

Assessment of Pittsburgh Zoo & PPG Aquarium's KidScience and Zoo U. Students' Conservation  
Attitudes and Actions Over a Two Year Period

IAP Final

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Abstract

Conservation education programs are designed to instill environmental values in young children that will, hopefully, stay with them throughout their lives and inform their attitudes and actions as adults. As the coordinator for two long-term, year-round conservation programs, I am in the unique position of teaching students as they grow from children into young adults. For this Inquiry Action Project, I asked who was more committed to conservation, younger students or older students. The comparative question was assessed through a survey administered on the first day of class in 2011, and the results were compared to results from the survey given on the first day of class in 2009. 'Younger' students were defined as 2009 students in both the KidScience and Zoo U. programs, while 'older' students were primarily defined as 2011 Zoo U. students. Because the older students have been exposed to more pro-environmental information and because they have more control over their daily behavior and choices, I predicted that older students would show a stronger commitment to conservation than younger students. However, results showed that older students were not more committed to conservation than younger students. In each measure of the survey, the 2011 students scored the same or even a bit lower than they did in 2009. Perhaps they hold the same attitudes as they did when they were younger and do not participate in more activities. Perhaps they were already so positive and committed to conservation in 2009 that they could not score any higher this year. The more likely scenario, however, is that the results are due to one or more of the following factors: older students are less focused on giving the responses they believe they should give, older students are more realistic in reporting how they are willing to behave, and/or a hopelessness and pessimism about the environment has begun to set in among the older teenage students with more conservation education courses.

## Introduction

Conservation education programs in Zoos and Aquariums are often tailored toward children, as they are more likely to be open to conservation messages and possess an innate sense of wonder about the natural world (Rickinson, 2001). The underlying objective in developing conservation education programs for children is the supposition that those who make personal connections with the environment early in life will be more likely to act in more environmentally conscious ways in their adult lives (Swanagan, 2000).

As coordinator for two long-term conservation education programs at the Pittsburgh Zoo & PPG Aquarium, I have the unique opportunity to witness and assess my students' conservation attitudes and commitment over the course of several years. Many of my students begin taking classes with me as children, and they continue with programs as they approach and begin adulthood. KidScience, a program for middle school students, is designed for participants between 11 and 14 years old. Zoo U. students are between 13 and 17 years old, as the courses are designed for a high school audience. Both programs are year-round, and all topics and themes build upon previous material. While some students do begin classes at different times or stop taking classes as they get older, most of our students begin attending classes as 1<sup>st</sup> year KidScience students and continue with the programs until they graduate high school.

Because of the long-term, continuous relationship I have with my students, I have designed this study to test if the students, in fact, do grow in their commitment toward conservation, both in attitude and action, as they grow in knowledge and independence. This study seeks to investigate the following question: Who is more committed to conservation—younger or older students? The predicted outcome is that older students will be more committed to conservation than younger students, as they have taken conservation education classes for a longer period of time and they have more independence to make conservation minded choices in their daily lives. 'Younger' students will primarily be students in 2009 in both the KidScience and Zoo U. program, while 'older' students will primarily be Zoo U. students in 2011.

Students in both the KidScience and Zoo U. programs were originally assessed in 2009. As in the original assessment, the commitment to conservation will be measured as the sum of two factors: attitude toward the environment and environmentally-friendly behaviors. Possible environmentally-friendly behaviors could include recycling on a regular basis, being aware of energy consumption and working to reduce energy usage, supporting conservation organizations, and participating in community conservation efforts. Those who have a more positive attitude toward the environment and those who engage in eco-conscious actions will be rated as having a higher level of conservation commitment. Because younger students have less control over their choices and behaviors than older students, it is hoped that even if younger students say they will do more for the environment, older students should likely rate higher in their actual environmentally friendly actions.

The current study is investigating the question of whether older students are committed to conservation than younger students in several ways. Data from the prior study will be compared to data obtained during the current study to determine if students have changed in their conservation attitudes over a two-year period. The survey results from the KidScience students in 2009 will be compared to Zoo U. survey results from 2011, as 1<sup>st</sup> and 2<sup>nd</sup> year KidScience students are now 1<sup>st</sup> and 2<sup>nd</sup> year Zoo U. students, respectively. Data collected from Zoo U. students in 2009 will also be directly compared to data collected from Zoo U. students in 2011, as students in early high school in 2009 are now upperclassmen and women in 2011.

