

Interior wood use in classrooms reduces pupils' stress levels

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Introduction

This study wants to answer the question if interior wood use in classrooms has beneficial effects on the pupils. Up to date, most studies examining the effects of school environments on pupils concentrate on light, ergonomics, air quality, noise, colours, etc. (Higgins et al., 2005). We did not find one study looking at effects of different furnishing materials (like wood) in classrooms. A recent review article from Nyrud, and Bringslimark (2010) reports the numerous positive effects of wood use in varying interior settings on humans' psychological and physiological health.

Methods

This quasi experimental, longitudinal study was performed in a secondary school in Styria, Austria. Four classrooms were completely refurbished during summer break. The floors, ceilings, cupboards and wall panels in two of the refurbished classrooms are now made of solid wood. Two other classrooms functioned as the control condition and were equipped with standard materials (floor: linoleum, walls: plasterboard, cupboards: chipboard). Chairs and desks were of the same material in all classrooms. A total of 36 pupils participated in the study. Pupils were between 13-15 years old and sexes were equally distributed in the two conditions. Eighteen pupils had all their lectures in the solid wood classrooms, while the other 18 had all their lectures in the control classrooms. Heart rate variability, subjective well-being (MBDF [Multidimensional Mood Questionnaire], Steyer et al., 1997), concentration (KLT-R [Concentration Performance Test-Revised], Düker et al., 2001), and perceived stress was measured (EBF, Recovers-Stress-Questionnaire, Kallus, 1995) at six points in time over the school year 2008/09 with an

interval of approximately two month (day of week and time of day were held constant at all times of measurement).

Results

We found significantly different changes over time between the two conditions in heart rate ($p=.004$) and heart rate variability ($p=.003$). Over the course of a school year pupils' heart rate significantly decreased in the solid wood classrooms but increased in the control classrooms. Heart rate variability increased in the solid wood classrooms but decreased in the control classrooms. Also, perceived stress from interactions with teachers (being shouted at, having a feeling of being stultified, having a feeling of being ignored) decreased significantly over the school year in the solid wood classrooms while it did not change in any direction for pupils in the control condition. We did not find significant differences or changes over time in pupils' concentration performances.

Discussion

The results indicate that the use of solid wood in classrooms can reduce pupils stress levels. The promising results should though be replicated with more subjects and different age groups. In this study we only had two classes in each condition. Therefore, potentially confounding variables like different teachers, social constellations within one class, etc. could have influenced the results and need to be out ruled by follow-up studies.

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