



Jan 19, 2024 13:23 CET

Scientific study shows that air pollutants commonly found indoors could have an impact on creativity

Camfil, the industry expert in clean air solutions, has collaborated with Nanyang Technological University, Singapore (NTU Singapore) on a scientific research study that sought to examine the impact of high levels of volatile organic compounds (gases released from products) on the creativity of participants tasked with constructing 3D models using LEGO® bricks.

Scientific Study

The study, led by NTU Singapore's Assistant Professor Ng Bing Feng and Associate Professor Wan Man Pun, aimed to objectively measure creative thinking by engaging 87 participants over 6 weeks in creative building activities using the LEGO® SERIOUS PLAY® methodology. The results were enlightening as they demonstrated a noteworthy link between clean air and heightened creativity. Specifically, exposure to common indoor air pollutants had a tangible impact on creative performance. Clean air was found to facilitate imaginative thinking, while poor air quality seemed to hinder the creative process.

Identifying the Culprits

From this study, the role of indoor air quality parameters (PM_{2.5}, TVOC, and CO₂) in maintaining a creative environment (involving lateral thinking ability) was evaluated.

Participants were given a challenge and were required to build a solution using LEGO® SERIOUS PLAY® within a given timeframe. They were then asked to describe their creation. The creations and descriptions were assessed based on originality, fluency, and construction quality.

“Camfil has been involved in a number of scientific studies over the years demonstrating the correlation between clean indoor air and human performance. This study is a very interesting approach to identify new aspects of how the air we breathe has a direct impact on our cognitive abilities” says Guillaume Gallet, President Molecular Contamination Control at Camfil.

Study Findings

The study's findings revealed a significant association between higher levels of total volatile organic compounds (TVOC) and lower-rated creative solutions. TVOC refers the total concentration of gaseous organic chemicals present simultaneously in the air, which can originate from both outdoor and indoor pollutants. Exposure to common indoor air pollutants, such as TVOC, has a tangible impact on creative performance. Notably, higher TVOC levels were found to be significantly linked to lower-rated creative solutions.

Assistant Professor Ng Bing Feng from NTU stated, “While most people would correctly associate indoor air quality with effects on the lungs, especially since we just emerged from a pandemic, our study shows that it could also

have an impact on the mind and creative cognition, or the ability to use knowledge in an unconventional way. Our findings suggest that relatively low TVOC levels, even if well within the accepted threshold, could impact an individual's creative potential." The study suggests that reducing TVOC levels by 71.9% (from an initial 1000 ppb) could enhance an individual's full creative potential by 11.5%. Link to study published in Scientific Reports 13, 15488 (2023): Experimental study on the impact of indoor air quality on creativity by Serious Brick Play method.

"The WHO gives clear indications on indoor air quality levels and according to these, 99% of the world's population is breathing unhealthy air. This study cements the facts that governments, business owners, managers, and individuals have a shared responsibility to cater for the human health by providing good indoor air" elaborates Tobias Zimmer, Vice President Global Product Management & International Standards.

Make Clean Air a Priority

The ability to generate fresh, captivating ideas is essential in various aspects for the society to evolve. This study prompts the consideration of the impact of clean air on creative abilities, a factor that is often overlooked. By prioritizing clean air in shared surroundings, potentially untapped creative potential can be unlocked, ensuring that innovation becomes a natural part of everyday experiences. The solutions are available and on hand.

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Contacts



Rose Avedissian

Press Contact

Global Marketing Director, Camfil Power Systems

rose.avedissian@camfil.com

+1 450 967 6777



Lynne Laake

Press Contact

Director of Marketing, North America

lynne.laake@camfil.com

+1 (513) 324-8346



Ola Skoglund

Press Contact

VP Group Marketing Communication

Group Marketing Communication

Ola.Skoglund@camfil.com

+46703492701