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The Effects of Thermal Discomfort on Health, Comfort and Intellectual Performance of Human being

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ABSTRACT: The principle concern of this paper is to find the problems to the humans when they losing the Thermal comfort, Building performance analysis and the Thermal analysis where carried out in the college campus and the result so that thermal conform is not provided at block II of the college campus.

We made an survey to students and staff. Ask about the heat and what the problem it cause them to Health problem to the occupant, due the over heat and high room temperature cause the physical and mental disturbance and problem to the occupant.

Due to the high heat and high room temperature cause the high impact in the Exam results and also in their health and its affects the student concentration toward the classes and the thermal comfort can provided by using the combination of facades, namely Green facade, solar facade and dynamic facade which minimize the heat radiation and maximize the ventilation and visual comfort.

KEYWORDS: Health problem; Dynamic facade; solar cladding; sustainable design; Green Facade; Thermal Comfort; Building Integrated Green Facade; Autodesk Formit 360; Autodesk Insight; Autodesk Flow design

I. INTRODUCTION

The research and survey carried out to provide the thermal comfort and visual comfort to the block II in the College campus because it's have more radiation over the south facade wall it can be minimized by using the dynamic facade and other combination of active and passive facade in the south side of the building to reduce the solar radiation.

The due to the lack of thermal comfort it cause the health and mental problem to the occupant and also its affect the exam result and affect the concentration of students towards the classes and staffs also unable to deliver and share their knowledge to the students .

Shelters created by humans first to provide thermal comfort and protection from natural elements, and this still remains a primary objective of buildings. The Dynamic façade workslike a physical separator between the interior and exterior of a building.

When designing the building envelope, building materials are important for knowing some fundamentals of and heat transfer will help you make the right trade-off decisions.

II.OCCUPANT COMFORT

Buildings are designed for people, and those people are trying to accomplish a task – whether it's raising a family, running an office, or manufacturing a product. The building needs to keep people in comfortable zone, to do their task sustainable building design prevent the occupant form the negative impact of the surrounding environment.

A. THERMAL COMFORT

Creating comfortable zone to the user which provide happiness to do their task with more efficiency. Often factors such as thermal comfort and room temperature are affected by a design, which cause the problem to the use and utilized

the more energy to provide the thermal comfort. When we losses the thermal comfort it may affect our brain working efficiency about 50% in the college the marks of student may get reduced and it's directly the percentage of Exam results.

To keep people comfortable you need to provide the right mixture of temperature, humidity, radiant temperature and air speed. The right level of these variables depends on what activity is occurring, how active the people are, and what they are wearing. Everyone has slightly different criteria for comfort, so comfort is often measured by the percentage of occupants who report they're satisfied with the conditions.

The cold breeze can provide the thermal comfort to user by natural, because in our country, we loses the thermal conform due to high temperature and in artificial by ceiling fans and air conditioning. HVAC equipment like air conditioner, fans, and humidity controller, but temperature over a surface and moving air have need to be considered too.

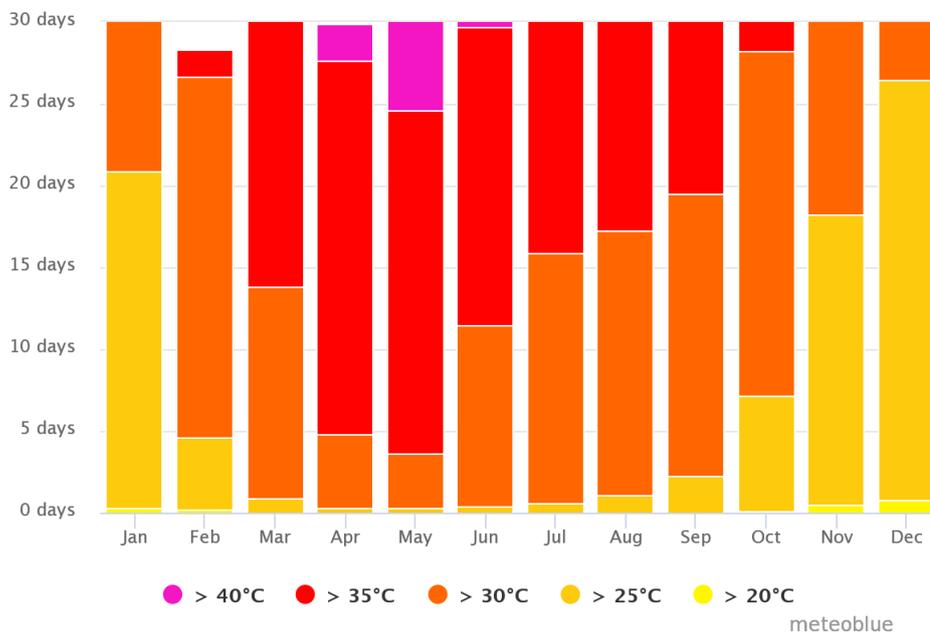


Figure 1 Average temperatures and precipitation

B. VISUAL COMFORT

Good visual helps absorb the board and to see and leaned the classes by students. Natural light are the best one even having the artificial lights. The visual conform is the important one for the concentration of student towards the professor.

