



NEW YORK STATE WATER RESOURCES INSTITUTE

Department of Biological and Environmental Engineering

230 Riley-Robb Hall, Cornell University
Ithaca, NY 14853-5701
<http://wri.cals.cornell.edu>

Tel: (607) 254-7163
Fax: (607) 255-4449
Email: nyswri@cornell.edu

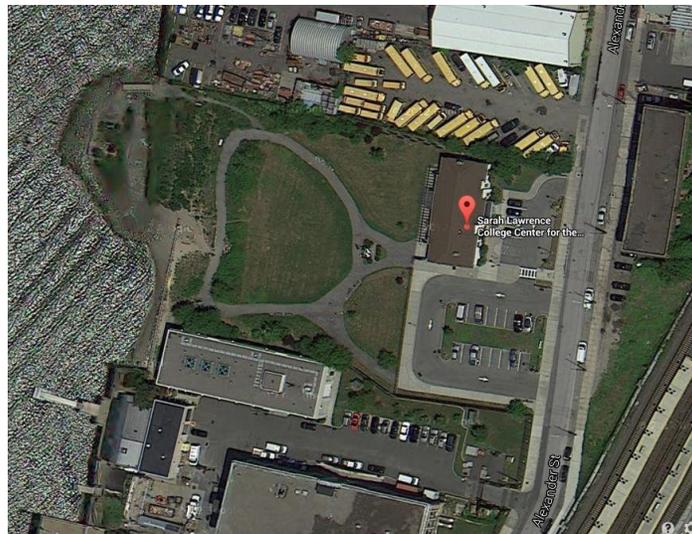
The Importance of Field Trips and Cultural Awareness in Education: A Case Study of Three Environmental Centers

Dr. Kathleen Ruen

The Art of Teaching Graduate Program, Sarah Lawrence College
kruen@sarahlawrence.edu

Vicky Garufi

Director of Education, Center for the Urban River at Beczak (CURB)
vgarufi@sarahlawrence.edu



Abstract (word limit - 200)

The Center for the Urban River at Beczak is a 3900-square-foot environmental education and research facility located on 2 acres of Hudson riverfront park in downtown Yonkers. It is operated by Sarah Lawrence College in cooperation with the Hudson River Valley Environmental Education Institute. The objective of this study was to extend the research done last year to measure the effects of a field trip to CURB on students' environmental empathy, environmental engagement, interest in CURB, and cultural awareness. This was achieved with qualitative and quantitative measures, including a multi-case study (Bogden & Biklen, 1998) and a quantitative survey. The qualitative multi-case study in the field of participatory action research (Denzin & Lincoln, 2000), included note-taking and observation of students attending CURB programs.

Three Summary Points of Interest

- Current research indicates that field trips play a positive role in childhood education.
- Few or no studies have measured the change in attitudes toward the environment after one or more field trip visits to an interactive environmental center using qualitative and quantitative methodologies.
- This study demonstrates how field trips are an integral part of the educational process and, in this particular case, produce environmental engagement, environmental empathy, interest in educational organizations such as CURB, and overall cultural and community awareness. It also shows how similar results are found at two similar environmental centers.

Keywords

Environmental education, environmental empathy, environmental engagement, cultural awareness, field trips

Introduction

As a year-round educational community center, CURB hosts many programs such as weekend family environmental education programs, evening lecture series, and special events that are free to the community. Their diverse offerings of school-group programs provide elementary, middle, and high school students with experiential science education and environmental awareness that prepares them not only for college and career but for a life of stewardship. They annually deliver approximately 200 education programs serving 4,000-5,000 local students, plus hundreds of teachers and parents.

We wanted to examine field trips were an integral part of the educational process and, in this particular case, produced environmental engagement, environmental empathy, interest in educational organizations such as CURB, and overall cultural and community awareness. Furthermore, we wanted assess the value of field trip experiences outside the classroom—an important and indispensable part of the curriculum— which would add to existing research on the importance of field trips in education. The thrust of this research is based heavily on an article, “The Educational Value of Field Trips,”(Greene, Kisida & Bowen, 2014) which found a way to quantify the value of field trips on children’s empathy, critical thinking, and interest in art museums. This study showed the positive results of students taking one visit to an art museum, and found that this experience was retained in the students’ memories and had significant positive effects. Although other studies investigate the value of field trips, there were no studies found which aimed to measure the change

in attitudes toward the environment after one or more field trip visits to an interactive environmental center using qualitative and quantitative methodologies.

After positive findings from year 1 of the grant, we decided to follow another year of school groups attending CURB, and also engage two environmental centers that offer water studies, Teatown and Westmoreland.

