Sick Building Syndrome in Office Environments

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SHINE
Summer High School Intensive
in Next-Generation Engineering

INTRODUCTION

- Sick Building Syndrome (SBS) is a condition that occurs when a person is present in an environment, specifically a working and living environment, and experiences health related symptoms such as headaches, dizziness, nausea, pain, etc. These symptoms are only present when in the specific environment and will get better when away from the environment.
- By analyzing Indoor Environmental Quality (IEQ) of office space, a possible solution or development can prevent Sick Building Syndrome.

OBJECTIVE

- **Dr. Bercerik-Gerber**'s research at i-lab focuses on studying human-building interaction with user-centered environments.
- **Vital Impact:** Human-centered buildings can address user's needs in numerous environments, including working and living spaces.
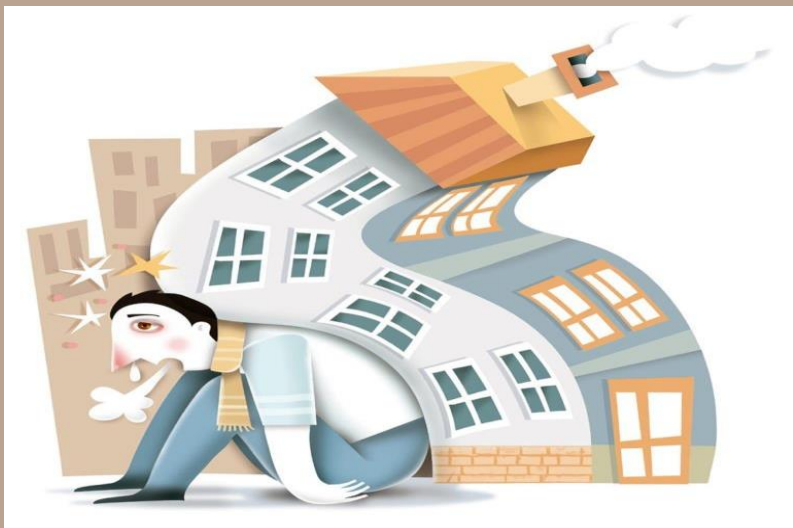
- **Objective of experiment:** To analyze the impact of the office environment on the health and comfort of office workers.
- **Significance:** The outcomes of this study can lead to the alteration and development of a user-centered environment that promotes healthier and comfortable work environments.

EXPERIMENT

We constructed a research experiment to analyze the coloration of Sick building syndrome with the perceived indoor environmental quality
Sensor Used: Awair Omni, Awair Business
Num. of Participants: Two office workers
Data Collection: One month

Awair Omni:
- Temperature
- Humidity
- CO2
- TVOCs
- PM2.5
- Noise
- Light

Questionnaire:
- SBS symptoms
- Comfort: Lighting
- Comfort: Temperature
- Comfort: Humidity
- Comfort: Noise
- Comfort: IAQ

NEXT STEPS

- **Continue** to challenge myself with difficult courses to explore the various fields in STEM and related courses outside of STEM.
- **Utilize** my skills to engineer programs, systems, and devices to make an impact in people's lives
- **Advice for future SHINE students:**
  - continue to expand out of the STEM boundaries and to pursue STEM challenges
  - avoid setting limits on what you can accomplish
  - Despite difficulties continue to persevere to reach your goals.

