Measuring the environmental attitudes of children in grade 4: A study in Clark County

Amir Khawaja

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Measuring the Environmental Attitudes of Children in Grade 4: A Study in Clark County

Amir Khawaja

University of Nevada, Las Vegas
Department of Environmental Studies
Thesis submitted in partial fulfillment of the requirements for the degree of Environmental Studies, B.A.

Year: Spring, 2003
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Abstract

The purpose of this study was to examine whether there is an increased positive effect on children’s attitude when they are taught about the environment in an outdoor/hands-on setting versus an indoor traditional classroom setting. The study focused on grade four students in the Clark County School District. Half of the group was comprised of students that were taught about the environment using traditional classroom learning materials while the other half consisted of students that were taught using the outdoor/hands-on approach. In order to test the results, the students were given a survey. The questionnaire created by Malkus and Musser (1994) was modified in order to stay consistent with the vocabulary familiar to most 4th grade students and meet the University of Nevada, Las Vegas and Clark County School District requirements. Results showed a positive correlation in children’s attitude when taught in an outdoor setting.
Introduction

In recent years, with global warming, water pollution, and other environmental crisis, some level of awareness needs to be raised in order to protect the environment (Castillo et al. 2002). Like adults, many young children are also concerned about their environment and the future environments in which they live in (Fleer, 2002). Parents and teachers play an important role in helping children understand and recognize the importance of promoting environmental awareness; however, perceptions play a vital role in this education process (Mosothwane, 2002). In the past little attention was given to environmental education (Gist, 1998). With the media on the tail of green house gases and melting polar ice caps, the term “Environmental Education” is receiving attention. Loughland et al. (2003) envision the idea of environmental education in schools as an important strategy to achieving environmental improvement. Giving children an alternate view about the environment has been a great struggle for teachers. Compared to the past, the newer generation of parents and children are keeping an open mind about environmental education since increase in awareness about the environment has been raised through various media.

What is Environmental Education?

The National Environmental Education and Training Foundation (NEETF) advocates “Environmental-based Education" by calling it a tool for achieving broader educational goals and “has the potential to dramatically increase the overall amount of time teachers spend on the environment each school year” (NEETF, 2001). Environmental education is a way of raising awareness about the environment to children and adults through traditional or outdoor learning, and giving them a full learning experience about wonders of our plant and the environment. A range of resources can be used in teaching environmental education. Examples include trips to
museums, gardens, backyards, wetlands, national parks, camping, building tree houses, etc. Many school districts have included environmental studies as part of the curriculum. By doing so, children are able to receive the education needed to understand the many facets associated with environmental protection and conservation.

As a foundation, the main goal of any curriculum is to increase the current knowledge of the students (Armstrong and Impara, 1991) and in order to make environmental education more effective; it must begin at an early stage (Gist, 1998). Although the media is helpful in this area, they are very selective in what to broadcast on television or the radio. Studies have shown that the major source for knowledge and information among young children is television. It was also found that children gave distant environmental problems prevalence over local problems; and that the children failed to make a connection between the two (Bonnett and Williams, 1998). This indicates that although the children have awareness to the larger global issues facing the environment, there is no emphasis on educating the children about similar issues plaguing the local surroundings. As a matter of fact, children as young as kindergarten are capable to form concepts concerning environmental problems and citizenship responsibility (Bryant and Hungerford, 1977). That being said, the purpose of this study was to measure the environmental attitudes of children in the fourth grade and examine whether this is a positive increase in their perception towards the environment when they are taught about environmental studies in an outdoor setting accompanied by hands-on training.

To some extent environmental education has some ties with the idea of self-concept. Self-concept can be defined as “feelings of personal worth and level of satisfaction regarding one’s self” (Purkey 1988, Walz 1991). Children perceive the environment differently than the adults; therefore, in order to change their behavior and attitude toward the environment, different
teaching methods need to be used. Perception is the key to changing behavior and attitude. By assessing the self-concept of children and the environment we can raise a “sufficient level of self-awareness.” (Strein, 1995). Can we help students in the 4th grade develop a more positive attitude towards the environment by providing environmental education in an outdoor setting?