Methods

Our research focused on 2nd-6th grade students in public and independent schools. The methodology and procedures consisted of a qualitative multi-case study (Bogden & Biklen, 1998) and a quantitative survey. The qualitative multi-case study in the field of participatory action research (Denzin & Lincoln, 2000) included note-taking and observation of students attending CURB, Teatown, and Westmoreland. Lars Freeman, the graduate student researcher, generated and analyzed qualitative and quantitative data of the above with the guidance of his advisor, Dr. Ruen.

The quantitative survey consisted of a pre- and post-fieldtrip survey, which were identical, consisting of 4 questions about knowledge of the Hudson River and a drawing section of what might be found in the Hudson River. For this cycle students were asked to circle their birth month and year, which enabled a 1:1 correspondence. The students filled out the pre survey before their visit and the post survey a week or two after their visit to the environmental center. The quantitative surveys, which were analyzed with the assistance of Dr. Kim Fergusen, helped gain a better understanding of the separate impacts of field trips on

children's environmental knowledge, awareness, attitudes and empathy; a better understanding of the impacts of field trips on individual children's experiences, learning and attitudes; and a better understanding as to how different field trips might compare in impact. Differences across school type (public, private) and children's socioeconomic status (particularly parent income level) were also considered. Finally, by generating pre and post survey items that specifically and separately evaluated changes in children's environmental knowledge, awareness, attitudes, and empathy, the survey allowed a more nuanced understanding of the impacts of field trips on children's relationship to the environment.

Results & Discussion

First Year: Through observation and documentation, the qualitative data gathered strongly highlighted themes such as quality of CURB's educational program, environmental engagement, environmental empathy, and overall cultural and community awareness. Instances of these were found in student comments: "This was the best field trip ever." "This is so cool." "Those poor fish, if I become president I'm going to make littering illegal!" (in reference to a fish caught in Styrofoam). "How would you feel if you were taken out of your environment and put into some person's hands?" "I didn't think there was so much life in the Hudson. I thought it was basically dead. I mean, I didn't expect to find so much." In total, roughly 24 schools participated in the surveys, 18 public, 6 private/independent, and a total of 790 students.

Reviewing all the schools and programs, we averaged the mean scores of the pre and post surveys. Then we broke the schools up based on the various programs they attended: Seining, Hudson River Start to Finish, and Food Chain, and based on what type of school: Private, independent, and Public. We wanted to give as fair assessment as possible. In each configuration or arrangement, schools invariably scored higher on the post survey. Eventually, we ran these numbers through a one-tailed and two-tailed correlated t-test. The correlations came out positive, numbers which showed that the possibility that the increase in scores between the pre and post surveys happened by chance was so small it was deemed insignificant or irrelevant and so was directly attributable to CURB's quality of education.

t-Test: Correlated Samples CURB Results

Pre and Post Seining-Public and Private:
Mean a -Mean b = -31.5714, t =-5.78, df = 13 **P** one-tailed=
<.0001, two-tailed= <.0001

Pre and Post Seining-Public:
Mean a -Mean b = -33.8889, t =- 4.83, df = 8 **P** one tailed=
0.0006525, two-tailed= 0.001305

Pre and Post Seining-Private:
Mean a -Mean b = -37.8, t = -6.33, df = 4 **P** one-tailed=
0.001594, two-tailed= 0.003188

Pre and Post All Programs-Public and Private:
Mean a -Mean b = -33.0417, t = -8.99, df = 23 **P** one-
tailed= <.0001, two-tailed= <.0001

Pre and Post All Programs-Public:
Mean a -Mean b = -33.2222, t = -7.56, df = 17 **P** one-
tailed= <.0001, two-tailed= <.0001

Pre and Post All Programs-Private:
Mean a -Mean b = -32.5, t = -4.51, df = 5 **P** one-tailed=
0.0031705, two-tailed= 0.006341

Pre and Post Water Clean Up-Public and Private
Mean a -Mean b = -11.3333, t = -3.56, df = 2 **P** one-tailed=
0.0353225, two-tailed= 0.070645

Pre and Post Food Chain-Public
Mean a -Mean b = -28.8571, t = -4.54, df = 6 **P** one-tailed=
0.0019665, two-tailed= 0.003933

Second Year: Through the process of visiting two additional centers, Lars Freeman was able to triangulate qualitative data and pull forward themes that cut across all of the observed field trips. These were:

1. Familiar to the unfamiliar
2. Grounding the intellectual into physical experience
3. Being a Scientist
4. Quality of the program
5. Environmental Empathy

Each of these themes were supported by multiple observations of the students in different settings. The Meta Theme came from the words of the children, heard many times and with great enthusiasm: "This was the Best Field Trip Ever!"

