iSaveSpecies

Summative Evaluation Report

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Executive Summary

The *iSaveSpecies* project was created by Project Dragonfly at Miami University, in partnership with the Cincinnati Zoo & Botanical Garden and a national consortium of zoos and aquariums. A central goal of the project was designing and implementing a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation, and the inquiry and action tools created under *iSaveSpecies* resulted in an evolving library of exhibit interactives adapted by partner institutions to suit the particular needs of their visitors. Additionally, more than 1,000 staff from informal science institutions and non-profit organizations nationwide have participated in related professional development through workshops and graduate courses.

This report focuses on networked exhibit kiosks which were based on the interactives developed at the Cincinnati Zoo & Botanical Garden for the *Wild Research* project (NSF610409), then refined and expanded for *iSaveSpecies*. There were two waves of exhibit stations: the first wave focused on "Great Apes," and the second wave focused on "Sustaining Life." The Great Ape Campaign allowed families to conduct research on captive ape populations and to help save wild apes through kiosk-based conservation tools based on the work of conservation researchers. The Sustaining Life Campaign built on widespread interest and growing exhibitry in environmental stewardship, renewable energy, and climate change. The resulting exhibits were placed in partner institutions beginning in 2014. The first wave of exhibits were placed in the Cleveland Metroparks Zoo (Cleveland Zoo), Columbus Zoo & Aquarium (Columbus Zoo), Pittsburgh Zoo & PPG Aquarium (Pittsburgh Zoo), Riverbanks Zoo and Garden, The Santa Barbara Zoo, and Zoo Atlanta. The second wave of exhibits were placed in the Boonshoft Museum, Chicago Zoological Society/Brookfield Zoo (Brookfield Zoo), Cleveland Zoo, Oregon Zoo, and Toledo Zoo. Each of these institutions incorporated up to three touchscreen-based research and/or conservation kiosks in an exhibition area. Additionally, *iSaveSpecies* stations based on wild cats were installed at the Night Hunters exhibit at the Cincinnati Zoo & Botanical Garden, a founding partner in both *Wild Research* and *iSaveSpecies*.

To support these efforts, the Lifelong Learning Group conducted front-end and outcome evaluations at eight of the zoos (four zoos involved with the Great Apes campaign and four with the Sustaining Life campaign) to measure how effective the *iSaveSpecies* electronic interactive kiosks were at fulfilling the desired outcomes. The front-end studies measured visitors' understanding of the animals and associated conservation actions prior to the installation of the exhibits. The outcome evaluations focused on the efficacy of the *iSaveSpecies* kiosks at engaging visitors and delivering their messages, which encouraged visitors to develop inquiry skills, to build knowledge of pertinent STEM content, and to engage in specific conservation actions.

Data were collected onsite at each of the eight zoos from adult visitors (N=1,978). Two types of participants were sought—those who used an *iSaveSpecies* kiosk and those who did not—to complete a questionnaire (n=1,818) or an interview (n=160).

The study found that visitors who engaged with the *iSaveSpecies* kiosks reported using basic science inquiry skills during their zoo visit. Relative to visitors who did not interact with *iSaveSpecies* kiosks, visitors who interacted were, by significant margins, more likely to report that they made a prediction, recorded information about an animal's behavior, compared research results with others, listened to the different calls animals made, and talked with others about what

they observed or did. Almost all visitors (>97%), regardless of whether they interacted with an *iSaveSpecies* kiosk, reported that they observed an animal carefully for more than a few seconds—there was no significant difference between groups on this inquiry skill.

An essential inquiry skill is the ability to ask questions that lead to investigations. While responses to a closed-ended question indicated that respondents who interacted with a kiosk were more likely to think about questions they might ask about what they observed, they were unlikely to share a question they had about the animal in response to an open-ended question found on the questionnaire (Great Apes Outcome Evaluation) or during an interview (Great Apes and Sustaining Life Outcome Evaluations). The low number of responses may be due to lack of time in the animal exhibit space or an environment unconducive to pondering a novel question.

Visitors who interacted with the *iSaveSpecies* kiosks reported feeling that they were more knowledgeable about how to study an animal, understood animals better, might like to study animals, and could investigate animal behavior through careful observation. Interviewees reported learning kiosk-specific STEM content from the Do All Day, Hang Out, and Hoot/Chirp/Roar kiosks: visitors who explored the Do All Day and Hang Out kiosks tested their hypotheses and learned how and where an animal spent its day. Those who interacted with the Hoot/Chirp/Roar kiosk learned "What we thought [the animal] meant was different than what they really mean."

Zoo visitors interacting with the kiosks indicated that they felt they could help the animals by protecting their environment, sharing conservation messages (either through the poster or by talking with others), or donating money to the zoo or other conservation organizations. Also, visitors who engaged with the Conservation Poster kiosk were more likely to be more aware that animals need to be protected and that they could help the animals than visitors who did not engage with the Conservation Poster kiosk.

However, the majority of those interviewed were unable to articulate anything these experiences introduced or remind them of that they might do to help the animals. This supports research that demonstrates individuals typically distance themselves from their own contribution to environmental issues. Individuals who shared something they could do to help the animals were most likely to state they could protect the animal's environment, share the conservation message, or donate money to the zoo or organizations helping to save the animals.

Because options to take conservation action at an exhibit are limited, visitors who completed activities at *iSaveSpecies* interactives received the option to email themselves or others something they created at the kiosk (e.g., their research findings or a digital poster), as well as conservation actions they could take at home. Data from the Conservation Poster interactive (a version of which was installed at all institutions) indicated that, depending on location, 20% to 60% of visitors who completed a conservation poster emailed the poster they created, along with associated conservation prompts. Data are not available to identify the percentage of visitors who took further action at home.

Visitors who engaged with the *iSaveSpecies* interactive kiosks felt it added value to their zoo visits. Mean scores for scaled value-added items of those who used the *iSaveSpecies* kiosks were all well above the midpoint. Respondents indicated the interactives were appealing and fun. The kiosks provided visitors a different way to engage with the animals and an opportunity to participate in an activity they could do with others in their group.

The key outcomes of this study are as follow:

- Visitors who engaged with the *iSaveSpecies* kiosks reported using basic science inquiry skills during their zoo visit. Visitors who interacted with a kiosk reported that they were more likely to make a prediction, record or enter information about an animal's behavior, compare research results with others, and listen to different calls animals make.

- Compared to visitors who did not interact with the kiosks, visitors who used the *iSaveSpecies* kiosks felt they were more knowledgeable about how to study an animal, understood animals better, and were more likely to report that they might like to study animals and could investigate animal behavior through careful observation.

- Visitors who engaged with the *iSaveSpecies* kiosks reported that they could protect the animal's environment, share the conservation message (either through an electronic poster or by talking with others), or donate money to the zoo or an organization that helps animals.

- Visitors who interacted with the *iSaveSpecies* kiosks felt it added value to their zoo visit.

The *iSaveSpecies* project also established a national learning partnership that offers professional development programs for informal science staff, classroom teachers, and other professionals. This includes two master's degree programs focused on community engagement in science and environmental stewardship. The Advanced Inquiry Program is currently co-delivered by the Bronx Zoo/Wildlife Conservation Society (New York), Brookfield Zoo (Chicago), Cincinnati Zoo & Botanical Garden, Cleveland Metroparks Zoo, Denver Zoo, Phoenix Zoo, San Diego Zoo Global, and the Woodland Park Zoo (Seattle), with additional partner institutions in development. The Global Field Program includes field courses in 16 countries with leading conservationists and community leaders in Africa, Asia, Australia, and the Americas. Miami University is responsible for evaluation of these professional development programs, and those findings are reported elsewhere.

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Introduction

The *iSaveSpecies* project was created by Project Dragonfly at Miami University, in partnership with the Cincinnati Zoo & Botanical Garden and a national consortium of zoos and aquariums. The project designed and implemented a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation. The inquiry and action tools created under *iSaveSpecies* resulted in an evolving library of exhibit interactives adapted by partner institutions to suit the particular needs of their visitors. Additionally, more than 1,000 staff from informal science institutions and non-profit organizations have participated in "Saving Species" professional development through workshops and graduate courses in major cities and conservation sites worldwide. The formal educational opportunities include two Master's degree programs co-delivered by Miami University and informal science institutions: (1) the Advanced Inquiry Program, and (2) the Global Field Program.

This report focuses on networked exhibit kiosks which were based on the interactives developed at the Cincinnati Zoo & Botanical Garden for the *Wild Research* project (NSF610409), then refined and expanded for *iSaveSpecies*. There were two waves of exhibit stations: the first wave focused on "Great Apes," and the second wave focused on "Sustaining Life." The Great Ape Campaign allowed families to conduct research on captive ape populations and to help save wild apes by joining the work of experienced field researchers. The Sustaining Life Campaign built on widespread interest and growing exhibitry in environmental stewardship, renewable energy, and climate change. The resulting exhibits were placed in partner institutions beginning in 2014. The first wave of exhibits were placed in the Cleveland Metroparks Zoo (Cleveland Zoo), Columbus Zoo & Aquarium (Columbus Zoo), Pittsburgh Zoo & PPG Aquarium (Pittsburgh Zoo), Riverbanks Zoo and Garden, The Santa Barbara Zoo, and Zoo Atlanta. The second wave of exhibits were placed in the Boonshoft Museum, Chicago Zoological Society/Brookfield Zoo (Brookfield Zoo), Cleveland Zoo, Oregon Zoo, and Toledo Zoo. Each of these institutions incorporated up to three touchscreen-based research and/or conservation action kiosks in an exhibition area. Additionally, *iSaveSpecies* stations based on wild cats were installed at the Night Hunters exhibit at the Cincinnati Zoo & Botanical Garden. By building cross-institutional partnerships committed to sustaining life on our planet, the *iSaveSpecies* project believes that the new tools for inquiry and public action will achieve broad national impact.

