



iSaveSpecies—Great Apes Summative Evaluation Report

Cleveland Metroparks Zoo

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Executive Summary

The iSaveSpecies project, created by Project Dragonfly at Miami University and a consortium of zoos and aquariums, designed and implemented a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation. The first wave of the iSaveSpecies exhibit stations focused on *Great Apes*, allowing families to conduct research on captive ape populations and to help save wild apes by joining the work of experienced field conservationists. Participating zoos have incorporated three touchscreen-based research and action kiosks in or near their ape/bonobo/orangutan exhibits.

To support these efforts, the Lifelong Learning Group conducted a summative evaluation to determine the effectiveness of the iSaveSpecies electronic interactive kiosks at engaging families in inquiry, STEM, and conservation actions. The study was designed to answer the question: Do the iSaveSpecies kiosks achieve their desired (collective) outcomes?

Data for this study were collected at four different zoos. This report focuses on the Cleveland Metroparks Zoo; data were collected onsite at the Zoo from adult visitors (N=241) in the orangutan viewing area. Two types of participants were sought—those who used the iSaveSpecies kiosk and those who did not—to complete a questionnaire or an interview.

The study found that visitors who engaged with the iSaveSpecies *inquiry kiosks reported they used basic science inquiry skills during their zoo visit*. Visitors who interacted with a kiosk reported they were more likely to talk with others in their group about what they observed or did, ask questions about what they observed, and observe a single animal carefully.

However, an essential inquiry skill is the ability to ask questions that lead to investigations, and respondents were less likely to share a question about the orangutans in response to an open-ended follow-up question on the questionnaire. Additionally, when asked how they would investigate their question, those who responded favored finding the answer on the internet or asking a zoo employee, rather than observing the orangutan. The low number of responses, the high number of simple/uninvestigable questions, and the visitors' passive investigation techniques may be due to several factors including a lack of time or an environment un conducive to writing a question and/or investigation.

Visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study orangutans, might like to study orangutans, and felt they could help orangutans than visitors who did not interact with the kiosks. Interviewees that completed the Hang Out Kiosk learned where orangutans like to hang out within their enclosure and those who explored the Which Are You kiosk shared that they learned about orangutan behaviors.

Cleveland Zoo visitors who interacted with the iSaveSpecies poster kiosk were more likely to report they understood great ape conservation efforts than visitors who did not use the poster kiosk. Additionally, these visitors were more likely to report having created a conservation poster and e-mailed it to someone. However, the mean scores were fairly neutral; with the mean scores for the majority of statements rated at the midpoint or slightly above.

Visitors who engaged with the iSaveSpecies interactive kiosks feel it added value to their zoo visit. Mean scores for those who used the iSaveSpecies kiosks were all well above the midpoint. Respondents indicated they had fun, found a different way to engage with the animals, and received

new information from the kiosk. The kiosks provided visitors an opportunity to participate in an activity they could do with others in their group.

The key outcomes of this study include:

- Visitors who interacted with the iSaveSpecies kiosks felt it added value to their zoo visit.
- Visitors who interacted with the iSaveSpecies kiosks felt more knowledgeable about how to study orangutans, and felt they could help orangutans more than visitors who did not interact with the kiosks.
- Visitors who engaged with the iSaveSpecies kiosks reported they used basic science inquiry skills during their zoo visit. Visitors who interacted with a kiosk reported they were more likely to talk with others in their group about what they observed or did, ask questions about what they observed, and observe a single animal carefully.
- Visitors who interacted with the iSaveSpecies poster kiosk understood great ape conservation efforts more than visitors who did not use the poster kiosk.

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Introduction

The iSaveSpecies project, created by Project Dragonfly at Miami University and a consortium of zoos and aquariums, designed and implemented a socially-networked exhibit system to engage family visitors to zoos and aquariums in inquiry and conservation. iSaveSpecies inquiry and action tools reside in an evolving library of exhibit interactives, modified by partner institutions to suit the particular needs of their visitors.

The first wave of the iSaveSpecies exhibit stations focused on *Great Apes*, allowing families to conduct research on captive ape populations and to help save wild apes by joining the work of experienced field conservationists. Six partner institutions — 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 — have participated in this project, incorporating three touchscreen-based research and action kiosks in or near their ape/bonobo/orangutan exhibits. By building cross-institutional partnerships committed to sustaining life on our planet, the iSaveSpecies projects believes that the new tools for inquiry and public action will achieve broad national impact.

