STEAM Camp 2014: Incorporating the Arts into STEM

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Introduction

What is STEAM Camp?
Growing from previous years’ STEM camps (started by Rebecca Citrin’ 2014), this summer’s STEAM camp incorporated the Arts into the STEM model of education. The theme of this year’s camp was “Our Beautiful World.”

Why STEAM?
There are numerous reasons why incorporating the Arts into STEM education is important, but here are some of the central reasons:
• Incorporating Art/Design into STEM and innovation helps students to look at problems from multiple perspectives:
• The STEAM fields are at the core of everything we do. Incorporating the Arts directly into the teaching environment aids children in making those connections.
• Creativity, which is much more encouraged in the Arts, helps students to look at problems from multiple perspectives.

Objective
This camp intended to use fun and engaging activities alongside modules to teach 4th-6th grade campers how the STEAM fields work together to create Our Beautiful World and how they influence the movement towards a more sustainable lifestyle.

We operated under the Brundtland Commission Report’s definition of sustainability: “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (Keeble, 1988).

Participants
The camp had 60 children between 3rd and 7th grade participate. 29 campers were female and 31 were male. There was a $50 entrance fee. Three full scholarships and two partial (half-priced) scholarships were given.

Grades Campers Entered in Fall 2014

<table>
<thead>
<tr>
<th>Grade</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd</td>
<td>1</td>
<td>1.6%</td>
</tr>
<tr>
<td>4th</td>
<td>8</td>
<td>13.3%</td>
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<tr>
<td>5th</td>
<td>19</td>
<td>31.7%</td>
</tr>
<tr>
<td>6th</td>
<td>29</td>
<td>48.3%</td>
</tr>
<tr>
<td>7th</td>
<td>3</td>
<td>5%</td>
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Note: 3rd and 7th graders were accepted upon early request of parents.

Module presenters, counselors, and other volunteers were recruited chiefly on a volunteer basis from Lafayette faculty, Lafayette summer EXCEL students, local students, community partners, and family friends. All adults completed a Lafayette background check in order to work with children.

Sources

Camp Setup

Modules
Over the span of the 4 days of camp, there were 12 different modules that covered all of the STEAM fields while incorporating the idea of “Our Beautiful World.”

All modules were created specifically for this camp.

Some of the titles of modules were:
• Hitting Our Stride: The Mathematics of Percussion
• Eight, Camera, Action! The Science of Color: Food for Thought: Where Does Food Come From?

Final Project
The final group project was to create a sustainable community on the provided island map. Campers had to provide enough food and energy for each house they place on the island, along with incorporating three other aspects of a community (schools, police station, shopping malls, etc.). Campers were to use ideas from each module to shape their community. The template was a geographical map of Miliano Island, part of the Cook Islands. At the end of the camp, the campers presented their group’s island to their parents and explained why it was sustainable.

Schedule
Camp started Monday, August 4th and ended Thursday, August 7th, 2014.
Campers arrived around 9 AM and were picked up around 4 PM. Campers progressed through three modules a day, filling out worksheets on each module in their own “Lab Notebook”. At the end of each day campers had around an hour to work on a final group project. On the last day, this hour was used to present their final projects to their parents.

Results

Analysis Procedure
In an attempt to empirically measure the academic success of the camp, campers were given pre- and post-surveys to complete. Parents and campers gave informed consent with IRB-approved form. Each camper was assigned a number to write in lieu of their name on the pre- and post- surveys.

Pre-surveys were given to campers at the start of camp before any modules and activities were completed. Post surveys were given to campers after all modules and activities were completed, before the final project presentation. The campers were also asked to draw a picture of their “Beautiful World” in relation to STEAM fields during pre-surveys, to be added onto during post surveys in a different color pen. “Green group completed their pre-survey at the start of day 2. Results were analyzed with SPSS using paired samples t-tests for the ten questions. Questions were graded according to their ideas with open-ended questions. The open-ended questions were graded on a 3 point scale:
1. Question left blank or sloppily answered (few or no words)
2. Answered partially answered, not clearly thought through and/or incorrect defined
3. Meaningfully and thoughtfully answered and/or correctly defined

SIGNIFICANT IMPROVEMENTS ON SURVEY RESULTS

| QUESTION 2 | PRE | POST |
| QUESTION 3 | PRE | POST |
| QUESTION 4 | PRE | POST |
| QUESTION 5 | PRE | POST |
| QUESTION 6 | PRE | POST |
| QUESTION 7 | PRE | POST |

*Complete analysis available upon request