To support these efforts, front-end and outcome evaluations were conducted at eight of the zoos (four zoos involved with the Great Apes campaign and four with the Sustaining Life campaign) to measure how effective the *iSaveSpecies* electronic interactive kiosks were at fulfilling the desired outcomes. For the front-end evaluations, evaluators met with zoo staff to determine the evaluation questions and methods. Zoo staff, advised by the evaluators, collected the data for the front-end studies. The methods were guided by the evaluation questions and included timing and tracking, interviews, and questionnaires. Typically the front end studies revealed that visitors shared a rudimentary understanding of the animal and associated conservation actions. When timing and tracking was used, it also revealed the amount of time spent in the area and with which exhibits the visitors engaged.

While the front-end evaluation measured visitor understanding of animals and conservation before the *iSaveSpecies* exhibits were installed, the outcome evaluation focused on how effective the *iSaveSpecies* interactive kiosks were at engaging visitors and delivering their messages, which

included encouraging visitors to develop inquiry skills, to build knowledge of pertinent STEM content, and to engage in specific conservation actions. The outcome evaluations were consistent among the eight zoos, utilizing questionnaires and interviews to gather data from zoo visitors. Questionnaire data were gathered from two types of visitors: those who used an *iSaveSpecies* kiosk and those who did not. Interviews were conducted with adult visitors seen interacting with at least one of the *iSaveSpecies* kiosks.

The overarching evaluation question for this summative evaluation was "Do the *iSaveSpecies* kiosks achieve their desired (collective) outcomes?" To address this larger question, five sub-questions were asked:

1. Did visitors who engaged with the *iSaveSpecies* inquiry kiosks report they have used basic science inquiry skills during their zoo visit?
2. Did visitors who engaged with the *iSaveSpecies* interactive kiosks have a better understanding of the STEM content related to the *iSaveSpecies* kiosks than those who did not engage with the kiosks?
3. Did visitors who engaged with the *iSaveSpecies* conservation poster kiosk understand conservation efforts?
4. Did visitors who engaged with the *iSaveSpecies* conservation poster kiosks report involvement in specific conservation actions?
5. Did visitors who engaged with the *iSaveSpecies* interactive kiosks feel it added value to their zoo visit?

Methods

Front-End Evaluation

Prior to the installation of the *iSaveSpecies* kiosks, zoo staff met with the evaluators to discuss the specific outcomes they hoped to achieve. While the overarching evaluation questions were similar, each zoo was unique; therefore, evaluation questions and methods were tailored to meet the needs of each zoo. The methods, guided by the evaluation questions, included timing and tracking, interviews, and questionnaires.

LLG prepared protocols and guide books for these studies, which were implemented by zoo staff. Advised by the evaluators, zoo staff collected data for the front-end studies and sent it to the evaluators for analysis. These studies were usually small, and the amount of data was limited. Interview responses were entered into an Excel spreadsheet for coding. During analysis, categories of visitor responses about their knowledge were developed inductively through the coding process (i.e., categories emerged from the data itself, rather than being prescribed). No demographic information was collected for interviewed visitors.

As questionnaire data were limited, they were similarly entered into an Excel spreadsheet for analysis. Responses to open-ended items were coded using rubrics developed for this study, and quantitative data were analyzed descriptively. Timing and tracking data, including time spent in

the exhibition area and exhibits viewed, were also entered into an Excel spreadsheet and analyzed descriptively.

Outcome Evaluation

The audience for the outcome evaluation was adult visitors to the exhibition area that held the *iSaveSpecies* kiosks. Two groups of visitors were compared to better understand the impact of the *iSaveSpecies* interactives: those who used the kiosks and those who did not.

To answer the evaluation questions, two different methods were used: a structured, intercept interview and a questionnaire. Using a continuous ask format, visitors who interacted with one of the *iSaveSpecies* kiosks were invited to participate in the interview as they finished the interactive. The interviews asked adults to describe what they did at the kiosk(s), and what they gained from the interaction in regards to scientific inquiry and environmental conservation.

The second method was a questionnaire. The original questionnaire for the Great Ape Campaign included questions about all three *iSaveSpecies* kiosks within the exhibit and asked visitors to compare their experience in the *iSaveSpecies* exhibit area with another animal exhibit area at the zoo. This questionnaire was used at one zoo (Columbus) and was found to overwhelm the zoo visitors responding. To reduce the number of questions a zoo visitor would need to answer, the seven remaining zoos in the study (three from the Great Apes campaign and 4 from the Sustaining Life campaign) used separate questionnaires for each kiosk, and visitors were not asked to compare their experience in the *iSaveSpecies* exhibit area to another animal exhibit area.

While each questionnaire used the same demographic, conservation, and affect questions, each kiosk questionnaire included different inquiry questions. Additionally, the questionnaire changed in its treatment of inquiry skills between the Great Apes and Sustaining Life outcome evaluations. During the Great Apes outcome evaluation, participants were asked to answer inquiry skills question with a yes or no answer (i.e., "Talked with others in my group about what I observed or did"). The yes/no questions were found to be limiting and changed in the Sustaining Life campaign to 7-point scaled items in order to better capture the range of respondents' interactions.

Using a continuous-ask sampling method, visitors in the animal exhibit area were asked to complete the questionnaire after they had moved past the iSaveSpecies kiosk. Data were collected from those who did and those who did not engage with the kiosk. A sample interview script and questionnaires can be found in Appendix A. Specific instruments can be found within individual zoo reports posted on informalscience.org.

Each component of the study was conducted using different sets of visitors (i.e., those who chose to attend each zoo during data collection). Data gathering was impacted by the unique context of each zoo's exhibition area, including the placement of the kiosks within the viewing area, the distance between the kiosk and animals, time of year (summer vs. fall), busyness of the area/traffic pattern, weather conditions (heat, rain, etc.), length of time kiosks were available to visitors, and other environmental and contextual elements created challenges to uniform data gathering.

Data were analyzed collectively. Interview responses were entered into an Excel spreadsheet and coded based on the question and the objectives of the interactive kiosks. During analysis,

categories of visitor responses about their knowledge were developed inductively through the coding process (i.e., they emerged from the data itself, rather than being prescribed). No demographic information was collected from interviewed visitors.

All questionnaire data were entered into an Excel spreadsheet. Responses to open-ended items were coded using rubrics developed for this study. Quantitative data were transferred into SPSS and analyzed descriptively. Where appropriate, inferential statistics were used to test specific questions or hypotheses about the data.

Findings

Front-End Evaluation

The installation of *iSaveSpecies* interactives provided an opportunity to build upon the strengths of existing space and interpretive materials. To support these efforts, a front-end evaluation was conducted to help zoo staff understand how visitors explored the existing exhibition area and to identify what visitors knew about the animals on display.

The front-end evaluation was specific to each zoo. Typically, the front end studies revealed that visitors shared a rudimentary understanding of the animal and associated conservation actions. When timing and tracking was used, the amount of time spent in the area and with which exhibits the visitors engaged were revealed.

Outcome Evaluation

Participants

Participating zoos had several options for *iSaveSpecies* kiosks, and, depending on their goals and exhibition area, each zoo could install up to three different kiosks. The only constant element across all zoos was the Conservation Poster. A list of zoos participating in this study and the kiosks present at each zoo can be found in Table 1.

Table 1. Kiosks by Zoo

	Conservation Poster	Which Are You	Do All Day	Hoot/ Roar	Hang Out	Wild Me	Communication Poster
Atlanta	X	X	X				
Boonshoft	X			X		X	
Brookfield	X						X
Cleveland	X	X			X		
Columbus	X	X	X				
Oregon	X	X		X			
Pittsburgh	X	X		X			
Toledo	X		X		X		
TOTAL	8	5	3	3	2	1	1

There were 1,978 visitors who participated in this study; 160 participants completed an interview and 1,818 participants completed a questionnaire. Those who completed interviews are referred to as "interviewees" throughout this report, those who completed questionnaires are referred to as "respondents." Table 2 illustrates the visitors in each study method category.

Table 2. Visitor participants by study method

		Interviewees	Respondents
Great Apes	Atlanta	19	220
	Cleveland	20	221
	Columbus	26	301
	Pittsburgh	25	279
Sustaining Life	Boonshoft	3	59
	Brookfield	26	227
	Oregon	16	217
	Toledo	25	294
	Total	**160**	**1818**

Every effort was made to gather data for each interactive kiosk. Table 3 itemizes the frequency of visitors interviewed per kiosk. Table 4 includes a breakdown of questionnaires completed by kiosk. While the majority of visitors commented on only one kiosk when interviewed, several interviewees commented on more than one exhibit. No demographic information was collected for visitors interviewed.

Table 3. Exit Interviews completed for each interactive kiosk

		Conservation Poster	Communication Poster	Do All Day	Hang Out	Hoot/ Roar	Which Are You	Wild Me	Total
Great Apes	Atlanta*	6		5			9		20
	Cleveland*	7			11		8		26
	Columbus*	8		16			16		40
	Pittsburgh*	10				21	6		37
Sustaining Life	Boonshoft	2				1			3
	Brookfield*	14	14						28
	Oregon*	7				7	11		25
	Toledo	5		12	8				25
	Total	**59**	**14**	**33**	**19**	**29**	**50**	**0**	**204**

*Interviewees discussed more than one exhibit

During data collection every effort was made to collect data from a diverse sample; however, the majority of respondents from each zoo were white, with an average of 88% among the eight zoos with a range of 74% to 94%. Other races/ethnicities represented were Latino(a)/Hispanic (8%) and African-American (4%). Based on race/ethnicity, the Atlanta and Brookfield zoos had the most diverse participant groups: at the Atlanta Zoo, 13% of respondents identified as Latino (a)/Hispanic, 12% as African-American, and 6% as Asian, and at the Brookfield Zoo, 19% of respondents identified as Latino(a)/Hispanic, and 6% identified as African-American.