To support these efforts, a summative evaluation was conducted to determine the effectiveness of the iSaveSpecies electronic interactive kiosks at engaging families in inquiry, STEM, and conservation actions. This study built on a prior evaluation of the kiosks, the Great Apes Kiosk Evaluation, which focused on visitor interactions with the interactive kiosks. That study found that the level of engagement with the iSaveSpecies interactives was high at most sites and visitors who engaged with the interactives spent up to three minutes longer in a viewing area. Additionally, visitors who interacted with the kiosk were likely to understand the “what?” message, but they were less likely to understand the “why?” message.

While the prior evaluation provided insight into visitor interaction with the kiosks, this study focused on the efficacy of the iSaveSpecies interactive kiosks engaging visitors and delivering their messages, including encouraging visitors to develop inquiry skills, knowledge of pertinent STEM content, and engaging in specific conservation actions.

A summative design utilized questionnaires and interviews to gather data from zoo visitors. Questionnaire data were gathered from two types of zoo 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 iSave Species kiosks?
3. Did visitors who engaged with the iSaveSpecies conservation poster kiosk understand great ape 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

The audience for this summative evaluation study was adult visitors to the Cleveland Zoo orangutan viewing area. Two types of participants were sought to better understand the impact of the iSaveSpecies interactives—those who used the iSaveSpecies kiosk 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. Since each kiosk had different goals for participants, separate questionnaires were designed and administered for each of the kiosks. While each questionnaire used the same demographic, conservation, and affect questions; each kiosk questionnaire had different inquiry questions. To better understand the impact of the kiosks, data were collected from those who did and those who did not engage with the kiosk. Visitors were asked to complete the questionnaire after they had passed the iSaveSpecies kiosk. Interview scripts and questionnaires can be found in Appendix A.

All data for the two methods of the study were collected with different groups of visitors. Data gathering was impacted by the uniqueness of the zoo's animal viewing area, including the placement of the kiosks within the viewing area.

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 for interviewed visitors.

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

Findings

Participants

Visitor participants in this study completed either an interview or a questionnaire. Those who completed interviews are referred to as “interviewees” throughout this report, those who completed questionnaires are referred to as “respondents.” Table 1 illustrates the number of visitors in each group.

Table 1. Visitor participants by study method

Zoo	Number of Interviewees	Number of Respondents
Cleveland	20	221

Every effort was made to gather data for each interactive kiosk; however, since the Where Do Orangutans Hang Out kiosk was only available for this study at the Cleveland Zoo, an effort was made to interview visitors who had interacted with this exhibit. While the majority of visitors typically commented on only one kiosk, several visitors commented on more than one. Table 2 itemizes the frequency of visitors interviewed per kiosk. No demographic information was collected for visitors interviewed.

Table 2. Exit Interviews completed for each interactive kiosk

Interactive Kiosks	Number of Interviewees
Which Orangutan Are You?	8
Where Do Orangutans Hang Out?	11
Conservation Poster	7

N= 20

Separate questionnaires were designed and administered for each of the kiosks. Table 3 has a breakdown of questionnaires completed by kiosk. Data indicate that respondents were likely to be white (92%) females (73%) traveling through the zoo with family (80%). Almost half of the respondents was frequent visitors, visiting two or more times each year, 13% were first time visitors. The remaining respondents (44%) were infrequent zoo visitors. Almost half of the respondents (41%) spent 5 – 15 minutes with the orangutans. The respondents were unlikely to be zoo members (62%). Appendix B contains tables for each of the demographic questions included in the questionnaire.

Table 3. Questionnaires completed for each interactive kiosk

Interactive Kiosks	Number of Respondents
Which Orangutan Are You?	74
Where Do Orangutans Hang Out?	77
Conservation Poster	70

N=221

Inquiry Skills

Overall, visitors interacting with the iSaveSpecies kiosks used inquiry skills more often than those who did not interact with the iSaveSpecies kiosk during their visit to the orangutan area at the Cleveland Zoo. Skills most often used by those who interacted with the kiosks were talking with others in their group about what they observed or did, asking questions about what they observed, and observing a single animal carefully.