Prior to conducting the assessment, I predicted that older students would be more committed to conservation than younger students, and they will hold more environmentally-friendly attitudes and report participating in more conservation-oriented actions. In 2009, Zoo U. students scored higher than KidScience students in all aspects of the survey. Because the older kids rated higher both in environmental attitudes (more positive toward the environment) and actual behavior in 2009, I predict they will rate higher again in 2011. In addition, I predict that older students, in general, will rate higher than younger students, so in the comparisons between the data collected in 2011 and the data collected in 2009, the 2011 results should show a stronger commitment to conservation.

It is my assumption that students who have more exposure to conservation messages and ecological concepts will be more likely to take more meaningful stances for conservation. Also, because older students likely have more freedom to make their own decisions regarding transportation, the products they buy, financial support of conservation organizations, and volunteering their time in an environmentally productive manner than younger students, they now have the opportunity to put many of the conservation education messages they have been receiving over the years into practice in their daily lives. Two years ago, both KidScience and Zoo U. students reported that they would be likely to behave in environmentally conscious ways when they were older. Now, as they are nearing adulthood, are they actually practicing these behaviors and still holding the positive environmental attitudes and outlooks they had when they had less knowledge and responsibility?

The objectives for this study are many. First, I want to obtain an assessment of the conservation commitment of all of my students, which will be used to tailor future course lessons and activities. I will be able to distinguish where current course materials are lacking and where we can improve the experience for the students. By looking at the results from 2009 and comparing them to the results obtained in 2011, I can better understand how well the students are absorbing the conservation messages being presented throughout the courses and incorporating them into their lives.

Several other people at the Zoo will utilize the program assessment in addition. The Curator and Assistant Curator of Education can perceive how the KidScience and Zoo U. programs influence the attitudes and behavior of its students. The results will demonstrate whether or not we are achieving the goals and objectives of the programs by engaging students and creating the next generation of conservationists. The assessments can, also, be used to secure future funding for the programs, as the development department often reports assessment results to granting organizations.

#### Method

A survey to assess the students' commitment to conservation was developed and administered to students on their first day of class for the Fall 2011 semester (See Appendix 1). The survey was originally developed in 2009 for use with my prior Inquiry Action Project, and it incorporated materials and

resources obtained through a previously taken Global Field Program course. The content of the survey was initially developed prior to the conservation values Community Engagement Lab assignment, which addressed survey techniques, in the Conservation Science and Community class. However, CSC class materials informed the piloting, editing, and implementation of the surveys (Schultz, 2001). The survey was piloted with staff members in the Conservation Education Department at the Pittsburgh Zoo & PPG Aquarium in 2009. Staff members responded to the survey, and they provided feedback regarding any clarifications that should be made, any statements that were confusing or misleading, and general critiques of the survey (Revak, 2009). The structure and content of the survey was edited accordingly at that time. Surveys were, then, administered to students in the KidScience and Zoo U. programs in October 2009, to assess their conservation attitudes. Because the survey was clear, concise, and produced compelling results in 2009, it was not modified before being given to students in October 2011.

Studies by Dunlap, et al. (2000) and Maloney & Ward (1973) informed many of the questions and statements included on the survey. The survey was comprised of several segments, which measured different aspects of environmental commitment. The Scale portion of the survey was designed to assess students' understanding of environmental issues and to measure their general worldview (Dunlap, et al., 2000). The Verbal portion of the survey was designed to measure what students say they would be willing to do for conservation. The Actual portion of the survey and the Yes/No portion both measure what students actually do for the environment, and the Affect portion measures students' emotion and attitude toward conservation (Maloney & Ward, 1973; Revak, 2009).

Subjects of the study were current students in the KidScience and Zoo U. programs at the Pittsburgh Zoo & PPG Aquarium (Table 1).