**Why Use 4th Grade Students?**

In this study 4th grade students were used as subjects to fill the survey. The primary focus of this study was “learning”, and according to Kolb, an organizational psychologist, learning can be defined as a “process whereby knowledge is created through the transformation of experience.”¹ (Miettinen, 2000). Hall (2002) in reference to Isaacs intellectual growth², points out the fact the “children learn from physical contact in this world” and that interest is strengthened when they grow curious and begin to ask questions about things and events of the natural world. Jean Piaget further supports this idea. According to Piaget (1953)³ “sensori-motor structures are the source of later operations of thought” meaning that actions causes children to mature in respects to their surrounding environment. Cloninger (1993) in reference to Erik Erikson’s Eight Stages of Development states that throughout our lives, we go through developmental stages. Children especially from the ages of 6 to 12, learns new skills and tries to “gain recognition by producing things.” Gaining recognition is important in regards to helping them learn about themselves. Going back to Piaget’s theory of intelligence, “children go through four cognitive stages of cognitive development” (Goswami, 2001) and from the age of 7 to 12 they are at a period of concrete operations (learning through interaction); however, children at this age are unable to process “conceptual ideas in to sequence” (Fortosis and Garland, 1990).

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² Isaacs, Intellectual Growth (1930), 80 (See Reference)
Since students in the 4th grade are in this transitional phase, they will learn more about the environment.

**Why not Use 5th Graders or Higher?**

According to John Dewey's naturalistic model of reflective thought and action, people (children included) go through primary and secondary experiences. The primary experience according to Dewey is composed of "material interaction with the physical and social environment" (Miettinen, 2000). The secondary experience is the rationalization process. Accord to Piaget, children form and comprehend concepts and ideas that are presented to him or her symbolically and theoretically (Fortosis and Garland, 1990). Children in the 5th grade and above have a better understanding about their surroundings, they are better able to rationalize things and create stronger hypothesis. Students in the 5th grade do not fit into the picture for this study due to the level of intellectual development.

**Outdoor Learning**

Exposing children to the outdoors will create a more positive attitude and increase their view on conservational behavior towards the environment (Ryan, 1991). This means that the child will exhibit environmentally safe habits and display an interest in learning about the environment. An outdoor setting allows adolescents to feel free from the constraints of parents, school, and peers at home (Dresner and Gill, 1994). Hence, using an outdoor setting to teach children about the environment is appropriate. This will allow children to express new aspects of their personality. Children will be able to better learn about the environment, i.e. the earth and its atmosphere, in a setting that can be motivating. Feeling comfortable in nature is an important goal leading to more responsible actions towards the environment (Dresner and Gill, 1994).

---

Childhood is an age when the gain of knowledge is of critical importance. The children learn a wide array of things from tying their shoe laces to feeding and walking the family dog. Younger children between the ages of 8 and 11 especially have very little knowledge of the environment. At this age, they are less likely to have well-established environmentally harmful behaviors to "unlearn" (Leeming et al. 1997), making them wonderful prospects for creating a more environmentally aware generation. In the past, many studies have been performed on the knowledge acquired by children about the environment. For example, "The Impact of an Environmental Education Program on Knowledge and Attitude (Armstrong and Impara, 1991)" is a study that surrounded the effects of the program Naturescope—a K-7 environmental education supplement. The study demonstrated that the children in the treatment group exhibited a higher mean when tested for environmental knowledge after exposure to Naturescope. This increase in awareness is an indication that children are responsive when exposed to environmental education. In addition, according to Piaget, "children do not internalize knowledge from the outside in, but construct knowledge from the inside out through interaction with the environment" (Alderidge and Eddowes, 1994). Furthermore, Piaget also emphasizes the concept of "Felt Need" where the behaviors of children are changed (physical or mental) because of their experiences and therefore they adjust according to the change (Fischer, 1999).