How We Know

Table 4 contains a list of inquiry skills divided by those who interacted with a kiosk (either on this visit or a prior visit) and those who did not interact with any of the kiosks. Inquiry skills most often used by visitors include:

- Talking with others in my group about what I observed or did
- Asking questions about what I observed
- Observing a single animal carefully for more than a few seconds

Questionnaire respondents who interacted with the iSaveSpecies kiosks were more likely to report using inquiry skills than respondents who did not use the iSaveSpecies kiosks. Using a Mann-Whitney U test, statistically significant differences were found with the following skills:

- Talking with others in their group about what they observed or did
- Asking questions about what they observed
- Making a prediction about an animal's behavior
- Recording information about an animal's behavior.

Table 4. Respondents' use of inquiry skills, separated by interaction with kiosks

Inquiry Skills	Interact (Frequency/%) n=124	No Interact (Frequency/%) n=97	z	p
Talked with others in my group about what I observed or did	91 (73%)	59 (61%)	-1.980	.048*
Asked questions about what I observed	47 (38%)	17 (18%)	-3.307	.001***
Observed a single animal carefully for more than a few seconds	42 (34%)	33 (34%)	-.023	.981
Made a prediction about an animal's behavior	30 (24%)	12 (12%)	-2.218	.027*
Discovered that I am similar to an animal	28 (23%)	17 (18%)	-.924	.356
Participated in research by answering questions	25 (20%)	14 (14%)	-1.106	.269
Compared myself to an animal	23 (19%)	19 (20%)	-.195	.845
Recorded information about an animal's behavior (on a touchscreen or on paper)	14 (11%)	3 (3%)	-2.264	.024*
Compared research results with others	9 (7%)	0	-2.703	.007**

N=221

***statistically significant to .001

**statistically significant to .01

*statistically significant to .05

Overall, the kiosks appear equally effective at encouraging the use of specific inquiry skills, additional analysis revealed that inquiry skills were reported consistently among the kiosks. Table 5 includes the complete analysis.

Regarding skills visitors felt they had not engaged in, the issue may be a matter of question semantics. Respondents may have not asked questions about what they observed or they may have felt that they needed to ask a question of a zookeeper or a docent. Those who did not indicate they recorded information about an animal's behavior may not have realized that answering the questions while interacting with the kiosk was recording information.

Table 5. Respondent’s use of inquiry skills, separated by interaction with each kiosk

Inquiry Skills	Poster		Hang Out		Which Are You	
	No Interact N=30	Interact n=40	No Interact n=34	Interact n=43	No Interact n=33	Interact n=41
Talked with others in my group about what I observed or did	14 (47%)	29 (73%)	23 (68%)	35(81%)	22 (67%)	27 (67%)
Asked questions about what I observed	3 (10%)	15 (38%)	6 (18%)	14(33%)	8 (24%)	18 (44%)
Recorded information about an animal’s behavior (on a touchscreen or on paper)			3 (9%)	14 (33%)		
Compared research results with others			0%	9(21%)		
Observed a single animal carefully for more than a few seconds			33(97%)	42 (98%)		
Made a prediction about an animal’s behavior			12(35%)	30 (70%)		
Compared myself to an animal					19 (58%)	23 (56%)
Discovered that I am similar to an animal					17 (52%)	28 (68%)
Participated in research by answering questions					14 (42%)	25 (61%)

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 and interviewees were asked “Based on your viewing in the primate area, what questions do you have about the orangutans?” and “How could someone investigate this?” Less than one third of visitors completing questionnaires (89 of 221) and interviews (7 of 20) shared a question and 57 visitors who completed questionnaires and 7 visitors interviewed shared how they would investigate this question. These low numbers may be due to the visitor’s inability to articulate a question or formulate an investigation about orangutans when they are focused on closed-ended questions or lack time because other members of their party desire to move to another exhibit. Additionally, respondents might not have found the environment conducive to writing a question and/or investigation scenario.

To determine if a question were investigable, responses to the question and investigation were examined collectively. In addition to the original categories of simple/uninvestigable and investigable; two additional question themes emerged, animal contentment and conservation. A question was considered investigable if the visitor proposed to investigate their question by observing the orangutans. For example, two respondents may both have written “What do the orangutans eat?” as their question. If the respondent followed up with an investigation that included watching the orangutan eat, the question was classified as investigable. If the visitor shared they would investigate by asking someone, the question was classified as simple/uninvestigable.