The majority of visitors who participated in this study were not zoo members (across the eight zoos, 68.5% of respondents); at different zoos, membership ranged from 17% (Pittsburgh) to 45% (Brookfield). Zoo membership was measured at 40% or greater at three zoos: Brookfield (45%), Oregon (43%), and Toledo (40%). The percentage of members may be higher at the Brookfield and Oregon zoos due to the time of year in which the sampling occurred—typically zoos have a higher percentage of members visiting with young children during the school year after school age children have returned to school.

Overall, the majority of respondents were infrequent zoo visitors (an average of 65% across the eight zoos) defined as those who visited once a year or less. One quarter of respondents were visiting a particular zoo for the first time. Atlanta had the greatest percentage of first-time visitors (43%), and Brookfield had the lowest (13%). Oregon Zoo respondents, who were queried in the fall after school was back in session, had the greatest percentage (33%) of visitors who visited the zoo five times or more per year.

Respondents visited the zoo with family (an average of 81% among the eight zoos), friends (an average of 13% among the eight zoos), and dates (an average of 12% among the eight zoos). Boonshoft had the greatest number of respondents exploring the museum with family (91%). Oregon had the smallest number of respondents traveling with families (71%), but the greatest number of respondents visiting with friends (17%) and dates (15%).

Slightly more than half of the respondents (54%) spent 5 – 15 minutes in the exhibit area, one quarter of the respondents spent 5 minutes or less in an exhibit area, and 21% of respondents spent more than 15 minutes in an exhibit area. Appendix B contains tables for each of the demographic questions included in the questionnaire.

Table 4. Questionnaires completed for each interactive kiosk

		Conservation Poster	Communication Poster	Do All Day	Hang Out	Hoot/ Roar	Which Are You	Wild Me
Great Apes	Atlanta	78		72			70	
	Cleveland	70			77		74	
	Columbus*	46		139			121	
	Pittsburgh	98				95	86	
Sustaining Life	Boonshoft	18				17		24
	Brookfield	110	117					
	Oregon	72				71	74	
	Toledo	98		98	98			
	Total	**590**	**117**	**309**	**175**	**183**	**425**	**24**

*Questionnaire invited respondents to comment on all three kiosks in the exhibit area

Inquiry Skills

Overall, visitors who interacted with the *iSaveSpecies* kiosks were more likely to report using inquiry skills than those who did not. The *iSaveSpecies* kiosks appear to have the greatest impact on encouraging visitors to record or enter information about an animal's behavior, to compare research results with others, and to listen to different calls animals make. Respondents were also more likely by significant margins to report that they made a prediction and talked with others about what they observed or did. Kiosks did not seem to impact the skill of observation, as measured by the percentage of respondents who reported they observed a single animal carefully for more than a few seconds: more than 97% responded positively on this question, regardless of whether they interacted with an *iSaveSpecies* kiosk or not. All *iSaveSpecies* kiosks had a positive impact on at least one inquiry skill. However, an essential inquiry skill is the ability to ask questions that lead to investigations, and while responses to a closed-ended question indicated respondents were more likely to think about questions they might ask about what they observed, few shared a question they had about the relevant animal.

How We Know

To ensure the fidelity of the data, data from similar instruments were analyzed together. Because Columbus Zoo used an instrument that included all three kiosks and asked respondents to comment on a comparison exhibit, those data were analyzed separately from the other three Great Apes campaign zoos. Sustaining Life campaign data, which used scales to measure respondents' interest/use of inquiry skills, was analyzed separately from Great Apes campaign data.

Overall, visitors interacting with the *iSaveSpecies* kiosks reported using inquiry skills more often than those who did not interact with the *iSaveSpecies* kiosks. Among Columbus respondents, those who interacted with the kiosk showed a statistically significant positive difference ($p<.001$; Mann-Whitney U test) compared to those who did not. There was also a difference of at least 20 percentage points between those who interacted with the kiosk and used the skill and those who did not interact with the kiosk and used the skill for each of the following skill items:

- *Recorded information about an animal's behavior (on a touch screen or on paper)* (difference of 44% points)
- *Participated in research by answering questions* (difference of 34% points)
- *Compared research results with others* (difference of 29% points)
- *Made a prediction about an animal's behavior* (difference of 20% points)

Visitors to the three other Great Apes zoos also typically reported using inquiry skills more often than those who did not interact with the kiosks, as illustrated in Table 5. For each of the following skills, a statistically significant positive difference ($p<.001$; Mann-Whitney U test) was found, as well as a difference of at least 18 points between the percentage of those who interacted with the kiosk and used the skill and those who did not interact with the kiosk and used the skill:

- *Recorded information about an animal's behavior* (on a touchscreen or on paper) (difference of 29% points)
- *Listened to different calls animals make* (difference of 24% points)
- *Asked questions about what I observed* (difference of 19% points)
- *Participated in research by answering questions* (difference of 19% points)
- *Compared research results with others* (difference of 18% points)

Visitors to Sustaining Life campaign zoos also reported using inquiry skills more often than those who did not interact with the kiosks, as illustrated in Table 6. Using a t-test, a statistically significant positive difference at the .001 level with a mean difference in excess of .750 was found with the following skills:

- *Entered information on a touchscreen or wrote down information about an animal's behavior* (mean difference of 2.302)
- *Listened to different calls animals make* (mean difference of 1.630)
- *Learned that I am like an animal* (mean difference of .755)

Table 5. Great Apes campaign respondents' use of inquiry skills, separated by interaction with kiosks (ATL, CLE, Pitt)

	Total Interaction	Interaction + Skill	%	No Interaction + Skill	No Interaction + Skill Total	%	Z	p
	N			N				
Talked with others in my group about what I observed or did* **	399	298	74.7%	321	200	62.3%	-4.160	.000
Asked questions about what I observed* **	399	168	42.1%	321	75	23.4%	-6.250	.000
Observed a single animal carefully for more than a few seconds	76	74	97.4%	73	71	97.3%	-.378	.706
Participated in research by answering questions* **	123	83	67.5%	107	52	48.6%	-4.814	.000
Discovered that I am similar to an animal **	180	108	60.0%	145	64	44.1%	-2.589	.010
Compared myself to an animal*	180	98	54.4%	145	70	48.3%	-2.244	.025
Made a prediction about an animal's behavior*	76	49	64.5%	73	36	49.3%	-2.537	.011
Recorded information about an animal's behavior (on a touchscreen or on paper)* **	76	31	40.8%	73	8	11.0%	-5.698	.000
Compared research results with others* **	133	37	27.8%	111	10	9.0%	-4.718	.000
Listened to different calls animals make* **	57	39	68.4%	38	17	44.7%	-2.870	.004

*** $p < .001$
** $p < .01$
* $p < .05$

The *iSaveSpecies* kiosks appear to have the greatest impact on encouraging visitors to record or enter information about an animal's behavior, to compare research results with others, and to listen to different calls animals make. All three of these were found to have statistically significant differences in the Great Apes campaign (at the $p < .001$ level, as measured by a Mann-Whitney U test), as well as average difference between those who interacted and those who didn't in excess of 15%. In the Sustaining Life campaign, these skills were found to have statistically significant differences (as measured by a t-test), as well as mean differences in excess of 2.0.

Visitors to zoos stated that they were at the zoo to observe animals, whether or not they interacted with an *iSaveSpecies* kiosk. The inquiry skill "observed a single animal carefully for more than a few seconds" had the highest reported interaction average (97.4%) and non- interaction average (97.3%) in the Great Apes campaign, as well as the lowest mean difference in the Sustaining Life campaign (.040) (See Table 6).

Table 6. Sustaining Life campaign respondents' use of inquiry skills, separated by interaction with kiosks

	Total Interaction	Interaction Mean	No Interaction	No Interaction Mean	Mean Difference	t	df	p
	N			N				
Talked with others in my group about what I observed or did*	470	5.03	269	4.67	0.365	2.544	737	.011
Thought of questions about what I observed*	448	4.51	269	4.18	0.329	2.307	715	.021
Observed a single animal carefully for more than a few seconds	104	6.37	89	6.33	0.040	.275	191	.784
Participated in research by answering questions*	43	4.21		3.18	1.027	2.232	63	.029
Compared myself to an animal*	84	3.65	49	2.88	0.777	2.149	131	.033
Made a guess or prediction about an animal's behavior	104	4.92	89	4.48	0.443	1.743	191	.083
Entered information on a touchscreen or wrote down information about an animal's behavior***	102	3.96	85	1.66	2.302	7.708	185	.000
Compared research results with others*	53	3.32	24	2.38	0.946	2.383	75	.020
Listened to different calls animals make***	54	5.00	27	3.37	1.630	3.361	79	.001
Learned that I am like an animal***	331	4.44	180	3.69	0.755	4.649	509	.000

*** $p < .001$
* $p < .05$

Patterns of response were generally consistent across the five kiosks. Overall, those who engaged reported they were more likely to engage with an inquiry skill than those who did not. Skills that appeared to be exceptions to this *observing a single animal carefully for more than a few seconds* (Hang Out in both campaigns; Do All Day in the Great Apes campaign) and *thinking of a question about what was observed* (Hoot/Chirp/Roar in the Sustaining Life campaign). Aggregated data from all eight zoos suggest that each of the named kiosks (i.e., interactions with a kiosk of a certain type, regardless of which location it was at) had a positive impact on at least one inquiry skill for visitors who interacted with it. See Appendix C for inquiry skill data tables by kiosk.

