



An Elementary School Environmental Education Field Trip: Long-Term Effects on Ecological and Environmental Knowledge and Attitude Development

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Program Profile	
Program Description:	The authors evaluated Parks as Classrooms, an environmental education program put on by the Great Smoky Mountains National Park (GSMNP). GSMNP has established field trip curricula for several grade levels that fit with Tennessee and North Carolina educational standards. Instruction focused on the effects of invasive species and human activity on the native biodiversity of the Smokey Mountains. The field trip lasted one day, and included nature hikes and exploration, as well as lectures and guided activities led by GSMNP Interpreters. Students learned about several species of trees, discussed food webs and the role of the moss spider in the forest ecosystem, and participated in an interactive lesson to learn about the effects of the invasive Woolly Adelgid on the Frasier Fir. Students visited an air quality monitoring station where rangers led a discussion of air pollution and its causes, encouraging the students to consider human impacts and conservation behavior. Students also hiked part of the Appalachian Trail and climbed the highest peak in the park, Clingman's Dome.
Program Goals:	The program's goal is to provide students with a variety of outdoor experiences, instruct them about ecological principles, and help them to understand their connection to and role in the natural environment.
Program Funding:	National Park Service, Great Smoky Mountains National Park
Program Links:	http://www.nps.gov/grsm/forteachers/parks-as-classrooms.htm
Evaluation Profile	
Evaluation Goals & Questions:	The evaluation sought to assess the long-term effects of short environmental education field trips on students, with the goal of assessing the usefulness of such programs. The National Parks Service wanted to know how participants in its programs react to and interpret their experiences in the parks. The study was not intended to produce results that can be generalized across the population, but rather to identify potential trends for further study. This evaluation is one of thirteen similar studies that the same group of researchers has been/is conducting at major national parks and historical sites.
Evaluation Methods:	The participants in this study were from a class of 30 fourth-grade students from a Gatlinburg, Tennessee, public school, who attended a Parks as Classrooms field trip in 2001. One year after the field trip, investigators contacted the participants by telephone. Fifteen of

	<p>the 30 students agreed to participate in the study. Investigators conducted open-ended interviews with participants, and encouraged students to recount as much as they could about the field trip. The investigators then transcribed the interviews in their entirety and used phenomenological analysis to seek common themes in the participants' accounts.</p> <p>With regard to the evaluation's analysis, one of the co-authors shared the following details:</p>
Evaluation Instruments:	<p>A partial set of evaluation instruments is available in the article. One of the co-authors describes the way data collected through these instruments were coded and checked:</p> <p>"We accomplished our analysis through a three step coding and data check process. First, through an open coding process, we extracted raw interview data from each interview through identifying and coding categories of data using NVivo software. We analyzed each transcript, breaking it into short phrases that described any memory a student had from the program and the trip to the park. These memories included parts of an activity, plant and animal names, ecological terminology, environmental issues, and various other ideas encountered during the program. As a second step, through axial coding, we organized clusters of data from the statements which allowed themes common to all the participants' descriptions to emerge. We validated these clusters of themes by checking against the original transcripts. Finally, crosschecked data by reviewing themes, analyzing the categories and the textual properties by comparing them to one another and again checking back to the original transcripts. To establish greater credibility for the qualitative inquiry, we completed the following protocol to reduce and minimize researcher bias: three researchers familiar with qualitative study, analysis, and the coding process crosschecked and cross-validated the themes and delineated data. We then discussed any discrepancies and re-evaluated those items for reliability. The authors reached consensus on delineated themes before using the specific coded data in the respective themes."</p>
How were results used?	<p>The results of the evaluation were published in the <i>Journal of Environmental Education</i> for public use. The researchers conducted a second-phase analysis, not included in the published manuscript, which was intended for the use of the National Parks Service (NPS) Interpreter's Development Program (IDP). The NPS intends to compare the impressions of the program participants detailed in the study with what the park Interpreters intended to teach. NPS will use the results for training purposes in the IDP and to modify the Parks as Classrooms curriculum to better achieve their goals.</p>
Evaluation Cost:	<p>The evaluation was funded by the National Parks Service. Most of the funds were allocated to the Interpreter Development Program. This study was part of a large grant to study several programs at 8 different national parks. Approximately \$1500 was allocated for this specific study to cover general expenses (telephone, computer software).</p>
Evaluation Insights:	<p>What worked well? The researchers suggest that the open-ended interview process effectively drew out participants' attitudes and impressions of the program, much more so than a survey with closed-ended questions. The researchers felt this method of obtaining data was especially effective.</p> <p>What were the important evaluation "lessons learned"? The first author commented that many past studies have claimed to analyze and distinguish between environmental "attitudes" and "behaviors." He felt the methods used in this evaluation were especially effective in identifying the perceived attitudes and behaviors of the participants and appropriate for asserting that the EE program "may cause" the observed behaviors. Further development of the methods is necessary, but the author feels that this study provides an appropriate approach for measuring subjective constructs as attitudes.</p> <p>What could have been done differently? The study was small in size and scope. The researchers would have liked to have had more of the students from the class participate (only 15 out of 30 volunteered). The evaluator was well aware that the participants in this study were from a metropolitan area close to the park where they took the field trip. He noted that participants from further away might not react to</p>

	<p>the GSMNP experience in the same way. This particular subject pool was useful for understanding how students react to environmental experiences that happens close to home, but cannot be generalized to groups from farther away. The researchers would also have liked to have a comparison group from farther away to see if their reaction to the GSMNP would be different.</p>
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