The focus of this study was to measure the attitude of children when they are taught about the environment outside versus inside the classroom. The study revolved around the attitudes of children in grade four in the Clark County School District, Las Vegas, Nevada. I made an assumption that the children have some pre-conception about the environment. This study tried to discover whether teaching about the environment outdoors and making use of hands-on

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learning material promoted the current attitudes of these elementary students. Currently, the Clark County School District (CCSD) is attempting to encourage science and mathematics in the elementary level. This study fitted right into the current mental mode of the teachers in grade four. CCSD has also implemented environmental studies as part of the curriculum for children in grade four making this study viable.

With most of today’s academic learning taking place in fixed structures like buildings, schools, museums, etc., teaching the children about the environment is also being restricted. When dealing with environmental education, it is necessary to include parks, woods, wetlands, and campsites as part of the learning experience. Implementing an environmental education program requires the understanding and awareness of the change. It is necessary to take into account the viewpoint and attitudes of teachers and administrators alike. When interviewed, teachers reported that they used the museums, zoos, and classroom a lot more than nature center or parks to teach about the environment (Simmons, 1993). Many of the teachers were also particularly confused with the distinction between outdoor education and environmental education. They assumed that taking a class outdoors would encompass the goals of environmental education (Samuel, 1993). Therefore, the need of this study to discover whether or not teaching the children about the environment in an outdoor setting plays a significant role in their attitude towards the environment.
Methods

The purpose of this study was to attempt to relate the feeling and attitude of student’s in the fourth grade towards the environment especially when taught in an outdoor setting. This section was divided into two sub-sections: Subject identification, Survey and Procedure.

Subject Identification

Grade four students from the Clark County School District (CCSD) were the subjects of this study. Two groups were created to compare grade four student’s learning attitudes toward the environment. For comparison purposes, a control group and an experimental group were identified. The experimental group was composed of students that are taught environmental studies by teachers that do not utilize outdoor teaching resources. The control group was composed of students that are taught about environmental studies by teachers that utilize many outdoor resources as well as hands-on demonstrations of theoretical concepts.

An estimated total of at least 120 students took part in this study. Clark County School District recommends 25-30 students per classroom teacher in the fourth grade; therefore, this study chose four teachers, each pair belonging to one group—Experimental and Control groups.

Survey and Procedure

Two teachers from each group type were handing a 14-question survey to their students. However, only students who had provided a signed parent consent form were allowed to take the survey. This survey is a modification of a measuring tool created by Malkus and Musser to measure the attitudes of the children (Musser and Malkus, 1994). The survey created by the two authors provides a tested method for measuring the attitudes of children between the ages of eight and twelve. The need for modification was necessary in order to fit the vocabulary of the students at the 4th grade level in CCSD. Malkus and Musser created this tool as a general-
purpose scale to measure environmental attitude. Hence, it is a good measuring tool for this study. Malkus and Musser constructed the test using psychometric principles to allow internal-consistency and test and re-test reliability.

The format of their test consisted of 25 questions phrased in a form that children between the ages of 8 to 12 could easily comprehend (Appendix B). For example, question one asks:

Some kids like to leave water running when they brush their teeth.

1 2 (Least Pro-environment)

Other kids always turn the water off while brushing their teeth.

3 4 (Most Pro-environment)

The test is setup with four numbers for each question. The number four is representative of the most pro-environment response while one represents the least pro-environment response. The survey requires the students to circle the larger number if they felt they were more like the first kid or the second kid. Hence, if the child felt they were like the kid that left the water running while brushing their teeth, they would circle the number 1. Similarly, if they felt that they were like the other kid that turns the water off while brushing their teeth; they would circle the number 4. If they were not exactly like the first kid then they would circle the number 2. Or, if they were not exactly like the second kid, they would circle the number 3.

For this study, however, the verbiage and format of the survey were changed. The administrators at Clark County School District made recommendations to change the wording and format of the survey to better suit the ability of a fourth grade student. For example:
Do you leave the water running when you brush your teeth?

- Always 1 (Least Pro-environment)
- Sometime 2
- Never 3 (Most Pro-environment)

Do you think about protecting the rain forest?

