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 all, 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.

(Engelbrecht 2003; Brubaker, 1998; Pile, 1997, as cited in Higgins et al., 2005, p. 22).

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).

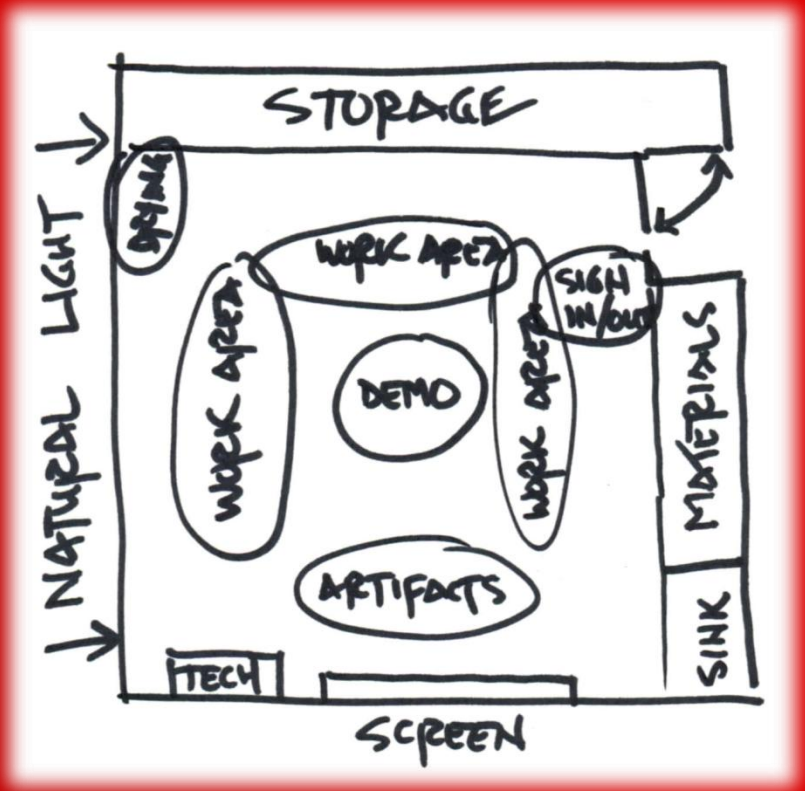
Physical Classroom Variables

- 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.

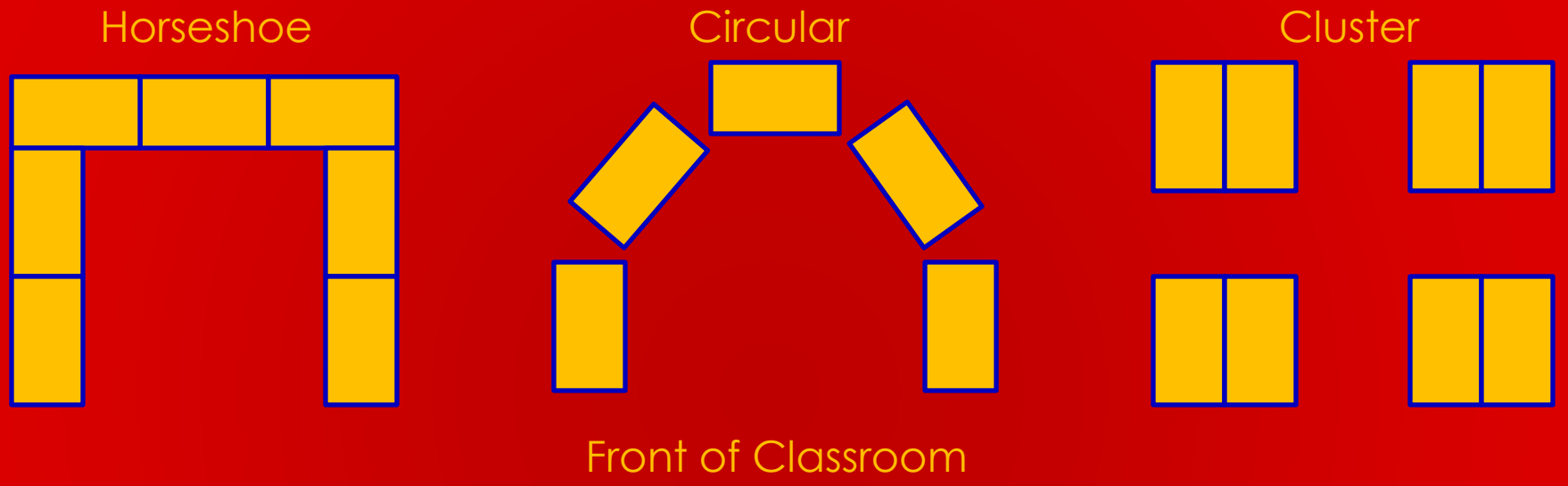
Space-Planning:

Design of Existing Space



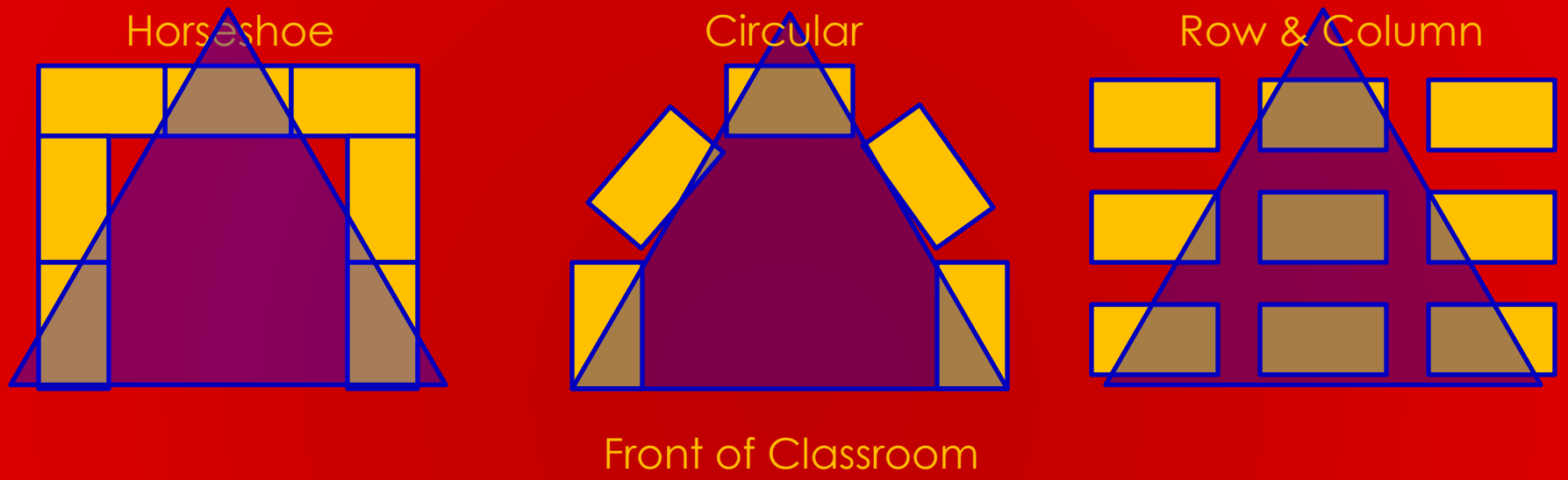
- Spatial arrangement flexibility offers considerate placement of equipment to reinforce work area boundaries.
- Spatial arrangement has been linked empirically to student behaviors relating to: attention span, noise levels and class interruptions, movement range, interest level, and frequency of verbal 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; Horne-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 aesthetisized 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; Weinstein, 1977; Susi, 1985, 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.

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