Conservation Poster

The inquiry skill of *talking with others in my group about what was observed or done* was found to have a statistically significant positive difference in the Great Apes ($p < .001$; Mann-Whitney U, with a difference of 12% between those who interacted with the kiosk and used the skill and those who did not interact with the kiosk and used the skill) and Sustaining Life campaigns ($p < .05$; t-test, with a mean difference of .570). In the Great Apes campaign, there was also a statistically significant positive difference ($p < .001$ level; Mann-Whitney U, with a difference of 19% between those who interacted and those who did not) related to *asking questions about what was observed*.

Hang Out

Comparing research results with others was found to have a statistically significant positive difference in both years (Great Apes campaign, $p < .001$; Mann-Whitney U, with a difference of 20%; Sustaining Life campaign $p < .01$; t-test, with a mean difference of 1.753). In the Sustaining Life campaign, a t-test also revealed a statistically significant positive difference ($p < .001$) for *entering information on a touchscreen or wrote down information about an animal's behavior* (mean difference of 2.112). In the Great Apes campaign, statistically significant positive differences were found for two additional inquiry skills using a Mann-Whitney U test:

- *Made a prediction about an animal's behavior* ($p < .01$, with a difference of 34%)
- *Recorded information about an animal's behavior (on a touchscreen or on paper)* ($p < .05$, with a difference of 24%)

Hoot/Chirp/Roar

The inquiry skill of *listening to different calls animals make* was found to have a statistically significant positive difference at the .001 level in the Great Apes (Mann-Whitney U, with a difference of 34%) and Sustaining Life campaigns (t-test, with a mean difference of 1.630). In the Sustaining Life campaign, a statistically significant positive difference was found for the inquiry skill of *comparing research results with others* ($p < .05$, mean difference of .946)

Do All Day

Two inquiry skills were found to have statistically significant positive differences in both campaigns. *Recording or entering information on a touchscreen about an animal's behavior* was found to have a statistically significant positive difference at the .001 level in the Great Apes campaign, as measured by a Mann-Whitney U (difference of 41% points) and in the Sustaining Life campaign, as measured by a t-test (mean difference of 2.490). *Comparing research results with others* was found to have a statistically significant positive difference at the .01 level in Great Apes (Mann-Whitney U, with a difference of 28% points) and at the .05 level in Sustaining Life (t-test, mean difference of .960).

Which Are You

One inquiry skill, *participating in research by answering questions*, was found to have statistically significant positive differences in the Great Apes ($p < .01$ as measured by a Mann-Whitney U, difference of 21%) and Sustaining Life campaigns ($p < .05$ as measured by a t-test, mean difference of .710). Additionally, using a Mann-Whitney U test, a statistically significant positive difference was found for the following skills in the Great Apes campaign:

- *Talked with others in my group about what I observed or did* ($p < .05$, difference of 21% points)
- *Asked questions about what I observed* ($p < .01$, difference of 21%)
- *Discovered that I am similar to an animal* ($p < .05$, difference of 17%)

Investigable Questions

An essential inquiry skill is the ability to ask questions that lead to investigations. To get a sense of a visitor's ability to do this, questionnaire respondents in the Great Apes Campaign and interviewees in both campaigns were asked to respond to two items: *Based on your viewing in the exhibit area, what questions do you have about the animal?* and *How could someone investigate this?* Due to the low response rate, these two questions were moved from the questionnaire to the interview for the Sustaining Life campaign with the assumption that verbally framing a question would be easier and more likely to capture ideas in visitors' heads than the written option. Despite this change, the majority of questionnaire respondents (627 of 1021, or 61%) and interviewees (99 of 160, or 62%) did not form a question or suggest an investigation.

The responses that were collected were analyzed to determine if each question was simple or investigable, and each respondent's question and investigation were examined together. A question was considered investigable if the participant suggested an investigation that included observation and/or collecting data, examples can be found in Figure 1. Of the questionnaire and interview responses, 18% of the questions asked were considered investigable, including: "When is their most active time of day?" which would be investigated by "Watch them over a week and observe," "Are they lethargic because they are in captivity or normally lethargic?" which would be investigated by "Observation in the wild and in captivity and compare results," and "What sorts of schedules have to be made based on the social hierarchies of these animals? ," which would be investigated by "Observational, non-obtrusive study." Finally, one young interviewee's question was "What toys do they like to play with?" He reported that he would investigate that by "Hang[ing a] tire and another toy and see what the elephants choose to play with." Figure 1 shows other examples of investigable questions and approaches offered by visitors.

Examples of Investigable Questions	Investigation
How [do] **elephants get up from the ground/nap?**	Spend time watching the elephants
Do they [elephants] **act mad at other elephants?**	Pay really close attention to elephants
How similar are they [elephants] **to humans?**	Observe how they [elephants] interact
Are gorillas susceptible to human diseases?	Observe gorillas and take health data
Are tigers lazy?	Look at the tiger

Figure 1. Examples of Investigable Questions and their Investigations

The majority of questions asked were considered simple or uninvestigable. These questions were those that did not require the participant to actively investigate; or the visitor believed they could be answered by asking a keeper or searching on the internet (see Figure 2). To better understand visitors' interest, the simple/uninvestigable questions were coded further to identify repeated themes. Simple/uninvestigable questions were most frequently related to the animal's behavior patterns (25%), personal information (24%), age (17%), and their environment (10%). Behavior-related questions included responses like "How do they sleep?," "When do they eat?," and "Is there a specific pattern for playing?" Personal questions included those that related to specific animals

and family relationships, such as "What is the baby's name?", "Will other family groups be initiated at the zoo?", "What is their relationship to Willie B?", and "How many babies are born here each year?" Environment questions included responses such as "Are these gorillas rescued or taken from the wild?," "How did you get them in the habitat?," and "Where exactly are they from?"

Examples of Simple or Uninvestigable Questions	Investigation
How often are they fed?	Speak with staff
What do gorillas eat?	Look it up on the internet
How old do they get?	Google
Do gorillas have a natural familial instinct? **Were they born at the zoo?**	Ask zoo workers

Figure 2. Examples of Simple Questions and their Investigation

There are several possible factors that could account for why a majority of respondents and interviewees did not form questions or pose investigations. For instance, respondents may not have found the environment conducive to thinking about a novel question and/or investigation scenario. In some cases, the low performance may be due in part to the high number of respondents and interviewees visiting with young children. At two zoos (Oregon and Brookfield), it was noted that 50% of those interviewed were exploring the grounds with children 5 years of age or younger, and travelling with young children may reduce an adult interviewee's ability to articulate a question or formulate an investigation because other members of their party desire to move to another exhibit. Another possible factor was the high percentage of visitors in this sample who were infrequent zoo visitors, which might also limit visitor's time with the questionnaire and interviewer: research indicates that infrequent visitors to a museum or zoo try to see as much as possible and spend less time with any individual exhibit. There was a strong demonstration of low use of critical engagement with the experience or scientific literacy around question formation. These data suggest that cultivating this inquiry skill likely needs more intensive interaction than normally occurs at an exhibit-based public kiosk.

STEM Content

Respondents who interacted with the *iSaveSpecies* kiosks reported that they felt more knowledgeable about how to study an animal, that they understood animals better, that they might like to study animals, and that they could investigate animal behavior through careful observation. Interviewees reported learning kiosk-specific STEM content from the Do All Day, Hang Out, and Hoot/Chirp/Roar kiosks.

How We Know

Respondents were asked questions regarding STEM content and asked to rate their agreement on a scale, where 1 represented "Strongly Disagree" and 7 represented "Strongly Agree." The data

indicated that respondents who interacted with an *iSaveSpecies* kiosk felt they were more knowledgeable about how to study animals than visitors who did not interact with the kiosks (see Table 7). Using an independent samples t-test, a statistically significant difference at the $p < .001$ level was found for all four statements:

- *I am more knowledgeable about how to study animals* (mean difference of .778)
- *I understand animals better* (mean difference of .560)
- *I might like to study animals (behavior, personality, etc.)* (mean difference of .481)
- *I can investigate animal behavior through careful observation* (mean difference of .362)

In addition to learning basic information about the animals, interviewees reported findings from their kiosk-inspired studies, i.e., determining where the animals hang out or what they do all day. An interviewee who engaged with the Hang Out kiosk in Toledo "thought [the elephants] would be in the shade, but they hung out in the sun," and another shared, "Elephants like area C because toys are in C." A Cleveland Zoo visitor learned where the orangutans "like to hang out, I thought tree, but they like to hang out on rocks."

A Pittsburgh Zoo visitor who explored the Hoot Like a Gorilla kiosk learned that a belch meant the gorilla was comfortable, a grunt sound stops young gorillas from doing "something bad," and a scream sounds an alarm. One visitor shared, "Next time they make a noise, I have an idea of what they are saying." An interviewee who completed the Chirp Like a Bat kiosk at the Boonshoft museum learned that "bats make more than one sound to communicate and hunt insects." A visitor who explored the Roar Like a Lion kiosk at the Oregon Zoo learned "What we thought they meant was different than what they really mean. Thought a moan was more ominous then it was." Another visitor shared that he "didn't realize that lions meowed."

An interviewed visitor who explored the Do All Day kiosk at Zoo Atlanta felt the kiosk "Made you look at one gorilla, [I] became more personal w/ the animal." Interviewees found that the Atlanta Zoo gorillas spent their time grooming and resting. A Toledo Zoo visitor learned "Elephants eat a lot, walk, and are social." Another commented that "Elephants do a lot of stuff, feeding, object use, dust bathing, and walking."

A Columbus Zoo visitor who completed the Which Are You kiosk reported learning that "A bunch of different bonobos live here, bonobos are not all alike, they are different," and a seven year old boy shared, "I was like Mary Rose, I'd be scared if a gorilla walked in." Interviewees at the Pittsburgh Zoo noticed that the apes have "different personalities, human tendencies. They aren't all the same," and they are "just like we are."