The majority of the questions were considered simple or uninvestigable (68 or 71%). To better understand visitor’s interest, the simple questions were further coded into four categories: behavior, age, environment, and personal. Although the majority of those who answered this question (both questionnaire and interview) shared only one question, a few guests wrote several. Simple/uninvestigable questions were most likely about the orangutans behavior patterns (33), age (20), zoo or natural environment (13), or personal information (12). Personal questions included

those who asked questions about specific orangutans, such as “Where is Gigi?”, “Are the two a couple?” and “What are the growths on her chest?” Visitors also asked behavior-related questions, including: “What/when do they eat?” and “What are all the ropes for?” and “How do they communicate with the zookeeper?”

There were eleven investigable questions, including: “Are their behaviors within the community learned or instincts?” which would be investigated by “observation” and “How long do they sleep?” which would be investigated by “watching them.” Additionally, there were nine questions that focused on the orangutan’s contentment, including “Do they enjoy being in cages?” and “Are they stressed by having people watch them?”

STEM Content

Visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study orangutans, might like to study orangutans, and felt they could help orangutans than visitors who did not interact with the kiosks. Interviewees who completed the Hang Out Kiosk learned where orangutans like to hang out within their enclosure and those who explored the Which Are You kiosk shared that they learned about orangutan behaviors.

How We Know

On a scale where 1 represents Strongly Disagree and 7 represents Strongly Agree, questionnaire respondents who interacted with an iSaveSpecies kiosk were more likely to agree with statements that they were more knowledgeable about how to study orangutans, might like to study orangutans, and felt they could help orangutans. See Table 6. Analyzing the data with an independent samples t-test, statistically significant differences were found with every statement. Statements that were found to be statistically significant to the .001 level include:

- I am more knowledgeable about how to study orangutans
- I am more aware that orangutans need to be protected
- I would like to work to help save orangutans in the wild
- I can help orangutans.
- I visit the Cleveland Zoo to learn and/or support conservation.

Interviewees who completed the Hang Out Kiosk learned where orangutans “like to hang out, I thought tree but they like to hang out on rocks.” Interviewees who explored the Which Are You kiosk shared that they learned about “how orangutans like to act, they can be playful, shy, aggressive. I was like a shy one.”

Table 6. Respondents' feelings regarding STEM content, separated by interaction with kiosks

	No Interaction	Interaction	Mean Difference	t	Df	p
I feel . . .						
I am more knowledgeable about how to study orangutans.	3.34	4.35	1.004	-4.387	193	.000***
I can investigate orangutan behavior through careful observation. v	3.90	4.47	0.573	-2.439	195	.016*
I am more aware that orangutans need to be protected.	4.33	5.17	0.84	-3.274	195	.001***
I can help orangutans.	3.84	4.67	0.831	-3.536	194	.001***
I might like to study orangutans (behavior, personality, etc.)	3.45	4.16	0.704	-2.890	191	.004**
I understand orangutans better	3.73	4.44	0.713	-2.918	188	.004**
I would like to work to help save orangutans in the wild	3.43	4.26	0.833	-3.374	193	.001***
I visit the Cleveland Zoo to learn and/or support conservation.	3.95	4.94	0.985	-3.875	196	.000***

N=221

n for No Interaction ranges from 82-86

n for Interaction ranges from 97-101

***statistically significant to .001

**statistically significant to .01

*statistically significant to .05

Conservation Efforts

Cleveland Zoo visitors interacting with the iSaveSpecies poster kiosk were more likely to report they understood great ape conservation efforts than visitors who did not use the iSaveSpecies poster kiosk. Visitors who engaged with the iSaveSpecies conservation poster kiosks were more likely to report they created a conservation poster and e-mailed it to someone than those who did not engage.

How We Know

Statistically significant differences were found between respondents who interacted with the iSaveSpecies poster kiosk and those who did not, using a Mann-Whitney U test, for the following statements:

- Learned about an animal or conservation issue
- Shared what I learned with others

The poster kiosk appeared to raise visitor awareness of orangutan behavior and habitat. Table 7 illustrates visitors' knowledge of conservation issues by interaction with the poster kiosk. Interviewees who explored the Poster Kiosk learned that "Orangs spend time in trees, I learned that from reading the words on the side" and the "different sounds of the rain forest."