The visual comfort is providing the correct amount of light it not be more power and not to dim. Lighting is often measured either by the amount of the amount of light reflecting off of a surface (luminance) or light falling on a surface (luminance).

III. HEALTH PROBELM

The healthy human body should maintains body temperature around 37°C. Variations, usually of < 1°C, during the day, level of mental and physical work can alter. A change of body temperature of > 1°C change only during fever or depending upon the surrounding conditions are more than the body's ability to adjust with environmental heat. As the environment temperature raises, the body temperature as well raised. The body's internal "thermostat" maintains a constant inner body temperature by pumping more blood to the skin and by increasing sweat production. In this way, the body increases the rate of heat loss to balance the heat burden. In a very hot environment, the rate of "heat gain" is more than the rate of "heat loss" and the body temperature begins to rise. A rise in the body temperature results in heat illnesses when the air temperature or humidity rises above the range for comfort, problems can arise. The first effects



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relate to how you feel. Exposure to more heat can cause health problems and may affect performance. As the temperature or heat burden increases, people may feel:

- Increased hard to do their works.
- lack of concentration
- low efficiency in physical and mental activities.
- unable to do skilled work or heavy work, smart work.

A. PHYSICAL PROBELM

Due to high temperature its affects the health of the students and staffs the following problems where arise in the body

- Head Pain
- Eye Irritation
- Skin Problem
- Pimple In Face
- Hair Losses
- Urinary Problem
- Stomach Pain

B. MENTAL PROBELM

The mental problem too rise due to the losing their thermal comfort and its directly affects the result in the examination and concentration of students towards to classes

- Stress
- Mental Pressure
- Felling Uncomforted

IV. HEAT ENERGY FLOWS IN BUILDINGS

There are of two types of heat flows: latent heat and sensible heat. Latent heat flow in the result of humidity to moistures. Sensible heat cause the change in surrounding and room temperature. Total heat flow is defined as the sum of sensible and latent flows. Human comfort depends on providing comfortable temperature.

A. SENSIBLE HEAT

The heat associated with change in temperature of a material/substance/ space.

B. LATENT HEAT:

The release or storage of heat associated with change in phase of a substance, without a change in the substance's temperature. In building design and structural design, this is often heat required to remove/add the moisture content (humidity) from the air and surrounding. Whenever an object is at a temperature different from its surroundings, moisture flows from areas of greater concentration to areas of lower concentration Likewise, heat flows from hot to cold.

C. CONDUCTION, CONVECTION, AND RADIATION

Buildings lose sensible heat to the environment (or gain sensible heat from it) in three principal ways:

1) Conduction: The transfer of a heat between substances or an element which are in direct physical contact with each other. Conduction occurs when heat flows through solid materials.

2) Convection: The movement of liquids and gasses caused by heat transfer. As a liquid or gas is heated, it warms rises and expands because it is less dense resulting in natural of convection.

3) Radiation: When electromagnetic waves travel through surrounding, it is known as radiation. When these waves transmitted from the sun, (for example) if they hit an object, it will transfer their heat to that object.

V. SURVEYING

The survey was carried out over the college the ask about their health problem and analysis the following question to all the student and staff over a 234 students from the different and 39 staffs with different classification based on their staying building

- 118 students from block I
- 116 students from Block II
- 18 staffs form Block I
- 21 staffs from Block II

Question 1

- occupying place (Block)
- Block I
- Block II

Question 2

- DO YOU HAVE FOLLOWING PROBLEMS?
- Head Pain
- Eye Irritation
- Skin Problem
- Pimple In Face
- Hair Losses
- Urinary Problem
- Stomach Pain