KidScience 2009		Zoo U. 2009	Zoo U. 2011
1 <sup>st</sup> year students (age 11-13)	2 <sup>nd</sup> year students (age 12-14)	Age 13-17	Age 13-17
30 respondents	24 respondents	29 respondents	35 respondents

Table 1. Survey participants in 2009 and 2011

Surveys were given on the first day of the 2011 Fall Semester of Zoo U. The survey was administered to 1<sup>st</sup> year KidScience kids on Saturday, October 1<sup>st</sup>, 2011. The survey was administered to the 2<sup>nd</sup> year KidScience kids on Saturday, October 8<sup>th</sup>, 2011. The survey was administered to Zoo U. students on Saturday, October 22<sup>nd</sup>, 2011. The 2009 surveys were administered on the first day of class for the 2009-2010 school year of KidScience and on the first day of the 2009 Fall Semester of Zoo U. The survey was administered to the 2<sup>nd</sup> year KidScience kids on Saturday, October 10<sup>th</sup>, 2009. The survey was administered to 1<sup>st</sup> year KidScience kids and Zoo U. kids on Saturday, October 17<sup>th</sup>, 2009. All students took approximately 20 minutes to complete the survey.

After the completion of the surveys, students were debriefed as to the scope of the study. Students were told that the survey would be used to determine whether KidScience or Zoo U. students are more committed to conservation, and the results of the survey would be used to inform future lessons, activities, and programs for the kids. Students were also invited and encouraged to make predictions as to the results of the survey. Students overwhelmingly predicted that older students would score higher in both environmental attitude and actions than younger students.

The students thought that because older students have been in the programs longer, they would have more knowledge that would lead them toward more positive environmental attitudes. In addition, the students felt that because they are older, they are more likely to have the means to behave in an environmentally-friendly manner. They will be better able to make their own choices, especially when it comes to transportation and which purchases to make, and they are more likely to have money that can be used for conservation purposes. The students cited the abovementioned examples without any suggestion from me or from any of the other teachers, so I was fascinated at how closely their ideas aligned with my own.

Data analysis was completed using Microsoft Excel. For all sections of the survey, mean and standard deviation were calculated. To compare results between 2009 and 2011, a t-test was also completed.

Results

In 2009, a total of 54 KidScience students completed the survey. The mean age of a KidScience student was 12.31 years old (sd=0.99). The mean amount of time in the program was 6.33 months, though because the survey was given on the first day of class ever for first-year students and the first day of classes for the second-year students, the standard deviation was 6.02 months (Revak, 2009).

A total of 29 Zoo U. students completed the survey in 2009. The mean age of a Zoo U. student was 14.48 years old (sd=1.06). The mean amount of time in the programs was 24.45 months, though because some kids had been in the program for several years, while others were just beginning the courses, the standard deviation was 11.70 months.

A total of 35 Zoo U. students completed the survey in 2011. The mean age of a Zoo U. student is now 15.35 years old (sd=1.35), and the mean amount of time in the programs has also increased to 41.15 months (sd=21.2). The range in amount of time in the programs is 1 month up to 72 months, with the mode being 48 months (Table 2).

	<b>Student Age (in years)</b>		<b>Months in Program</b>	
	<i>Mean</i>	<i>St. Dev.</i>	<i>Mean</i>	<i>St. Dev.</i>
<b>KidScience 2009</b>	12.31	0.99	6.33	6.02
<b>Zoo U. 2009</b>	14.48	1.06	24.45	11.7
<b>Zoo U. 2011</b>	15.35	1.35	41.15	21.2

Table 2. Survey participant ages and number of months participating in Pittsburgh Zoo Conservation Education Programs at time of survey

The survey was broken down into sections and the results were analyzed. In 2009, Zoo U. students scored higher than KidScience students on every portion of the survey, and the standard deviation for each section was generally lower for Zoo U. students in 2009, as well. However, in 2011, Zoo U. students unexpectedly scored lower in many of the sections than they did in 2009 or there was no significant difference between the two surveys (Table 3).

The “Scale” section of the survey was a Likert-style scale that asked students to rank statements from 1 to 5, with one being ‘strongly disagree’, three being ‘I don’t know’, and five being ‘strongly agree’. The scoring on questions 3, 5, 7,9, 12, 14, and 15 was reversed, as the wording of the statements

were such that disagreement with the statement reflected a pro-environmental view, as opposed to the other 8 questions, which reflected wording in which agreement would indicate a pro-environmental view (Dunlap et al, 2000). The responses were added up on each survey and divided by the number of statements in the section, which was 15, to obtain the mean score for an individual student. All student scores were then averaged to obtain the total mean for the program (Revak, 2009). The 2011 Zoo U. students scored higher ( $m=4.05$ ,  $sd=0.33$ ) on the Scale portion of the survey than either the 2009 Zoo U. students ( $m=3.95$ ,  $sd=.40$ ) or the 2009 KidScience students ( $m=3.67$ ,  $sd=.35$ ), though the difference was not significant ( $p=0.12$ ).

