Marsh Madness: An Education Adventure focused on Wetland Environments

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Introduction

• 2006 -2012: U.S. Department of Education GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs) funding
• Worked with students for six years beginning in the sixth grade, in a cohort approach
• Field science experiences at the Lake Waco Wetland, a 180-acre wetland and research and education center
• Teacher preparation and professional development elements were also included

Objectives

GEAR UP primary goal: to significantly increase the number of low-income students who are prepared for meaningful interaction with colleges and universities

Program-specific goals:
• To develop rigorous biology and environmental science based content related to grade-appropriate targets.
• To stimulate interest among students in post-secondary education by ongoing interactions with environmental professionals

Methods

Hands-on science projects, working together in groups on science projects, and working on science-related activities not for schoolwork are associated with higher student achievement in science.¹

Marsh Madness field experiences incorporated all of these elements, and were designed by Baylor faculty and staff in conjunction with teachers and school district science specialists to address cohort needs.

Students completed a different field experience each semester, for a total of 11 over the course of the project.

Teacher workshops included Saturdays in the Swamp and a weeklong Summer Swamp School each year for cohort science teachers.

Results

Assessment after Year 4 of the project showed no difference in participation by gender, or under-representation by race/ethnicity (Figures 1 and 2).

However, because participation was voluntary, students or campuses did self-select for greater participation in the program by academically higher performing students (Fig. 3).

Teacher attitudes regarding the importance of student-directed research changed as result of completing their own research projects in Summer Swamp School (Fig. 4). However, there are barriers to implementation of student research in classrooms (Table 1).

Table 1. Teacher perception of barriers to student-conducted research²

<table>
<thead>
<tr>
<th>Potential Challenges for implementing scientific research projects in classroom</th>
<th>% teachers that reported challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough time to do project based inquiry</td>
<td>66% 50% 33%</td>
</tr>
<tr>
<td>Project based inquiry is not aligned with the TAKS</td>
<td>0% 0% 0%</td>
</tr>
<tr>
<td>High pressure to prepare students for the TAKS</td>
<td>66% 50% 66%</td>
</tr>
<tr>
<td>I cannot find a suitable project for my students</td>
<td>33% 50% 33%</td>
</tr>
<tr>
<td>My students are not ready for project based inquiry</td>
<td>33% 50% 0%</td>
</tr>
<tr>
<td>My school lacks resources</td>
<td>66% 0% 33%</td>
</tr>
</tbody>
</table>

References