- Always 3 (Most Pro-environment)
- Sometime 2
- Never 1 (Least Pro-environment)

Scoring of the survey was tabulated in a way similar to Malkus and Musser's where number three is representative of the most pro-environment response while one represents the least pro-environment response. Scores were not visible on the survey sheet to avoid anxiety among 4th grade students.

The test scores can range anywhere from fourteen to forty-two points where fourteen is representative of a student that is the least pro-environment and forty-two represents a student that is the most pro-environment. Survey collected from each group were compared and analyzed by adding up the scores of each student. The students were separated based on their teacher to check whether or not there are discrepancies between teachers and their students. This provided a self-test to check whether the teacher was an influence on the attitudes of students.
Data Analysis

The purpose of this study was to measure the environmental attitude of children in the fourth grade in two elementary schools in the Clark County School District. The survey had fourteen questions that measured environmental attitudes. A total of 120 surveys were distributed to the two schools. However, only 46 surveys were usable. Unusable surveys were discarded because the Office for Protection of Research Subjects (OPRS) mandates parental consent and anonymity of subjects under the age of 18. Therefore, the discarded surveys were the ones where: a) parents did not consent to their child taking the survey, b) the student wrote their name on the survey, and c) incomplete surveys.

Based on the surveys received, Table 1 shows a simple statistical analysis of the results for the survey (See Appendix E). The students of Gibson Elementary have a higher mean and median than students at Gragson Elementary.
### Descriptives

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Statistic</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gibson ES</strong></td>
<td>Mean</td>
<td>32.87</td>
</tr>
<tr>
<td>95% Confidence</td>
<td>Lower Bound</td>
<td>31.64</td>
</tr>
<tr>
<td>Interval for Mean</td>
<td>Upper Bound</td>
<td>34.09</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>32.91</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>8.028</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2.833</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>-.078</td>
<td>.481</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.424</td>
<td>.935</td>
</tr>
<tr>
<td><strong>Gragson ES</strong></td>
<td>Mean</td>
<td>30.39</td>
</tr>
<tr>
<td>95% Confidence</td>
<td>Lower Bound</td>
<td>28.63</td>
</tr>
<tr>
<td>Interval for Mean</td>
<td>Upper Bound</td>
<td>32.15</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>30.48</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>30.00</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>16.613</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>4.076</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>-.058</td>
<td>.481</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.428</td>
<td>.935</td>
</tr>
</tbody>
</table>

*Table 1: Simple statistical analysis of results.*

The histograms below, Graph 1a and 1b, present a visual depiction of the survey score of each student from each school.
Graph 1a: Survey results for Gibson Elementary as a histogram.

Graph 1b: Survey results for Gragson Elementary as a histogram.
Graph 2 shows a comparison of the two schools indicating that the students at Gragson Elementary scored lower than the students at Gibson Elementary.

Graph 2: Gragson Elementary vs. Gibson Elementary

Figures 1a and 1b below show a Stem-and-Leaf plot of the survey results from each school. It illustrates that the population result is near a normal distribution curve.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Stem &amp; Leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.00</td>
<td>2 . 78</td>
</tr>
<tr>
<td>14.00</td>
<td>3 . 0111122223344</td>
</tr>
<tr>
<td>7.00</td>
<td>3 . 5666678</td>
</tr>
</tbody>
</table>

Stem width: 10
Each leaf: 1 case(s)

Figure 1a: Stem and Leaf plot for Gibson Elementary
Figure 1b: Stem and Leaf plot for Gragson Elementary

Figure 2 shows the results of the Shapiro-Wilk and Kolmogorov-Smirnov normality tests. These tests were performed to ensure that the data gathered were close to a normal distribution allowing statistical tests like correlation and t-Test to be conducted.