RESULTS
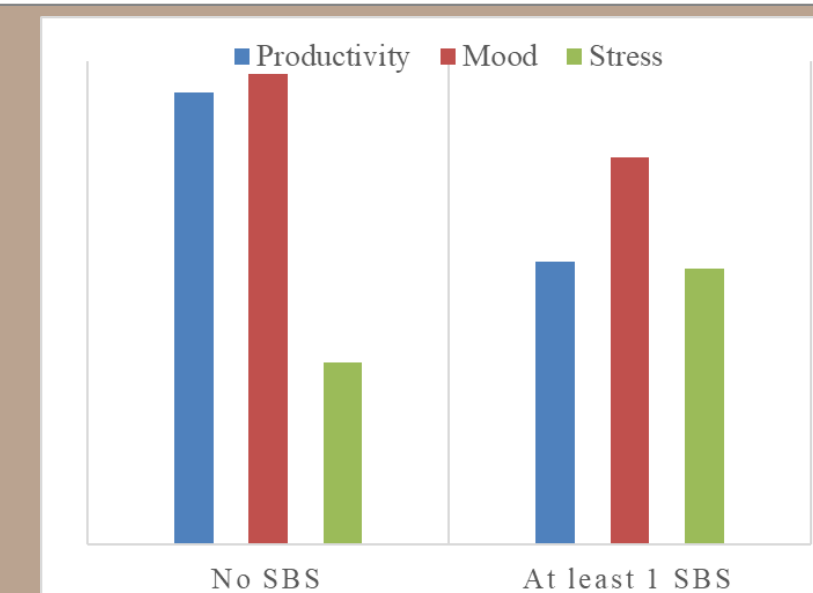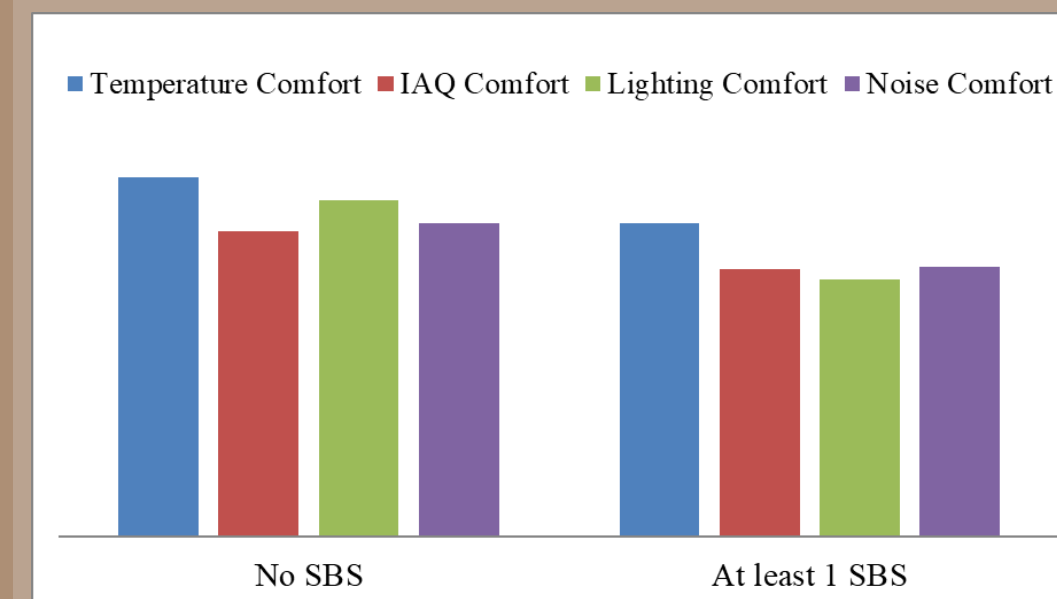
STEM COURSEWORK

- The SHINE research and guest speaker panels that I participated in have broadened my STEM vision and understanding.
- I will be able to bring the skills I learned in SHINE to my school community.
- I will continue to challenge myself with difficult courses and stay updated with current research with my skills in reading research papers.
- I will use my learned research, data collection, and programming skills to build human-centered projects to improve human lives.

ACKNOWLEDGEMENTS

I would like to express my earnest gratitude and appreciation to the following people, all of whom made my SHINE experience possible to **Professor Becerik-Gerber** for allowing me to participate in i-Lab, to my **Ph.D. mentor, Mohamad Awada** for guiding and mentoring me throughout my research project, to **SHINE staff** and **students** for providing me with an amazing and unforgettable SHINE experience, and to Northrop Grumman for providing me with a full scholarship to be able to attend the SHINE program.

SKILLS

- **Technical:** Utilization and creation of surveys using google forms.
- **Research:** Organizing and planning experiments and data collection. Analyzing acquired statistics/data
- **Contribution:** Teach high school students about the process of research
- **Communication:** Communicate scientific findings

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