Visitors who explored the Conservation Poster at the Boonshoft Museum learned several facts about bats, including "bats eat a lot of insects," "are an endangered species", and "don't fly in your hair." Brookfield Zoo visitors learned about penguins, including "penguins are going to be extinct."

Table 7. Respondents' feelings regarding STEM content, separated by interaction with kiosks

	Interaction Mean	No Interaction Mean	Mean Difference	t	Df	p
I feel . . .						
I am more knowledgeable about how to study animals* **	4.52	3.74	.778	9.010	1276	.000
I can investigate animal behavior through careful observation* **	4.77	4.41	.362	4.264	1296	.000
I might like to study animals (behavior, personality, etc.)* **	4.26	3.78	.481	5.403	1651	.000
I understand animals better* **	4.78	4.22	.560	7.012	1618	.000

N ranges from 1277 - 1652
n for No Interaction ranges from 545-677
n for Interaction ranges from 733-976

*** $p < .001$

Conservation Efforts

Zoo visitors who interacted with the kiosks expressed that they could protect the animal's environment, share the conservation message (either through the poster or by talking with others), or donate money to the zoo or organizations helping to save the animals. Visitors who interacted with the Conservation Poster kiosk in particular were also more likely to be aware that animals need to be protected and that they could help the animals.

How We Know

Among respondents who completed the Conservation Poster questionnaire, those who interacted with the associated kiosk were compared to those who did not interact with the kiosk. When asked to rate their level of agreement with conservation-themed statements on a scale where1 represents Strongly Disagree and 7 represents Strongly Agree, respondents who interacted with the Conservation Poster kiosk were significantly more likely to agree that they learned about the animal and conservation issues, as measured by an independent samples t-test. (See Table 8.)

Table 8. Conservation Poster Kiosk visitors' knowledge of conservation issues

	Poster Interaction Mean	No Poster Interaction Mean	Mean Difference	t	df	p
Learned about the animal and conservation issues* **	4.54	3.77	.773	5.119	539	.000
Shared what I learned about the animal or conservation issues with others, either at the zoo or via e-mail	3.65	3.63	.029	.143	415	.886

n for Poster No Interaction ranges from 139 - 261
n for Poster Interaction ranges from 278-280

*** $p < .001$

Additionally, the majority of visitors who interacted with the Conservation Poster kiosk had stronger feelings of agreement regarding conservation measures, including awareness that animals need to be protected and they could help the animals, compared to respondents who did not interact with the poster kiosk (see Table 9.)

Table 9. All respondents' feelings regarding conservation measures separated by interaction with the Conservation Poster kiosk

	Poster Interaction Mean	No Poster Interaction Mean	Mean Difference	t	df	p
I feel . . .						
I am more aware that animals need to be protected*	5.32	5.12	.208	2.443	1693	.015
I can help the animals*	4.71	4.53	.185	2.109	1655	.035
I would like to work to help save animals in the wild	4.32	4.16	.165	1.680	1658	.093
I visit the Zoo to learn and/or support conservation	4.75	4.66	.092	.908	1330	.364

N for poster interact ranges from 498-506
N for poster no interact ranges from 826-1159

* $p < .05$

Although the mean ratings for each of the specific conservation actions were negative to neutral ($\bar{x}$= 2.61 to 4.07), the actions appear to be influenced by the poster kiosks; all of the conservation action statements were rated higher by those who interacted with the poster than those who did not (see Table 10). Additionally, one of the three statements was found to have a statistically significant positive difference, as measured by an independent samples t-test:

- *Create a conservation poster and e-mail it to someone* ($p < .001$, mean difference of .485)

Table 10. Visitors' likelihood of completing specific conservation actions

	Poster Interaction Mean	No Poster Interaction Mean	Mean Difference	t	df	p
Create a conservation poster and e-mail it to someone* **	3.09	2.61	.485	4.728	1714	.000
Donate to this Zoo	4.06	3.96	.103	.924	1368	.356
Donate to other conservation organizations	4.07	3.90	.163	1.494	1505	.135

N ranges from 285-288
n for No Poster ranges from 981-1218
n for Poster ranges from 389-498

*** $p < .001$

Of the 160 interviewees, only 39% were able to articulate something they might do to help the animals. The low number of interviewees who could share something they might do to help the animal is supported by the research that demonstrates individuals typically distance themselves from their own contribution to environmental issues.

Responses to this question were coded to identify trends. Individuals who shared something they could do to help the animal were most likely to mention the following conservation actions:

- Protect the animal's environment (22%)
- Share the conservation message, either through the poster or by talking with others (17%)
- Donate money to the zoo or organizations helping to save the animals (17%)
- Recycle (10%)

Other actions expressed included the following:

- Sustainable palm oil products (Cleveland)
- Recycling cell phones (Columbus)
- Building bat houses (Boonshoft)
- Purchasing fair trade items (Toledo). The interviewee did not "know about them, but may look them up on the internet."

Additionally, 22% of those interviewed said the kiosks increased their awareness of the animal and its associated conservation issues, which could motivate a conservation action in the future. Visitors who completed the poster interactive received an email prompt at home to view their poster online and with conservation actions they could take, including forwarding the conservation message they created. Data from the *iSaveSpecies* servers indicate that, depending on location, 20% to 60% of visitors who completed a conservation poster emailed their posters and associated conservation prompts. Data are not available to determine the percentage of visitors who took further action at home.

Value Added

Visitors who used the *iSaveSpecies* kiosks reported that the kiosks added value to their visit, indicating it provided a different way to engage with the animals.

How We Know

Respondents who reported interacting with a kiosk were asked to rate their level of agreement with a set of value-added statements, where 1 represented "Strongly Disagree" and 7 represented "Strongly Agree" (Table 11). All statements were found to be above the midpoint, indicating visitors were generally pleased with the kiosks. The interviews found that the majority of respondents indicated that they found the interactives appealing and fun. Respondents appeared to appreciate that the kiosk was a fun activity they could do with others in their group and that it provided a different way to engage with the animals.

Table 11. Respondents who interacted with a kiosk feelings regarding value added statements

	Great Ape		Sustaining Life		All	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Stopping at the touchscreen interactive was worth my time	5.13	1.537	5.23	1.548	5.18	1.542
The touchscreen interactive was appealing	5.27	1.476	5.51	1.419	5.39	1.451
The touchscreen interactive provided an activity I could do with others in my group	5.31	1.592	5.39	1.534	5.35	1.562
I had fun with the touchscreen interactive activity.	5.40	1.514	5.41	1.511	5.40	1.512
The touchscreen interactive activity provided me a different way to engage with the animals	5.29	1.569	5.36	1.494	5.33	1.530
The touchscreen interactive provided me with new information	5.28	1.591	5.27	1.529	5.28	1.559
I will look at animal differently because of the touchscreen interactive activity	4.97	1.719	4.80	1.764	4.88	1.743

Great Ape Campaign n ranges from 279 - 384
Sustaining Life Campaign n ranges from 400 - 408
All N ranges from 783 - 796

Conclusions

The overarching question for this summative evaluation was "Do the *iSaveSpecies* kiosks achieve their desired (collective) outcomes?"

To answer this question, five sub-questions were asked to allow for analysis of the impact of *iSaveSpecies* interactive kiosks on the different outcomes.

- Did visitors who engaged with the *iSaveSpecies* inquiry kiosks report they have used basic science inquiry skills during their zoo visit?

This was true to some extent: responses to closed-ended questions indicate that the kiosks appear to have been effective in promoting basic inquiry skills and increasing visitors' knowledge of the animals. The *iSaveSpecies* kiosks appear to have the greatest impact on encouraging visitors to record or enter information about an animal's behavior, comparing research results with others, and listening to different calls animals make. A very high percentage of all visitors (>97%) reported observing a single animal carefully, and this inquiry skill was not significantly impacted by kiosk use. All *iSaveSpecies* kiosks had a positive impact on at least one inquiry skill.

An essential inquiry skill is the ability to ask questions that lead to investigations. While responses to a closed-ended question suggested that respondents were more likely to think about questions they might ask about what they observed, relatively few shared a question they had about the animal in response to an open-ended question found on the questionnaire (Great Apes campaign) or during an interview (Great Apes and Sustaining Life campaigns). Factors that may have limited limit visitor's ability to formulate a question include the high percentage of visitors in this sample who were infrequent zoo visitors, which might limit visitors' time with the questionnaire, as research indicates that infrequent visitors to a zoo or aquarium try to see as much as possible and spend less time with any individual exhibit. Additionally, the majority of participants were traveling with family, including young children and the pressing need to keep an eye of young children in the party, might contribute to an adult's ability to formulate a question. Respondents might not have found the environment conducive to pondering a question and/or an investigation scenario. The kiosks themselves may have framed questions, but they did not necessarily lead people to ask their own questions. Cultivating this inquiry skill likely requires more intensive interaction than normally occurs at an exhibit-based public kiosk, and it might be strengthened through associated staff interactions or other interventions.

- Did visitors who engaged with the *iSaveSpecies* interactive kiosks have a better understanding of the STEM content related to the *iSaveSpecies* kiosks than those who did not?

Yes, visitors who interacted with the *iSaveSpecies* kiosk reported they felt they were more knowledgeable about how to study an animal, understood animals better, might like to study animals, and could investigate animal behavior through careful observation. Interviewees reported learning kiosk specific STEM content from the Do All Day, Hang Out, and Hoot/Chirp/Roar kiosks.

Visitors who explored the Do All Day and Hang Out kiosks tested their hypothesis and learned how and where the animal spent their day. Those who interacted with the Hoot/Chirp/Roar kiosk learned "What we thought [the animal] meant was different than what they really mean."

