A Review of the Research Literature on Classroom Spaces

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Introduction

• Scholars have cited a general neglect in interest surrounding the influence of physical space on learning which has led to low awareness and minimal understanding (Banning & Canard, 1986; Van Note Chism, 2002).
• Empirical research surrounding physical space in educational environments has been conducted on several levels (Lackney, 1999).
• Much of this research is over 30 years old, but has not been displaced by more current findings.

General Environmental Variables

• Temperature
• Air Quality
• Noise
• Lighting
• Color
• Structural Building Characteristics

These variables are not always in the control of the classroom teacher, however, due to empirical findings linking these variables to student behavior & performance, classroom teachers may be interested.

Temperature

• Temperature, heating, and air quality are rated as the most important individual environmental elements connected to student achievement (Earthman, as cited in Higgins et al, 2005).
• The temperature range best suited for learning is 68-74 °F (Hamer, as cited in Schneider, 2002).

Air Quality

• Research consensus connects air quality to health, and health to attitude, behavior, and absenteeism.
• Poor attitude affects health, health affects attendance.

Noise

• Research has found a connection between chronic noise exposure and impaired cognitive functioning (Higgins et al, 2005).
• Several noise-related studies connect to deficiencies in pre-reading skills and reading problems (p. 18).
Lighting

- Researchers disagree on the lighting source of choice (Higgins et al., 2005).
- Natural light yields positive biological effects (Wurtman, 1975), but is difficult to control.
- Good lighting combines both direct and indirect sources (Barnitt, 2003).

Windows

- Students & parents prefer a windowed classroom (Larson, as cited in Weinstein, 1979).
- Teachers prefer a windowless classroom based on minimized distraction from weather changes and outside noise (Weinstein, 1979).
- Minimizing windows maximizes bulletin board space (Weinstein, 1979).

Color

Conflicting evidence exists relating the effect of color on learning.
Research shows classroom wall color affects:

- Children’s cooperative behavior (Read, Sugawara, Brandt, 1999).
- Productivity and accuracy (Engelbrecht, 2003).
- Mood, mental clarity, and energy level (Higgins et al., 2005).
- Color stimulation varies by age (Engelbrecht, 2003).

Eyestrain Relief

Eyestrain can be relieved by painting the wall directly behind the teacher a different color.

Ceiling Height

High ceilings offer:

- Decreased perceptions of crowding; increased teacher satisfaction with the room (Ahrentzen & Evans, 1984).
- Decreased cooperative behavior among preschool students. As the ceiling gets higher, cooperation decreases (Read et al., 1999).
- Acoustic and lighting issues (Earthman, 2004).

Physical Classroom Variables

- Design (space-planning)
- Furniture Arrangement
- Seating Location
- Aesthetic Treatment

These variables are potentially available as teacher and/or student resources, as empirical findings link these variables to student behavior & performance.
Space-Planning: Design of Existing Space

- Spatial arrangement flexibility offers considerable placement of equipment to reinforce work area boundaries.
- Spatial arrangement has been linked empirically to student behaviors relating to: attention span, noise levels and class interruptions, movement range, interest level, and frequency of verbal participation (Kritchevsky & Prescott, 1969; Zifferblatt, 1972; Weinstein, 1977; Evans & Lovell, 1979; Sommer & Olsen, 1980).

Furniture Arrangement

- Furniture arrangement has been widely studied. The horseshoe is appreciated by both students and teachers because it permits conversation and control (Alexander, 1992; McNamera & Waugh, 1993; Marx et al., 2000; Home-Martin, 2002).
- On-task behavior (primary students) is lowest in rows, increased in clusters, and highest in circular formations (Rosenfield, 1985).

Seating Position

- Seating position has been widely studied. Empirical findings relate to frequency of participation, level of attentiveness, level of self-esteem, valuation of learning, and course grade.
- Research consensus confirms an "action zone" of increased participation (Adams & Biddle, 1970; Koneya, 1976; Marx et al., 2000).

Aesthetic Treatment

- Seminal studies:
  - Evaluations done in a "beautified" room were more positive than those done in an "uglified" room (Maslow & Mintz, 1956)
  - People spend more time in a "beautified" room than in an "uglified" room (Mintz, 1956).
- An aesthetized environment relates to increased participation in frequency & sample (Sommer & Olsen, 1980); and higher test scores, positive teacher evaluations, and positive student attitudes (Wollin & Montagne, 1981).

Take Aways

- Spatial considerations of teaching involve contents arrangement, varieties & frequencies of behavior, & patterns of travel (Hall & Hall, 1977; Sommer, 1977; Araca, 1986).
- Physical space is particularly significant to the art educator due to the varied behaviors (i.e. making, collaborating, critiquing, viewing) associated with art education (Susi, 1986).
- Research surrounding the relationship between environment and attitude, behavior, and emotion is particularly valuable to an art educator.
- Much of this research is over 30 years old, but has not been displaced by more current findings.
References


Hamer, J. (1999, July 1). Bibliography of empirical research investigating the relationship between the physical environment of educational settings and educational outcomes. N/A. Educational Resources Information Center database (ED441331).