The “Yes/No” portion of the survey measured behaviors actually carried out by the students. Respondents were given one point for each ‘yes’ reported. Because there were seven statements in the section, a maximum of 7 points were possible (Revak, 2009). In this section, 2011 Zoo U. students ( $m=4.74$ ,  $sd=1.14$ ) scored higher than 2009 KidScience students ( $m=4.61$ ,  $sd=1.23$ ), but they actually scored lower than the 2009 Zoo U. students ( $m=5.03$ ,  $sd=1.07$ ). The difference, however, was not significant ( $p=0.25$ ).

The “Verbal”, “Actual”, and “Affect” portions of the survey were presented as statements, to which the students responded by writing true or false to indicate agreement or disagreement. The “verbal” section measured what students say they are or would be willing to do for the environment, the “actual” section measured what behaviors the students report having actually performed, and the “affect” section measured how students feel about environmental issues. Students were given 1 point for each statement that matched the environmental viewpoint (Revak, 2009).

The 2011 Zoo U. students scored lower than either the 2009 Zoo U. students or the 2009 KidScience students in both the “verbal” portion and the “actual” portion of the survey. The difference in the “verbal” scores were significant ( $p=0.003$ ), while the difference in the “actual” scores are not ( $p=0.13$ ). The “affect” score for the 2011 Zoo U. students was slightly higher, than the 2009 KidScience kids, but lower than the 2009 Zoo U. students, though the differences, were again not significant ( $p=0.08$ ). (See Table 3).

		Scale		Yes/No		Verbal		Actual		Affect	
	Total points possible	5		7		8		10		10	
		<i>Mean</i>	<i>St. Dev.</i>								
<b>KidScience 2009</b>		3.67	0.35	4.61	1.23	5.44	1.8	4.56	2.12	7.34	1.97
<b>Zoo U. 2009</b>		3.95	0.4	5.03	1.17	5.7	1.38	5.73	1.78	8.04	1.73
<b>Zoo U. 2011</b>		4.05	0.33	4.74	1.14	4.71	2.2	5	1.74	7.41	1.86

Table 3. KidScience and Zoo U. Means and Standard Deviations for Survey Portions, 2009 and 2011

Discussion

Because the predicted outcome of the survey is that older students, thus the Zoo U. students in 2011, would score higher in all measurements than younger students, or all students in 2009, the actual outcome was somewhat surprising. The older students in 2009 did score higher in all measurements than the younger students in 2009. However, the comparison between the 2011 results and the 2009 results tells a different story. Based on the mean ages and months of participation in the programs, the students are both older and more experienced in the long-term conservation education programs at the Pittsburgh Zoo & PPG Aquarium in 2011 than they were in 2009. However, despite being older, presumably more knowledgeable, and in more control of their own behaviors than two years ago, students did not score higher than before, and actually, in the ‘verbal’ measurement, they scored lower than before.

While this outcome initially surprised and dismayed me, as I felt I was not succeeding in my goal of inspiring a new generation of conservationists, I came to realize that this result may be far more fascinating and complex than it seemed to be on the surface. So, what really is happening? Maybe the students do hold the same attitudes as they did when they were younger, and they do not participate in more activities. They may even hold slightly more negative attitudes and outlooks than two years ago. But perhaps a combination of factors is at play, including younger students reporting results they believe they should report, older students being realistic regarding their true willingness to make sacrifices for the environment, and younger students possessing a more hopeful, optimistic view of the future.

The students actually scored very high, overall, on all measurements of the survey. While this study did not survey average high school students not taking an elective conservation education course at the Pittsburgh Zoo, I suspect that my students would likely rate higher than the average high school student in most, if not all, measurements of the survey. DeChano (2006) reviewed several studies which stated that average people have little knowledge about the environment, and she also discussed that typically, a positive correlation is reported between environmental knowledge and positive attitudes. Based on this information, I would expect my students to rate higher in both environmental knowledge and attitude than the average high school student. Of course, since this measurement was not taken, there is no way of knowing whether this assumption would be supported or not. Regardless, I can be pleased that my students rated very well on the survey. Because they rated so well, perhaps there was no positive change in the past two years because they maximized the realistic amount of pro-environmental attitudes and behaviors in 2009. Unfortunately, I feel this is the least likely explanation of the results.

