Assessing an Environmental Education Program

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Assessing an Environmental Education Program

Conference on Research and Practices in Science Education
Hong Kong 16/12/05

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University of Nevada, Las Vegas
Abstract

We developed a comprehensive assessment plan and tested the curriculum to determine whether hands-on outdoor recreation events promote knowledge, attitudes, and performance among at-risk urban children. Knowledge, attitude, and performance assessments were developed, refined and implemented with a variety of age groups participating within the events. Findings revealed that knowledge, attitudes, and performance increased substantially as a result of participating in the outdoor recreation events.
The Program: Discover Mojave

- Half-day events based on environmental themes formed by an environmental educational committee (federal agency and community groups)
- Recreational in nature
  - Events occurred at local outdoor parks or public lands
- Each event had 3 components
  - An awareness session
  - The activity session
  - Debriefing
Wetlands Bird Safari

- Birdwatching at a local park
- Focus on the use of binoculars to find and watch birds
- Learning about birds and their habitats
Fun with Fishing

- Introduction to casting
- Learning about different kinds of fish and their habitats
Cool Canoeing

- Canoeing at a local park
- Learning about strokes and water safety
Assessing Knowledge

- Each event had 2 knowledge questions related to the specific event.
- Knowledge questions were open-ended, requiring children’s written responses.
- Response sheet included a word bank for children’s use.
Assessing Knowledge

Knowledge Questions (Pre)
- What do you know about watching birds?
- What do you know about canoeing?
- What do you know about fishing?

Knowledge Questions (Post)
- What did you learn about watching birds?
- What did you learn about canoeing?
- What did you learn about using a rod and reel?
Assessing Attitudes

- Each event had 5 attitude related items
  - I would like to show my friends how to fish
  - Birdwatching is fun
  - I would like to do another canoeing program
- General attitudes related to environmental themes were also assessed
  - I know how to keep the water clean and safe
- Attitude items were Likert-type
Assessing Performance

- Each event had 2 – 3 specific skills that were used to measure each child’s performance
  - Participant successfully used binoculars to find and focus on an object
  - Participant makes casts properly and safely
  - Participant successfully demonstrates basic paddle stroke
- Skills assessment in the form of a checklist completed by the event facilitator
Procedures

- 13 recreational events involving 72 children were conducted and assessed

- 2 groups of participants
  - Members of an Environmental Science Club (28 fifth graders)
  - Members of a recreational drop-in program (44 children, aged 8 – 12)
  - All participants completed pre and post test measures of knowledge, attitudes, and skills

- Individual and small group interviews were conducted with participants at the conclusion of each event
# Results: Knowledge

<table>
<thead>
<tr>
<th>Event</th>
<th>Participants</th>
<th>Knowledge - Pre</th>
<th>Knowledge - Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birdwatching</td>
<td>50</td>
<td>None 41/100 41%</td>
<td>4/100 4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partial 59/100 59%</td>
<td>15/100 15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More Complete 0/100 0%</td>
<td>81/100 81%</td>
</tr>
<tr>
<td>Fishing</td>
<td>37</td>
<td>None 39/74 53%</td>
<td>3/74 4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partial 32/74 43%</td>
<td>19/74 26%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More Complete 3/74 4%</td>
<td>51/74 69%</td>
</tr>
<tr>
<td>Canoeing</td>
<td>34</td>
<td>None 12/34 35%</td>
<td>1/34 3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partial 21/34 62%</td>
<td>3/34 9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More Complete 1/34 3%</td>
<td>30/34 88%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>121</td>
<td>None Complete 92/208 44%</td>
<td>8/208 4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partial Complete 112/208 54%</td>
<td>37/208 18%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More Complete 4/208 2%</td>
<td>162/208 78%</td>
</tr>
</tbody>
</table>
## Results: Skills

<table>
<thead>
<tr>
<th>Event</th>
<th>Participants</th>
<th>Performance Skill Demonstration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birdwatching</td>
<td>50</td>
<td>Some: 2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most: 8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All: 90%</td>
</tr>
<tr>
<td>Fishing</td>
<td>37</td>
<td>Some: 0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All: 95%</td>
</tr>
<tr>
<td>Canoeing</td>
<td>34</td>
<td>Some: 0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most: 0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All: 100%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>121</td>
<td>Some: 1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Most: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All: 94%</td>
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</table>
## Results: Attitudes

<table>
<thead>
<tr>
<th>Event</th>
<th>Mean</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td>Birdwatching</td>
<td>17.33</td>
<td>18.86</td>
</tr>
<tr>
<td>Fishing</td>
<td>18.77</td>
<td>19.33</td>
</tr>
<tr>
<td>Canoeing</td>
<td>19.11</td>
<td>19.61</td>
</tr>
</tbody>
</table>
Discussion

- Knowledge increased dramatically over the course of the children’s participation in the events
- The majority of the participants demonstrated all performance skills
- All attitudes were very positive
  - Post-event attitudes were significantly higher than pre-event attitudes