ABSTRACT

Thermal comfort is the state of mind that represents fulfillment with the environment. Thermal comfort varies from one person to another. To maintain thermal equilibrium it is necessary that the heat generated as a result of human activities is made to dissipate at a rate to maintain equilibrium within the body. Discomfort occurs when the heat gain or heat is beyond this result. Understanding thermal comfort is vital to architecture since it acts as a base for the foundation for building design but also affects the field of sustainable design. New models of thermal comfort propose that a narrow temperature range should be applied equally across all building types, zones, and populations. This method casts the building occupants as subject of thermal applications, leading to thermal comfort standards that require energy-intensive environmental control strategies. Often this can result in a large need for air conditioning. Initial research and new Heating, Ventilating, and Air Conditioning (HVAC) design systems are challenging the accepted ideas of thermal comfort parameters on the foundation that they overlook principal cultural, climatic factors of comfort.

The Predicted Mean Vote (PMV) model stands among the most apperceived thermal comfort model. Heat balance and experimental data were obtained under the control and steady condition environment for its development. This model is valid for all buildings which are air conditioned.

Based on Predicted Mean Model study was carried out in a small office building located in Jamshoro, Sindh, Pakistan by changing its construction materials. Four cases were considered i.e. Concrete wall, Single Brick wall, Double Brick Wall and combination three layers (Wood, Wool and Concrete block). The 2-D plan and 3-D model of a building was carried out in AutoCAD 2017 and Sketch up 2018 respectively and, all the parameters of the building were

defined in Energy plus 2.13 Software. Based on the simulation results the PMV of the Concrete Wall was found to be much more as compared to other 3 cases. While, PMV of the Wood, Wool and Concrete block was much less in comparison to others.