Since the 'verbal' section of the survey was the main one in which the 2011 students scored significantly lower than either group in 2009, I primarily focused on why this result occurred. One of my concerns is that perhaps the younger students responded to the survey in the way they thought they were expected to respond, rather than the way they actually felt. Attitude surveys have a notorious design flaw in that researchers have found and generally accept that people tend to respond in a way that they feel they are expected to respond, to satisfy the researcher, rather than to accurately record their true feelings and/or commitment (DeChano, 2006). I suspect this could be at play in the results of this study, as I would expect younger students to be more conscious of trying to please me with their responses than older students, even though all students completed the survey anonymously. While older students likely still wanted to impress me with their survey responses, I would expect the older students to be somewhat more true to their actual attitudes and actions when completing the survey, as anecdotally, the older students tend to directly seek my approval less than the younger students.

There are many factors affecting an individual's actual pro-environmental behaviors and attitudes. Recently, questions have been raised as to the direct correlation between environmental

knowledge and positive environmental attitudes (DeChano, 2006). Once individuals are educated to the problems, they do not automatically exhibit positive environmental behaviors. Old behaviors are hard to break, especially without being reinforced by an individual's social network. In particular, people are willing to make positive environmental changes only if they are beneficial to them and do not require them to make drastic changes to their lifestyle or daily habits (Kollmuss & Agyeman, 2002).

Perhaps this is another reason why the 'verbal' score went down this year. The older students recognize what it truly will mean for them to act in an environmentally-friendly way, and they are being more realistic about what they say they are willing to do. Even though they have gained more knowledge, they recognize that many pro-environmental actions, choosing to take public transportation rather than driving, for example, are beyond what they are realistically willing to do in their lives. They want to help the environment, but now that they are old enough to be faced with decisions, they are realistic about their preference for personal convenience and/or comfort over environmental concern. This can be especially true if all of the rest of their friends and family members do not make a habit of taking the environmentally-friendly option.

Anecdotally, I once fell into this category of student. After being an outspoken environmentalist as a child, as a teenager, I did not want to be perceived as being a 'tree-hugger' or in any way different from the rest of my family or friends. While in my teens, I quietly continued to be concerned about the environment, but I did not go out of my way to make a difference in my school or community in a way that would draw attention to myself or set me apart from my peer group. When I look back on my thoughts and behavior as a teenager, I am disappointed with my younger self for being so concerned about the way I would be perceived by my peers, but it gives me an insight into how my teenage students may be feeling and why they may have responded the way they did to the survey.

Another reason the reported environmental attitudes and actions did not increase over the past two years could be that rather than feeling empowered by their environmental knowledge, they are feeling overwhelmed and paralyzed by it. A 1999 study (Connell, et.al.) found that many young people, while concerned about environment and knowledgeable about the issues, did not feel confident that they could

contribute to positive environmental changes. Overall, they were pessimistic about the future and their ability to do anything to address environmental problems. Teenagers in the study felt that they, as individuals, had no power to affect change, as they perceived that it would be too difficult or expensive to change the culture of governments and industries that have the true power to address environmental issues (Connell, et.al. 1999). While this may be true, it is important for all people, especially the traditionally optimistic and idealistic teenagers, to understand that while a lot of the power may be out of their hands, each individual can make a difference in his or her own life and community by undertaking realistic, practical actions and working with others to address larger, global concerns.

Many young people think about the future pessimistically, especially after viewing television shows or learning about many of the negative problems plaguing our world without being presented with practical, optimistic solutions (Hicks & Holden, 1995). Perhaps the key, then, is to present students with solutions or to empower them to come up with their own solutions that can be implemented in their own lives, in addition to simply educating them about global and local environmental issues.

Unfortunately, the survey did not address the reasons the students gave their responses, so I can only speculate as to the rationale for the survey results. In the future, I plan to reassess the Zoo U. students' attitudes and actions. Additionally, I will ask them to report why they feel the way they do, why they are or are not willing to perform particular behaviors, and whether they feel they are capable of making a difference in the world. I will also examine their feelings regarding the future—do they have hope, do they feel powerless, do they see that an individual or small group can have a positive impact on the environment?