Respondents were asked to rate their level of agreement with a set of conservation-themed statements, where 1 represents Strongly Disagree and 7 represents Strongly Agree. (See table 8.) Data were analyzed for two groups, those who interacted with the Poster kiosk on this visit or a prior visit and those who did not interact with the Poster kiosk. Questionnaire respondents interacting with the iSaveSpecies poster kiosk were more likely to agree with statements that they are more aware that orangutans need to be protected, visit the Cleveland Zoo to learn and/or

support conservation, and understood orangutans better. Statistically significant differences using a t-test were found between the two groups for each statement. Two statements found to be statistically significant at the .001 level were:

- I am more aware that orangutans need to be protected
- I visit the Cleveland Zoo to learn and/or support conservation.

Table 7. Visitors’ knowledge of conservation issues separated by interaction with kiosks

Poster	No Poster N=181	Poster N=40	z	p
Learned about an animal or conservation issue	12 (7%)	28 (70%)	-10.948	.000***
Shared what I learned with others	4 (2%)	15 (38%)	-10.282	.000***

***statistically significant to 0.001

The statement with the highest mean score for both groups was “I am more aware that orangutans need to be protected,” indicating visitors understand that the orangutans need to be protected, either from this or prior zoo visits, or from messages received outside the zoo.

Table 8. Respondents’ feelings regarding conservation measures separated by interaction with the poster kiosk

I feel . . .	No Poster	Poster	Mean Difference	t	df	p
I am more aware that orangutans need to be protected.	4.57	5.91	1.346	4.109	195	.000***
I can help orangutans.	4.16	5.00	0.84	2.693	194	.008**
I might like to study orangutans (behavior, personality, etc.)	3.73	4.44	0.705	2.150	191	.033*
I understand orangutans better	3.98	4.91	0.925	2.860	188	.005**
I would like to work to help save orangutans in the wild	3.77	4.51	0.746	2.306	193	.022*
I visit the Cleveland Zoo to learn and/or support conservation.	4.31	5.42	1.102	3.347	196	.001***

N=221

n for No Poster ranges from 158-163

n for Poster ranges from 32-36

***statistically significant to .001

**statistically significant to .01

*statistically significant to .05

Specific conservation action statement means were found to be closer to the midpoint (4) than the general conservation statements. While a statistically significant difference was found between visitors who engaged with the iSaveSpecies conservation poster kiosk and those who did not create a conservation poster and e-mail it to someone, the overall means for both groups were below the midpoint.

Table 9. Visitors' likelihood of completing specific conservation actions

	No Poster	Poster	Mean Difference	t	df	p
Create a conservation poster and e-mail it to someone.	2.42	3.49	1.07	3.307	203	.001***
Use Palm Oil Guide	2.85	3.51	0.663	1.835	201	.068
Donate to this zoo for orangutan conservation or ask others to do so.	3.72	4.03	0.306	.918	203	.360
Purchase Sustainable	3.47	4.26	0.79	2.177	202	.031*

N=221

n for No Poster ranges from 168-169

n for Poster ranges from 35-37

***statistically significant to .001

*statistically significant to .05

Although the majority of interviewees either could not share a specific action tied to the iSaveSpecies kiosks, there were two (of 21) interviewees who shared specific actions. One interviewee shared about palm oil, "Using and/or purchasing some of the items on the sign about palm oil sustainability. That's why I sent the palm oil guide to myself." The second interviewee shared about the poster, she thought "the exhibit was perfect for her 17 year-old son because he could email poster to a friend and he is really into social media."

Value Added

Visitors who used the iSaveSpecies kiosks found that the kiosks added value to their visit.

How We Know

Respondents who indicated they interacted with a kiosk were asked to rate their level of agreement with a set of value-added statements, where 1 represents Strongly Disagree and 7 represents Strongly Agree. See Table 10. All statements were found to be above neutral, indicating visitors were generally pleased with the kiosks. All those interviewed were part of family groups and respondents appeared to appreciate that the kiosk was an activity they could do with others in their group. Respondents also indicated they had fun, learned new information, and found a different way to engage with the animals from the kiosk.