<table>
<thead>
<tr>
<th>Tests of Normality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gibson ES</td>
</tr>
<tr>
<td>Gragson ES</td>
</tr>
</tbody>
</table>

* This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 2: Normality tests

The survey contained questions that could be broken down into four categories. These categories are Environmental Conservation, Ecological Conservation, Resource Management, and Land Use Management. There were five questions from Ecological Conservation, four questions from Environmental Conservation, three questions from Resource Management, and two from Land Use Management. Table 2 shows the results of the t-Test for the various categories that were contained within the survey.
<table>
<thead>
<tr>
<th>t-Test</th>
<th>Reject $H_0$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological</td>
<td>Yes</td>
<td>5%</td>
</tr>
<tr>
<td>Environmental</td>
<td>Yes</td>
<td>1%</td>
</tr>
<tr>
<td>Resource Mgmt.</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Land Use Mgmt.</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Aggregate</td>
<td>Yes</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Table 2: categorical and aggregate result of the t-Test*
Data Interpretation/Discussion

Based on the literature review, I was expecting the students at Gibson Elementary School, the group that was exposed to environmental education using outdoor/hands-on instruction, to show a higher positive environmental attitude compared to the students at Gragson Elementary School, the group where the students were taught primarily using textbooks and worksheets. The results of the survey support my hypothesis that teaching about the environment in an outdoor setting and using a combination of hands-on training will yield a more positive impact on the students' attitude towards the environment. The average student score on the survey from Gibson Elementary is higher compared to the students at Gragson Elementary. This is a clear indication of a positive impact in environmental attitude.

Graph 2 shows the difference between the two groups visually. It visually illustrates the positive impact of using outdoor/hands-on environmental education. In order to statistically verify that there is a difference between the two groups, a two-sample t-Test was performed. Since the two-sample t-Test requires that the two populations be normal, a Shapiro-Wilk test was performed to test for my normality assumption. The results of this test may be seen in figure 2. The test result indicates that both samples appear to be normal. Therefore, the two-sample t-Test may be performed to see if there is a significant difference between the means of the two samples. The null hypothesis was that there will be no difference between Gibson Elementary ($\mu_1$) and Gragson Elementary ($\mu_2$); the alternative hypothesis tested was that there will be a significant difference between Gibson Elementary ($\mu_1$) and Gragson Elementary ($\mu_2$). The result of the t-Test may be seen in Table 2. The results indicate that there is a significant difference between the two groups at the 99% confidence interval. That is:

$$\mu_1 > \mu_2$$
In addition, when the responses of the two groups are compared categorically, there is a significant difference between them for the categories of Environmental Conservation and Ecological Conservation at confidence intervals of 99% and 95% respectively. However, no difference was observed between the two groups for the categories of Resource Management and Land Use Management.
Conclusion

Since environmental education is a new subject in most school curriculums, teaching about the environment will always be a difficult task. Compared to the present generation, teachers and parents in the past did not have a good grasp about environmental issues or the environment. In order to have a sustainable environment, it is important that the teachers at all levels should give their students maximum exposure to the environmental education. Parents need to learn from their children and do their part in thinking about sustainability, ecological conservation, and environmental conservation. This study focused and tried to support the idea of outdoor education in a school setting. Based on the results gathered from the survey, it could be concluded that the outdoor/hands-on group showed a positive environmental attitude. This means that the students exposed to environmental education using outdoor/hands-on techniques exhibited a positive inclination towards ecological and environmental conservation.

Recommendations

For the future, the following recommendations may help in improving the sample size of students: First, change the verbiage of the "Parent Consent Form" to be more understandable to all parents. Second, a more detailed instruction needs to be provided to the teachers distributing the survey to ensure that students do not write their names on the survey. Third, possibly give a pretest to students beginning the fourth grade and then give a post-test survey three months later to determine a correlation between the before and after attitude change and instructional method. This will help developing curriculums that are effective for indoor teaching methods.
References


