Customization of indoor environmental quality in a classroom

Keywords: Indoor environment quality, individual control, comfort, performance, pupils

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Area of Research: Indoor Environmental Quality

Research Summary: It is well known that indoor environmental quality (IEQ), which encompasses indoor air quality, acoustical quality, visual quality and thermal quality, has an important influence on comfort, health, satisfaction and performance of occupants. These influences will most likely be amplified in classrooms, because children are more vulnerable than adults to environmental conditions. In order to give every single pupil an optimal comfortable local environment, customized settings on a personal level are a possible way to achieve this. However, information about individual control of IEQ in classrooms is limited at present. Considering this research gap, it is necessary to carry out a study on customization of IEQ in classrooms and find out the impact on pupils’ comfort and performance.

The aim of this study is to improve IEQ by using individually controlled systems in classrooms to create a learning environment in which the act of learning is done in the best way with minimal discomfort and make every pupil feel satisfied. In that way the energy of pupils to be spent on gathering information and focusing on the learning process is saved, instead of spending it on distractions caused by the indoor environment.

Research Methodology: This research can be divided into three parts:

1. The first step is Literature Studies, by which the basic knowledge of IEQ in classrooms, current studies about ICS and the methods to test pupils’ performance can be acquired.
2. The second step is Field Studies, during which some physical parameters about the classrooms was measured in the real classrooms in the Netherlands, and pupils there will be asked to do a questionnaire about the IEQ and their experience of their classrooms.
3. The last step of this research is Lab Studies. Its main purpose is to design an ICS to allow pupils to control their ambient environment.

Main Question: How to improve indoor environmental quality in a classroom of a primary school in such a way that it is satisfying all pupils

Deliverables: Children have different annoyances and preferences of the IEQ in classrooms. Customized design should be the direction for future research.
Key Publications:


Link(s)

https://www.tudelft.nl/staff/d.zhang-
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