#### Action project

Based upon the results of the survey, throughout the remainder of the semester and throughout the spring, students will be encouraged to consider their actual knowledge, attitudes, and actions toward environmental and conservation issues. Often, people say they are committed to conservation, but their actions do not fit with their words (Nisbet, Zelenski, & Murphy, 2009; Scott & Willits, 1994; Maloney & Ward, 1973). Because the results of the survey suggest that the students are no more committed to

conservation than they were two years ago, the action component of this study will involve designing a Zoo U. course that empowers students to use their knowledge and their passion to make an observable difference in their community and in the world.

The new course, with the proposed title, “Impact Your World: Hands-On Conservation” will address the feelings of hopelessness that may exist in the student population by engaging the students in a few hands-on conservation efforts and community conservation problem solving activities (See Appendix 2). I hope that by focusing on a few specific issues and looking at tangible, practical green behaviors, the students will lose the feeling of being overwhelmed and will be inspired to become conservation leaders in their own lives.

Perhaps the most crucial element in creating lasting behavioral changes is fostering a feeling of hope for a brighter future, especially one in which individuals feel the ability to exercise a level of control or ownership (Swaisgood & Sheppard, 2010). By focusing on just a few concrete conservation issues that the students may face in their everyday lives, I will allow the students to examine the issues from a personal perspective, determine how they can address it in their daily lives, and explore how they can affect additional changes in their area by educating their families, friends, classmates, and community.

The primary issues that will likely be examined include the palm oil crisis, sustainable seafood, and environmentally-conscious consumerism (See Appendix 3). These topics were chosen for accessibility to the students, importance of the issues, and ease of making practical behavior changes for a typical teenager. Each topic will be studied for two class sessions, during which they will look in-depth at the primary conservation issues. Students will also be given time to problem solve the issue, discuss which actions and behavior changes may have the biggest impact, and design a way to educate others about the issues.

The palm oil portion of the course will examine the palm oil crisis and the environmental and conservation issues related to it. Students will also delve into the complicated issue of whether it is better to avoid palm oil based products entirely or if it is better to only purchase sustainably grown and harvested palm oil products. They will also look at the challenges in determining whether a product uses

sustainable palm oil. Students will also critically evaluate the Palm Oil Shopping Guide designed by the El Paso Zoo, and they will be assigned to make their own version of the palm oil guide for use with their families and friends.

The sustainable seafood portion of the program will look at the issues surrounding overfishing, and other unsustainable seafood practices, such as bottom trawling and pollution-causing aquaculture practices. Students will learn to use the Monterey Bay Aquarium's Seafood Watch Cards and discuss how they can get more restaurants, stores, and individuals to consult the cards. They will be assigned to design a project to get the word out to the public about sustainable seafood.

The environmentally-conscious consumerism portion of the course will examine overconsumption and how our culture of consumerism can lead to problems for the environment. We will also look at green product choices, such as cleaning supplies. Students will be encouraged to evaluate their own consumer habits, and they will make a plan for reducing their current and future footprint by becoming more conscious of the way their choices impact the world.

### Conclusions

One of the biggest challenges facing conservation biologists and environmental educators is educating the public without overwhelming them with a feeling of hopelessness. People must believe their individual actions, taken collectively, can make a difference. Otherwise, people can fall into inactivity through learned helplessness (Swaisgood & Sheppard, 2010).

Even though my students have grown in age and knowledge over the past two years, they have not grown in conservation actions and commitment, as reported in the survey. The older students did not hold more environmentally friendly attitudes, were not more likely to participate in environmentally-friendly actions, and did not report a higher likelihood to be more environmentally conscious in the future than their younger selves two years ago. So, while my predictions were not supported, the answer to my comparative question, who is more committed to conservation—older or younger students, does not have a clear answer. It appears that the older students are not more committed to conservation than the younger students, but based on the results, it is not clear that the younger students are necessarily more committed

to conservation than the older students. On most measurements, there was little or no difference between the groups. Though, on the measure of what the students say they are willing to do for the environment, the older students scored lower than the younger students.