Acknowledgements

I would like to thank my family for their support and patience throughout the thesis process. I would also like to thank my content advisor Elena Baker and her husband Tom for their guidance in finding the schools, the contacts, as well as help in statistical analysis. My uttermost gratitude to Dr. Helen Neill for her helpful insight in writing a thesis paper and making herself available to answer my questions out of her busy schedule. I want to thank the principals of Gragson and Gibson Elementary Schools for allowing me to distribute the surveys in their schools and in making this thesis a success. I would like to especially thank Mr. Charles Anderson, principal of Gragson Elementary School, for his valuable input and review of the survey used in this research. I would also like to thank Danny Eichelberger and Jennifer Tarno, teachers at Gibson Elementary School for their extensive feedback on the survey responses. Thank you for making time for me. Specials thanks to Aaron Wyrick and Theresa Norton for allowing me the time to complete what I had started especially during our busy work schedules. You guys are the best!
Appendix A – Survey

1. Do you leave the water running when you brush your teeth?
   - □ Always
   - □ Sometime
   - □ Never

2. Do you think about protecting the rain forest?
   - □ Always
   - □ Sometime
   - □ Never

3. Do you use both sides of the paper when you draw or write?
   - □ Always
   - □ Sometime
   - □ Never

4. Do you think we should build more landfills to hold our garbage?
   - □ Always
   - □ Sometime
   - □ Never

5. Do you think we should reuse things when we are done with them?
   - □ Always
   - □ Sometime
   - □ Never

6. Do you think about visiting national parks?
   - □ Always
   - □ Sometime
   - □ Never

7. Do you think about plants getting hurt near dams and rivers?
   - □ Always
   - □ Sometime
   - □ Never

8. Do you worry about animals becoming extinct?
   - □ Always
   - □ Sometime
   - □ Never

9. Do you bring home bugs and plants you find outside?
   - □ Always
   - □ Sometime
   - □ Never

10. Should we use chemicals in our gardens?
    - □ Always
    - □ Sometime
    - □ Never

11. Do you think about making bird houses?
    - □ Always
    - □ Sometime
    - □ Never

12. Do you pick up yours and other trash and throw it away?
    - □ Always
    - □ Sometime
    - □ Never

13. Do you turn outdoor lights off at night to save electricity?
    - □ Always
    - □ Sometime
    - □ Never

14. Do you worry about air pollution?
    - □ Always
    - □ Sometime
    - □ Never
Measuring Environmental Attitudes 25

### Appendix B – Malkus and Musser Survey

#### TABLE 1. Items and Scoring for the Children’s Attitudes Toward the Environment Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Some kids like to leave water running when they brush their teeth.</td>
<td>but</td>
<td>Other kids always turn the water off while brushing their teeth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Some kids use both sides of the paper when they draw or write.</td>
<td>but</td>
<td>Other kids use only one side of the paper when they draw or write.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Some kids think we should throw away things when we’re done with them.</td>
<td>but</td>
<td>Other kids think we should recycle things.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Some kids think dams on rivers are good because they prevent floods.</td>
<td>but</td>
<td>Other kids think dams on rivers are bad because they hurt plants and animals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Some kids like to bring home plants or bugs they find outside.</td>
<td>but</td>
<td>Other kids like to look at plants or bugs outside but they never bring them home.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Some kids don’t like to make bird feeders or bird houses.</td>
<td>but</td>
<td>Other kids like to make bird feeders or bird houses.</td>
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<td>7. Some kids think outdoor lights should be turned off at night because they use electricity.</td>
<td>but</td>
<td>Other kids think outdoor lights should be left on at night because they keep us safer.</td>
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<td>8. Some kids think people are more important than animals.</td>
<td>but</td>
<td>Other kids think people and animals are equally important.</td>
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<td>9. Some kids are concerned about the rain forest.</td>
<td>but</td>
<td>Other kids aren’t concerned about the rain forest.</td>
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<td>10. Some kids think we should build more landfills to hold our garbage.</td>
<td>but</td>
<td>Other kids think we should find other ways to deal with our garbage.</td>
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<td>11. Some kids like visiting national parks.</td>
<td>but</td>
<td>Other kids don’t like to go to national parks.</td>
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<td>12. Some kids don’t worry about animals becoming extinct.</td>
<td>but</td>
<td>Other kids worry about animals becoming extinct.</td>
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<td>13. Some kids throw things away when they are done with them.</td>
<td>but</td>
