of Pavia, Via Ferrata 1, 27100 Pavia, Italy

* Corresponding author. e-mail: cinzia.buratti@unipg.it

ABSTRACT

Students spend a lot of time at school, highlighting the great importance of providing comfortable conditions in educational buildings. Indoor environmental conditions are also related to student productivity and well-being, but Literature reviews mainly examine the effects of single parameters on human comfort, lacking in the evaluation of comfort combining different aspects, such as thermal, acoustic, and visual ones. The aim of the paper is to propose an index for the evaluation of the environmental comfort tacking into account thermal, acoustic, and lighting conditions. Seven university classrooms were investigated; measurements of environmental factors were performed including thermal, acoustic, and lighting parameters. Subjective evaluations were also carried out through survey questionnaires purposely elaborated. Three single indexes were proposed basing on the strongest correlation between questionnaire's answer and experimental results: a Predicted Mean Vote Index for the thermo-hygrometric conditions, a Sound Index for the acoustic comfort, and a Visual Index for the lighting conditions. All the indexes are dimensionless and normalized in a 0-1 range: values next to 1 indicate good comfort conditions and values next to 0 indicate bad comfort conditions. On the basis of different weights given for the three aspects, a final combined comfort index was calculated for each classroom and compared with questionnaires results, in order to assess the methodology.

Keywords: thermal comfort, acoustic comfort, visual comfort, combined comfort index , classrooms, questionnaire.

Download English Version:

<https://daneshyari.com/en/article/6697067>

Download Persian Version:

<https://daneshyari.com/article/6697067>

[Daneshyari.com](https://daneshyari.com)