Perhaps the students hold the same attitudes as they did when they were younger and do not participate in more activities. Perhaps they were already so positive and committed to conservation in 2009 that they could not score any higher this year. The more likely scenario, however, is that the results are due to one or more of the following factors: older students are less focused on giving the responses they believe they should give, older students are more realistic in reporting how they are willing to behave, and/or with more conservation education courses, a hopelessness and pessimism has begun to set in among the older teenage students.

In the future, and possibly for my third IAP, I will revisit this survey again with my students to determine if the Spring Zoo U. hands-on conservation course has the intended effect by empowering them to recognize that they do have the power to make a difference in the world. I will also include a section of the survey to address their actual feelings regarding the future, and why they responded the way they did to the survey. I want to understand my students' thoughts and motivations, rather than purely speculate as to the reason for the survey's outcome.

Through the proposed Spring 2012 Zoo U. course, I hope to address all of the aforementioned factors that may have produced the results in this study by allowing students to perceive that a hopeful future is possible and instilling a sense of power that students can take personal control over conservation issues. People, even teenagers, can truly make a difference in their own lives, in their communities, and in the world.

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Appendix 1

**KidScience/Zoo U. Pre-Survey**

How old are you?

Approximately how long have you been taking KidScience and/or Zoo U. classes?

Do you remember the month and/or year of your first class?

Is your home in an urban (in a city), suburban (in a small town or housing plan), or rural area (surrounded mostly by fields and trees)?

What does the word environment mean?

What does the word nature mean?

What is conservation?

Why do you feel conservation is important?

What do you think is the biggest threat to the environment?

Place a number in the left column using the following scale for each question to estimate how you feel after reading each statement.

1	2	3	4	5
Strongly Disagree	Disagree	Not sure	Agree	Strongly Agree

	When humans interfere with nature, it often produces disastrous consequences.
	The balance of nature is very delicate and easily upset.
	The balance of nature is strong enough to cope with the impacts of modern industrial nations.
	Humans are severely abusing the environment.
	The ecological crisis facing humankind has been greatly exaggerated.
	If things continue on their present course, we will soon experience a major ecological catastrophe.
	Human ingenuity will insure that we do not make earth unlivable.
	Despite our abilities, humans are still subject to the laws of nature.
	Humans will eventually learn enough about how nature works to be able to control it.
	The earth is like a spaceship with very limited room and resources.
	We are approaching the limit of the number of people the earth can support.
	The earth has plenty of natural resources if we just learn how to develop them.
	Plants and animals have as much right as humans to exist.
	Humans have the right to modify the natural environment to suit their needs.
	Humans were meant to rule over the rest of nature.

Please answer the following questions with a YES or NO

During the past 2 years, have you...

	Contributed time or money to an environmental or wildlife conservation group?
	Started buying a product because you think it protects the environment?
	Contacted a government agency to get information about the environment?
	Read a conservation or environmental magazine?
	Watched a television program on the environment?
	Learned about a political candidate's position on the environment?
	Recycled newspapers, glass, or other items on a regular basis?

Directions: Answer each question with **True** or **False**. There are no right or wrong answers. Simply answer with the statement that fits you best.

T or F ?

	When I grow up, I'd be willing to take a bus to work in order to reduce air pollution.
	I would never join a group or club which is concerned solely with ecological issues.
	I would be willing to use a bus system or other mass transit to help reduce air pollution.
	I would ask family and friends to give up driving on a weekend due to a smog alert.
	I'm not willing to go out of my way to do much about ecology since that's the government's job.
	I would donate a week's allowance to a foundation to help improve the environment.
	I would be willing to write my congressman weekly concerning ecologically issues.
	I probably wouldn't go house to house to distribute literature on the environment.
	I have not purchased a product due to its lower pollution impact.

