

## **Integrated Thermal Control to Improve Workers' Intellectual Concentration in Office Environment**

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**Abstract :** The authors have focused on the thermal difference between office rooms and break rooms, and proposed an integrated thermal control method to improve workers' intellectual concentration. First, a trial experiment was conducted to verify the effect of temperature difference on workers' intellectual concentration with using two experimental rooms; a thermally neutral break room and a cooler office room. As the result of the experiment, it was found that the thermal difference had a significant effect on improving their intellectual concentration. Workers, however, often take a short break at their desks without moving to a break room, so that the thermal difference cannot be given to them. So utilization of airflow was proposed as an integrated thermal control method instead of the temperature difference to realize the similar effect. Concretely, they are exposed to airflow when working in order to reduce their effective temperature while it is weakened when taking a break. Another experiment was conducted to confirm the effect of the airflow control on their intellectual concentration. As the result of concentration index and questionnaire survey, their intellectual concentration was significantly improved in the integrated thermal controlled environment. It was also found that most of them felt more comfortable and had higher motivation and higher degree of concentration in the environment.

**Keywords :** airflow, evaluation experiment, intellectual concentration, thermal difference

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