Table 10. Respondents who interacted with a kiosk feelings regarding value added statements

	Mean	Std. Deviation
The touchscreen interactive provided an activity I could do with others in my group	4.71	1.953
I had fun with the touchscreen interactive activity.	4.70	1.903
The touchscreen interactive provided me with new information	4.67	1.905
The touchscreen interactive was appealing	4.66	1.793
The touchscreen interactive activity provided me a different way to engage with the animals	4.60	1.947
Stopping at the touchscreen interactive was worth my time	4.58	1.730
I will look at orangutans differently because of the touchscreen interactive activity	4.52	1.993

N ranges from 107-110

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?

To some degree. Closed-ended questions indicate the kiosks appear to be effective in promoting basic inquiry skills and increasing visitors' knowledge of orangutans. Visitors who interacted with a kiosk were more likely to talk with others in their group about what they observed or did, ask questions about what they observed, and observe a single animal carefully.

However, an essential inquiry skill is the ability to ask questions that lead to investigations. While responses to a close-ended question indicated respondents asked questions about what they observed, they were less likely to share a question about the orangutans in response to an open-ended follow-up question on the questionnaire. Additionally, when asked how they would investigate their question, those who responded favored finding the answer on the internet or asking a zoo employee, rather than observing the orangutan. The low number of responses, the high number of simple/uninvestigable questions, and the visitors' passive investigation techniques may be due to several factors including a lack of time or an environment un conducive to writing a question and/or investigation. This study found a high percentage of first time and infrequent zoo visitors. Research indicates that new and infrequent visitors to a museum or zoo try to see as much as possible, spending less time with any individual exhibit; this might explain visitors lack of time to complete this question.

Did visitors who engaged with the iSaveSpecies interactive kiosks have a better understanding of the STEM content related to the iSave Species kiosks?

Yes, visitors who interacted with the iSaveSpecies kiosks reported they felt more knowledgeable about how to study orangutans, might like to study orangutans, and felt they could help orangutans than visitors who did not interact with the kiosks. Interviewees that completed the Hang Out Kiosk learned where orangutans like to hang out within their enclosure and those who explored the Which Are You kiosk shared that they learned about orangutan behaviors.

Did visitors who engaged with the iSaveSpecies conservation poster kiosk understand great ape conservation efforts? and Did visitors who engaged with the iSaveSpecies conservation poster kiosks report involvement in specific conservation actions?

To some extent. Cleveland Zoo visitors who interacted with the iSaveSpecies poster kiosk were more likely to report they understood great ape conservation efforts than visitors who did not use the poster kiosk. Additionally, these visitors were more likely to report having created a conservation poster and e-mailed it to someone. However, the mean scores were

fairly neutral; with the mean scores for the majority of statements rated at the midpoint or slightly above.

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 they had fun, found a different way to engage with the animals, and received new information from the kiosk. The kiosks provided visitors on opportunity to participate in an activity they could do with others in their group.

Appendix A: Data Collection Instrument Samples

Cleveland Zoo Interview

This zoo has recently installed some new interactive kiosks in this area and we are trying to better understand who uses these and what visitors might gain from these experiences. May I ask you a few questions about your experience in the orangutan area. It will take about ten minutes and your participation is voluntary and your responses are completely confidential.

Begin by showing visitor screen shot cards and asking the following questions for each of the 3 kiosks (A, B, C).

A	<p>1. During your visit today, do you remember seeing this exhibit? Y N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y N If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>
B	<p>1. During your visit today, do you remember seeing this exhibit? Y N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y N If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>
C	<p>1. During your visit today, do you remember seeing this exhibit? Y N</p> <p>2. Did you, or anyone in your group, interact with the exhibit (push buttons, read information, etc)? Y N If yes, what did you do?</p> <p>3. If yes to question 2, who in your group interacted with the exhibit.</p> <p>4. What did you learn, if anything, from this exhibit?</p>

Talk to me about how this/these experiences [with the kiosks] relate to investigating orangutans or how to understand them better?

Based on your viewing in the primate area, what questions do you have about the orangutans?

How could someone investigate this?

This zoo is committed to conserving animals in the wild. Did these experiences introduce you to or remind you of things you might do to help the primates?

**Cleveland Metroparks Zoo
Where Do Orangutans Hang Out?**

This zoo has recently installed new 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 with the orangutans?

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

During your visit today, do you remember seeing this touchscreen interactive? Yes No



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

- Yes No

Who in your group interacted with the exhibit?