- Did visitors who engaged with the *iSaveSpecies* conservation poster kiosk understand conservation efforts?
- Did visitors who engaged with the *iSaveSpecies* conservation poster kiosks report involvement in specific conservation actions?

This was true to some extent: Zoo visitors who interacted with the Conservation Poster kiosk were more likely to be aware that animals need to be protected and that they could help the animals than visitors who did not interact. Zoo visitors who interacted also shared that they could protect the animal's environment, share the conservation message (either through the poster or by talking with others), or donate money to the zoo or organizations helping to save the animals.

However, the majority of those interviewed were unable to articulate anything else that these experiences introduced or reminded them that they might do to help the animals. This supports research that demonstrates individuals' tendency to distance themselves from their own contributions to environmental issues. Individuals who shared something they could do to help the animal were most likely to say that they could protect the animal's environment, share the conservation message, or donate money to the zoo or organizations helping to save the animals. Data indicate that a substantial percentage of visitors who created conservation posters emailed their posters and associated prompts for conservation actions.

- Did visitors who engaged with the *iSaveSpecies* interactive kiosks feel it added value to their zoo visit?

Yes, mean scores for those who used the *iSaveSpecies* kiosks were all well above the midpoint. Respondents indicated the interactives were appealing and fun. The kiosks provided visitors a different way to engage with the animals and an opportunity to participate in an activity they could do with others in their group.

The *iSaveSpecies* project also established a national learning partnership that offers professional development programs for informal science staff, classroom teachers, and other professionals. This includes two master's degree programs focused on community engagement in science and environmental stewardship: The Advanced Inquiry Program from Miami University is currently co-delivered with the Bronx Zoo/Wildlife Conservation Society (New York), Brookfield Zoo (Chicago), Cincinnati Zoo & Botanical Garden, Cleveland Metroparks Zoo, Denver Zoo, Phoenix Zoo, San Diego Zoo Global, and the Woodland Park Zoo (Seattle), with additional partner institutions in development. The Global Field Program includes field courses in 16 countries with leading conservationists and community leaders in Africa, Asia, Australia, and the Americas. Miami University is responsible for evaluation of these programs and those findings are reported elsewhere.

Appendix A: Sample Data Collection Instruments

Date:
Number:

Toledo Interview

This zoo has recently installed some new interactive touch screen kiosks in this area and we are trying to better understand who uses these and what visitors might gain from these experiences. I noticed you interacting with one and would like to ask you a few questions about the kiosk and your experience in the Tembo Trail. It will take about five minutes and your participation is voluntary and your responses are completely confidential.

Which exhibit: Poster Do All Day Hang Out

I believe someone in your group explored the interactive touchscreen kiosk? Is that correct? Can you tell me who?

What did you[they] do with it?

What, if anything, did you[they] learn from this interactive touchscreen kiosk?

Talk to me about how this/these experiences [with the kiosks] helped you to understand elephants, or your relationship with elephants?

Based on your experience in Tembo Trail, do you have any questions about elephant's behavior?

How could someone investigate this?

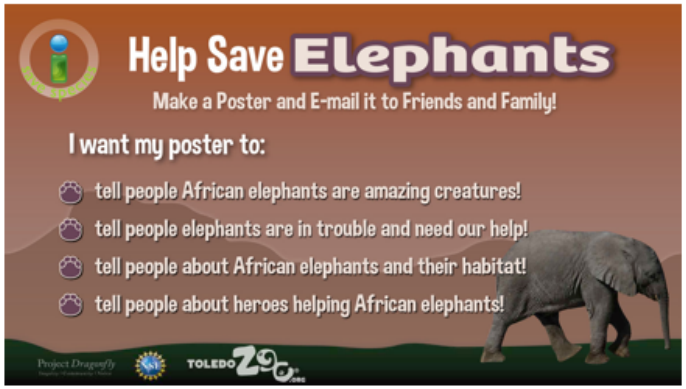
This zoo is committed to helping elephants. Did these experiences introduce you to or remind you of things you might do to help the elephants?

Toledo Zoo
Poster Questionnaire
Summer 2015

This zoo has recently installed some new touch screen interactive kiosks in this area and we are trying to better understand who uses these kiosks and what visitors might gain from these experiences. The survey will take you about five minutes to complete. Your participation is voluntary and your responses are completely confidential.

During your visit today, about how much time did you spend in the Tembo Trail (Elephant Exhibit)?

- ☐ Less than 3 minutes
- ☐ 3 – 5 minutes
- ☐ 5 – 10 minutes
- ☐ 10 – 15 minutes
- ☐ 15 + minutes



During your visit today, do you remember seeing this touch screen interactive kiosk?

☐ Yes ☐ No

Did you, or anyone in your group, interact with the touch screen interactive kiosk (push buttons, read information, etc.)?

☐ Yes ☐ No

Who in your group interacted with the touch screen interactive kiosk? Check all that apply.

☐ Adult ☐ Youth

Did you or anyone from your group already interact with this touchscreen interactive kiosk on an earlier visit to this zoo?

☐ Yes ☐ No

To what degree do you believe you did any of the following during your visit to the Tembo Trail (Elephant Exhibit)?

	Definitely Not						Absolutely Yes
Learned about elephants and conservation issues	1	2	3	4	5	6	7
Shared what I learned about elephants or conservation issues with others, either at the zoo or via e-mail	1	2	3	4	5	6	7
Thought of a question about the elephant's behavior	1	2	3	4	5	6	7
Talked with others in my group about what I observed or did	1	2	3	4	5	6	7

How likely are you to participate in these conservation actions, where 1 represents very unlikely and 7 represents very likely.

	Very Unlikely						Very Likely
Create a conservation poster and e-mail it to someone.	1	2	3	4	5	6	7
Add $1 Conservation Today donation to any of your purchases at the Toledo Zoo gift shops to support elephant conservation efforts	1	2	3	4	5	6	7
Donate to organizations that support elephant conservation or ask others to do so	1	2	3	4	5	6	7

We would like to know if that interaction changed the way you feel about science and conservation. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

I feel . . .	Strongly Disagree						Strongly Agree
I am more aware that elephants need to be protected	1	2	3	4	5	6	7
I can help elephants	1	2	3	4	5	6	7
I might like to study elephants (behavior, personality, etc.)	1	2	3	4	5	6	7
I understand elephants better	1	2	3	4	5	6	7
I would like to work to help save elephants in the wild	1	2	3	4	5	6	7
I visit this zoo to learn and/or support conservation	1	2	3	4	5	6	7

If you used any of the touchscreen interactive kiosks today, please answer the next question. **If not, please skip to the "Tell me a little bit about yourself" section.** →

We would like to know if the touchscreen interactive kiosks **added value** to your experience at the zoo. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

	Strongly Disagree						Strongly Agree
Stopping at the touchscreen interactive was worth my time	1	2	3	4	5	6	7
The touchscreen interactive was appealing	1	2	3	4	5	6	7
The touchscreen interactive provided an activity I could do with others in my group	1	2	3	4	5	6	7
I had fun with the touchscreen interactive activity	1	2	3	4	5	6	7
The touchscreen interactive activity provided me a different way to engage with the animals	1	2	3	4	5	6	7
The touchscreen interactive provided me with new information	1	2	3	4	5	6	7
I will look at elephants differently because of the touchscreen interactive activity	1	2	3	4	5	6	7

Please tell me a little about yourself.

Are you a member of this zoo? ☐ Yes ☐ No

Are you ☐ Male ☐ Female

About how often do you visit this zoo? (Select the one best answer)

- ☐ Today is my first visit
- ☐ I haven't visited for many years
- ☐ Once every few years
- ☐ About once a year
- ☐ 2-4 times per year
- ☐ 5+ times per year

Who are you visiting the zoo with today? (Please check all that apply)

- ☐ Alone
- ☐ Date
- ☐ Family
- ☐ Friends
- ☐ Organized Group (i.e., Scouts, Church, School, etc.)

What is your race/ethnicity? (Please check all that apply)

- ☐ African American/Black
- ☐ American Indian/Native Alaskan
- ☐ Asian/Asian American
- ☐ Latino(a) or Hispanic
- ☐ Native Hawaiian/Pacific Islander
- ☐ White, Non-Hispanic

What are the ages of the adults in your group?
(Please check all that apply)

- ☐ 19-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

What are the ages of the children in your group (if any)?
(Please check all that apply)

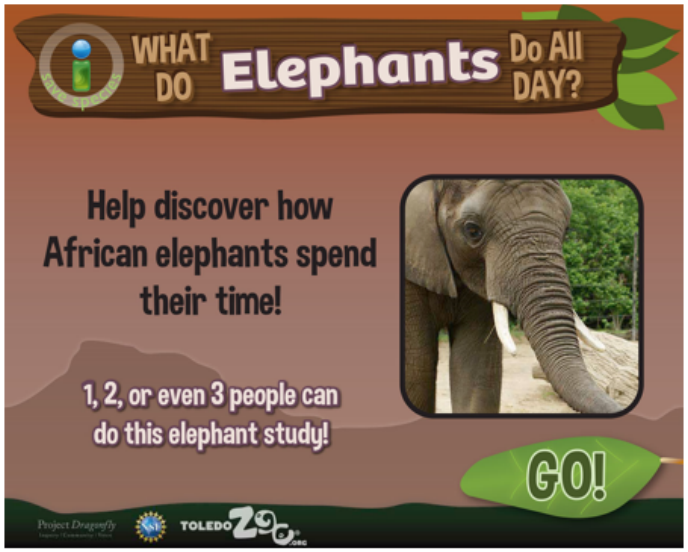
- ☐ Infant – less than 2 years old
- ☐ 2 – 4 years old
- ☐ 5 – 7 years old
- ☐ 8 – 12 years old
- ☐ 13 – 17 years old

Toledo Zoo
Do All Day
Questionnaire
Summer 2015

This zoo has recently installed some new touch screen interactive kiosks in this area and we are trying to better understand who uses these kiosks and what visitors might gain from these experiences. The survey will take you about five minutes to complete. Your participation is voluntary and your responses are completely confidential.