<td>Other kids reuse things or give them to other people to use.</td>
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<td>14. Some kids think we shouldn’t use chemicals and fertilizers in our gardens.</td>
<td>but</td>
<td>Other kids think we should use chemicals and fertilizers in our gardens.</td>
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<td>15. Some kids pick up trash and throw it away.</td>
<td>but</td>
<td>Other kids don’t like to pick up smelly trash.</td>
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<td>16. Some kids don’t sort their trash.</td>
<td>but</td>
<td>Other kids sort their trash and recycle it.</td>
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<td>17. Some kids like to live where there are lots of plants and animals.</td>
<td>but</td>
<td>Other kids like to live where there are lots of people.</td>
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<thead>
<tr>
<th></th>
<th>Some kids</th>
<th>but</th>
<th>Other kids</th>
<th>Scoring</th>
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<td>18.</td>
<td>Some kids touch or catch wild animals. but Other kids never touch or catch animals they find outside.</td>
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<td>19.</td>
<td>Some kids don't like to carpool because they don’t like being crowded in the car. but Other kids like to carpool even if it is a little crowded.</td>
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<td>20.</td>
<td>Some kids are excited about solar energy. but Other kids don’t care about solar energy.</td>
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<td>21.</td>
<td>Some kids believe people should be able to live wherever they want. but Other kids believe that people should be careful not to destroy animals’ homes.</td>
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<td>22.</td>
<td>Some kids worry about air pollution. but Other kids don’t worry about air pollution.</td>
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<td>23.</td>
<td>Some kids think we should be able to hunt all wild animals. but Other kids think that animals need protection.</td>
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<td>24.</td>
<td>Some kids turn off the lights when they leave. but Other kids leave the lights on.</td>
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<td>25.</td>
<td>Some kids get their parents to drive them places they want to go. but Other kids ride their bikes or walk when they can.</td>
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Note: When the scale is administered, for each question, children are told to choose which of the two groups of children (the group described on the left side of the word but or the group described on the right side of the word but) they are like. Once they have made this decision, children are instructed to put a check mark in the big box if they are a lot like the described children or a check mark in the small box if they are only a little like the children described in the statement. Each item is scored from 1 to 4. With 4 representing the most pro-environmental response. The scoring for each item is presented in the boxes below the item. (Only the boxes, not the numbers, are presented to children.) Scores from each item are added together to create a total environmental attitude score, which can range from 25 to 100.
Appendix C – Parent Consent Form

University of Nevada, Las Vegas
Department of Environmental Studies

INFORMED CONSENT

General Information:
I am Amir Khawaja from the UNLV Department of Environmental Studies. I am currently a student at my college and also the researcher on this project. I would like to invite the participation of your child in a research study – “Measuring the Environmental Attitude of Children in Grade 4: A Study in Clark County.”

Procedure:
If you allow your child’s participation in this study, he or she will be asked to do the following:

- Participate in a survey.

Benefits of Participation:
By allowing your child’s participation in this study, you will allow me complete a vital part of my undergraduate coursework. You and your child will also receive an increased understanding of the effect of teaching environmental studies related concepts in an outdoor versus indoor setting. For your convenience, a copy of the survey to be administered has been attached with this packet. In addition, the survey will be administered by your child’s classroom teacher and not by me or any other member of this study.

Risks of Participation in:
Your child may experience minimal risk while participating in this research. Minimal risk may involve feeling uncomfortable answering any or all of the questions asked on the survey. If you or your child is uncomfortable answering any or all of the questions asked, you are encouraged to discuss this with me. I will attempt to explain the questions to you in more detail.

Contact Information:
If you have any questions about the study or if you believe you may have experienced harmful effects as a result of participation in this study, you please contact Helen Neill, Ph.D. at 895-4892 (UNLV phone number). Or, you may contact me at 203-5880.

For questions regarding the rights of research subjects, you may contact the UNLV Office for the Protection of Research Subjects at 895-2794.

