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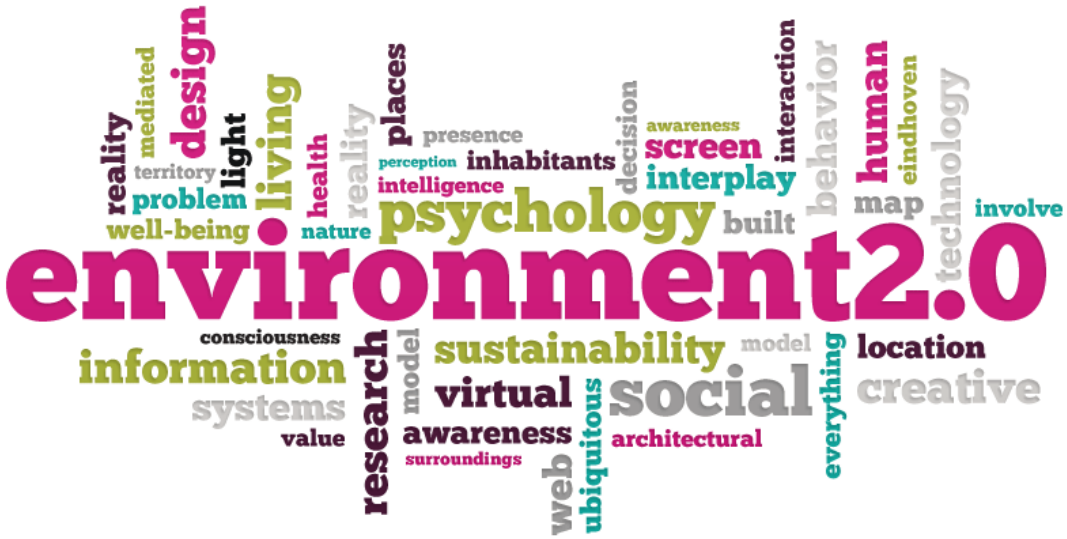

Proceedings

Shedding light on learning: The impact of dynamic lighting on school outcomes

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Introduction

The physical context at schools is one of the factors that make education more enjoyable for the teaching staff and school children. The educational context can make education more efficient, and recent academic interest considers the influence of the physical school and classroom environment on learning. While various studies suggest the importance of artificial and natural lighting in human performance, there is limited empirical evidence on how lighting affects school children's outcomes. In addition, research in education mainly focuses on teaching and learning, although environmental variables, such as lighting, also may affect children.

This paper describes two studies into the effects of a dynamic lighting system on school outcomes.

Field study

For the purpose of a quasi experimental field study, two classrooms (grade 4 and 6) in a single elementary school were equipped with a dynamic lighting system. The school children's outcomes were compared to school children's outcomes of a second school that did not have the dynamic light system. The goal of this study was to examine the influence of dynamic lighting on pupil outcomes (i.e. alertness, motivation wellbeing and performance), in a natural environment.

Data were collected among 97 Dutch elementary school children. Results showed that children's alertness was positively affected by the dynamic lighting system.

Laboratory study

The second study was designed as an experimental laboratory study and focuses on the mediating effect of affect in the relation between lighting and school children's behavior and performance. To this end, a windowless simulated classroom was equipped with the dynamic lighting system, resulting in a 1 factor between subjects design with 4 different light settings: (i.e. standard setting, calming setting, focus setting, energy setting). A total of 114 school children (mean age 10.7 years, SD = 1.09) participated in this study. In line with findings of Baron, Rea and Daniels (1992), the mediating effect of affect could not be confirmed. More important, significant effects of the light settings were found for affect (enthusiasm), interpersonal communication and cooperative learning.

Discussion

Both studies together provide a rich and thorough investigation of the extent to which the dynamic lighting system affects various school children's outcomes. The general conclusion is that specific instructional tasks and goals require specific light settings. This underlines the importance of a dynamic lighting system that enables us to adjust the level of lighting to the task at hand. The findings emphasize the importance of lighting for learning, and several implications and suggestions are provided for further research.

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