During your visit today, about how much time did you spend in the Tembo Trail (Elephant Exhibit)?

- ☐ Less than 3 minutes
- ☐ 3 – 5 minutes
- ☐ 5 – 10 minutes
- ☐ 10 – 15 minutes
- ☐ 15 + minutes



During your visit today, do you remember seeing this touch screen interactive kiosk?

☐ Yes ☐ No

Did you, or anyone in your group, interact with the touch screen interactive kiosk (push buttons, read information, etc.)?

☐ Yes ☐ No

Who in your group interacted with the touch screen interactive kiosk? Check all that apply.

☐ Adult ☐ Youth

Did you or anyone from your group already interact with this touchscreen interactive kiosk on an earlier visit to this zoo?

☐ Yes ☐ No

Next →

To what degree do you believe you did any of the following during your visit to the Tembo Trail (Elephant Exhibit)?

	Definitely Not						Absolutely Yes
Observed a single elephant carefully for more than a few seconds	1	2	3	4	5	6	7
Made a guess or prediction about the elephant's behavior	1	2	3	4	5	6	7
Entered information on a touchscreen or wrote down information about a elephant's behavior on paper	1	2	3	4	5	6	7
Compared what you learned to what others learned about elephants	1	2	3	4	5	6	7
Thought of a question about the elephants behavior	1	2	3	4	5	6	7
Talked with others in my group about what I observed or did	1	2	3	4	5	6	7

How likely are you to participate in these conservation actions, where 1 represents very unlikely and 7 represents very likely.

	Very Unlikely						Very Likely
Create a conservation poster and e-mail it to someone	1	2	3	4	5	6	7
Add $1 Conservation Today donation to any of your purchases at the Toledo Zoo gift shops to support elephant conservation efforts	1	2	3	4	5	6	7
Donate to organizations that support elephant conservation or ask others to do so	1	2	3	4	5	6	7

Over →

We would like to know if that interaction changed the way you feel about science and conservation. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

I feel . . .	Strongly Disagree						Strongly Agree
I am more knowledgeable about how to study elephants	1	2	3	4	5	6	7
I can investigate elephant behavior through careful observation	1	2	3	4	5	6	7
I am more aware that elephants need to be protected	1	2	3	4	5	6	7
I can help elephants	1	2	3	4	5	6	7
I might like to study elephants (behavior, personality, etc.)	1	2	3	4	5	6	7
I understand elephants better	1	2	3	4	5	6	7
I would like to work to help save elephants in the wild	1	2	3	4	5	6	7
I visit this zoo to learn and/or support conservation	1	2	3	4	5	6	7

If you used any of the touchscreen interactive kiosks today, please answer the next question. **If not, please skip to the "Tell me a little bit about yourself" section.** →

Next →

We would like to know if the touchscreen interactive kiosks **added value** to your experience at the zoo. Please rate the extent to which you agree with the following statements using a scale from 1 (strongly disagree) to 7 (strongly agree).

	Strongly Disagree						Strongly Agree
Stopping at the touchscreen interactive was worth my time	1	2	3	4	5	6	7
The touchscreen interactive was appealing	1	2	3	4	5	6	7
The touchscreen interactive provided an activity I could do with others in my group	1	2	3	4	5	6	7
I had fun with the touchscreen interactive activity	1	2	3	4	5	6	7
The touchscreen interactive activity provided me a different way to engage with the animals	1	2	3	4	5	6	7
The touchscreen interactive provided me with new information	1	2	3	4	5	6	7
I will look at elephants differently because of the touchscreen interactive activity	1	2	3	4	5	6	7

Please tell me a little about yourself.

Are you a member of this zoo? ☐ Yes ☐ No

Are you ☐ Male ☐ Female

About how often do you visit this zoo? (Select the one best answer)

- ☐ Today is my first visit
- ☐ I haven't visited for many years
- ☐ Once every few years
- ☐ About once a year
- ☐ 2-4 times per year
- ☐ 5+ times per year

Who are you visiting the zoo with today? (Please check all that apply)

- ☐ Alone
- ☐ Date
- ☐ Family
- ☐ Friends
- ☐ Organized Group (i.e., Scouts, Church, School, etc.)

What is your race/ethnicity? (Please check all that apply)

- ☐ African American/Black
- ☐ American Indian/Native Alaskan
- ☐ Asian/Asian American
- ☐ Latino(a) or Hispanic
- ☐ Native Hawaiian/Pacific Islander
- ☐ White, Non-Hispanic

What are the ages of the adults in your group?
(Please check all that apply)

- ☐ 19-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

What are the ages of the children in your group (if any)?
(Please check all that apply)

- ☐ Infant – less than 2 years old
- ☐ 2 – 4 years old
- ☐ 5 – 7 years old
- ☐ 8 – 12 years old
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Toledo Zoo
Hang Out
Questionnaire
Summer 2015

This zoo has recently installed some new touch screen interactive kiosks in this area and we are trying to better understand who uses these kiosks and what visitors might gain from these experiences. The survey will take you about five minutes to complete. Your participation is voluntary and your responses are completely confidential.

During your visit today, about how much time did you spend in the Tembo Trail (Elephant Exhibit)?

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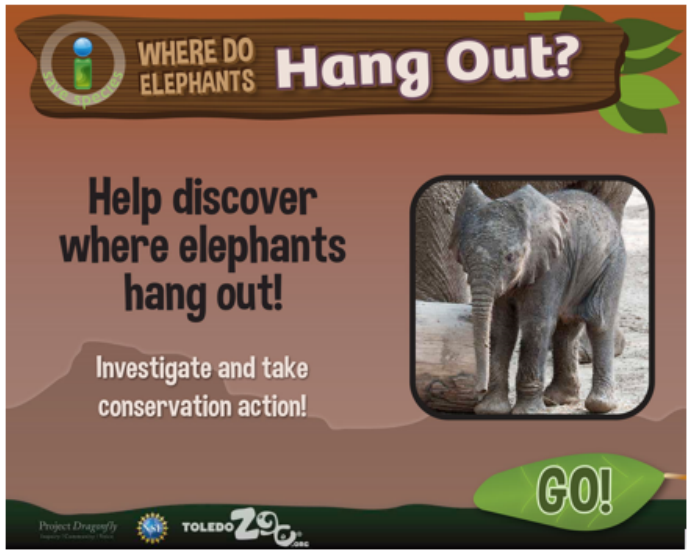
- ☐ 3 – 5 minutes
- ☐ 5 – 10 minutes
- ☐ 10 – 15 minutes
- ☐ 15 + minutes



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☐ Adult ☐ Youth

Did you or anyone from your group already interact with this touchscreen interactive kiosk on an earlier visit to this zoo?

☐ Yes ☐ No

Next →

To what degree do you believe you did any of the following during your visit to the Tembo Trail (Elephant Exhibit)?

	Definitely Not						Absolutely Yes
Observed a single elephant carefully for more than a few seconds	1	2	3	4	5	6	7
Made a guess or prediction about the elephant's behavior	1	2	3	4	5	6	7
Entered information on a touchscreen or wrote down information about an elephant's behavior on paper	1	2	3	4	5	6	7
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Thought of a question about the elephants behavior	1	2	3	4	5	6	7
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How likely are you to participate in these conservation actions, where 1 represents very unlikely and 7 represents very likely.

	Very Unlikely						Very Likely
Create a conservation poster and e-mail it to someone	1	2	3	4	5	6	7
Add $1 Conservation Today donation to any of your purchases at the Toledo Zoo gift shops to support elephant conservation efforts	1	2	3	4	5	6	7
Donate to organizations that support elephant conservation or ask others to do so	1	2	3	4	5	6	7

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I visit this zoo to learn and/or support conservation	1	2	3	4	5	6	7

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The touchscreen interactive activity provided me a different way to engage with the animals	1	2	3	4	5	6	7
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Please tell me a little about yourself.

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Are you ☐ Male ☐ Female

About how often do you visit this zoo? (Select the one best answer)

- ☐ Today is my first visit
- ☐ I haven't visited for many years
- ☐ Once every few years
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- ☐ 2-4 times per year
- ☐ 5+ times per year

Who are you visiting the zoo with today? (Please check all that apply)

- ☐ Alone
- ☐ Date
- ☐ Family
- ☐ Friends
- ☐ Organized Group (i.e., Scouts, Church, School, etc.)