#Adult _____ #Youth _____

Please circle the best answer if you did any of the following during your visit at the orangutan area:

- | | | |
|--|-----|----|
| Observed a single animal carefully for more than a few seconds | Yes | No |
| Made a prediction about an animal's behavior | Yes | No |
| Recorded information about an animal's behavior (on a touchscreen or on paper) | Yes | No |
| Compared research results with others | Yes | No |
| Asked questions about what I observed | Yes | No |
| Talked with others in my group about what I observed or did | Yes | No |

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

- Yes No

Based on your viewing in the orangutan area, what is a question you would like to ask about the orangutans?

How could someone investigate your question?

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
Use and share the palm oil shopping guide.	1	2	3	4	5	6	7
Give money to this zoo for orangutan conservation.	1	2	3	4	5	6	7
Purchase products that use sustainably grown palm oil.	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 knowledgeable about how to study orangutans.	1	2	3	4	5	6	7
I can investigate orangutan behavior through careful observation.	1	2	3	4	5	6	7
I am more aware that orangutans need to be protected.	1	2	3	4	5	6	7
I can help orangutans.	1	2	3	4	5	6	7
I might like to study orangutans (behavior, personality, etc.)	1	2	3	4	5	6	7
I understand orangutans better	1	2	3	4	5	6	7
I would like to work to help save orangutans in the wild	1	2	3	4	5	6	7
I visit Cleveland Metroparks Zoo to learn and/or support conservation.	1	2	3	4	5	6	7

If you used the touchscreen interactive today, please answer the question below. **If not, please skip to the next page and tell us a little about yourself.**

We would like to know if the touchscreen interactive **added value** to your experience with the orangutans. 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 orangutans 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 Cleveland Metroparks Zoo?

- Yes
- No

About how often do you visit Cleveland Metroparks Zoo?

- 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 with today?

Including you, how many people are in your group today?

Adults _____ # Children _____

Are you

- Male
- Female

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? [Check all that apply]:

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

What are the ages of the children in your group (if any)? [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

Thank you for taking the time to help us today!

**Cleveland Metroparks Zoo
Help Save Orangutans! Poster**

This zoo has recently installed new 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 with the orangutans?

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

During your visit today, do you remember seeing this touchscreen interactive? Yes No



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

- Yes No

Who in your group interacted with the exhibit?

#Adult _____ #Youth _____

Please circle the best answer if you did any of the following during your visit at the orangutan area:

Learned about an animal or conservation issue	Yes	No
Shared what I learned with others	Yes	No
Asked questions about what I observed	Yes	No
Talked with others in my group about what I observed or did	Yes	No

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

- Yes No

Based on your viewing in the orangutan area, what is a question you would like to ask about the orangutans?

How could someone investigate your question?

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
Use and share the palm oil shopping guide.	1	2	3	4	5	6	7
Give money to this zoo for orangutan conservation.	1	2	3	4	5	6	7
Purchase products that use sustainably grown palm oil.	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 knowledgeable about how to study orangutans.	1	2	3	4	5	6	7
I can investigate orangutan behavior through careful observation.	1	2	3	4	5	6	7
I am more aware that orangutans need to be protected.	1	2	3	4	5	6	7
I can help orangutans.	1	2	3	4	5	6	7
I might like to study orangutans (behavior, personality, etc.)	1	2	3	4	5	6	7
I understand orangutans better	1	2	3	4	5	6	7
I would like to work to help save orangutans in the wild	1	2	3	4	5	6	7
I visit Cleveland Metroparks Zoo to learn and/or support conservation.	1	2	3	4	5	6	7

If you used the touchscreen interactive today, please answer the question below. **If not, please skip to the next page and tell us a little about yourself.**

We would like to know if the touchscreen interactive **added value** to your experience with the orangutans. 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 orangutans 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 Cleveland Metroparks Zoo?

- Yes
- No

About how often do you visit Cleveland Metroparks Zoo?

- 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 with today?

Including you, how many people are in your group today?

Adults _____ # Children _____

Are you

- Male
- Female

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? [Check all that apply]:

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

What are the ages of the children in your group (if any)? [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

Thank you for taking the time to help us today!

**Cleveland Metroparks Zoo
Which Orangutan Are You?**

This zoo has recently installed new 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 with the orangutans?

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

During your visit today, do you remember seeing this touchscreen interactive?

- Yes No



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

- Yes No

Who in your group interacted with the exhibit?