	I keep track of my congressman's and senator's voting records on environmental issues.
	I have never written a congressman concerning pollution problems.
	I have contacted a community agency to find out what I can do about pollution.
	I don't make a special effort to buy products which are sold in recyclable containers.
	I have attended a meeting of a club specifically concerned with helping the environment.
	I have switched products for environmental reasons.
	I have never joined a cleanup drive.
	I have never attended a meeting related to ecology or the environment.
	I (or my family) subscribe(s) to ecological publications (magazines, newspapers, etc.).
	I feel people worry too much about pesticides on food products.
	It frightens me to think that much of the food I eat is contaminated with pesticides.
	It makes me angry or upset to think that the government doesn't do more to help control pollution of the environment.
	The statement "Many species are in danger of becoming extinct if we do not act now." doesn't bother me.
	I become very angry or upset when I think about the harm being done to plant and animal life by pollution.
	I am not bothered by "noise-pollution."
	I get depressed on smoggy days.
	When I think of the ways industries are polluting, I get frustrated and angry.
	The whole pollution issue has never upset me much since I feel it's somewhat overrated.
	I rarely ever worry about the effects of smog on myself and my family.

Appendix 2

**ZOO U.**  
**COURSE CATALOG**  
**SPRING 2012**

**IMPACT YOUR WORLD: HANDS-ON CONSERVATION**

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”—*Margaret Mead*

Students will focus on conservation issues that impact their daily lives. Through in-course activities, guest speakers, and problem solving sessions, participants will work to make a positive impact on local and global conservation initiatives. Students will experience first-hand that individuals and small groups can have a positive impact on the world, the environment, and their community. Potential course topics include the palm oil crisis, sustainable seafood, and making conscientious, yet simple, consumer choices. In-course activities may benefit those looking for volunteer hours and/or help to fulfill school project requirements.

**DAY AND TIME:** Every other Saturday beginning January 28th— 1 pm to 3 pm. 6 class sessions.

**COST:** \$145 for Zoo members, \$170 for non-members.

**WILD JOBS: CAREER EXPLORATION**

Students will examine several different careers, with an emphasis on those related to animal care, research, and science. In addition to career information, we will look at college programs and schools designed to prepare you for a future working in an animal-related field. Throughout the course, we will meet with people who are currently working in these areas, and you will learn what it takes to break into these highly competitive fields. Topics may include veterinary sciences, marine biology, and animal keeping.

**DAY AND TIME:** Every other Saturday beginning January 28<sup>th</sup>--3pm to 5pm. 6 class sessions.

**COST:** \$145 for Zoo members, \$170 for non-members.

**INDEPENDENT STUDY:**

Do you have a great idea for a research project? Do you need some help making it happen? In this course you will be working independently, but you will have guidance from staff and keepers to help you complete the project. *Requirements:* Any student

undertaking independent study must check in with staff at least twice a month and make adequate progress each meeting. Students must also be able to work independently throughout the project by presenting research ideas and goals, project design, and timelines to your supervisor. A final paper/project must be produced by a reasonable deadline.

**DAY AND TIME:** To be determined on an as needed basis.

**COST:** FREE to those enrolled in other Zoo U. Courses

Appendix 3

Proposed syllabus for "Impact Your World: Hands-On Conservation."



PITTSBURGH ZOO  
& PPG AQUARIUM

**Impact Your World: Hands-On Conservation**  
**Class Syllabus, Spring 2012**  
**1:00 pm -3:00 pm**

<b><u>Class 1</u></b>	Focus on Palm Oil Guest Speaker: Michelle Farmerie, Lead Orangutan Keeper What is the Palm Oil Crisis? How can we help?	<b><u>January 28th</u></b>
<b><u>Class 2</u></b>	Problem Solving: Sustainable palm oil vs. No palm oil Which products should we choose? Making a user-friendly list of sustainable consumer options	<b><u>February 11th</u></b>
<b><u>Class 3</u></b>	Focus on Sustainable Seafood Guest Speaker: Aquarium Staff Seafood Watch Cards: What issues do they address?	<b><u>February 25th</u></b>
<b><u>Class 4</u></b>	Problem Solving: Educating businesses and consumers about sustainable seafood and/or palm oil	<b><u>March 10th</u></b>
<b><u>Class 5</u></b>	Focus on Environmentally-Conscious Consumerism What are good sources for learning about products? "The Story of Stuff Project"	<b><u>March 24th</u></b>
<b><u>Class 6</u></b>	Problem Solving: How can you use what you learned in this course to make a difference in your life, school, community, etc?	<b><u>April 14th</u></b>

Bonus Activity: Saturday, April 21<sup>st</sup>, Party for the Planet (Pittsburgh Zoo Earth Day Activities)  
Share your knowledge with the community!

*\*Please note: This is a tentative schedule. All activities subject to change\**