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## The health and performance implications of the school environment

### A contribution to the Ergonomics of the School



#### The Institution

This study has been carried out by the Institute for Interdisciplinary School Research of the University Bremen. The costs involved in this undertaking have been sponsored by Institutions for Statutory Accident Insurance and Prevention Hannover and Hessen. The study has been carried out under the direction of Dr. Gerhart Tiesler and was undertaken from October 2006 until December 2007.

The institute is a faculty of the University Bremen, residing in the Psychology department.



#### The Analysis

The starting point of this study is that a:

*high CO<sub>2</sub> level results in concentration impairment and fatigue.*

Thus a measurement of the CO<sub>2</sub> levels in classrooms was undertaken. Fatigue could be proved using various methods. In addition, concentration tests were carried out with both teachers and students. Further indications of fatigue could be the sound pressure levels in the classroom, or even a change in the teaching methods adopted by teachers as a reaction to the shift in behaviour of the students. Furthermore, the heart rate of the students was monitored as an indicator for fatigue.



#### How does fatigue manifest itself?

Even before the beginning of the 20<sup>th</sup> century physicians recognised that fatigue was apparent during classroom tuition. This finding was justified by the obvious reduction in performance of the students.

Fatigue causes a reversible reduction in performance, which can be recognised by symptoms of tiredness and acts as a safety mechanism.

Important characteristics are:

- Perception impairment
- Reduced eye/hand coordination
- Reduced awareness
- Concentration breakdown
- Thinking capacity reduced
- Motor functions impairment
- Change in social behaviour