#Adult _____ #Youth _____

Please circle the best answer if you did any of the following during your visit at the orangutan area:

- | | | |
|---|-----|----|
| Participated in research by answering questions | Yes | No |
| Compared myself to an animal | Yes | No |
| Discovered that I am similar to an animal | Yes | No |
| Asked questions about what I observed or did | Yes | No |
| Talked with others in my group about what I observed or did | Yes | No |

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

- Yes No

Based on your viewing in the orangutan area, what is a question you would like to ask about the orangutans?

How could someone investigate your question?

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
Use and share the palm oil shopping guide.	1	2	3	4	5	6	7
Give money to this zoo for orangutan conservation.	1	2	3	4	5	6	7
Purchase products that use sustainably grown palm oil.	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 knowledgeable about how to study orangutans.	1	2	3	4	5	6	7
I can investigate orangutan behavior through careful observation.	1	2	3	4	5	6	7
I am more aware that orangutans need to be protected.	1	2	3	4	5	6	7
I can help orangutans.	1	2	3	4	5	6	7
I might like to study orangutans (behavior, personality, etc.)	1	2	3	4	5	6	7
I understand orangutans better	1	2	3	4	5	6	7
I would like to work to help save orangutans in the wild	1	2	3	4	5	6	7
I visit Cleveland Metroparks Zoo to learn and/or support conservation.	1	2	3	4	5	6	7

If you used the touchscreen interactive today, please answer the question below. **If not, please skip to the next page and tell us a little about yourself.**

We would like to know if the touchscreen interactive **added value** to your experience with the orangutans. 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 orangutans 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 Cleveland Metroparks Zoo?

- Yes
- No

About how often do you visit Cleveland Metroparks Zoo?

- 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 with today?

Including you, how many people are in your group today?

Adults _____ # Children _____

Are you

- Male
- Female

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? [Check all that apply]:

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

What are the ages of the children in your group (if any)? [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

Thank you for taking the time to help us today!

Appendix B: Demographic Tables

Table 11. Amount of time spent with orangutans

	Number	%
Less than 3 minutes	31	14.4%
3 – 5 minutes	90	41.7%
5 – 10 minutes	71	32.9%
10 – 15 minutes	17	7.9%
15 + minutes	7	3.1%

N = 216

Table 12. Zoo membership

	Number	%
Yes	82	37.8%
No	135	62.2%

N = 217

Table 13. Visit frequency

	Number	%
Today is my first visit	30	13.6%
I haven't visited for many years	24	10.9%
Once every few years	30	13.6%
About once a year	43	19.6%
2-4 times per year	53	24.1%
5+ times per year	40	18.2%

N = 220

Table 14. Others in respondent's group

	Number	%
Family	138	80.2%
Friends	6	3.5%
Family & Friends	11	6.4%
Couple	12	7.0%
Alone	2	1.2%
Group	0	0%
Other	3	1.7%

N = 172

Table 15. Number of Adults in Respondent's Group

	Number	%
1	58	26.9%
2	93	43.1%
3	37	17.0%
4	22	10.2%
5	5	2.3%
6	1	0.5%
7	0	0%
8	0	0%
9+	0	0%

N = 216

Table 16. Ages of adults in respondent's group

	Number	%
18-29	95	43%
30-39	70	32%
40-49	65	29%
50-59	30	14%
60+	47	21%

N = 221

Table 17. Number of Children in Respondent's Group

	Number	%
0	0	0%
1	45	28.5%
2	64	40.5%
3	24	15.2%
4	17	10.8%
5	5	3.2%
6	2	1.2%
7	1	0.6%
8	0	0%
9	0	0%
10+	0	0%

N = 158

Table 18. Ages of children in respondent's group

	Number	%
Infant – less than 2 years old	38	17%
2 – 4 years old	62	28%
5 – 7 years old	68	31%
8 – 12 years old	73	33%
13 – 17 years old	41	19%

N = 221

Table 19. Respondents' Gender

	Number	%
Male	59	26.9%
Female	160	73.1%

N = 219

Table 20. Respondents' Race/Ethnicity

	Number	%
African American/Black	8	3.7%
American Indian/Native Alaskan	0	0%
Asian/Asian American	2	0.9%
Latino(a) or Hispanic	6	2.8%
Native Hawaiian/Pacific Islander	1	0.5%
White, Non-Hispanic	201	91%

N = 221