In total, roughly 420 students from the three environmental centers participated in the surveys. In terms of the quantitative data, we averaged the mean scores of the pre and post surveys. The results came out positive across all three organizations, showing an increase in knowledge after having attended the programs.

CURB: Pre-0.631498127/Post-0.841307116.
Teatown: Pre-0.769784173/Post-0.773381295.
Westmoreland: Pre-0.302727273/Post-0.605909091

In addition, data from the first and second year of surveys at CURB were compared to further track validity and impact for students in private and public schools:

In 2015, a total of twenty-four (19 public school, 4 independent school, 1 private school) classes of children from 2nd grade-6th grade participated. Across all participating schools, students received a significantly higher score on the post- ($M = 80.50\%$, $SD = 13.95$) than on the pre-survey ($M = 47.46\%$, $SD = 22/57$), $t(23) = 8.99$, $p < .0001$. These findings held true for students attending both private and public schools, $t(5) = 4.51$, $p = .003$ and $t(17) = 7.56$, $p < .001$, respectively.

In 2016, a total of 267 Kindergarten through 6th grade children completed the pre- and post-surveys. Again, in a t-test for correlated samples, children performed significantly better on the post-test ($M = 84.14\%$, $SD = 27.31$) than on the pre-test ($M = 63.30\%$, $SD = 36.46$), $t(266) = 10.20$, $p < .0001$ (see Figure 1). These findings held true for students attending both private (pre-test $M = 85.88\%$, $SD = 24.94$; post-test $M = 94.44\%$, $SD = 16.50$) and public (pre-test $M = 53.77\%$, $SD = 36.45$; post-test $M = 79.88\%$, $SD = 29.71$) schools, $t(77) = 4.16$, $p < .0001$ and $t(188) = 9.69$, $p < .0001$, respectively (see Figure 2).

The qualitative and quantitative data strongly confirm that a quality hands-on field trip to an environmental education center has a large impact on the students attending.

Policy/Management Implications

This study has value for the DEC and other institutions that promote and fund environmental education programs, offering the insight needed to effectively meet their goals. Further, the data may prove valuable to regional non-profits, community groups, and municipal agencies that provide, or are interested in providing, similar environmental education services.

Outreach Comments

The methodology and results of this study were presented at the January 15th, 2016 Regional Environmental Educators Day and at the Department of Environmental Conservation (DEC) River Educators Gathering on March 24th, 2016.

This year an article including more details about the study was published on Sarah Lawrence Digital Commons in March of 2017:

http://digitalcommons.sl.c.edu/art_of_teaching_research/1/

As of this report, the article has been downloaded 82 times and is one of the most accessed research articles in the Sarah Lawrence College Digital Commons.

Student Training

This study trained the graduate student researcher, Lars Freeman, in the basics of environmental hands-on education, the methodology of qualitative research, and on creating a survey that would best measure the effectiveness of field trips, and analyzing quantitative data. This training was undertaken by the Educational Director at CURB, Vicky Garufi, the Principal Investigator, Dr. Kathleen Kristin Ruen, and Psychologist Dr. Kim Ferguson. Graduate student Yolanda Cando

was trained in the practice of quantitative research while looking at the second year of surveys.

Additional final reports related to water resource infrastructure research are available at <http://wri.cals.cornell.edu/grants-funding>

References

1. Blatt, E., & Patrick, P. (2014). An Exploration of Pre-Service Teachers' Experiences in Outdoor 'Places' and Intentions for Teaching in the Outdoors. *International Journal Of Science Education, 36*(13), 2243-2264.
2. Carrier, S. J., Thomson, M. M., Tugurian, L. P., & Stevenson, K. T. (2014). Elementary Science Education in Classrooms and Outdoors: Stakeholder views, gender, ethnicity, and testing. *International Journal Of Science Education, 36*(13), 2195-2220.
3. Greene, J.P., Kisida, B., Bowen, D.H. (2014). The Educational Value of Field Trips. *Education Next, Winter 2014, 79-86.*
4. Tülay, Ö. (2014). Increasing Social Studies Teacher Candidates' Awareness and Sensitivity towards Environmental Problems with applied field trip Method. *International Journal Of Social Sciences & Education, 4*(4), 863-880.
5. Vascellaro, S. (2011) . *Out of the Classroom and Into the World: Learning from Field Trips, Educating from Experience, and Unlocking the Potential of Our Students and Teachers.* The New Press. New York, New York.
6. Denzin K. Norman, Lincoln S. Yvonna. (2000). *Handbook of Qualitative Research Second Edition.*
7. Bogdan C. Robert, Biklen K. Sari. (1998). *Qualitative Research for Education Introduction to Theories and Methods.*