Voluntary Participation:
Your child’s participation in this study is voluntary. You may refuse your child’s participation in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.
Measuring the Environmental Attitude of Children in Grade 4: A Study in Clark County
INFORMED CONSENT (continued)

Confidentiality:
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link your child to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be discarded (i.e., destroyed)

Participant Consent:
I have read the above information and agree to my child’s participation in this study. A copy of this form has been given to me.

Signature of Parent ___________________________ Date __________

Parent’s Name (Please Print) ___________________________
Appendix D – Student Consent Form

Child Assent Form/Student Permission Form

Your class has been chosen to take part in a research study that will measure environmental attitude. You can participate by answering questions on a survey form. There is very little risk involved. The risk is that you may feel uncomfortable answering any or all of the questions. Participation is voluntary. You must ask your parents permission before taking part in this study. You may keep a copy of this form for your own records.
### Appendix E – Raw Results

| Question 1 | S 1 | S 2 | S 3 | S 4 | S 5 | S 6 | S 7 | S 8 | S 9 | S 10 | S 11 | S 12 | S 13 | S 14 | S 15 | S 16 | S 17 | S 18 | S 19 | S 20 | S 21 | S 22 | S 23 |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Question 2 | 3   | 2   | 3   | 2   | 3   | 1   | 3   | 3   | 3   | 3    | 2    | 1    | 1    | 3    | 3    | 2    | 2    | 1    | 2    | 3    | 3    | 3    | 1    |
| Question 3 | 2   | 3   | 1   | 1   | 2   | 1   | 3   | 1   | 3   | 1    | 2    | 1    | 1    | 2    | 3    | 2    | 2    | 1    | 3    | 3    | 1    | 1    | 3    |
| Question 4 | 3   | 3   | 2   | 3   | 3   | 1   | 1   | 3   | 3   | 3    | 3    | 3    | 3    | 2    | 3    | 1    | 3    | 1    | 3    | 3    | 3    | 1    | 3    | 3    |
| Question 5 | 1   | 1   | 2   | 3   | 3   | 3   | 2   | 2   | 2   | 2    | 3    | 1    | 1    | 2    | 3    | 1    | 3    | 2    | 3    | 2    | 3    | 3    | 3    | 3    |
| Question 6 | 2   | 2   | 3   | 1   | 1   | 2   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 1    | 2    | 1    | 2    | 2    | 1    | 3    | 3    |
| Question 7 | 3   | 1   | 3   | 3   | 2   | 3   | 3   | 1   | 3   | 3    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 2    | 2    | 2    | 3    | 3    | 3    |
| Question 8 | 3   | 3   | 3   | 3   | 2   | 3   | 3   | 1   | 3   | 3    | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 2    | 2    | 3    | 3    | 3    | 3    |
| Question 9 | 1   | 1   | 2   | 2   | 3   | 3   | 3   | 1   | 3   | 3    | 3    | 3    | 1    | 2    | 1    | 1    | 3    | 3    | 1    | 2    | 2    | 3    | 3    | 3    |
| Question 10| 1   | 1   | 2   | 1   | 3   | 1   | 3   | 2   | 2   | 1    | 2    | 2    | 3    | 2    | 1    | 2    | 1    | 3    | 1    | 1    | 2    | 2    | 2    | 3    |
| Question 11| 2   | 2   | 2   | 3   | 2   | 2   | 2   | 3   | 3   | 2    | 2    | 3    | 2    | 2    | 3    | 1    | 3    | 3    | 2    | 2    | 2    | 1    | 3    | 3    |
| Question 12| 2   | 3   | 2   | 3   | 2   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 2    | 3    | 3    | 2    | 3    | 3    | 3    | 1    | 3    | 3    | 3    |
| Question 13| 1   | 1   | 3   | 2   | 1   | 1   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 2    | 3    | 1    | 2    | 3    | 2    | 3    | 3    | 3    | 3    |
| Question 14| 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3    | 3    | 3    | 3    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |

Results from Gragson Elementary. S 1 to S 23 are the students.

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