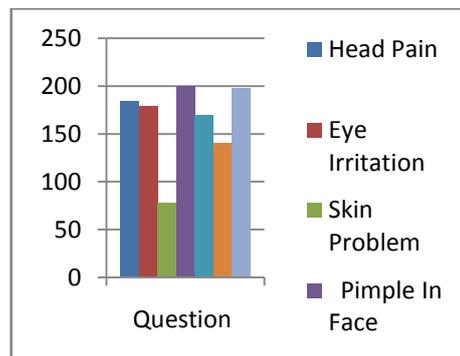


Figure 2 Having Problems

Question 3

- CAN YOU CONCENTRATE ON CLASSES
- yes
- no

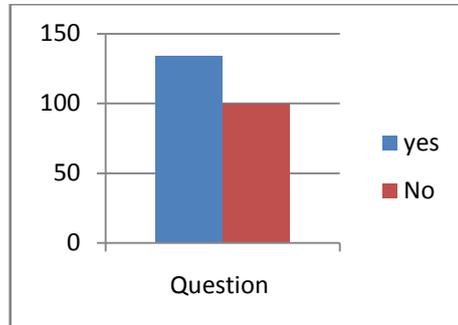


Figure 3 Question 3

Question 4

➤ CAN YOU EXPRESS FULL EFFICIENCY

- yes
- no

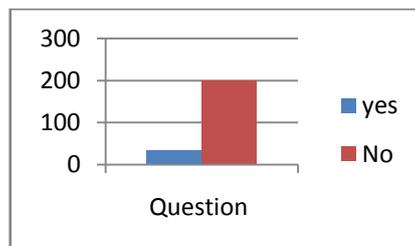


Figure 4 Question 4

Question 5

➤ IF YOU HAVE HYPERTENSION

- yes
- no



Figure 5 Question 5

Question 6

➤ IF YOU FEEL OVER HEAT

- yes
- no

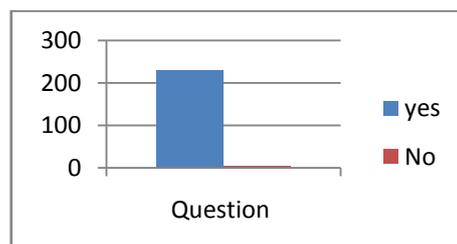
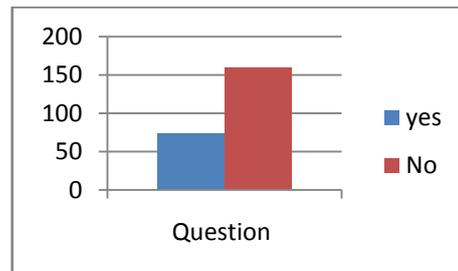


Figure 6 Question 6

Question 7

➤ IF YOU REALISE HEAT WOULD BE A REASON FOR ALL YOUR PROBLEM

- yes
- no

**Figure 7 Question 7****VI. RESULT**

The above result so that the overheat cause several problem in the health of the student those who are occupying the places. The optimum and sustainable design of Dynamic facade is designed by referring the building performance analysis, thermal analysis wind flow analysis The building integrated green facade BIGF & Dynamic Facade in recent years has evolved conceptually from a primarily aesthetic design, gardening, or of artistic expression by the designer or the manifestation of economic power by the promoter, no a "vegetated architecture" in which the vegetation is another element of the building, with specific functions to develop the building as well as its relationship with the environment (energy aspects, acoustic protection material, support of biodiversity, provide thermal comfort).the green facade reduce the HAVC load and give the oxygen by the process of photosynthesis a vertical vegetation cover could lower the temperature of a facade wall and buffered its fluctuation with time, leading to reduced power loading air-conditioning. Time lag in temperature increase reflected that a vegetated cladding could mitigate the potential impact of solar heat that continued to affect the indoor space after sunset. With a green plant cover on a facade over south elevation wall, student could be benefited by a physical and mentally and get good result in exams. The management can have cheaper electricity bill in addition to the ecological merits of the vertical green panels and solar cladding, Dynamic facade. In general, the use of vegetation and Dynamic Facade, so well designed and managed, can be a useful tool for passive and active thermal control of buildings with the consequent energy saving. This can occur in four ways, often related, thermal insulation, and the interaction with solar radiation, i.e. shade, evaporative cooling, and the variation of the wind on the building

REFERENCES

- 1] R.Saravan., M.P.Salaimanimagudam., ENERGY ASSESSMENT OVER A SOLAR CLADDING BY USING GEOGRAPHIC INFORMATION SYSTEM,Journal of Engineering and Applied Sciences, Medwell publication(Scopus indexed) ,Year: 2017 ,Volume: 12 .,Issue: 22 SI., Page No.: 6160-6162
- 2] M.P.Salaimanimaguda,S.Abdulwahab .P.Hariprakash,,Dr.r.saravanan, ANALYSIS OF SOLAR RADIATION IN EXTERNAL WALL BY USING REMOTE SENSING & GIS, International Journal of Advanced Research in Basic Engineering Sciences and Technology (IJARBEST) Vol.3, Special Issue.24, March 2017
- 3] R.Saravan.,A.MohamedMansoor., M.P.Salaimanimagudam.,CONCEPTUAL DESIGN OF GREEN FACADE TO PROVIDE THERMAL COMFORTInternational Journal of Advanced Research Methodology in Engineering &Technology, ISSN 2456-6446Volume 2, Issue 1, January 2018 page no. 12-18
- 4] M. Musy, L. Malys, B. Morille, C. Inard, The use of SOLENE-microclimat model to assess adaptation strategies at the district scale, Urban Clim. 14 (2015) 213–223.
- 5] H. Akbari, Shade trees reduce building energy use and {CO₂} emissions from power plants, Environ. Pollute. 116, Supplement 1 (2002) S119–S126.



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