BEYOND ABC’S: CAN PLANTS IN A CLASSROOM HAVE AN IMPACT ON HIGH SCHOOL MATH STUDENT BEHAVIOR AND ACADEMICS?

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Introduction

- Humans have an intricate connection with nature. Perceiving and collecting vital information from the landscape with plants being an essential element.
- Plants provide many practical benefits such as, ability to add oxygen, control soil erosion, and improve the aesthetic outdoor and indoor environment.
- Research indicates that potted plants improve indoor air quality by increasing relative humidity, removing particulate matter, and removing volatile organic compounds.
- Powerful aesthetic and emotional values are also associated with plants and natural settings including stress and aggression reduction, increased productivity, and faster recovery time from an illness.
- People prefer and are physiologically affected by particular landscape types, tree shapes, and tree colors.

Objective

- A pilot study was developed to investigate if indoor potted plants in high school math classrooms would affect academic and social behaviors.
- Study was conducted at a Hawaiian high school that was located in a socio-economically disadvantaged area.
- Math classes were selected since math is generally a subject that causes stress in many students.

Students standardized math test scores and classroom disciplinary reports, along with student and teacher self-reports were measured.

Data was collected for a semester before, a semester during, and a semester after plants were placed in five classrooms.

Classrooms were 25"x25", and were physically similar except for one that was windowless.

Students in each classroom were of mixed standings from Freshman-Seniors & from Pre-algebra-Trigonometry.

Plants were placed in approximately the same location in each room, with more in the front where students’ attention is usually directed (See Figure 1. below).

Placement species and quantity: 3-4 Dracaena deremensis ‘Janet Craig’; 3-4 Dracena marginata ‘Colorama’; and 3 Anthurium scherzerianum.

Students from a ag-science class were trained to care for the plants weekly.

Methods

Classroom Set-Up

Pre-Plant Classrooms

Plants in Classrooms

Figure 1. Typical Plant Setup

Table 1. The Difference in the Number of Discipline Reports

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Difference of discipline reports from Fall to Spring across five classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2004 compared to Spring 05</td>
<td>1 (5.76)</td>
</tr>
<tr>
<td>Fall 2005 compared to Spring 06</td>
<td>-42 (3)</td>
</tr>
<tr>
<td>Fall 2006 compared to Spring 07</td>
<td>-30 (3.90)</td>
</tr>
</tbody>
</table>

Table 2. The Difference in Test Scores

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Difference in test scores from Fall to Spring across five classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2004 compared to Spring 05</td>
<td>-0.928 (5.7912)</td>
</tr>
<tr>
<td>Fall 2005 compared to Spring 06</td>
<td>3.02 (4.1044)</td>
</tr>
<tr>
<td>Fall 2006 compared to Spring 07</td>
<td>2.013 (2.9477)</td>
</tr>
</tbody>
</table>

Results

Conclusions

- Students scored higher on standardized testing, and had less disciplinary problems when plants were present in classrooms.

- Students reported that they had lower levels of stress, felt more comfortable, felt the air was fresher, and were able to concentrate for longer periods.

- These results indicate that plants in classrooms improved students’ feelings of well-being, improved academic achievements and decreased discipline problems.

References Cited