What is your race/ethnicity? (Please check all that apply)

- ☐ African American/Black
- ☐ American Indian/Native Alaskan
- ☐ Asian/Asian American
- ☐ Latino(a) or Hispanic
- ☐ Native Hawaiian/Pacific Islander
- ☐ White, Non-Hispanic

What are the ages of the adults in your group? (Please check all that apply)

- ☐ 19-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

What are the ages of the children in your group (if any)? (Please check all that apply)

- ☐ Infant – less than 2 years old
- ☐ 2 – 4 years old
- ☐ 5 – 7 years old
- ☐ 8 – 12 years old
- ☐ 13 – 17 years old

Appendix B: Demographic Data Tables

Table 12 Amount of time (%) spent in exhibition area

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**216**	**216**	**299**	**274**	**56**	**197**	**203**	**258**	
Less than 3 minutes	6	14	1	15	5	6	1	4	6.5
3 – 5 minutes	19	42	9	20	20	10	12	12	18
5 – 10 minutes	38	33	22	26	45	31	28	30	31.625
10 – 15 minutes	19	8	27	21	23	30	27	29	23
15 + minutes	18	3	41	18	7	23	32	26	21

Table 13. Zoo membership

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**219**	**217**	**293**	**274**	**59**	**214**	**202**	**286**	
Yes	23	38	26	17	20	45	43	40	31.5
No	77	62	74	83	80	55	57	60	68.5

Table 14. Visit frequency

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**216**	**220**	**296**	**275**	**59**	**216**	**199**	**289**	
Today is first visit	43	14	24	26	36	13	23	22	25.1
I haven't visited for many years	15	11	12	11	12	10	6	16	11.6
Once every few years	12	14	13	20	14	10	7	14	13
About once a year	7	19	21	20	15	13	11	13	14.9
2-4 times/ year	11	24	19	16	7	27	21	22	18.4
5+ times/ year	12	18	10	8	17	27	33	12	17.1

Table 15. Others in respondents' groups

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**158**	**172**	**Data Not Available**	**214**	**54**	**225**	**212**	**294**	
Family	73	80		65	91	79	71	81	77.1
Friends	9	4		13	15	14	17	13	12.1
Date	7	7		13	4	11	15	12	9.9
Alone	2	1		1	0	1	0	1	1
Group	1	0		3	2	1	2	1	1.4

Table 16. Ages of adults in respondents' group

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**218**	**221**	**297**	**278**	**54**	**224**	**211**	**294**	
18-29	35	43	48	50	24	34	43	36	39.1
30-39	37	32	30	33	59	44	44	36	39.4
40-49	25	29	28	27	24	23	26	34	27.0
50-59	20	14	27	24	13	11	10	20	17.4
60+	16	21	23	10	6	13	11	15	14.4

Table 17. Ages of children in respondents' group

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**219**	**221**	**297**	**276**	**54**	**223**	**189**	**294**	
Infant – less than 2 years old	11	17	13	17	19	27	23	19	18.3
2 – 4 years old	23	28	13	24	50	40	39	25	30.3
5 – 7 years old	31	31	11	25	56	26	35	20	29.4
8 – 12 years old	34	33	17	29	39	20	23	28	27.9
13 – 17 years old	23	19	20	13	7	10	7	21	15.0

Table 18. Respondents' gender

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**217**	**219**	**Data Not Available**	**273**	**59**	**218**	**202**	**287**	
Male	34	27		37	41	32	38	41	35.7
Female	66	73		63	59	68	62	59	64.3

Table 19. Respondents' race/ethnicity

	Atlanta	Cleveland	Columbus	Pittsburgh	Boonshoft	Brookfield	Oregon	Toledo	Average %
N=	**217**	**221**		**274**	**53**	**225**	**211**	**294**	
African American/ Black	12	4		4	6	6	2	4	4.4
American Indian/ Native Alaskan	2	0		1	6	1	4	1	2.6
Asian/ Asian American	6	1	**Data Not Available**	1	2	2	7	3	3
Latino(a) or Hispanic	13	3		4	4	19	9	4	8
Native Hawaiian/ Pacific Islander	0	1		1	0	0	2	1	0.8
White, Non-Hispanic	74	91		93	94	77	87	90	88.2

Appendix C: Inquiry Skill Data Tables by Kiosk and Year

Table 20. Poster—Great Apes Outcome Evaluation

	Total Interaction	Interaction + Skill	%	Total No Interaction	No Interaction + Skill	%	z	p
	N=	N=		N=	N=			
Talked with others in my group about what I observed or did	399	298	74.7%	321	200	62.3%	-4.160	.000
Asked questions about what I observed	399	168	42.1%	321	75	23.4%	-6.250	.000

Table 21. Poster—Sustaining Life Outcome Evaluation

	N=	Interaction Mean	N=	No Interaction Mean	Mean Difference	t	df	p
Talked with others in my group about what I observed or did	173	5.05	100.00	4.48	0.570	2.502	271	.013
Thought of questions about what I observed	174	4.43	100.00	4.13	0.300	1.343	272	.180

Table 22. Hang Out—Great Apes Outcome Evaluation

	Total Interaction	Interaction + Skill	%	Total No Interaction	No Interaction + Skill	%	Z	p
	N=	N=		N=	N=			
Talked with others in my group about what I observed or did	43	35	81.4%	34	23	67.6%	-1.381	.167
Asked questions about what I observed	43	14	32.6%	34	6	17.6%	-1.472	.141
Observed a single animal carefully for more than a few seconds	43	42	97.7%	34	33	97.1%	-.168	.867
Made a prediction about an animal's behavior**	43	30	69.8%	34	12	35.3%	-2.997	.003
Recorded information about an animal's behavior (on a touchscreen or on paper)*	43	14	32.6%	34	3	8.8%	-2.477	.013
Compared research results with others**	43	9	20.9%	34	0	0.0%	-2.820	.005

Table 23. Hang Out—Sustaining Life Outcome Evaluation

	N=	Interaction Mean	N=	No Interaction Mean	Mean Difference	t	df	p
Talked with others in my group about what I observed or did	52	5.42	41	4.95	0.472	1.223	91	.225
Thought of questions about what I observed	52	4.83	43	4.14	0.687	1.713	93	.090
Observed a single animal carefully for more than a few seconds	53	6.32	43	6.51	-.191	-1.091	94	.278
Made a guess or prediction about an animal's behavior	53	4.95	43	4.65	.198	.570	94	.570
Entered information on a touchscreen or wrote down information about an animal's behavior***	51	3.59	42	1.48	2.112	5.332	91	.000
Compared research results with others***	50	4.52	43	2.77	1.753	3.849	91	.000

Table 24. Hoot—Great Apes Outcome Evaluation

	Total Interaction	Interaction + Skill	%	Total No Interaction	No Interaction + Skill	%	z	p
	N=	N=		N=	N=			
Talked with others in my group about what I observed or did	53	42	79.2%	37	24	64.9%	-1.086	0.278
Asked questions about what I observed	52	23	44.2%	37	11	29.7%	-1.13	0.259
Discovered that I am similar to an animal	52	37	71.2%	36	17	47.2%	-1.935	0.053
Compared myself to an animal	52	35	67.3%	37	22	59.5%	-0.34	0.734
Compared research results with others	52	18	34.6%	36	8	22.2%	-1.121	0.262
Listened to different calls animals make***	56	39	69.6%	37	13	35.1%	-3.265	0.001

Table 25. Hoot—Sustaining Life Outcome Evaluation

	N=	Interact Mean	N=	No Interact Mean	Mean Difference	t	df	p
Talked with others in my group about what I observed or did	54	4.85	25.00	4.64	0.212	.457	77	.649
Thought of questions about what I observed	52	4.08	25.00	4.48	0.463	-.915	75	.363
Compared myself to an animal	40	3.28	25.00	2.76	0.515	1.001	63	.321
Compared research results with others*	53	3.32	24.00	2.38	0.946	2.383	75	.020
Listened to different calls animals make***	54	5.00	27.00	3.37	1.630	3.361	79	.001
Learned that I am like an animal	52	3.19	25.00	2.80	1.000	-.597	13	.561

Table 26. Do All Day—Great Apes Outcome Evaluation

	Total Interaction	Interaction + Skill	%	Total No Interaction	No Interaction + Skill	%	Z	p
Talked with others in my group about what I observed or did	31	24	77.4%	37	24	64.9%	-.996	.319
Asked questions about what I observed**	31	17	54.8%	31	8	25.8%	-2.734	.006
Observed a single animal carefully for more than a few seconds	33	32	97.0%	38	38	100.0%	-.119	.905
Made a prediction about an animal's behavior	32	19	59.4%	38	24	63.2%	-.339	.734
Recorded information about an animal's behavior (on a touchscreen or on paper)***	31	17	54.8%	37	5	13.5%	-3.527	.000
Compared research results with others**	30	10	33.3%	37	2	5.4%	-2.836	.005

Table 27. Do All Day—Sustaining Life Outcome Evaluation

	N=	Interaction Mean	N=	No Interaction Mean	Mean Difference	t	df	p
Talked with others in my group about what I observed or did	51	5.47	45	4.89	0.580	1.409	94	.162
Thought of questions about what I observed	51	4.59	45	4.00	0.590	1.370	94	.174
Observed a single animal carefully for more than a few seconds	51	6.41	46	6.15	0.260	1.144	95	.255
Made a guess or prediction about an animal's behavior	51	5.00	46	4.33	0.670	1.828	95	.071
Entered information on a touchscreen or wrote down information about an animal's behavior***	51	4.33	43	1.84	2.490	5.648	92	.000
Compared research results with others*	51	4.37	44	3.41	0.960	2.031	93	.045

Table 28. Which Are You—Great Apes Outcome Evaluation

	Total Interaction	Interaction + Skill	%	Total No Interaction	No Interaction + Skill	%	z	p
Talked with others in my group about what I observed or did*	106	89	84.0%	98	62	63.3%	-2.291	.022
Asked questions about what I observed**	103	51	49.5%	93	26	28.0%	-2.745	.006
Participated in research by answering questions**	112	83	74.1%	98	52	53.1%	-2.894	.004
Discovered that I am similar to an animal*	107	71	66.4%	93	46	49.5%	-2.224	.026
Compared myself to an animal	108	63	58.3%	95	47	49.5%	-1.102	.270

Table 29. Which Are You—Sustaining Life Outcome Evaluation

	N=	Interaction Mean	N=	No Interaction Mean	Mean Difference	t	df	p
Talked with others in my group about what I observed or did	43	5.07	24	4.46	0.610	1.227	65	.224
Thought of questions about what I observed	43	5.00	24	4.29	0.710	1.566	65	.122
Participated in research by answering questions*	43	4.21	22	3.18	1.030	2.232	63	.029
Compared myself to an animal	44	4.00	24	3.00	1.000	1.978	66	.052

*** $p < .001$
** $p < .01$
* $p < .05$